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Marlin Moose

First I would like to say, I love your magazine. Of all the different outdoor and gun magazines I receive, this is the one I look for. On page 31 ("Memoriam for Mediums?" May/June), Craig Boddington stated he shot the moose in the lead photograph with a .338 Rem. Ultra Mag, but he has a lever action. I know they do not make a lever action in .338 Rem. Ultra Mag.

Thomas Gresch

Once again your old, befuddled editor has fallen down on the job. Craig submitted images of two different moose, and in looking at his caption list I got them mixed up when I added the caliber to the text of his article. He killed the moose in question with a .338 Marlin Express.—Scott

Best Bet for Forming Brass

Really good insightful, educational article on forming brass ("All That Brass," March/April). Always enjoy learning something new through my reloading endeavors, and until recently I had no need to reform cases. Really like my 6.8 Western cartridge, but the only downside is the availability of brass. Recently I converted .300 WSM by trimming and running through a sizing die, but you can also turn 6.5 and 7 Rem. Short Action Ultra Mag into 6.8 Western as Joseph von Benedikt described in the second half of the article. My question is, given the option, would you rather form through a die or fire-form?

Bruce Abbott

Given the option, I'll always form in a die rather than fire-form. I'm protective of barrel life, and when shooting a powerful cartridge, fire-forming a couple hundred cases can potentially shorten a barrel's life by 20 to 40 percent.—Joseph

Red Dots and Awareness

The "Right on the Dot" piece (March/April) was another great article by Craig Boddington. He stressed one hugely important feature that red dot optics promote: shooting with both eyes open. As he wrote, "Especially in field shooting, the binocular vision advantages of peripheral vision and depth perception cannot be overestimated." Both factors are essential for gun users to maintain a high

awareness of their surroundings. Craig also discusses how the unlimited eye relief of red dots allows them to be positioned farther down the barrel. I think that would also provide shooters with less obstructed views of what is happening around them than do rear-mounted optics.

Many years ago, two young friends were sighting in the scope on a .22, and as the shooter was pulling the trigger, the dog accompanying them bolted in front of the rifle. The spotter yelled, but it was too late. That incident still reminds me of how very limited our field of vision can be, especially with a rear-mounted scope, which can fool us into thinking we are seeing the big picture. Then our environmental awareness gets even narrower as our brains focus on the target. I try to remember that what I am not seeing through those sights is...everything else.

Ed Cox

Clocking Bullets

I really enjoy your magazine, and I especially like reading articles on the older rifles and their chamberings. But after a while, it got me to thinking about how they measured bullet speed back in the day. I know that they didn't have any of the whiz-bang chronographs we do now, so what did they use? I think an article on how they came to their velocities and what they used would be great.

Todd Klein, Montana

That could be interesting. A cursory internet search indicates that the first portable "modern" chronograph dates to 1918. The first Oehler, long considered the gold standard, came out in the mid-1960s.—Scott

Savage Passes It On

Savage Arms continues its support of Pass It On—Outdoor Mentors, a group working to expand opportunities for young hunters to experience safe, mentored hunts. Savage provides guns, gear, people and dollars to help make this happen.

"Getting kids in the outdoors is essential to the future of our pastime, and our conservation efforts," said Beth Shimanski, Savage's marketing director who also serves on Pass It On's board. "As a company, Savage is committed to preserving the hunting heritage by fostering new opportunities for the next generation. Personally, it has been rewarding and inspiring to be directly involved. We're excited for more hunts and hunting experiences done the right way for young hunters."

To learn more about this program or to sign up as a youth hunter, mentor or landowner, check it out at OUTDOORMENTORS.ORG.



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BANISH 223



Quiet in the Backcountry

SHORT AND LIGHT, THE SILENCER CENTRAL BANISH BACKCOUNTRY IS DESIGNED WITH HUNTERS IN MIND.

by J. Scott Rupp

The improved access to suppressors is one of the best things to happen to shooters and hunters in a long time, but some big game hunters are understandably concerned about the added length and weight. Enter Silencer Central's Banish Backcountry (\$1,099, SILENCERCENTRAL.COM).

Able to handle chamberings up to and including .300 Rem. Ultra Mag, it is just 5.5 inches long and weighs only

7.8 ounces. By comparison, the Backcountry's Banish 30 stablemate, which has a similar caliber range, is seven inches long and weighs 11.2 ounces without its extension. That may not sound like much, but it makes a huge difference.

The Backcountry ships with a direct-mount hub with a 5/8x24 thread pitch. That is going to fit the vast majority of barrels in big game chamberings, but if you have a barrel with a different threading, Silencer Central sells a variety of direct-mount hubs in different pitches that will fit the Backcountry—including 1/2x28, 11/16x24, M13x1LH and more. (As an aside, if your current rifle doesn't have a threaded muzzle, the company also offers a barrel threading service for rifles other than lever actions. Visit Silencer Central's website for details.)

This suppressor was designed with hunters in mind. One of the rifles I tested the Backcountry on is a Ruger American Predator in .308. That gun sports an 18-inch barrel, and with the Backcountry installed its overall

length is just 43 inches—only an inch longer overall than your typical bolt action with a 22-inch barrel.

If you spend a lot of time hunting heavy cover, with the Backcountry you get the hearing-saving benefits of a suppressor without sacrificing handling. Similarly, my wife—who's on our suppressor trust, which Silencer Central will set up for free if you want one—used the Backcountry on a whitetail hunt last year. She loved the shorter length for hunting out of various blinds, where maneuvering a rifle to get a shot can be difficult.

Obviously the big reason to get a suppressor is noise reduction. Sure, we all use hearing protection at the range, but it's just as important in the field because every gunshot irreparably damages our hearing to some degree.

The Backcountry's sound suppression is 30 dB. That translates to a reduction in decibels of a .308 Win. to 135 dB; 137 dB for the .300 Win. Mag.; and 138 dB for .300 RUM.

There's definitely a reduction in recoil as well and, obviously, muzzle

blast. Accuracy? I've seen groups shrink significantly by spinning on a suppressor. My Ruger American Gen 2 in 6.5 Creedmoor shot better with the Backcountry with two loads I've tried so far. Hornady's Precision Hunter 143-grain load turned in a 0.42-inch average with the Backcountry, compared to 0.58 inch without. Remington's 129-grain Core-Lokt Tipped ammo improved to a 1.01-inch average from a pedestrian 1.29 inches.

However, suppressors aren't a magic bullet. I've also experienced loads that didn't change or didn't shoot as well with a suppressor aboard. One thing is certain, though. Your point of impact will change, so once you're zeroed with a can, if you decide to shoot without it you'll need to rezero.

And suppressors do change how a rifle handles due to the added weight at the muzzle. For me, the less weight I have out there the better my hold is from unsupported positions. I know—everyone is using bipods and tripods these days. But I think it's still important to be able to shoot unsupported because you never know when that's going to be necessary.

I don't have any empirical evidence to back this up, but in shooting the Backcountry and the short form of the Banish 30 side by side on both Rugers, my holds were much more stable with the Backcountry from offhand and sling-assisted sitting and kneeling.

The Backcountry is made of titanium and has a Cerakote finish, in your choice of black, OD green or tan. The specs list the Backcountry as "not self-service," meaning you can't disassemble it down to individual baffles. But that doesn't mean you can't or shouldn't clean it.

In fact, the company recommends cleaning every 50 to 100 rounds and adds that you should avoid lead or plated bullets. The manual indicates that one way to clean it is to plug the muzzle end and fill with solvent, although be sure the solvent you use won't hurt the Cerakote finish.

It also says you can soak it in soapy water. Since that's how I've always cleaned my flintlock, I decided to try that method. I grabbed one of those



The Banish Backcountry (l.) is notably shorter than the Banish 30, even without the latter's extension installed. The Backcountry's direct-mount hub (below) is threaded 5/8x24, a common pitch found on hunting rifles with threaded muzzles.

plastic containers that lunchmeat comes in, filled it with dish soap and water, and let the Backcountry soak for a couple of hours. Then I ran a nylon twist-wire brush that happened to be the right diameter through it to help loosen the carbon. A nylon .30 caliber bore brush on a pistol-length cleaning rod would've worked just as well.

Prior to this I'd removed the hub with an adjustable wrench and thoroughly cleaned the threads with Bore Tech carbon cleaner. After the body of the suppressor was dry, a process speeded along by a heat gun, I gave those threads a good wipe-down with the same solvent and reassembled.

If you've been reluctant to take the suppressor plunge, as I was initially, Silencer Central makes it oh-so easy. The company handles all the paperwork, and with the exception of the fingerprint kit it provides for \$10, all of it is done electronically. This makes it not only low stress but speeds up the process. Between that and the reduced approval times at ATF, the process takes a lot less time than it used to.

While you're placing your order, do yourself a favor and pick up a suppressor cover. Suppressors heat up quickly, and after multiple shots you'll get a lot of heat mirage coming off it—to the point it can obscure your view of



the target. A cover reduces this significantly. Plus you'll grab a bare, hot suppressor only once—ouch. Silencer Central offers its Devour line of covers, including a 5.5-inch version designed specifically for the Backcountry.

The cost of the suppressor and the \$200 federal tax stamp puts you squarely in the realm of buying a new rifle. But the benefit of saving your hearing is priceless, and the Backcountry can be used on multiple rifles because of its wide caliber range. If your piggy bank is lighter than you wish it was, Silencer Central offers interest-free financing options that won't increase your wait time.

I own several suppressors now, and the Backcountry one stands out as the most versatile of the bunch. For most hunters it's going to cover all the bases and is well worth the investment. ■

CARTRIDGE CLASH » J. Scott Rupp

.270 Winchester vs Itself

Ed. Note: One of our most famous hunting cartridges, the .270 Win., turns 100 years old this year. Brad Fitzpatrick, who usually pens this column, was off somewhere doing writer stuff, so the editor is jumping in.

Time was, the biggest campfire cartridge argument was “.270 or .30-06?” Introduced in 1925 by Winchester in its first centerfire bolt action, the Model 54, the .270 Win. was one of the speed kings of its day, with a 130-grain bullet exceeding 3,000 fps.

It was faster and shot flatter than the already established .30-06, and for a lot of its history it was largely thought of as a Western cartridge—no doubt due in large part to the influence of outdoor writer Jack O'Connor. His exploits using the .270 Win. for sheep, elk, deer and more had a big impact on the sporting public.

The cartridge is based on the .30-03, forerunner of the .30-06. The .270, though, used a .277-inch bullet. That diameter was an out-of-the-box choice at the time, but the round caught on and has been a mainstay for U.S. big game hunters, with plenty of speed and power but relatively low recoil.

The 130- and 150-grain loads have historically been the most popular. A typical 130-grain spitzer load leaves the muzzle at just over 3,000 fps for a muzzle energy around 2,730 ft.-lbs. With a 200-yard zero it'll drop just under 19 inches at 400 yards, retaining around 1,450 ft.-lbs. of energy. The 150 leaves the gate at about 2,850 fps for 2,705 ft.-lbs. At 400 yards it's dropping 24.4 inches and carrying around 1,175 ft.-lbs. of energy.

The .270 is loaded by everyone who sells centerfire hunting ammunition, and countless rifles of every persuasion—bolt, lever, pump, semiauto,

single-shot, straight pull—have been chambered to it.

For all its attributes, though, some consider the .270 somewhat limited. Thanks to its typical 1:10 twist it can't really handle anything heavier than 150-grain bullets. That shortcoming led to the recent 6.8 Western, which is designed to shoot long, heavy .277 bullets up to 170 grains with high ballistic coefficients.

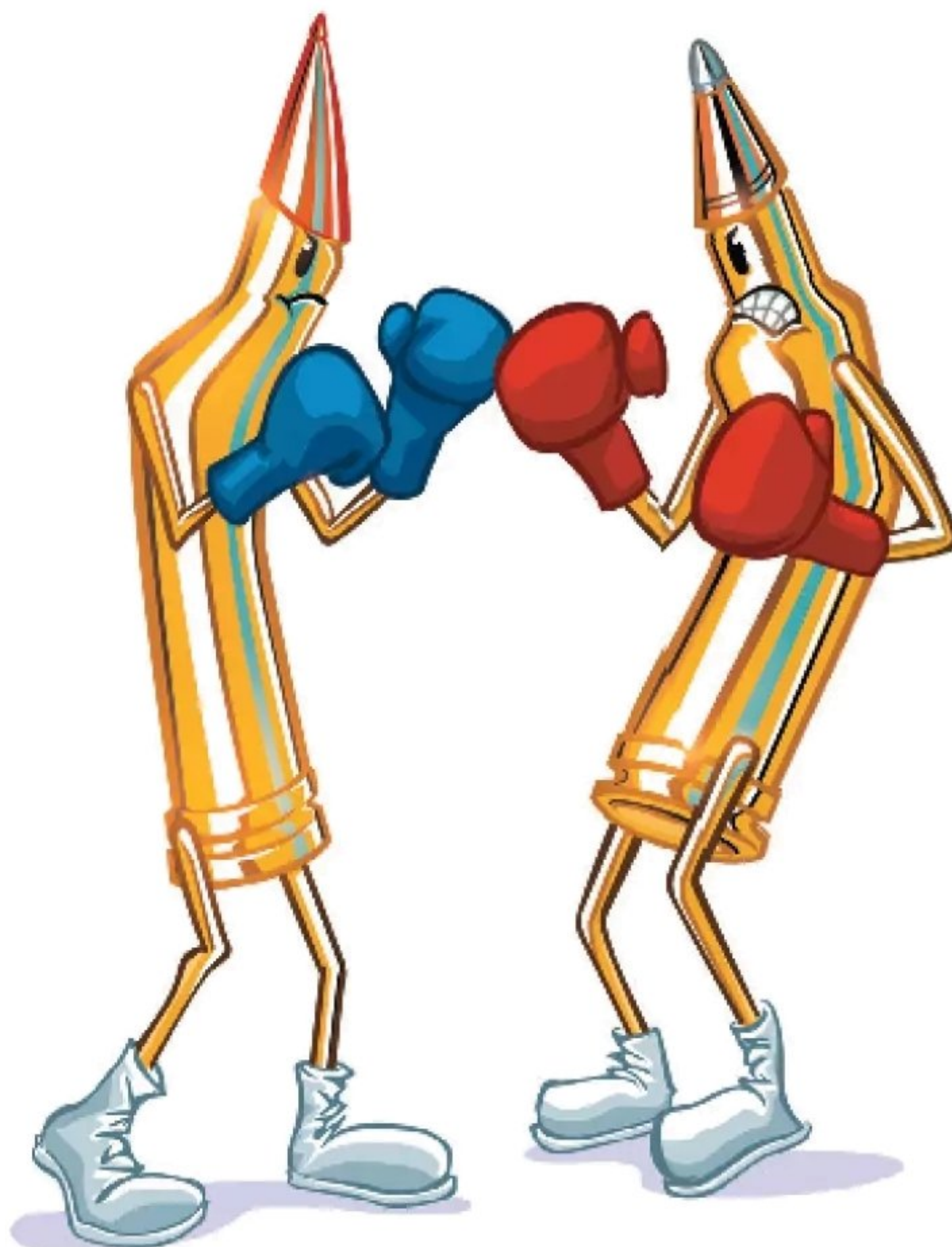
Whether you find this restricting depends on what, how and where you hunt. Deer? The .270 is all you ever need for whitetails, mulies or black-tails. Same goes for wild sheep (just ask Jack), goats and pronghorns.

Bigger game? The .270 was and is an effective elk cartridge with proper bullet and placement. And if you think it's on the light side for moose, lots of hunters would tell you you're wrong, including me. On a once-in-a-lifetime combo sheep/moose hunt in Alaska, I killed a fine ram at over 200 yards and a few days later anchored a monster moose with the same .270 at 30 yards.

While I don't have a ton of experience with black bears, there's really no reason the right .270 bullet placed in the right spot won't work. Brown bears? I'm sure it's been done, but you won't catch me trying it.

On my first African safari, one of the guys in camp killed every species of plains game on his menu—warthog, gemsbok, kudu, even an eland—with a .270. One-shot kills all.

It's fashionable these days to look down one's nose at long-action cartridges; short actions are all the rage.



In last year's big game rifle roundup, of the rifles we covered the .270 was chambered in only 17 new models; its fellow long-action old-timer, the .30-06, just 19. That compares to 31 for the 6.5 PRC, 23 for the 7mm PRC and .308 Win., and 22 for the 6.5 Creedmoor.

As someone who shoots both the .308 and the .280 Rem. a lot, I don't get hung up on action length, although I certainly understand the advantages that short actions offer.

As Craig Boddington is fond of saying, you can't love or use all cartridges equally. Other than that Alaska trip and maybe one or two other “work” hunts, I was never a .270 guy. But if you handed me a good-shooting .270 right now and told me this was the only rifle I could use for the rest of my hunting days, I'd just nod and say “Okay”—and not feel like I'd gotten a raw deal.

.270 WINCHESTER

HITS

- Shoots flat with plenty of energy
- Not a ton of recoil
- Lots of ammo, load data and guns

MISSES

- Relatively narrow bullet range
- 1:10 twist can't handle the high BC stuff
- Long actions losing their luster

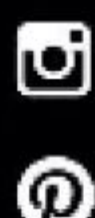


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Aftermarket 700 Triggers



Options for replacing your Model 700 or clone include (l.-r.) Rise Armament Reliant Pro, Geissele Super 700, Timney The Hit, Jard Ultra Match and Trigger Tech Diamond.

The Remington 700 has been a mainstay of the American rifle shooter since 1962, and its action has been cloned more than any other in history. It is easily among the most customizable rifles you can own. Limitless upgrades exist for this platform, chief among which is the trigger group. I did some digging to round up and test the best of the best for your consideration.

JARD ULTRA MATCH While Jard itself has been in business since 2000, this trigger has only been around since late 2024—spurred by a demand for a four-lever trigger when rival trigger maker Jewell ceased production. This system increases mechanical advantage, allowing for the lightest pull possible.

I found a pull-weight adjustment range of four to six ounces, making it the lightest I would test. Overtravel is also adjustable, with both aspects being accessible without having to remove the stock. Jard offers models with a trigger-mounted bolt release for true Remington 700 actions, as well as versions where this part is omitted for the clones that move the bolt release to the receiver.

It is available only for right-handed equipment, although the company indicates that the removal of the safety will permit the unit to fit left-handed

actions and stocks. However, this practice should be reserved only for rifles that will be fired the instant they are loaded, like in benchrest competition. **>>\$255, JARDINC.COM**

RISE ARMAMENT RELIANT PRO This is the first trigger from Rise outside the AR realm. Rise prides itself on the safety features baked into the Reliant Pro, including the Posi-Catch overtravel and pull-weight screws. This system captures these parts from falling free from the rifle while offering tactile click adjustments designed to stay in place under recoil.

The Reliant Pro is one of the few triggers to include a complete tool kit, making installation a breeze. I was able to dial the pull weight down to 23 ounces with a max of 58. Best of all, both pull weight and overtravel adjust screws are accessible through the trigger guard. It is available only in the right-handed configuration, but there are versions for both true 700s and their clones, each with the option of either a straight or curved trigger bow. **>>\$260, RISEARMAMENT.COM**

GEISSELE SUPER 700 Known for its AR triggers, Geissele also makes a honey of a trigger for the 700: the Super 700. In its traditional style, it is one of the few two-stage Remington 700 triggers on the market, but it can also be con-

verted to single-stage. The Super 700 comes configured for a conventional Remington 700 action, but the bolt release is removable, giving you more flexibility to transfer it to other rifles. The pull weight of each stage is adjustable, as is the amount of overtravel. I found a total pull weight range of 19 to 51 ounces. Southpaws are out of luck on this one, although Geissele has teased two new additions to this series in the coming years. **>>\$250 (at press time), GEISSELE.COM**

TRIGGERTECH DIAMOND At the core of this trigger sits a rolling friction mechanism that rounds out a typically square sear engagement. And to keep tolerances as tight as possible, the most important parts are crafted as a matched set, much in the way that custom firearms themselves are built.

The result produced, in my test, a minimum break weight of 4.2 ounces and a top end of 30 ounces according to my test. These adjustments are also made through the trigger guard, again eliminating the requirement to remove the stock.

The Diamond offers options galore. It can be purchased in either a single- or two-stage configuration with one of two curved finger levers or the increasingly popular straight one. There are even left-handed options. **>>\$325, TRIGGERTECH.COM**

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LANDS & GROOVES

TIMNEY THE HIT Timney is older than the Remington 700 itself, and it has several offerings for the Remington 700 owner. I chose The Hit for this review simply because it covers so many shooters, and Timney says all of The Hit's parts are fully machined—nothing stamped or metal-injection molded.

The unit comes configurable for either a clone or true 700 and offers an option for either right-hand or left-hand. Buyers can also select their lowest adjustment value in one of four versions. I opted for the eight-ounce option and found it to be spot on, with a maximum pull weight of just shy of two pounds.

Take note that the gun's stock does need to be removed to make pull-weight adjustments, so I found it best to dial everything in during installation. Overtravel is also adjustable but not advisable, and in my testing I did not see any reason to



The Reliant Pro from Rise comes with a complete installation tool kit.

work outside of the manufacturer's suggestion.

>> \$261, TIMNEYTRIGGERS.COM

I can't crown one king after testing, especially since they are all within \$75 of each other. Remember

that pull-weight values are dependent on firing pin spring tension, so you might need to do some work there to achieve spec weights. I think each is going to satisfy the discerning shooter and just might inspire you to build a few extra rifles.—*Frank Melloni*

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The Model 2020 Rimfire family offers shooters a refined rimfire rifle with all the quality and performance you've come to expect from Springfield Armory. Offered in both Classic wood-stocked and Target synthetic-stocked versions, the Model 2020 Rimfire carries an impressive accuracy guarantee and the heirloom quality of a firearm you will keep in your family for generations.



SPRINGFIELD ARMORY.

SPRINGFIELD-ARMORY.COM



Mossberg Patriot Carbine

Sporting shorter threaded barrels just right for suppressor use, the Patriot Carbine line offers a wide range of options for today's hunters. The lineup is available in .22-250 (18-inch barrel, threaded 1/2x28), 6.5 Creedmoor (18, 5/2x24), 6.5 PRC (20, 5/8x24), 7mm PRC (20, 5/8x24), .308 (16.5 and 18, 5/8x24), .300 Win. Mag. (20, 5/8x24), .350 Legend (18, 11/16x24) and .450 Bushmaster (18, 11/16x24). Weight range for the synthetic-stocked guns is right around 6.5 pounds, and each is fitted with a Picatinny optics rail and Mossberg's excellent LBA trigger.

>>MOSSBERG.COM

Burris Fullfield

To commemorate the Fullfield's 50th anniversary, Burris has introduced an all-new lineup built on one-inch tubes. Models include 2-8x35mm, 2.5-10x42mm, 3-12x42mm, 3-12x56mm, 4-16x50mm (shown) and 6-24x50mm. Reticles are in the second focal plane, and the new Fullfields can be had in styles from standard duplex to advanced ballistic. This is the first Burris scope to feature a turret system that allows you to switch between capped and exposed knobs, and it will accept Burris's custom laser-engraved knobs.

>>\$192-\$600, BURRISOPTICS.COM



Fiocchi Hyperformance Barnes TTSX

The TTSX is a tipped monometal design that delivers excellent weight retention and a level of accuracy that can be a cut above what other all-copper bullets offer. Now the TTSX is in Fiocchi's Hyperformance line. Offerings include both PRCs: a 120-grain at 3,070 fps in the 6.5 and a 150 at 3,110 in the 7mm. There's also a 168-grain .308 (2,670 fps) and a 120-grain 6.5 Creedmoor (2,900 fps). And good on Fiocchi for including the .243 Win. (80 at 3,275) as well as the 6mm Creedmoor (80 at 3,300).

>>FIOCCHIUSA.COM



MTM Case-Gard Carbine Rifle Case

The perfect companion for your SBR or pistol-caliber carbine, this new case measures 34x9.5x3.2 inches inside. Exterior dimensions are 35x11.8x4.0 inches, which is great for throwing in your vehicle without taking up a ton of space. It's built of high impact plastic and features a foam lining. Dual padlock points on either side of the integral handle offer security.

>>\$50, MTMCASE-GARD.COM



Remington Ole Granddad

Shooters of a certain age hold the Remington bullet knife in high regard. This year's edition is a lockback folder featuring a genuine bone handle in a natural stag color, with the famous nickel silver bullet shield on the side. The 3.73-inch clip blade is 440-C stainless that's polished to a light satin. Made in the U.S.A. from U.S. materials.

>>\$160, REMINGTON.COM





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A sleek, modern take on the classic lever action rimfire rifle. Crafted with precision engineering and advanced materials, this rifle embodies a fusion of tradition and innovation. Your new go-to backpack rifle boasts timeless aesthetics with cutting-edge performance and a simple takedown. This rifle sets a new standard in rimfire firearms. This is Revel.



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Much Ado About the '92

WINCHESTER'S 92 TRAPPER WAS A HANDY RIFLE THAT TODAY IS A VALUABLE GUN FOR COLLECTORS.

If there's one Browning-designed Winchester lever action that can rival the Model 94 in terms of sheer popularity, it'd be the slightly earlier Model 92. As great as the Model 94 was—and, of course, is—the short throw and greased-glass action of the original Model 1892, which is a direct descendant of Browning's larger 1886, kept it alive all the way to 1945. The original run of Model 92s numbered 1,007,608 rifles.

While the 94 was chambered the .30-30 Win. and .32 Spl., Model 92 calibers included .218 Bee, .25-20, .32-20, 38-40 and, of course, the iconic .44-40.

The Model 92 served as a wildly popular, yet chronologically incorrect, stand-in for other Winchesters in countless Western movies and TV shows. The most notable examples were the big-loop Model 92 of "The Rifleman" TV series and John Wayne's rifle in "Stagecoach."

Throughout its original half-century production run, the Model 92 was produced in several variants. Today, there are five models marketed by Winchester stateside.

The original I have here is one of the relative rarities: a 14-inch Trapper's Carbine in .44-40. It could also be had in 15-, 16- or 18-inch barrel lengths. All



With its short barrel and short throw, the original Model 92 Trapper in 14-inch trim is about as handy a carbine as was ever made. (Below) Step-adjustable open iron sights and a saddle ring are traditional hallmarks of a Winchester saddle gun.

these were round barrels with two barrel bands. Because of their curio & relic status, the rifles under 16 inches are exempt from standard federal short-barrel-rifle regulations—if the rifle is a documented factory original.

This sample was made in 1905 and had stood unmolested in a farm shed for nearly half a century. The owner, Richard Jackson, had relegated it to "family heirloom" status until I prevailed upon him to drag it to the range.

The bore was more than a bit on the crusty side, and the overall finish was advanced well beyond the patina stage. But it took everyone's breath away who handled it.

You could put up a pretty good case for the .44-40 as "The Caliber That Won the West." Designed in 1873 to pair with Winchester 1873, it was also the premier chambering for Colt's Single Action Army, thus providing rifle/handgun cartridge commonality. And the cartridge transitioned seamlessly into the Winchester Model 92.

My .44-40 factory ammo supply included Cowboy Action loads from Hornady and Black Hills, along with Winchester's Super-X jacketed soft-point. The 14-inch barrel generated somewhat higher velocities than factory specs, but recoil was very tolerable and that short barrel was slightly less "blasty" than expected. And while the .44-40 wouldn't be anyone's first choice



as a deer load today, it anchored more than its share of venison during its lengthy heyday.

In terms of accuracy, the Model 92 Trapper preferred the Black Hills 200-grain stuff. I shot it at 40 yards, and three-shot groups stayed just under two inches, which seemed pretty good for open sights, old eyes and a pretty rough bore.

A Model 92 Trapper of any vintage or caliber—and with a relatively short barrel length—would make for an ideal pickup-truck rifle. Original Model 92s in good shape are pricey, and many eclipse the \$2,000 mark. Short-barreled Trapper versions are really expensive. I read an article about a Trapper with a 15-inch barrel, circa 1904, that was valued at at least \$8,000.

The idea of the Trapper was obviously too good to abandon, although the legal 16-inch barrel is as short as you're going to get these days. Unless you luck into an original like the one I was fortunate enough to shoot. ■

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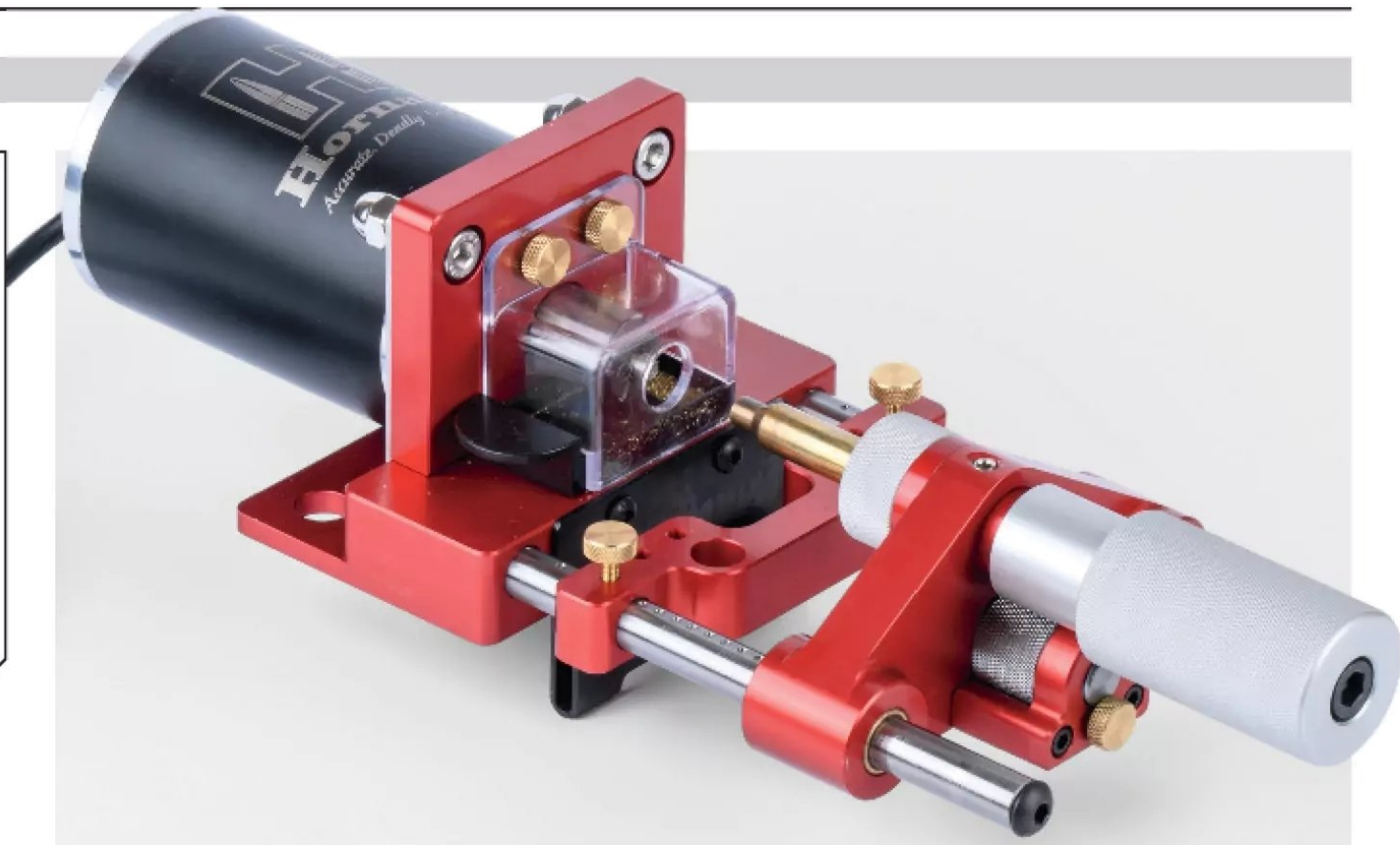


RCBS.COM



The Need for Speed

HORNADY'S NEW 3-IN-1 HIGH-SPEED CASE TRIMMER MAY BE THE BEST AND FASTEST SUCH TOOL EVER DESIGNED.



Hornady's 3-in-1 trimmer is built for speed and ease of use. It can trim up to 25 cases per minute, with case-length click adjustments of 0.001 inch via the small knurled silver wheel.

Historically, case trimming is tedious and slow to accomplish because it requires a lot of fiddling. Hornady's new 3-in-1

powered case trimmer alleviates that. Rated to trim, chamfer and deburr up to 25 cases per minute—accomplishing these tasks all in one step—it enables you to process a few hundred cases in a half hour or less. That is a big deal.

The High Speed 3-in-1 powered trimmer accepts cases from 1.450 inches up to 3.5 inches long, and up through .30 caliber. The unit is easy to install. Position the trimmer appropriately on the edge of your bench. Mark and drill two half-inch holes in your bench and secure the trimmer with machine bolts (not included). Plug it in, and you're ready to go.

The High Speed 3-in-1 trimmer has a superbly ergonomic case interchanging setup. No more fiddling, clamping, levering or otherwise wrestling with case after case.

With a twist of the wrist Hornady's new trimmer unlocks and drops the trimmed, chamfered and deburred case into the included bin. Insert the base of another case into the collet, twist the big knurled handle a quarter-

turn or so to secure the case, and you're back to trimming again.

Each High Speed 3-in-1 trimmer comes with dual carbide cutters. During initial setup, choose the correct pilot; .22, 6mm, 6.5mm and .30 caliber are included. Insert the pilot into the cutter body and tighten the set screw to secure it. I found it's easiest to remove the cutter body to do this; just loosen the set screw that holds it on the drive shaft and pull it off.

Next, one at a time loosen the set screws that hold the carbide cutters on each side of the pilot, snug the cutter against the base of the pilot, and retighten the set screw.

One cutter has a tiny needle-like blade that slices a low-drag chamfer into the inside edge of the case mouth. The other has a deburring angle that burnishes the outside edge of the case mouth. Both have razor-sharp 90-degree bevels that trim the case to length.

Hornady's tolerances are such that there's no need to make adjustments. Simply snug the cutters up firmly

against the shaft of the pilot, tighten the set screws, and go to work. Your cases' mouths will be trimmed perfectly square, and they will come out with a modest low-drag chamfer and a barely-there deburr on the outside.

Once the correct pilot is installed and the cutters secured, install the clear safety screen made of high-impact plastic. Don't skip this step, as the screen is important for chip management—deflecting the chips down into the catch tray. Slide said catch tray for shavings into place, and you're ready to set and fine-tune trim length.

First, make sure the correct case collet is installed. There are two, each with a series of steps that allow it to fit several different case-head sizes. Between them they'll handle most of the popular cartridges on the market and a bunch of obscure ones. Collet A works with all .30-06/.308 family cartridges and with all .223 case-head sizes. Collet B handles belted and non-belted magnums and PPC/ARC case head sizes.

If you need to swap collets, spin the knurled silver collet housing cap off. It's got reverse threads, so spin it the "wrong" way. Pull out the existing collet and swap it for the other. Spin the collet cap back on—again turning it opposite of what feels intuitive—and snug it firmly.

To set trim length, insert the base of a case in need of trimming into the collet. Grip the big knurled silver collet handle and turn it clockwise to clamp the cartridge in place. With the unit turned off, gently move the collet shuttle forward on its slide rods until the mouth of the case slides over the pilot and touches the carbide cutters. Loosen the macro-adjust hard stop if necessary by unscrewing the knurled brass locking bolts.

With the case mouth touching the cutters, slide the hard stop against the collet shuttle and tighten the brass knurled-head bolts down. With the hard stop roughly set, you'll use the click-adjustable silver micro-adjust

dial to fine-tune trim length. Each click equals .001 inch, which is a lot of precision for a piece of high-speed machinery.

Hornady includes a case catch bin with the trimmer. Once the device is mounted, hook the bin on the already-installed ledge. With the bin in place, you don't have to remove trimmed cases; you just allow them to drop into the bin when you loosen the collet handle.

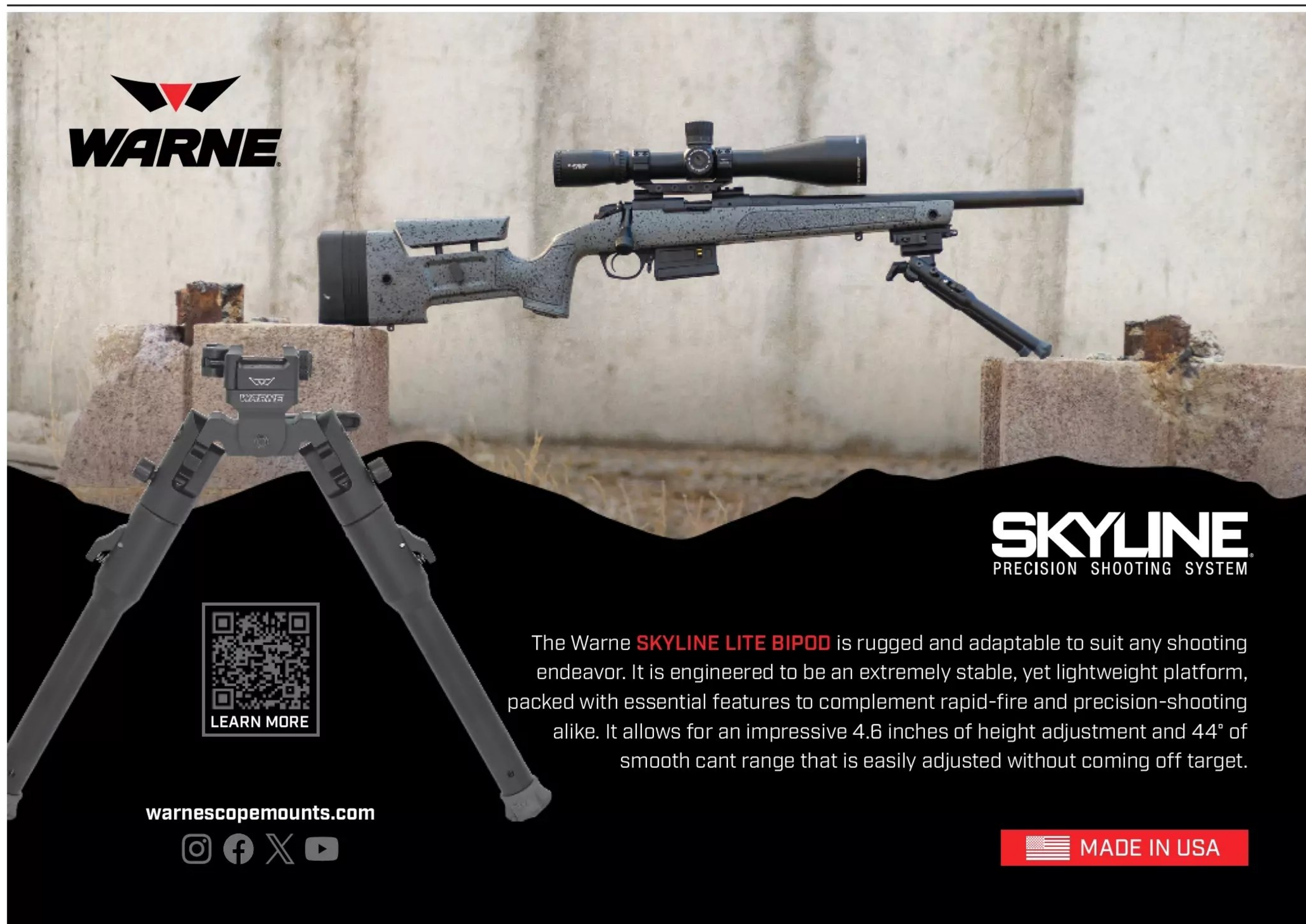
If you prefer to pluck your trimmed cases out of the collet rather than let them drop into the catch bin, or if you don't want your trimmer hanging out over the edge of your reloading bench, you can remove the bin hanger and mount the trimmer anywhere atop the flat surface of your bench.

With all systems go, it's time to trim mass quantities of fired brass with the greatest of ease. In short order you'll develop a rhythm: Loosen the collet handle, insert an untrimmed case, snug the handle down, smoothly slide

the shuttle forward until the case mouth kisses the high-speed trimmer. It's rotating at about 2,000 rpm and will perform its function incredibly fast. Draw the shuttle back. Repeat.

A few notes on proper, safe operation. Make sure the unit is off while making gross adjustments to trim length. Those sharp cutters will eat a tenth-inch of your case mouth in a hurry. Don't crank the collet handle tight on an empty collet. Doing so can bend and compress the collet, making it difficult or impossible to insert cartridge cases.

The only downside to the High Speed 3-in-1 is cost. This is not a tool for the casual reloader. Full suggested retail is \$775. Various online sites such as Brownells, Grafs and Midway USA have it listed for anywhere from \$510 to \$650. That's a substantial investment, but if you're a serious handloader who spends hours each month trimming cases, it'll pay for itself in the time you save. ■



The advertisement features a black and white photograph of a Warne Skyline Lite BiPod supporting a rifle with a scope. The rifle is positioned horizontally, resting on the biopod's legs. The background is a blurred outdoor setting. In the top left corner, the Warne logo is displayed. In the bottom left, there is a QR code with the text "LEARN MORE" below it. In the bottom right, the "SKYLINE PRECISION SHOOTING SYSTEM" logo is shown. Below the QR code, the website "warnescopemounts.com" is listed, followed by social media icons for Instagram, Facebook, X, and YouTube. A red banner in the bottom right corner reads "MADE IN USA" with a small American flag icon.

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The Warne **SKYLINE LITE BIPOD** is rugged and adaptable to suit any shooting endeavor. It is engineered to be an extremely stable, yet lightweight platform, packed with essential features to complement rapid-fire and precision-shooting alike. It allows for an impressive 4.6 inches of height adjustment and 44° of smooth cant range that is easily adjusted without coming off target.

Good Gets Better

LEUPOLD UPDATES THE VX-6HD WITH TOOLLESS SPEED DIALS AND AN UP-GRADED ADJUSTMENT SYSTEM.

I was lying prone on a stone outcropping in northern New Mexico watching the FireDot of my Leupold VX-6HD Gen 2 scope settle on the chest of a yapping coyote. While I didn't take the shot because we were hunting elk, the encounter offered me an opportunity to test the VX-6HD Gen 2's low-light capabilities. Dawn was nothing more than a silver streak on the eastern horizon at that time, and I couldn't see the 'yote with the naked eye. With the scope, however, I could clearly make out the dog as it lay in a bare patch on the prairie.

I wasn't particularly surprised by this since the previous-generation VX-6HD was heralded for clarity and low-light performance. Leupold's outstanding Professional Grade Optical System carries over to the new Gen 2 model. But the VX-6HD Gen 2 does have some new tricks up its sleeve, and I think they make this an even better optic.

The most notable upgrade is the new CDS-SZL2 SpeedSet dial. The CDS-SZL2 dial first appeared in 2017, and while everyone loved the concept of being able to swap out dials to perfectly match your favorite loads, there was one problem. Previous versions of the VX-6HD required a hex wrench to



The author tested the VX-6HD Gen 2 while hunting elk in New Mexico last year and found that the optic performed extremely well in tough conditions.

loosen the elevation dial and reset the zero or swap out dials.

If you've shot a lot of Leupold scopes with ZeroLock dials, you probably stashed a few of the correct wrenches in your wallet or pickup and certainly carried one in your range bag. Should you arrive in hunting camp and find that you needed to rezero the optic and didn't have your wrench, you were in a pickle. Those days are gone thanks to the SpeedSet dial system.

By pressing a button and rotating a lever you can remove the elevation and windage dials, reset them to the appropriate zero and lock them into place by rotating the lever into the locked position. It's a simple and quick process that doesn't require any wrenches.

The SpeedSet dial is a worthwhile upgrade, but it's not the only improvement on the VX-6HD Gen 2. New competition-grade adjustments ensure even more precision when dialing for distance. I've had good luck with the VX-6 and VX-6HD scopes since they

SPECIFICATIONS

LEUPOLD VX-6HD GEN 2

POWERxOBJ.	3-18x44mm (tested)
LENGTH, WEIGHT	13.5 in., 22.1 oz.
MAIN TUBE	30mm
RETICLE	FireDot Duplex (tested) second focal plane; red illumination w/8 levels
ADJUSTMENTS	toolless SpeedSet dials; 1/4 m.o.a. adjustments; zero stop
BATTERY	CR2032, 300–1,600 hrs. runtime
EYE RELIEF	3.7–3.8 in.
PRICE	\$2,300 (as tested)
MANUFACTURER	Leupold, LEUPOLD.COM

were first introduced over a decade ago, but apparently some shooters thought the VX-6HD scopes didn't track like the company's world-beating Mark 5HD competition scopes.

Leupold made an easy fix that

solved the issue. It now installs the same adjustment system found in the Mark 5HD in the VX-6HD. Whether you need a class-leading competition-grade adjustment system in your hunting rifle scope is debatable, but that's what you get with the new VX-6HD Gen 2.

Some scopes—even high-priced ones—have “mushy” dials that don't inspire confidence. The Gen 2's clicks are clean and precise, and they never left me wondering whether I adjusted two clicks or three.

The VX-6HD Gen 2 is available in 1-6X, 2-12X, 3-18X and 4-24X magnifications, so there's an optic in the lineup that will work on everything from varmint guns to safari rifles. The 3-18x44mm model I tested has an overall weight of 22.1 ounces and a length of 13.5 inches. There has been a trend toward heavier scopes with larger objective lenses in recent years, but the VX-6HD Gen 2 remains light enough to be useful on a mountain rifle.

It's a second-focal-plane optic with a side-focus parallax and a 30mm main tube. I tested the FireDot Duplex reticle; other options include FireDot Twilight Hunter, TMO and FireDot Boone & Crockett. The FireDot reticles offer a runtime from 300 to 1,600 hours and eight brightness settings.

The illuminated reticles are powered by a CR2032 battery housed in the side-focus knob. The battery cover has a locking system that requires a tool—this stemming from new legislation requiring button batteries be secured to prevent children from swallowing them.

Leupold scopes are known for their generous eye relief, and the Gen 2 provides 3.7 to 3.8 inches. As someone who shoots a lot of hard-kicking rifles, I very much appreciate this.

Other goodies include Alumina flip-back lens covers, Guard-Ion lens coatings, a clever integrated throw lever that's neither ridiculously oversize nor so small as to be ineffective, and an electronic reticle level.

When I arrived in New Mexico, I rezeroed the rifle because my initial zero was at about 1,000 feet, and I



The new SpeedSet dial has an integral lock that requires just the push of a button instead of a hex wrench as with older models. (Below) Gen 2 upgrades include the adoption of the Mark 5HD's adjustment system. Due to a law designed to keep button batteries away from little kids, the battery cap has a locking system that requires a tool to open.



was now at more than 6,000. I simply pressed the button to release the lever on the elevation dial, flipped the dial up to loosen the turret, and adjusted the elevation down six 1/4 m.o.a. clicks—all without a wrench in sight.

Because our elk camp was not too far from the NRA Whittington Center, I had the luxury of a world-class range loaded with steel targets where I could test the VX-6HD Gen 2. After adjusting my 100-yard zero and sending a verification round into paper at 100 yards, I started hunting for steel—getting first-shot hits on targets from 225 to 685 yards.

Then it was time to head afield. My opportunity came on a bull at 225 yards when he stepped into a clearing not much wider than his barrel chest and stopped. I knew the shot would have to be quick, so I adjusted the scope's dial and settled the rifle on

shooting sticks. When the red FireDot settled on the bull's chest, I fired. The bull jumped out of sight but piled up in a jumble of rocks about 20 yards below where he was standing.

With prices ranging from \$1,999 to \$2,699, the VX-6HD Gen 2 isn't the cheapest scope available, but it's hard not to consider this one of the premier big game scopes on the market. I'm currently putting together a .375 H&H rifle for an upcoming Cape buffalo hunt, and that gun will wear one of the new Leupold VX-6HD Gen 2 1-6x24mm scopes.

The scopes come with a certificate for two free SpeedSet dials, and I highly recommend cashing it in. Keep those CDS-SZL2 dials in a safe place so you can switch between loads on your hunting rifle, but you can pitch that hex wrench you carried to swap scope dials in the trash. We've moved on. ■

Outdoors on Demand



These days, America's sportsmen and women are clamoring for more "content," as we call it in the media: more articles, more television shows, more website info. Outdoor Sportsman Group—which publishes this magazine as well as bringing you the Sportsman Channel and Outdoor Channel—has answered that call with the My Outdoor TV (MOTV) app.

It's a resource like no other, a curated treasure trove of outdoor-oriented television shows and videos. Think of it like your own personal Netflix, with episodes of "Gun Stories" with Joe Montegna, the gun restoration show "The Gunfather," "Guns & Ammo," "Shooting USA" and more. The universe of content is even bigger when it comes to hunting, and I know a lot if not most of you enjoy your time in

the field. Check out "Petersen's Hunting Adventures," shows by hunting legends Fred Eichler and Jim Shockey, "Meat Easter" and many, many more. Plus there is a ton of fishing as well, including live streams of various angling competitions.

MOTV is an incredibly deep library containing more than 20,000 episodes of outdoor television shows as well as short-form video encompassing how-to instructional and history topics you can watch anytime, anywhere.

In addition to the TV episodes, I think *RifleShooter* readers will really appreciate short-form videos such as "Gun Stories Tidbits" on iconic rifles as the M1 Garand, the Remington rolling block and the AK-47. And, again, it's all HD-quality video for the ultimate viewing experience.

Perhaps even better for shooters and hunters on the go, in addition to

streaming video, you can take this content with you via the "Take With Me" feature that allows you to download content for later viewing when you're without Internet access—say, at the range or in hunting camp.

If you're one of the folks out there who can't get Sportsman Channel or Outdoor Channel through your television provider, this is your porthole into the awesome world of true outdoor programming. MOTV is available on the web, as well as Apple and Android platforms.

A subscription is just \$9.99 per month or \$98.99 per year, and you get multiple device accessibility with one account. New content is loaded every month, and with the yearly subscription you can get a free magazine subscription. MOTV is the TV you want, your way. Check it out today at MYOUTDOORTV.COM. ■

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EXPEDITION



STRAIGHT TALK

BERETTA'S BRX1 STRAIGHT-PULL RIFLE IS THE LATEST SUCH GUN TRYING TO WIN THE HEARTS OF AMERICAN SHOOTERS.

by Brad Fitzpatrick

Traditional bolt-action rifles are as American as baseball and apple pie, but our friends on the far side of the Atlantic prefer

straight-pull designs. In places like Germany and Finland, where driven hunts are common, the straight pull has become the rifle of choice.

We're seeing more straight pulls

show up in the States every year, though. Companies like Blaser, Heym and Merkel have been importing a limited number of straight-pull rifles for years. Savage introduced the first



Michael Anschuetz photo

American-made centerfire straight pull, the Impulse, in 2021, and most recently Beretta began offering its BRX1 straight-pull rifle in the U.S.

The BRX1 has been available in Europe for a few years, so while it's not technically a "new" rifle, it is a recent arrival on American gun store shelves. In concept the BRX1 is very similar to other European straight pulls like the Blaser R8, in that cycling the action simply requires a straight back-and-forth pull on the bolt handle. However, the Beretta's operation is very different than most other straight pulls.

With a traditional bolt-action rifle, the shooter locks the lugs by rotating the bolt handle down into the firing

position. The trick with straight pulls is to design a mechanical system in which the lugs lock every time to ensure safe and reliable function. With guns like the Savage and the Blaser, the bolt handle actually rotates as the lugs lock and unlock.

The BRX1's bolt handle doesn't rotate during cycling, which was confounding for a guy like me who was familiar with the Blaser and Savage designs. Instead, the BRX1's system uses a bolt lockup that's similar in concept to the familiar AR-15.

When the bolt is shoved forward, the lugs—eight for standard calibers, 16 for magnums—rotate and lock in position in the steel barrel extension. Unlike AR-

15s, which use gas pressure to unlock the lugs, the BRX1 relies on the force applied by pulling the bolt rearward to unlock the bolt. The bolt handle stays in the same position relative to the bolt body, which confused me at first. Shouldn't it move when the lugs lock? Nope, not with this design.

Another similarity between the BRX1 and the AR-15 is the concept of an upper and lower receiver, although on the Beretta the bolt constitutes the entire upper receiver portion.

The "lower" consists of the aluminum chassis, and the fore-end and buttstock are separate. There's a barrel and barrel extension into which the lugs lock, and two screws that are accessible

through the bottom of the fore-end hold the whole works together. The 20.1-inch cold-hammer-forged barrel is free-floated and features a 1:10 twist. It also comes with a 5/8x24 threaded muzzle and a thread protector. Like other European rifles, the BRX1 bears the proof house marks to indicate it has passed pressure testing protocol.

The Beretta BRX1 is currently available in 6.5 Creedmoor, .308 Win., and .300 Win. Mag. You may be piecing together that the design is modular, and

that's correct. You can remove the barrel and, if necessary, swap out the bolt head and magazines to switch calibers. In addition, a Picatinny rail is attached to the barrel extension, so the scope remains attached to the barrel—reducing or eliminating the need to re-zero the rifle if you change it to a different chambering.

Bolt stroke is just a bit under five inches and therefore long enough to operate with magnum-length calibers, although it's a bit more space than is

needed for short actions like the .308 Win. I tested.

It's easy to switch calibers with the BRX1, but it's also very easy to swap between right- and left-handed operation. Remove the bolt from the rifle, press a detent, and the bolt handle can be swapped from the right to the left side.

But wait, there's more. You can also remove the bolt head and rotate it 180 degrees so the gun ejects spent cartridges to the left. Or if you decide you want the empty cases to eject to the left so they land on the bench top while you're shooting with a right-handed bolt configuration, you can do that, too. And the whole process requires neither special tools nor a master's degree in mechanical engineering to complete.

The tang-mounted safety is ambidextrous, but it's a very European design. At its rearmost position the rifle is completely in the Safe position and the bolt cannot be unlocked. Slide it forward one position and a white bar appears, indicating the gun is on Safe but the bolt is unlocked. Pressing to the forward-most position, indicated by a visible red bar, disengages the safety for firing.

The process requires noticeably more force than most traditional bolt-action safeties, and it may take some



Michael Anschuetz photo

The bolt constitutes the entire upper receiver, and once it's removed the Picatinny rail stays attached to the barrel so the gun loses little to no zero on disassembly and reassembly.



Unlike other straight pulls, the Beretta's bolt doesn't rotate the bolt handle but rather stays in the same position relative to the bolt body. The orange tabs that show on both sides of the receiver are actually part of the magazine. Pinching the tabs releases it.

time to become familiar with safety operation. There's a lever on the top of the safety that must be depressed to move the safety catch forward, but if you press down on the lever without applying forward pressure, the safety moves backward. However, once you're familiar with the process it's simple and intuitive as well as safe.

BRX1 rifles come equipped with double-stack magazines that are bright orange, so if you drop one you won't have trouble finding it. When the magazine is in position, two orange tabs are visible on either side of the magazine base. Simply pinch these and the polymer magazine drops into your hand.

Since the tabs are on both sides of the magazine, operation is once again ambidextrous, and whether or not you like the looks of the bright orange tabs—which are always visible on the rifle—they make it very easy to deter-

mine whether or not a magazine is in place, even when the gun is leaning in a rack across the campfire.

The buttstock can be modified to fit the shooter. The included pistol grip is removable and can be replaced by a more vertical target-style grip that is available through Beretta.

You can also adjust length of pull. The stock comes with a half-inch spacer installed, producing a length of pull of 14.5 inches. Remove it to shorten length of pull by half an inch.

The BRX1 stock has a negative comb, which means it slopes down from rear to front. This allows for some adjustment front and back to accommodate for scope height. The rifle's rail sits fairly high, so if you're a person who likes to bury your face against the comb like you're shooting quail with a shotgun, you might find that a comb pad is in order.

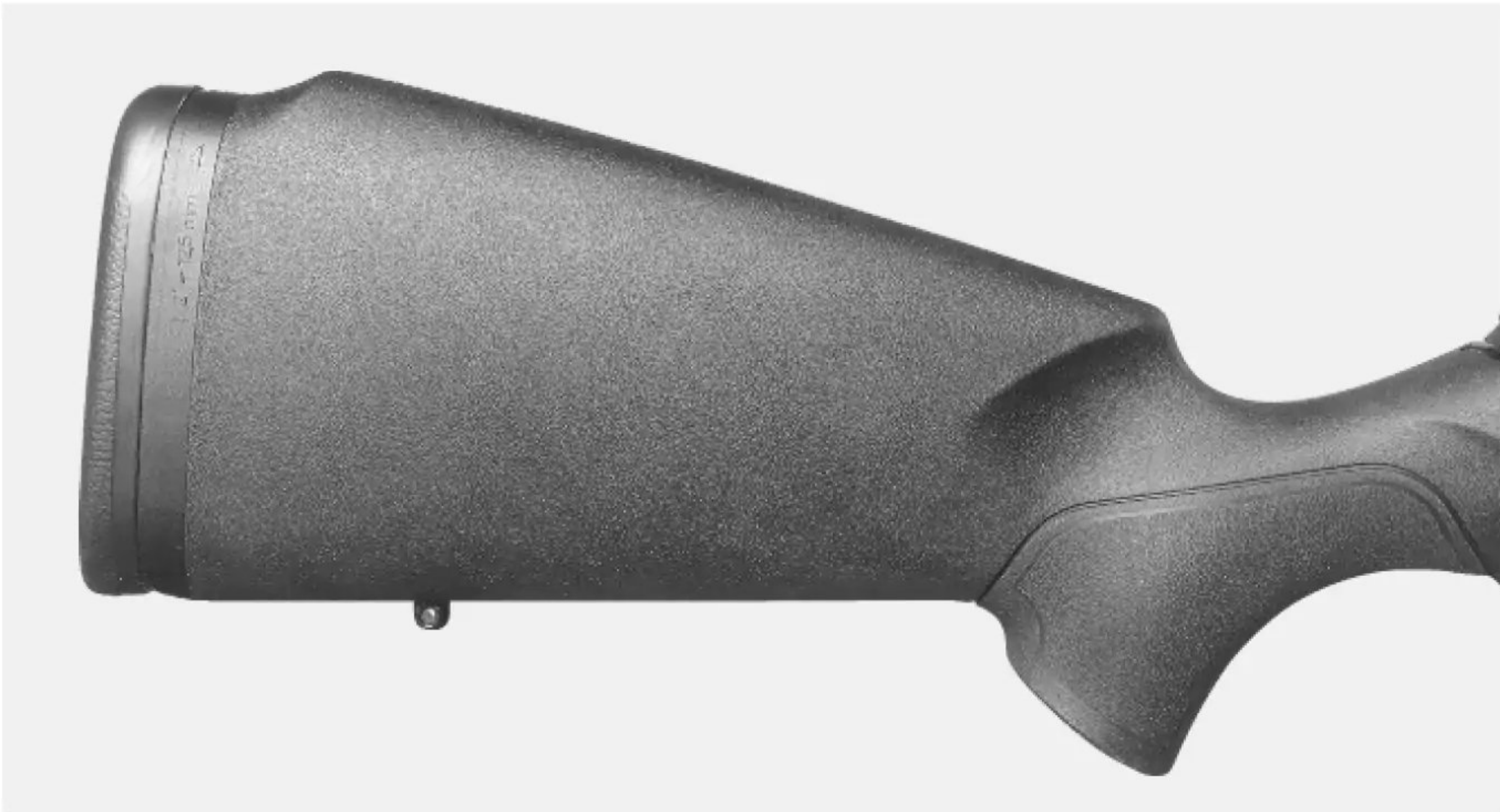
The rifle includes front and rear sling studs, and the mostly rounded fore-end is somewhat flat on the bottom so it's not prone to wobbling on horizontal surfaces.

The trigger assembly is housed in a cassette that can be easily removed using a flathead screwdriver. The assembly houses not only the trigger but the hammer, and on the left side of the trigger assembly is the trigger adjustment button. By swapping the button to the top, middle or bottom positions you can change trigger pull from around 2.1 pounds to roughly 3.25 pounds.

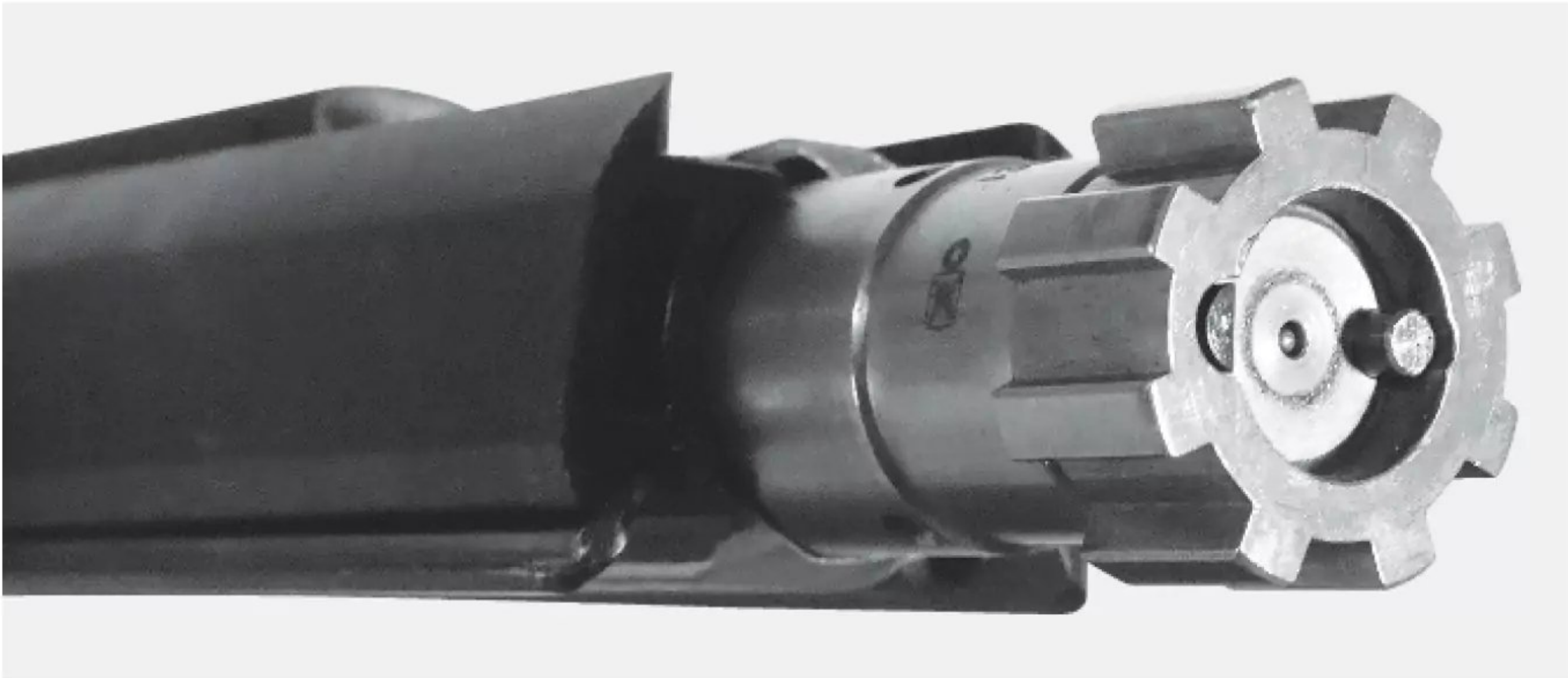
Removing the bolt simply requires lifting up on the lever on the left side of the gun.

Straight-pull rifles are rarely lightweight since they are biased toward fast, accurate shooting; their weight and the associated reduction in recoil are benefits for this. The .308 BRX1 I tested weighed right at 7.5 pounds unloaded, and with a scope and a full magazine you can expect the gun to weigh more than nine pounds.

A BRX1 version with a carbon-fiber-wrapped barrel is available if you want to shave a few ounces, but this rifle is



The polymer stock is durable and features a negative comb that slants forward. The comb design and the gun's weight do an excellent job managing recoil.



The BRX1's bolt head design shares some similarities with the AR-15, although with the Beretta it unlocks via rearward force on the bolt.

SPECIFICATIONS	
BERETTA BRX1	
TYPE	straight-pull centerfire
CALIBER	6.5 Creedmoor, .308 Win. (tested), .300 Win. Mag.
CAPACITY	5
BARREL	matte blue 20.1 in. cold-hammer-forged, 1:10 twist; threaded 5/8x24
OVERALL LENGTH	40.75 in.
WEIGHT	7 lb., 8 oz.
STOCK	black polymer, interchangeable length-of-pull spacers, interchangeable pistol grip
FINISH	anodized black
TRIGGER	adjustable; 2 lb., 1 oz. pull (measured, as received)
SAFETY	three-position tang
SIGHTS	none; Picatinny rail
PRICE	\$1,599
MANUFACTURER	Beretta, BERETTAUSA.COM

built for a specific mission, and hiking for sheep at thin-air altitudes is not the name of the game.

I topped the Beretta BRX1 with a Leupold VX-5HD 3-15x44 optic and tested it with three different .308 loads. Recoil is scant with this setup, and once I stopped trying to lift the bolt handle I found I could run the action very quickly. The round bolt knob is easy to operate, but it's removable if you prefer a different design.

I did notice, however, that the bolt comes precariously close to the shooter's nose with every cycle of the action. The odds of making contact between the rear of the bolt and your nose vary with how you position your face on the stock (as well as the size of your nose, I suppose). I never got punched, but I did get in the habit of rotating my head slightly away from the stock with each shot.

Since the BRX1's bolt runs on rails it's extremely smooth, and the prodigious opening left when the bolt is retracted offers numerous reloading options. You can, of course, feed cartridges from the magazine, but the large gap allows you to single-load a round into the chamber or top-load the magazine if you'd like.

I actually tried to jam the gun, tossing loose cartridges into the action atop the mag and then driving the bolt forward. But the BRX1 wasn't having it, feeding the cartridge into the chamber with every push of the bolt handle. I never had an issue with reliability, save one instance when I forgot to seat the mag fully and it dropped free after the first shot.

That really was my fault because this is a no-fuss magazine that loads easily and functions reliably. I had no issues stuffing the promised five rounds in the

magazine, and the cartridges seated naturally. The magazine is, as mentioned, very bright. You're not likely to lose it unless it falls into a pile of traffic cones.

The trigger is light, breaking at just 2.1 pounds without modification. There's a bit of movement initially, but it's manageable and the trigger break is very predictable.

Accuracy was good. Beretta backs the BRX1 with a sub-m.o.a. accuracy promise. While I did get a few three-shot groups under an inch at 100 yards, most three-shot groups were around 1.2 inches at that distance.

As I said, I grew up a traditional bolt-action fan, but guns like the Beretta make a compelling case for straight pulls. With a flick of the wrist you can cycle the action and have a fresh round ready to fire.

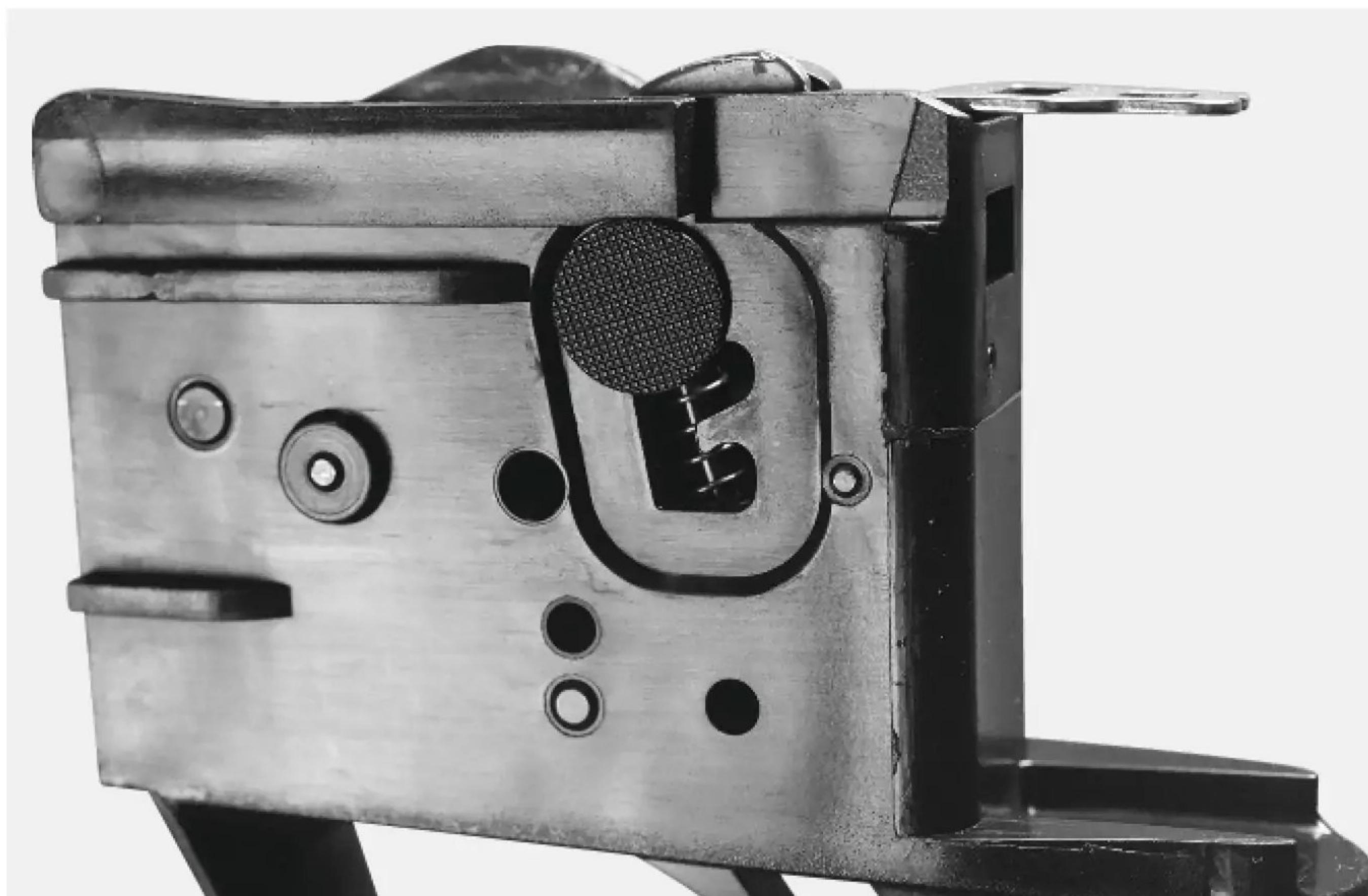
The safety is a bit odd if you aren't familiar with the European design, but it is easy to operate and functions well. However, I will point out that a scope with a large eyepiece mounted low to the receiver might make the safety difficult to access.

The relatively short barrel will work wonderfully with suppressors like my Silencer Central Banish Backcountry. And because the rifle is modular it allows you to swap calibers.

Another advantage of the design is you can transport the gun disassembled, allowing it to fit in a shorter case that isn't so obviously designed for a rifle. That makes travel much simpler and safer.

Lifelong bolt-action fans will find the receiver proportions are odd, but you can't argue that this rifle offers a lot. It's also relatively affordable for a European straight pull at \$1,599, which is thousands less than a comparable Merkel, Blaser or Heym.

Will the BRX1 win over the masses in America? It's hard to say, but I'm a fan. When I finish evaluations on a hunting rifle I always ask myself two questions: Would I enjoy owning this gun and, after my range session, would I be comfortable taking the rifle on a personal hunt? The answer to both in this case is a resounding yes. ■



The removable trigger cassette has a button on the left side that allows you to adjust the trigger pull weight to three different settings.

ACCURACY RESULTS

BERETTA BRX1

.308 Win.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Federal Terminal Ascent	175	2,525	7	0.97
Sako Powerhead Blade TEC	162	2,567	12	1.19
Hornady Superformance CX	150	2,772	10	1.35

Notes: Accuracy results are averages of three three-shot groups fired at 100 yards from a fixed rest. Velocity figures are 10-shot averages recorded on a Caldwell VelociRadar. Temperature 39 degrees; elevation 1,020 feet. Abbreviation: TEC, tipped expanding copper

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#SHOOTBETTER



BC OR BUST?

A VETERAN HUNTER'S TAKE ON TODAY'S HIGH-BALLISTIC-COEFFICIENT CRAZE.

by Craig Boddington



It was a roundnose-bullet world until 1898. The French Balle D was developed by Capt. Georges Desaleux and adopted in the 8x50 Lebel cartridge. Not only was the new French bullet sharply pointed, it was also the first known boattail design. The improved aerodynamics of the revolutionary Balle D increased maximum ranges, and most of the world's militaries, including ours, soon shifted to pointed projectiles, often boattailed.

The German word *Spitzgeschoss*

means “pointed bullet,” and we still use “spitzer” to differentiate a sharply pointed bullet from a roundnose or flatpoint. That says nothing about the base, which could be flat or boattailed.

The boattail reduces drag and increases a bullet's ballistic coefficient—the index we use to judge a bullet's ability to overcome air resistance or drag and to fly flatter. BC is the drag factor and is expressed in thousandths, as in .380 or .481. The higher the number, the lower the drag and the flatter the trajectory. When I was young, a bullet with a .481 G1 BC was high. Today's low-drag bullets far surpass this number; some modern bullets now have G1 BCs beyond the .600s.

You might be asking where the “G1” comes from. The original concept of ballistic coefficient stems from English mathematician and clergyman Rev. Francis Bashforth's experiments in the late 1860s. He hit upon using a “standard projectile” one inch in diameter and weighing one pound, with a flat base and conical nose.

The “G” stems from the French Gavre Commission, which analyzed firing tests of various projectiles from 1873 to 1898. Combining Bashforth's and the commission's efforts, we get to the G1 ballistic coefficient model, although today the G1 BC is based on a slightly modified version of Bashforth's standard projectile.

Bashforth's work pre-dated spitzers and boattails, as well as the higher velocities of smokeless propellants. Later experimentation showed that Bashforth's model had variances with different bullet shapes and at different velocities. These developments eventually led to the G7 BC, which is based on a standard projectile with a boattail base, a long, tapering ogive and a sharp nose. The G7 model is closer to today's low-drag projectiles.

Until recently, most manufacturers used G1 BC to quantify and compare their projectiles. Today, and especially with high-BC bullets that might be fired at extreme distances, G7 BCs are often used. Some manufacturers provide both. Walt Berger was probably the first to include both G1 and G7 BCs on his packaging, along with rifling twist recommendations.

Neither G1 nor G7 is perfect, due to the drag variances at different velocities. Some ballisticians solve this dilemma

by adjusting values for different velocity regions. Most notably, Sierra Bullets provides three velocity-specific G1 BCs for its projectiles.

Numerically, the G7 value is about half the G1. So we can say that a bullet with a G7 BC of about .275 is aerodynamic, and a bullet with a G7 BC approaching .350 is a screamer. For instance, Hornady's 175-grain ELD-X, with the highest BC listed in the accompanying chart, has a G1 of .689 and a G7 of .347.

Whichever one you choose, with today's compact computers and ballistic apps at our fingertips, BC is wonderfully simple to apply. Know the BC, know the actual muzzle velocity, and you can essentially know the trajectory of your bullet. This is provided both numbers—and the table or program used—are accurate.

Published BCs are more correct than ever, but not all are perfect. And as range increases, even slight variations in atmospheric conditions—altitude, barometric pressure, humidity, temperature—become ever more critical. Even if starting data are perfect, which is unlikely, there are still differences in drag as velocity changes over distance. So to create perfect data, there is no substitute for shooting at actual distance.

However, whether you need perfect data depends on what you want to do. Thousand-yard competitors and shooters pushing rifle accuracy into miles need it. No ballistic app can yield such solutions; they are obtained only by extensive shooting at actual distances, constantly adjusted to shifts in atmospherics.

You could say that shooting at extreme distance is parallel to zeroing a rifle with a new scope. In the latter instance, you bore-sight or use a collimator or laser. You know it won't be perfect. Your goal is simply to get bullets on paper, then adjust. For shooting at extreme range, you use a good ballistic calculator to “get on paper,” then adjust, repeat and record the data.

For me, and for many of us reading this magazine, extreme-range precision is of only clinical interest. Sure, I love to ring steel, but I'm not a competitor, and I have no desire to explore the outer limits. I'm mainly a hunter, and my target is a volleyball on deer-size game and more like a medicine ball on larger game.

I'm not an extreme-range shooter on

game. I take it personally when I miss, and I’m haunted for years by wounded animals. I accept that both can happen, but I avoid uncertain shots. Sure, with today’s nearly perfect knowledge of range, plus better equipment, I can shoot farther—confidently—than was possible when I was younger. But I always have a go/no-go distance in mind, which is flexible depending on conditions.

Wind is the primary variable. Bullets

with higher BCs resist wind deflection better than bullets with lower BCs. Like air resistance, wind deflection is a constant. If you know the wind speed, wind direction and deflection of your bullet, the solution can be plugged in—if the wind remains constant. There’s the rub. In the field, absent range flags, the longer the shot, the more difficult it becomes to read the wind.

Terrain channelizes wind, and the

wind’s direction at the target can be different than where you’re standing—as well as between you and the target. At Tim Fallon’s SAAM shooting course in Texas, to demonstrate this they use smoke bombs in broken terrain, and I’ve seen the wind blow in three different directions across 600 yards.

It’s fun to ring steel under such conditions, but it’s too risky on game. With uncertain wind, your chances go up if you shoot a bullet that gets there quickly and minimizes wind deflection. But the bottom line is that BC can’t read the wind.

Here’s how I put BC numbers into practice. If, say, I’m preparing for a mountain hunt, I start with the best input possible. Using the manufacturer’s BC and my measured velocity, I add in expected atmospheric for where I’ll be hunting. For my purposes, medium to long range—but not extreme—it doesn’t matter much whether I use G1 or G7. Either will get me “on paper.”

Then I verify and adjust, shooting at actual distance. I make certain my data is correct far beyond any distance I’m likely to shoot. On arrival at a distant hunting destination, I check zero and verify data.

Sometimes the shot you don’t take is as important as the shot you make. When Hornady’s ELD-X bullet was new,



Berger, a leader in low-drag bullets, was probably the first to print both G1 and G7 BCs on its packaging, along with rifling twist recommendations.

Ballistic Coefficient / Trajectory / Wind Drift Comparison												
Bullet	Bullet Weight (gr.)	G1 BC	Velocity (fps)				Drop (in.)			Wind Deflection (in.)		
			Muzzle	400	600	1,000	400	600	1,000	400	600	1,000
.277												
Hornady Interlock	130	.409	3,080	2,222	1,853	1,264	-19	-66	-303	18	45	151
Federal Terminal Ascent	136	.493	3,000	2,294	1,979	1,420	-19	-64	-276	15	37	120
Hornady ELD-X	145	.536	2,950	2,251	1,939	1,386	-19	-67	-287	14	34	109
Nosler Partition	150	.465	2,900	2,165	1,843	1,314	-21	-71	-313	17	42	137
7mm												
Federal Terminal Ascent	155	.586	3,000	2,294	1,979	1,420	-19	-64	-376	15	37	120
Nosler Partition	160	.434	3,000	2,201	1,853	1,291	-20	-68	-306	18	44	144
Hornady ELD-X	175	.689	3,000	2,480	2,241	1,805	-19	-57	-235	11	25	77
.308												
Hornady Interlock	180	.425	3,000	2,185	1,833	1,268	-20	-69	-312	18	45	148
Nosler Partition	200	.481	2,900	2,188	1,874	1,351	-20	-70	-305	17	40	131
Hornady ELD-X	200	.597	2,900	2,317	2,054	1,585	-19	-65	-264	13	31	98
Notes: Factory G1 BC used for consistency. Velocities are based on 24-inch barrels and are standard factory loads or available in current loading manuals. Calculations run on a Hornady standard ballistics calculator with these inputs: temperature, 60 degrees; elevation, sea level; barometric pressure, 29 mb; humidity, 70 percent; wind, 15 mph at 90 degrees.												

I set up my Jarrett .300 Win. Mag. with a 200-grain ELD-X (G1 BC .626) for a backpack sheep hunt in Alaska. I'd fired the rifle out to 900 yards and verified it on arrival.

Early on, we watched three rams vanish over a distant skyline. We caught them in a bowl in the long Arctic twilight. They were at 600 yards, and there was no way to get closer. The wind was blowing in every direction, so I never even considered a shot. We found the same group several days later, and I took the best ram at 120 yards. I didn't need a low-drag bullet for that shot, or the magnum for that matter, but it worked.

On the other end of the spectrum, one of the toughest shots I've taken was on a blue sheep in Nepal. We topped a ridge and spotted a dozen rams across a valley up the next slope, just over 500 yards away. We had a howling crosswind, but we were at 15,000 feet elevation, far from camp and I was at the end of my rope. I had to consider it.

From the moving grass, it appeared the wind was quiet in the valley below, and not as strong on the next ridge. The best ram was facing left, wind blowing from right to left. I held the Zeiss Z-Plex reticle for 500 yards, with a generous sliver of daylight between rump and ver-

tical crosshair. I hit him low behind the shoulder with my first shot from a Blaser in .300 Blaser Mag. with a Barnes TTSX bullet (G1 BC .484). I adjusted accordingly and centered the shoulder with my second. Here the high-BC round was a big help in getting it done.

As much as I hate doing charts, the accompanying one is worth studying because it shows what we're up against as distance increases. My goal is to show downrange differences in trajectory and wind deflection as BC changes even slightly.

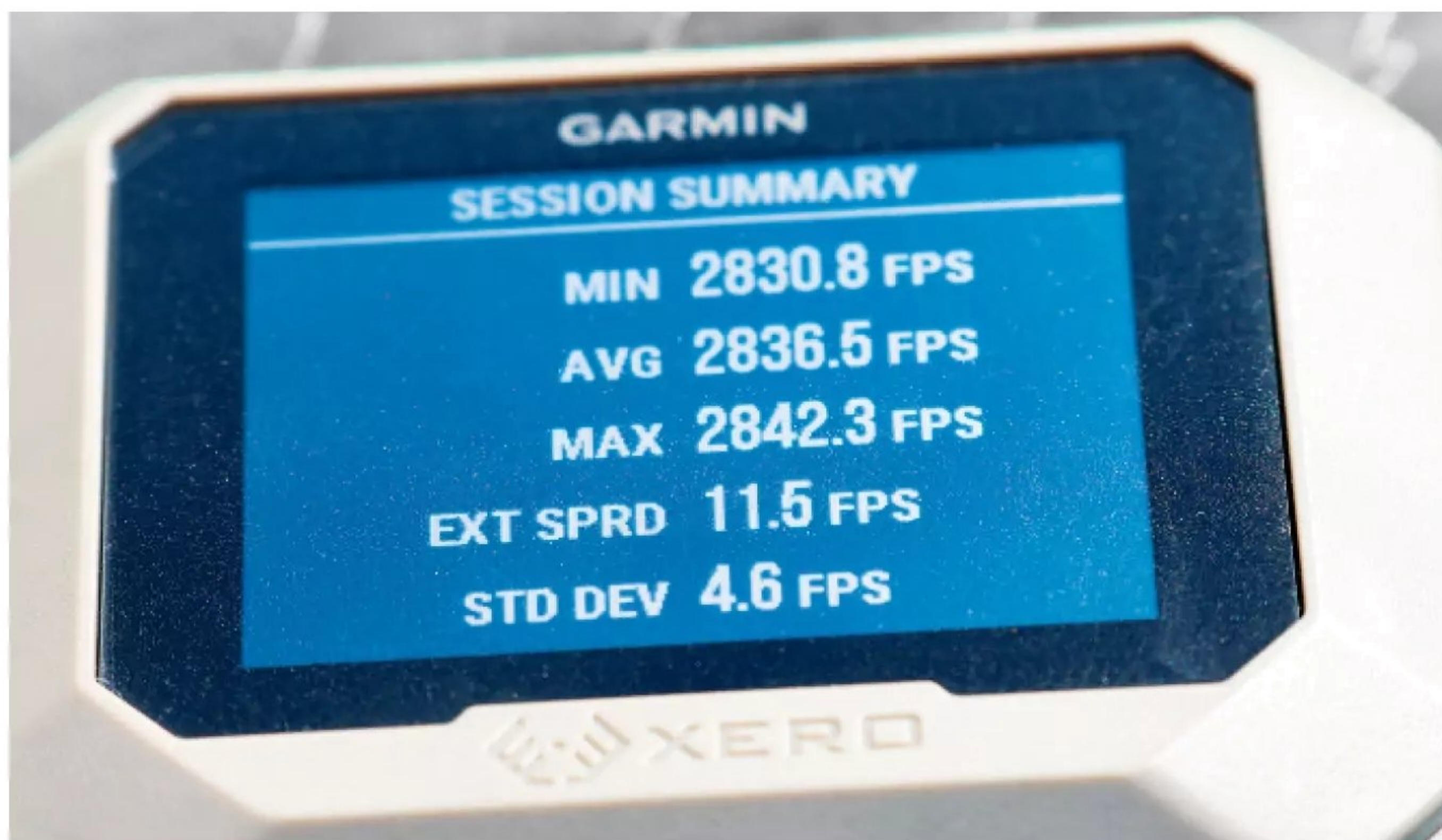
The cartridges don't matter. BC doesn't care about case design. Velocity matters, and the velocities are typical with either handloads or factory loads. To keep it simple, I used a tiny selection of hunting bullets that I've shot often. They include flatbase spitzers like the Hornady InterLock and Nosler Partition as well as the low-drag Federal Terminal Ascent and Hornady ELD-X.

The .277 choices are listed with .270 Win. velocities. The 7mms lean toward speeds in the 7mm Rem. Mag. and 7mm PRC class, and all the .30 calibers use .300 Win. Mag. velocities.

Although the bullets and BCs vary considerably, with a 200-yard zero the 400-yard drops vary by just 3.5 inches, well within the margin of error for deer-size game and most steel plates. Most experienced rifle shooters could lie down and make good 400-yard hits simply by holding high.

At 600 yards, the variance isn't much more, but the drops range from five to six feet—meaning a verified stadia line or dialing a turret is probably best. Beyond that, though, BC starts to tell: At 1,000 yards there's a variance of more than six feet of drop among these aerodynamic bullets. At this point you're faced with serious math and a need for accurate inputs.

For fun, I plugged in an arbitrary 15 mph right-angle wind. Not howling but leaves and grass moving boisterously. At 400 yards, a foot to 1.5 feet into the wind will do it. At 600 yards, there are big differences, two feet to nearly four. At 1,000 yards, from six feet with my flattest-shooting choice to more than 12 feet. We can adjust for anything if we know



Along with your bullet's published BC, it's best to have actual measured velocities out of your rifle. Then use a ballistic app or program to get a chart of trajectory and wind drift info.



As range increases, atmospheric conditions such as altitude and humidity become more critical, so it's vital to check your at-home results against those obtained under prevailing conditions. Nothing substitutes for actual shooting.

BC OR BUST?

the number, but with wind, how can we know?

Air resistance and gravity cannot be denied. Regardless of velocity and how high the BC, at some distance bullet drop

and wind deflection grow from inches that we can visualize to large numbers of feet, mils or minutes of angle. Now we have a complex mathematical problem, no different than aiming long-range

artillery. However, you can pre-register artillery, as you can on steel targets, but you can't on a big game animal. You have to be right the first time.

Also, none of this speaks to accuracy. In my experience, flatbase bullets with their lower BCs often shoot tighter groups than boattails. And some rifles produce their best groups with blunt-nose bullets despite poor aerodynamics.

However, high BC is good because it simplifies longer shots. Just keep two things in mind. First, BC doesn't kill game. Bullet performance does. A lot of our most aerodynamic, most accurate and flattest-flying bullets are intended for target shooting, not for hunting.

If you're looking for a hunting bullet, don't get caught up in BC euphoria. Be sure your bullet is designed to perform on game; the flattest-flying bullet may not be the best choice. Second, regardless of what bullet you choose, remember that even the slightest breath of wind works on all projectiles every step of the way—no matter how high the BC. ■



The bullets in the accompanying chart include some of Boddington's favorites. (L.-r.): Hornady spire point InterLock, Nosler Partition, Federal Terminal Ascent and Hornady ELD-X.

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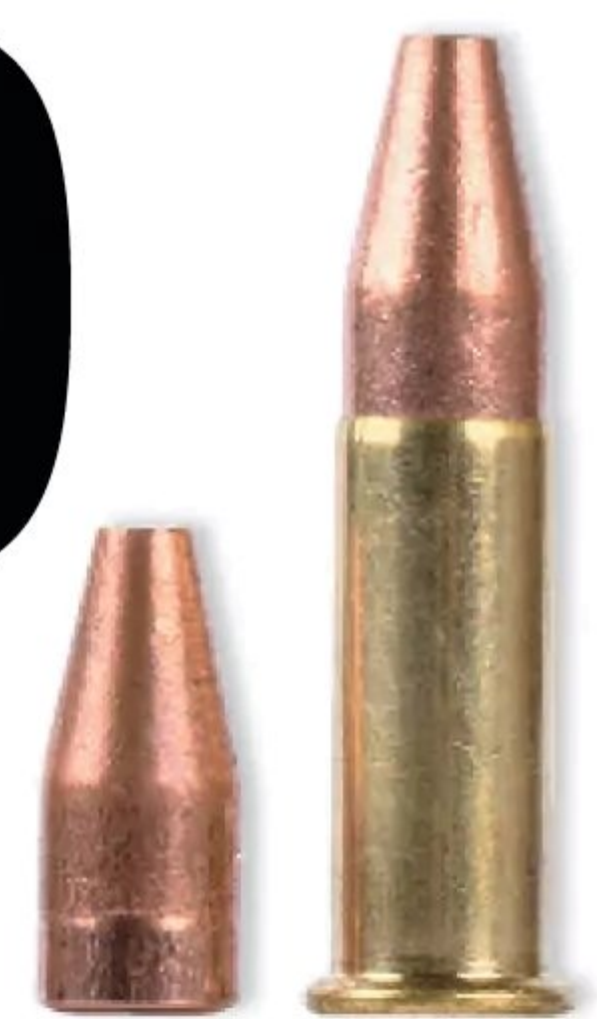
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LOOKING SHARP.





WINCHESTER'S .21 SHARP LOOKS TO CHANGE THE RIMFIRE LANDSCAPE.

by Joseph von Benedikt

Winchester's new .21 Sharp fires true .21 caliber projectiles out of classic .22 Long Rifle rimfire cases.

The bore diameter of .21 Sharp rifles is .210, rather than .223. Some of you are already thinking: Is this not the answer to an unasked question?

That depends on where you're from. If you live in California or some other lead-restricted region and have struggled to achieve adequate accuracy with nontoxic .22 LR ammo, the .21

Sharp may be exactly the answer you've been looking for.

One of the four initial loads offered by Winchester is a speedy flatnose 25-grain Copper Matrix monometal bullet. Yes, it's light compared to the standard .22 LR's 40-grain bullet, but it exits the muzzle at a speedy 1,750 fps. Inside practical hunting distances out to 100 yards, that high velocity makes up for the lack of projectile mass.

This load is under the Winchester USA banner and labeled as Game & Target. Two others under the same

branding include a 37-grain black copper-plated bullet rated at 1,335 fps and a 42-grain full metal jacket at 1,330 fps. The fourth initial .21 Sharp load is a jacketed hollowpoint Super-X load at 1,500 fps.

Winchester claims the 25-grain .21 Sharp Copper Matrix load is better than nontoxic offerings in the classic, tried-and-true .22 Long Rifle. In pure engineering terms, the company is right.

When the .22 Long Rifle was introduced back in 1887, it was configured with a heeled bullet like many other rimfire cartridges prevalent at the time. Heeled bullets have a bearing surface that's the same diameter as the cartridge case itself, with a small step down in diameter at the rear—the heel—that seats inside the mouth of the cartridge case.

It's an outdated, even antiquated design. Even so, it's served honorably for a century and a half, and the .22 Long Rifle shows no sign of fading. I suspect it'll still be the most popular cartridge in the world 150 years from now.

Winchester claims to have corrected this design flaw by eliminating the heeled bullet, saying it has more or less perfected the small rimfire cartridge. Being a vintage cartridge lover, that sort of raises my hackles. But that said, projectiles with parallel shanks fitting inside the mouths of cartridge cases do have advantages. There's less potential for tipping, more bearing surface to maximize concentricity inside the bore, a smoother, more aerodynamic profile and so forth.

A few notes regarding the accompanying chart listing ballistics for these new .21 Sharp loads. One, I suspect the copper-plated load is slower, relatively speaking, because its swaged-lead construction doesn't hold up as well at higher speeds. Two, you will note that in addition to the monometal Copper Matrix projectile, two loads feature jacketed bullets. Yep, traditional lead cores with copper jackets.

For those thinking, "We don't need no jacketed bullets in a rimfire!" it's worth pointing out that the .22 Mag. uses the same jacketed-bullet technology as the new .21 Sharp, and the .22 Mag. has a lot of loyal disciples. Further, jacketed bullets are generally more

consistent and clean-shooting than swaged-lead bullets—but are incompatible with the classic .22 Long Rifle. That’s another refinement that makes the .21 Sharp superior to the .22 Long Rifle, at least in theory.

Compatibility with jacketed projectiles enables the .21 Sharp to fire more refined bullets and more versatile bullets. Whether that’s a significant enough advantage to ensure the .21 Sharp’s survival, only Father Time can say. On the

downside, jacketed rimfire bullets are generally more expensive than swaged-lead bullets.

Terminal performance will be similar to the .22 LR in many ways, with some significant exceptions. The 25-grain Copper Matrix bullet is a true non-expanding design, with a flat meplat and a fairly sleek angled ogive. Winchester says it will penetrate around three feet in typical penetration-testing medium, which is unprecedented for any small rimfire bullet.

I watched a YouTube video in which the host filmed and documented this bullet going through a full 40 inches of ballistic gelatin. Impressive.

Accuracy, of course, will also play a significant role in the .21 Sharp’s survival. If standard off-the-shelf ammo was, for example, to shoot comparably to top-shelf premium .22 Long Rifle ammo from SK or Eley, I suspect hunters will flock to the cartridge.

Will Winchester load ammo to exacting enough specs to capitalize on the .21 Sharp’s jacketed-bullet accuracy potential? I hope so, but who knows. Candidly, it’ll be pretty hard to match a century of .22 LR accuracy-maximizing experience by Eley and others.

As I write this, it’s early on in the .21 Sharps’s existence, and few test rifles are available. Currently, Winchester’s Xpert will be chambered to the cartridge, but *RifleShooter* was unable to get one. However, Savage is chambering several models in .21 Sharp, and the company provided me with a Mark II Minimalist.

It’s super handy, and it proved to be 100 percent reliable. The Minimalist has the excellent AccuTrigger, which arrived with a two-pound pull. Now, this is not a precision rimfire, as its weight is just 5.5 pounds and the 18-inch barrel is relatively slender in profile. As much fun as it is to shoot, I don’t believe it accessed the .21 Sharp cartridge’s full accuracy potential.

I was able to obtain two of the initial four factory loads. I bolted a CVLife bipod to the fore-end and mounted a Trijicon 3-18x44 scope on the factory-installed cross-slot bases. Results are shown in the accompanying chart.

At 50 yards, accuracy was consistent-



Winchester’s new .21 Sharp cartridge uses the same case as the classic .22 Long Rifle but employs different bullet technology.



The .22 LR (l.) uses a heeled bullet while the .21 Sharp’s bullet—the monometal version is shown here (r.)—has parallel sides. Eliminating the heel is potentially beneficial to accuracy and consistency.

FACTORY BALLISTICS					
WINCHESTER .21 SHARP					
Load	Bullet Weight (gr.)	Muzzle Velocity (fps)	100 Yd. Velocity (fps)	100 Yd. Energy (ft.-lbs.)	100 Yd. Drop (in.)
USA Copper Matrix	25	1,750	1,173	76	3.4
Super-X JHP	34	1,500	1,121	95	4.4
USA copper-plated	37	1,335	1,016	85	5.9
USA FMJ	42	1,330	1,049	103	5.6

Notes: Factory ballistics based on a 50-yard zero. Abbreviations: FMJ, full metal jacket; JHP, jacketed hollowpoint



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ly minute of squirrel—and that’s plenty good for a compact little rifle such as the Mark II Minimalist. It’s worth noting that the 1.58-inch average of the 25-grain Copper Matrix and the 1.32 average of the 34-grain jacketed hollow-

point weren’t huge improvements over typical nontoxic copper-plated zinc bullets in most .22 LR ammo—at least not out of this particular rifle. However, I anticipate that when fired from a heavy-barreled rifle configured for accuracy

rather than light weight, the nontoxic .21 Sharp load would outshoot most nontoxic .22 LR ammo.

Velocity was impressive. Both loads outperformed factory specs. The 25-grain Copper Matrix clocked 86 fps faster than the 1,750 fps on the box. The slightly heavier 34-grain jacketed hollowpoint also beat its advertised 1,500 fps by 67 fps. It’s unusual for factory ammo to shoot faster than expected.

Although 67 to 86 fps isn’t much in the centerfire high-power cartridge world, it’s fairly significant in a small rimfire. It’s enough to flatten trajectory at 100 yards and noticeably increase on-impact energy. Chalk up a win for the .21 Sharp.

Another win for the new rimfire cartridge is the ease with which existing .22 LR firearms can be adapted to the new round. The .21 Sharp uses the same magazines, the same bolt faces, operates at the same pressure, and in short shares all things but bullet diameter and design with the .22 LR. Aside from boring barrels to a slightly smaller internal diameter, manufacturers need change nothing at all to add the .21 Sharp to their lineups.

I can’t help pondering whether the .21 Sharp has a chance of surviving. It’s not as different or as cool as the 2002-introduced .17 HMR, which is the only rimfire that has gained significant traction since the .22 Mag. was announced in 1959.

The accuracy advantage is probably limited to nontoxic projectiles, so it’s doubtful it will apply to the average shooter across the U.S. and around the world. In my opinion, Winchester’s claim to have fixed the design issues with the .22 LR is more likely to ruffle feathers than to convert shooters.

But the .21 Sharp has one redeeming virtue that may well prove to be its saving grace. It’s probably the best cartridge available for rimfire shooters in lead-restricted areas. And although those of us who aren’t similarly restricted might roll our eyes and give the .21 Sharp the cold shoulder, those shooters may well be enough to shift the balance and put this new little rimfire on solid footing.



Options for the .21 Sharp include the 25-grain Copper Matrix (l.) and a 34-grain jacketed hollowpoint (r.). Compatibility with jacketed bullets is one of the Sharp’s advantages.



The .21 Sharp shot decent groups at 50 yards out of the lightweight Savage Minimalist. Four of five shots often clustered into an inch or less.

ACCURACY RESULTS				
SAVAGE MARK II MINIMALIST				
.21 Sharp	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev.	Avg. Group (in.)
Winchester USA Copper Matrix	25	1,836	36	1.58
Winchester Super-X JHP	34	1,567	21	1.32

Notes: Accuracy results are averages of five five-shot groups fired prone from a bipod at 50 yards. Velocities are averages of 15 rounds measured with a Garmin Xero C1 Pro chronograph. Temperature, 35 degrees; elevation 4,700 feet. Abbreviation: JHP, jacketed hollowpoint

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AN ALL-AROUND .22

by Keith Wood

WHETHER FOR HUNTING OR PRACTICAL/LONG-RANGE GAMES, THE BERGARA BMR-X CARBON HAS YOU COVERED.

First came outlaw “sniper” matches. Precision rifle competitions typified by the Precision Rifle Series followed. Inevitably, rimfire games with a similar type of format came along.

Such matches require an accurate rifle that is capable of being shot from practical real-world positions. Bergara has recently introduced the BMR-X (Bergara Micro Rimfire) Carbon, a lightweight precision rifle with several attributes that make it a competitive factory option for small game hunters, varminters and plinkers alike. It just so happens that, in the process, the company may have developed the nearly

perfect factory rifle for precision rimfire matches.

Like most competitive shooting leagues, NRL22—one of a handful of governing bodies for precision rimfire—allows for different equipment categories. One of these is the Base division, designed to allow shooters to compete with factory rifles without being disadvantaged. The Base division requires that a rifle system—rifle, optic and accessories—have a combined suggested retail price of \$1,500 or less. This division has created a defined demand for a precision factory rimfire rifle at a price point that allows room for a quality optic. I think the Bergara BMR-X Carbon fits perfectly into this niche.

The BMR-X begins with a diminutive steel action that not only accommodates the .22 LR but is also available chambered in .22 Mag. and .17 HMR. My test sample was in .22 LR.

The action features a two-lug bolt with a 90-degree throw and an oversize bolt knob. There are dual extractors, one on either side of the bolt face. The two-position safety is on the right side of the tang, and the bolt stop is located at the receiver’s nine o’clock position. A cocking indicator extends from the bottom of the bolt shroud so it can be seen or even felt in the dark.

Bergara’s rifles have rapidly built a name for themselves in recent years thanks to their consistently great perfor-



mance. A key element in that equation is the company's barrels, produced at Bergara's factory in northern Spain. Bergara barrels are straightened, deep-hole drilled, honed and button-rifled, and they are then stress-relieved. This process produces extremely accurate barrels that numerous other manufacturers purchase for building their own rifles.

The BMR-X is available with a traditional steel barrel or a carbon-fiber one for \$100 more. My sample came with the latter.

A carbon-fiber barrel requires additional steps in the barrel-making process. The rifled blanks are turned to a minimal contour, eliminating weight in the process. To regain the necessary structural integrity, the profiled barrels are wrapped with carbon-fiber fabric.

The result is a barrel that is lightweight yet stiff. At the end of the process, the gun makers in Spain fit the barrel and cut a match-dimensioned chamber.

Why a carbon barrel? I favor the use of carbon-fiber barrels when I'm seeking a lightweight rifle but want a sturdy steel profile at the muzzle for a proper

thread shoulder. Mounting a suppressor to a pencil-thin steel barrel rarely provides satisfactory performance.

The BMR-X's barrel is 18 inches long and is threaded 1/2x28, so it is compatible with standard rimfire suppressors. The barrel's profile is a beefy 0.910 inch behind the threads, providing a solid shoulder for any muzzle device. A thread protector comes installed. An NRL22 match can require up to 10 rounds, making the BMR-X's 10-round

detachable box magazine ideal for competition. A shorter five-round magazine is also included and might be useful for hunting situations, since it has a smaller profile.

Unlike many .22s on the market, the BMR-X uses a traditional straight-feed magazine in lieu of a rotary design. This makes the magazine less cumbersome to load and, in my experience, the system was 100 percent reliable.

A large ambidextrous paddle-style



The BMR-X has a 30 m.o.a. scope mounting rail for shooting at extended ranges, and the Bergara Performance Trigger proved to be excellent, breaking at just 2.5 pounds.

magazine release makes changing magazines easy, even in the dark or when wearing gloves. This is ideal for the BMR-X's application as a hunting rifle.

Accuracy is an important aspect of rifle performance, but real-world shootability is what really matters. To that end, great rifles require great triggers. The Bergara Performance Trigger used

on the BMR-X is fantastic. This single-stage trigger is user-adjustable for pull weight without removing the stock. My sample trigger broke cleanly at 2.5 pounds, so I didn't bother to touch the adjustment screw.

A heavy rimfire trigger can really show itself when it comes to testing a rifle from the benchrest. The trigger on the BMR-X was a significant factor in the

excellent performance I experienced on the range.

The BMR-X features an injection-molded stock with a textured finish. The lines of the stock combine those of a traditional sporting rifle with elements of more modern tactical-style design. The flat-bottom fore-end is generous without being a full beavertail, and the buttstock's grip is a semi-vertical hybrid that is comfortable in a variety of positions.

The comb is straight, and there is a hook at the toe for supporting the butt with the weak hand. Sandwiched between the stock and the one-inch soft rubber recoil pad are three spacers that can be removed to adjust the length of pull in 0.4-inch increments.

With all three spacers in place, the length of pull is 13.4 inches, and it can be adjusted as short as 12.2 inches simply by loosening the recoil pad screws and slipping out the spacers. This adjustable setup is ideal for a child or young adult who is still growing. Traditional sling swivel studs are mounted fore and aft, and four QD-style sling



A series of spacers allows you to adjust the stock's length of pull from 13.4 to 12.2 inches.



The BMR-X includes a five- and a 10-round magazine. An ambidextrous paddle-style magazine release sits in front of the trigger guard.

SPECIFICATIONS

BERGARA BMR-X CARBON

TYPE	bolt-action rimfire
CALIBER	.17 HMR, .22 LR (tested), .22 Mag.
CAPACITY	10+1 detachable box magazine
BARREL	18 in., 1:16 twist; threaded 1/2x28
OVERALL LENGTH	38 in. (as received)
WEIGHT	5 lb., 11 oz.
FINISH	Cerakote
STOCK	injection-molded synthetic, adjustable for length of pull
TRIGGER	Bergara Performance Trigger adjustable single-stage; 2.5 lb. pull (measured, as received)
SIGHTS	none; integral 30 m.o.a. Picatinny rail
SAFETY	2-position rocker
PRICE	\$819
MANUFACTURER	Bergara, BERGARA.ONLINE/US

attachments are also incorporated into the stock.

The BMR-X comes with a one-piece scope mount affixed to the receiver with four Torx screws. This steel base provides 30 m.o.a. of built-in elevation, so a scope is less likely to run out of elevation adjustment when you're correcting for shooting at longer ranges. Considering the .22 LR's trajectory, this is a great idea.

Given the precision theme of this rifle and the boulder-like external ballistics of the .22 LR, I mounted a Tract Toric 2.5-15x44mm. This scope would give me plenty of adjustment at extended distances and a first-focal-plane reticle suitable for making precise wind holds.

I used three .22 LR loads for testing: Norma Match, CCI Standard Velocity and Aquila. I fired a series of three-shot groups at 50 yards. Accuracy (dispersion if we want to get technical) was, candidly, exceptional—especially with the CCI ammunition. The smallest three-shot group fired was 0.128 inch center to center.

I wanted to get a better picture of the gun's accuracy since this rifle would fit right into the competition games. At the end of my range session, I did my best to shoot a 10-shot group with the CCI load, since it showed such great potential. My 10-shot group measured just under half an inch, and eight of those rounds went into a single 0.33-inch hole! That's great performance by any definition.

With the baseline accuracy and a working zero established, I decided to push things out a bit to see what this rifle was capable of. Here's where things got fun. A 40-grain lead roundnose has a published ballistic coefficient of .120. For reference, that's somewhere between a musket ball and a flatpoint .45-70 bullet. Aerodynamic it is not.

Coupled with its modest velocity, pushing such a bullet much past 100 yards requires some math. Hitting a 200-yard target with a .22 LR required me to dial more than seven mils of elevation to correct for the 55 inches of bullet drop.

For comparison's sake, a 6mm ARC

that I was also shooting that day would have used that same elevation adjustment for a target at 860 yards. For the record, hitting one of the 400-yard Extended Long Range (see sidebar) targets would require a 22.7 mil hold thanks to 27 feet of drop.

Wind was another factor. Shifting gusts required me to hold between one

and two mils to keep my shots on the small steel hexagon. Given the complete lack of felt recoil, I could watch the bullet traces of my misses in the mirage just as I would when shooting centerfire rifles at extended ranges.

Once I figured out the wind hold, hits came relatively easy. My shots were all at 12 o'clock, 10 shots landing inside



The BMR-X Carbon's carbon-fiber barrel is threaded 1/2x28, so it's compatible with most rimfire suppressors on the market.



Wood fired this group at 200 yards, with 10 of the shots landing in a three-inch group—great extended-range performance.

ACCURACY RESULTS				
BERGARA BMR-X CARBON				
.22 Long Rifle	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
CCI Standard Velocity LRN	40	1,078	11	0.30
Aquila Standard Velocity LRN	40	1,149	9	0.80
Norma Match-22 LRN	40	1,079	8	0.80

Notes: Accuracy results are averages of three three-shot groups at 50 yards from a benchrest. Velocities are averages of 10 shots recorded on a Garmin Xero C1 chronograph. Temperature, 59 degrees; elevation, 194 feet. Abbreviation: LRN, lead roundnose.

a three-inch group at 200 yards. It was clear that this rifle meets the raw accuracy requirements that an NRL22 match might demand.

With a few pennies' worth of ammunition, I had an excellent simulation of true-long range shooting. This is an easy way to put the fun back in shooting without having access to a super-deep range. After spending a few days shooting the BMR-X, I found myself searching online for the nearest rimfire match.

With a suggested retail price of \$813, the BMR-X allows \$687 for an optic and mounts to stay under the NRL22 Base division's \$1,500 price ceiling. One strategy would be to select the steel-barreled version of the BMR-X, which would allow an additional \$100 for an optic. There are several suitable optics on the market at this price point.

I'm told that the folks at Bergara didn't set out to build the perfect rifle for the Base division of the various precision rimfire matches. Their goal

Precision centerfire rifle shooting's surge in popularity has exposed shooters to a few realities. For starters, most rifle ranges, particularly in more populated areas, lack the physical footprint to allow for true long-range shooting. Second, burning through several hundred rounds of centerfire rifle ammunition gets prohibitively expensive very quickly, especially when using factory loads. In response to these challenges, the sport of precision rimfire shooting emerged.

Precision rimfire matches are held in the same spirit as centerfire precision rifle competitions, but they can be hosted on smaller ranges using inexpensive rimfire ammunition.

was to build a great all-around rimfire rifle for use in the great outdoors. They certainly built a great hunting rifle, but that same attention to detail also resulted in a rifle that should be capable of performing at a high level in one of

Rimfire Games

A prime example is the National Rimfire League 22 (NRL22.com) series. During these matches, competitors engage targets ranging from a quarter-inch to six inches at distances up to 200 yards—or just 100 yards if a range's distances don't extend beyond that.

In addition to its centerfire competitions, Precision Rifle Series (PRECISIONRIFLESERIES.COM) also runs a rimfire program where you might shoot out to 300 yards or more, as does NRL22X. There's also an Extreme Long Range Association that conducts matches with distances out to 400 yards. [Ed. note: The ELR 22 Association's website wasn't accessible at press time. However, you can check them out on Facebook.]—KW

the fastest-growing shooting sports. The fact is that the Bergara BMR-X's excellent accuracy, fantastic trigger, reliability and overall ergonomics make it a great choice regardless of the user's needs. ■

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The Ruger Model 77 Magnum in .416 Rigby weighs only two ounces more than the 10 pounds John Rigby specified for his original rifle back in 1911.



.416 FEVER

by Layne Simpson

JOHN RIGBY'S .416 WAS A GREAT ROUND AND ALSO SPAWNED SEVERAL OTHERS IN THIS POWERFUL CLASS.

John Rigby & Company introduced the .416 Rigby in 1911 on a lengthened version of the commercial Mauser Model 98 Magnum action. The Model No. 5, .416 Bore Big Game Rifle had a 26-inch barrel, and it weighed 10 pounds. The magazine held four rounds and the three-leaf rear sight was said to be regulated for 100, 200 and 300 yards.

Rigby also introduced ammunition loaded with 410-grain softnose, hollow-nose and steel-covered solid bullets at

a velocity of 2,371 fps for 5,119 ft.-lbs. of energy. Cordite—an extremely temperature-sensitive smokeless propellant introduced by the British in 1889—was used, and because the ammunition would be subjected to the tropical climates of India and Africa, it was loaded to a rather mild chamber pressure of 38,100 psi—about the same as American loadings for the .30-30 Win. The cordite was also quite corrosive to barrels.

The .416 cartridge was proprietary to Rigby, and since other English firms did

not chamber rifles for it, its fame greatly exceeded the number of rifles actually built. Despite that, the .416 became a favorite of several famous hunters. One was Scotsman J.A. (John) Hunter, a professional hunter from the early 1900s until the 1940s. He wrote several books on Africa, including one of my favorites, simply titled *Hunter*. Working with the Kenya Game Department for many years, Hunter spent a great deal of time culling game. A letter to John Rigby & Company read in part: “You will be pleased to know that the rifle



which accounted for the rogue lions on my last hunting expedition was the .416 Bore Magazine Rifle you supplied me with. I cannot speak too highly of it.

"Its stopping power was extraordinary and the fact that all lions, rhino and buffalo were shot at comparatively short range, and no other rifle to back me up, speaks volumes for the accuracy and efficiency of your rifle."

Hunter was referring to a 90-day outing during which he shot 88 lions, 10 leopards and undisclosed numbers of rhinos and buffaloes.

John Kingsley-Heath was a director of Ker & Downey Safaris Ltd and held a professional hunter's license for more than three decades. When lions and buffaloes were on the menu, he often carried a .416 Rigby, as he did while in charge of wildlife operations during filming of the 1962 movie "Hatari!" starring John Wayne. Kingsley-Heath's classic book *Hunting the Dangerous Game of Africa* (1998) holds a special place in my library.

Professional hunter Harry Selby, who became known for guiding Robert Ruark, used a .416 Rigby for about 40 years. When the Mauser magnum ac-

tion eventually became scarce, Rigby built .416s on standard Model 98 actions.

The Selby rifle has that action, with

modifications such as a lengthened bolt throw and magazine and a clearance notch machined into the rear of the receiver ring to allow the ejection of



(L.-r.): .416 Rigby, .416 Rem. Mag., .416 Hoffman, .416 Ruger, .416 Taylor. The Rigby operates at lower pressure than all the rest.

loaded rounds. I had the pleasure of shooting that rifle, and at the time it was on its second barrel.

Jack O'Connor's first .416 Rigby was a custom job on a highly modified 1917 Enfield action. Wearing a Weaver K2.5 scope, it weighed 10.5 pounds. His favorite handload—105 grains of H4831 behind 400-grain bullets made by Kynoch and Fred Barnes—clocked 2,450 fps on Vernon Speer's chronograph.

O'Connor first used the rifle while hunting in Mozambique with Harry Manners in 1962. In *Buffalo Make Me Nervous*, he placed a bullet in the "sticking place," a frontal shot into the upper chest. The bull dropped, was suddenly back on its feet, traveled about 100 yards, keeled over and stayed put.

O'Connor brought the .416 Rigby to the attention of many American hunters through his books and magazine articles, but the lack of readily available rifles and ammunition put it beyond reach by all except a few. For this reason, several wildcat cartridges sprang from the bushes.

One was developed by Robert Chatfield-Taylor, a test pilot for Consolidated Vultee Aircraft Corporation during World War II. In addition to being an experienced big game hunter, he occasionally wrote about his adventures. His cartridge was formed by necking down the .458 Win. Mag. case for 400-grain bullets made by the British firm of Kynoch.

During a luncheon at the 21 Club in New York, he mentioned his wildcat to Bill Ruger, Jack O'Connor and John Kingsley-Heath, and while O'Connor suggested using the .375 H&H case instead, Ruger thought the .458 was a great idea.

In 1970 Chatfield-Taylor used a rifle in .416 Taylor built by Winchester on a Model 70 action to hunt buffaloes in Botswana, but the company never got around to adding it to the option list for the Model 70, or loading the ammunition.

Ruger chambered a couple of Model 77s and the same number of No. 1 rifles for the .416 Taylor, with one of the

single-shot versions going to Kingsley-Heath.

Then there was George Hoffman, who in 1974 became one of the few Americans ever to be licensed as a professional hunter in Africa. During the following decades he guided hunters in eight African countries for elephants, buffaloes, hippos, lions, leopards and the various antelopes.

The rifle in .416 Rigby he so desired was beyond his financial reach, so he necked up the .375 H&H case and fire-formed it to have less body taper. Bill Atkinson of Atkinson & Marquardt—who later went to work for Bill Ruger—built the first rifle in .416 Hoffman on a Remington Model 700 action, and Hoffman used it for many years.

Dumoulin of Belgium became the first company to offer factory-built rifles chambered for the cartridge. In America, A-Square built .416 Hoffman rifles on 1917 Enfield actions, loaded the ammunition and made unprimed cases with the proper headstamps.

When engineers at Remington



A Kimber Model 89 African in .416 Rigby accounted for this buffalo in Zambia.

began developing a new .416 caliber cartridge on the 8mm Rem. Mag. case, Hoffman was retained as a consultant. The .416 Rem. Mag., introduced in 1988, differed mainly by a longer case neck that exceeded bullet diameter. This was accomplished by moving the shoulder back a bit. While doing so decreased case capacity, it wasn't enough to make a big difference in velocity. In a pinch, .416 Rem. Mag. ammo can be fired in a rifle chambered for the Hoffman cartridge, but not conversely.

Several months before officially introducing the cartridge, Remington chambered four Model 700 rifles for it and hauled four writers to Alaska for a moose hunt. Like the others, I bagged a good bull and later used my rifle while hunting Asiatic buffaloes in Australia. I still have that Model 700.

Weatherby quickly followed with its .416 Wby. Mag., which is basically the Rigby case given a double radius shoulder and a belt. Ruger joined the chase by necking up the .375 Ruger case for .416-inch bullets.

The .416 Rigby officially made its way to America when Federal began offering the ammunition. Swift and Hornady eventually followed. I first used the cartridge in 1988 while hunting buffaloes in Zambia's Luangwa Valley with Greg Warne who, along with his father Jack, had founded Kimber of Oregon in 1979.

The Kimber Model 89 African held four cartridges, and while carrying the rifle for most of 14 days, I found it to be quite effective on buffaloes. My handloads consisted of Federal 215 primers, A-Square cases and 106.0 grains of H4831 pushing the 400-grain Swift A-Frame and A-Square monolithic solid to 2,375 fps.

That rifle was a loaner, so I acquired a Ruger Model 77 Magnum in .416 Rigby shortly after it was introduced in 1989. Its weight of 10 pounds, two ounces is close enough to what John Rigby prescribed for his cartridge back in 1911. A Circassian walnut stock, fairly heavy 24-inch barrel and Bond Street-style quarter rib holding a three-leaf express sight—along with a banded, ramped bead up front—make



Federal was the first in the U.S. to offer .416 Rigby ammunition in 1990, with Swift and Hornady soon following. All three still load the cartridge.

it one of the most elegant standard-production rifles ever built by Ruger.

Unlike the Rigby and Kimber rifles, the Ruger's magazine holds only three rounds, although that has yet to be not enough. For those who insist on things being original, a .416 caliber Big Game Rifle on the single or double square bridge magnum Mauser action can be purchased from Rigby, with prices starting at \$19,000.

Both Hornady and Quality Cartridge produce excellent .416 Rigby cases for handloading. The Extreme version of H4831 delivers low velocity spread during wide swings in temperature, making it an even better choice today than when O'Connor chose the original version back in the 1960s. A charge weighing 106.0 grains fills the case to its shoulder/neck juncture, and seating a 400-grain bullet for crimping in its cannellure compresses the powder just enough for uniform ignition.

Other temperature-insensitive propellants with the correct burn rate are Vihtavuori N560, Reloder 23 and IMR

7977. Regardless of the chosen propellant, the Federal 215 or other magnum primer should be used. Hornady, Nosler and Swift make great bullets of expanding and solid designs.

Most .416 Rigby ammunition manufactured today seldom exceeds 45,000 psi, and load data published by various sources are held to about the same pressure level.

Bullets weighing from 400 to 410 grains exiting the barrels of rifles at 2,300 to 2,400 fps have handled extremely challenging tasks quite well for more than a century, and there's no point in messing with a good thing.

I love John Rigby's old cartridge and will always have a rifle chambered for it, but I have to admit that the Ruger and Remington versions are more practical choices today. ■

WARNING: The loads shown here are safe only in the guns for which they were developed. Neither the author nor Outdoor Sportsman Group assumes any liability for accidents or injury resulting from the use or misuse of this data. Shooting reloads may void any warranty on your firearm.



THE EVERYMAN'S SAVAGE



SAVAGE UPDATES ITS BUDGET RIFLE LINE WITH THE AXIS 2, OFFERING EVEN MORE GUN FOR THE MONEY.

by Brad Fitzpatrick

Back in 2010, rifle manufacturers were battling to build the most affordable, accurate bolt action. Savage's entry into that budget bolt-gun market was the Axis, a bare-bones push-feed design with an inexpensive injection-molded

polymer stock and plenty of chambering options. Eventually the company offered the Axis II with an AccuTrigger, as well as the XP models, which shipped with a pre-mounted and bore-sighted scope.

The Axis has remained a best-seller for Savage for more than a decade, and

this gun has made it into the hands of enough shooters that if you have a few hundred bucks to spend and want a reliable, reasonably accurate hunting rifle, then the Axis is an ideal choice. But times and tastes have changed, and the original Axis/Axis II was getting a bit long in the tooth. This year, the Axis rifle gets a refresh with the launch of the new Axis models.

Before diving into the details, a breakdown of Axis rifle nomenclature will prove helpful because differentiating among the Axis, Axis II and Axis 2 can be confusing. Shortly after the original Axis made its debut, Savage decided to offer a model with the AccuTrigger—calling it the Axis II. Both were offered in scoped XP combos.

Today, the original, non-AccuTrigger Axis is offered only in the XP version. Many of the Axis II models are gone, and of those that survived, some are sold only through exclusive arrangements with specific firearm distributors.

The Axis 2 is now the line's mainstay. It features the AccuTrigger and a newly redesigned stock in your choice of OD green, gray or flat dark earth. XP versions come with a 3-9x40mm Bushnell scope. The line-topping model is the Axis 2 Pro, which offers the choice of Savage Woodland or Savage Western Camo finish on the stock. It also features a Picatinny rail, a Cerakote finish and a slightly heavier barrel contour sporting a threaded muzzle. For wood-stock fans, there's an Axis 2 XP Hardwood model as well.

Prices for these rifles range from \$489 for the Axis XP to \$689 for the Axis 2 Hardwood XP. That may not mean much to the rifle snob for whom only exhibition-grade, hand-oiled walnut stocks will do, but it sure does for the kid baling hay in the heat of summer to buy his first hunting rifle, or the person holding down two jobs and hoping to squeeze enough extra into their bank account to afford a suitable deer gun that's worth owning.

In addition to offering solid guns at affordable price points, the Axis family of rifles gives buyers more options than almost any other guns on the market.

Several companies offer left-handed rifles, and most offer compact guns, but few offer both. Savage does. All Axis rifles are available in both right- and left-handed models, with your choice of a full-size or compact stock.

What's more, Savage offers these guns in a wide range of chamberings. If every available model were listed in printed form, the Savage catalog most certainly wouldn't fit through the mail slot.



The Axis 2 XP comes with a Bushnell scope mounted and bore-sighted. The rifle's controls are similar to those on its predecessors. Like the Model 110, the XP's barrel is secured to the action via a smooth nut.



Compared to earlier models, the Axis 2 XP offers a more vertical grip with thumb rests and palm swells, and the rifle's bolt handle is larger and diamond shaped for sure operation.

"With our international offerings, different chamberings and right- and left-handed versions, we have about 700 different SKUs," says Beth Shimanski, director of marketing at Savage Arms.

That made it difficult to determine which rifle I should test, but Shimanski made it easy by deciding to send me the Axis 2 XP in 6.5 Creedmoor with the stock in flat dark earth. Suggested retail price is \$549, and if you shop around you'll likely find one of these guns on store shelves for about \$500.

The most obvious change is the stock design. Early Axis rifles were built with sporter-style stocks with relatively thin pistol grips. Some hunters with big hands complained that there wasn't enough room on the grips for their large mitts, and that there was a bit of flex in the pistol grip.

Both issues have been resolved with the inclusion of beefier, more vertical grips on the new Axis 2 stocks. There's plenty of room for large hands, and the vertical grip gives the gun a more modern feel. Savage also added a palm swell and pronounced "shelves" on both sides of the stock for a thumb-forward shooting position.

The stock itself is molded polymer with texturing on the pistol grip area and fore-end. On the top of the fore-end is a finger groove with vertical molded lines, and more lines are molded into the sides of the buttstock to give the gun a modern look.

I wish the comb was a bit higher to properly align my eye with the scope, but the pistol grip is an improvement, and I like the cushy recoil pad with its radiused heel, which prevents hanging up on heavy clothing when mounting the gun. A pair of metal sling studs are recessed into the stock, although the angle may preclude the use of certain accessories. I couldn't mount a Magpul bipod, for example, but a Caldwell fit without issue.

Controls include a large two-position safety on the tang that does not lock the bolt in the Safe position. There's also a bolt release lever on the right side of the gun. With the rifle unloaded, draw back the bolt, pull the

ACCURACY RESULTS

SAVAGE AXIS 2 XP

6.5 Creedmoor	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Hornady ELD-X	143	2,632	13	0.89
Nosler Whitetail Country JSP	140	2,678	15	1.21
Remington Core-Lokt Tipped	129	2,844	15	1.49

Notes: Accuracy results are averages of three three-shot groups at 100 yards from a fixed rest. Velocity figures are 10-shot averages recorded on a LabRadar located at the muzzle without suppressor. Temperature 50 degrees; elevation 1,020 feet. Abbreviation: JSP, jacketed softpoint.

trigger and fully depress the lever to remove the bolt.

The dual-lug bolt features Savage’s floating bolt-head design with a plunger-style ejector extending through the bolt face and a small extractor positioned in the center of the outboard lug. The bolt handle of the new Axis 2 rifles has been redesigned and enlarged, and it now sports a hexagonal diamond shape. It’s a major improvement over the much smaller bolt handle on the old Axis.

All Axis 2 rifles have carbon steel receivers and barrels with a blue finish. Lengths of the sport-contour barrels range from 18 to 22 inches, and they are not threaded. The Savage barrel nut design ensures exact head-spacing, which is one of the primary reasons these rifles enjoy a reputation for outstanding accuracy. Feeding is

courtesy of a four-round metal detachable box magazine.

It was dead calm at midday when I sent the first shots downrange with the Axis 2 XP, and I knew right away the results were very good—or very bad—on the first three-shot group with Hornady’s 143-grain ELD-X in 6.5 Creedmoor. I couldn’t see more than one shot on the target through the Bushnell scope, but as it turned out that group was very good, measuring just 0.65 inch. The next group measured 1.2 inches, but the third group went down to just 0.80 for an average of 0.89 inch. The rest weren’t all that bad either, as you can see in the accompanying chart.

As mentioned, I much prefer the new vertical grip over the old sporter-style pistol grip, and there is indeed plenty of room for large hands. I also

like the larger bolt knob, which is easier to operate quickly than the previous design.

The AccuTrigger adjusts from 2.5 to six pounds, and this one performed well as expected, with an average pull weight of 3.5 pounds out of the box. If you can afford the Axis 2 XP, as opposed to the Axis XP, the added cost to obtain that AccuTrigger is money well spent.

The Bushnell scope comes mounted in Weaver-style rings and bases, and the rings were properly tightened from the factory. It was bore-sighted as well. There isn’t as much eye relief as with some higher-priced scopes, but the optic worked fine. Furthermore, it features a BDC-style reticle with holdover stadia lines, a nice feature on an optic with capped turrets.

The magazine worked well and was no trouble to remove or insert. There were no issues feeding, but twice the extractor released an empty case before it had been removed from the action. This left the empty case floating in the action and caused a malfunc-



The redesigned stock profile has a modern look, although Fitzpatrick would have preferred a slightly higher comb. A cushy pad absorbs recoil.



The rifle’s metal sling studs are recessed into the molded stock. The forward stud may not accommodate all bipods.

SPECIFICATIONS	
SAVAGE AXIS 2 XP	
TYPE	two-lug bolt-action centerfire
CALIBER	.223 Rem., .22-250 Rem., .243 Win., .25-06 Rem., 6.5 Creedmoor (tested), .270 Win., 7mm-08, .308 Win., .30-06, .350 Legend, .400 Legend
CAPACITY	4
BARREL	22 in. carbon steel, sporter profile, 1:8 twist
OVERALL LENGTH	42.5 in.
WEIGHT	7 lb., 12 oz. w/scope; 6 lb., 9 oz. bare
STOCK	injection-molded polymer, flat dark earth finish (as tested)
FINISH	matte blue
TRIGGER	AccuTrigger, 3 lb., 8 oz. (measured)
SIGHTS	Bushnell Banner 3-9x40mm scope
PRICE	\$549
MANUFACTURER	Savage Arms, SAVAGEARMS.COM

tion. However, I've tested this rifle with six different loads and fired it nearly 100 times, and this problem has occurred only twice.

The fit and finish are consistent with an entry-level rifle, but I saw nothing on the gun that wouldn't stand up well in the field. If I were to replace anything I might consider buying sturdier bases and rings.

I do wish the rifle had a three-position safety that allowed you to lock the bolt, like the one on the Ruger American Gen 2. If you're walking a lot in heavy cover, the bolt can flop open, which is an annoyance. The safety was also a bit difficult to operate because of the angle, but it's very wide and easy to locate.

Overall weight of the scoped test rifle was 7.75 pounds, which is average for this price category.

Overall, you can expect good accuracy—potentially even sub m.o.a.—and the AccuTrigger is excellent. The rifle itself doesn't offer a lot of frills,



The two-position safety does not lock the bolt and can be stubborn to operate, but it's conveniently located.

but the workmanlike design is suitable for hunting big game out to moderate ranges. If the rifle has a weak point I'd say it might be the extractor—if the one on my sample wasn't just a fluke.

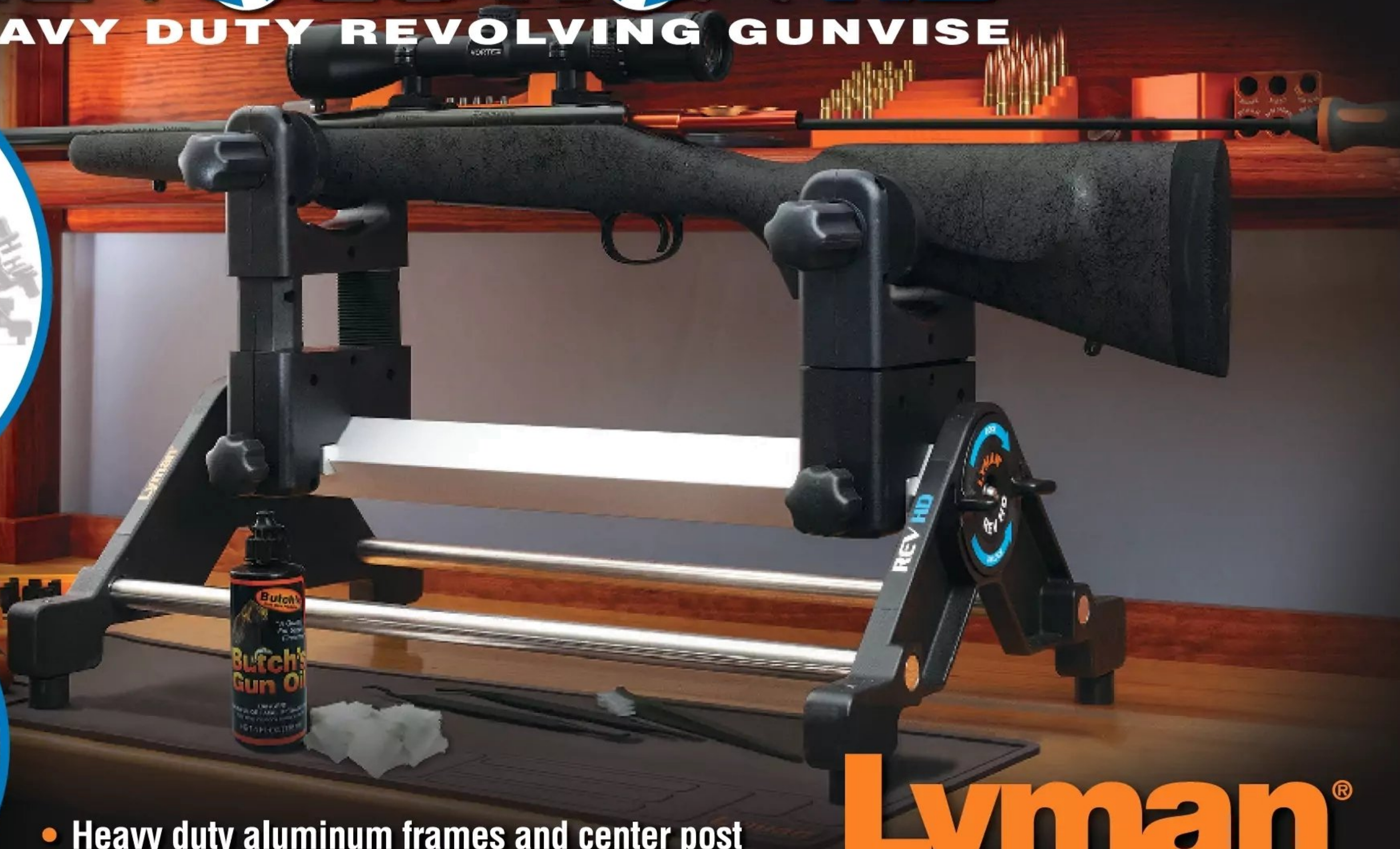
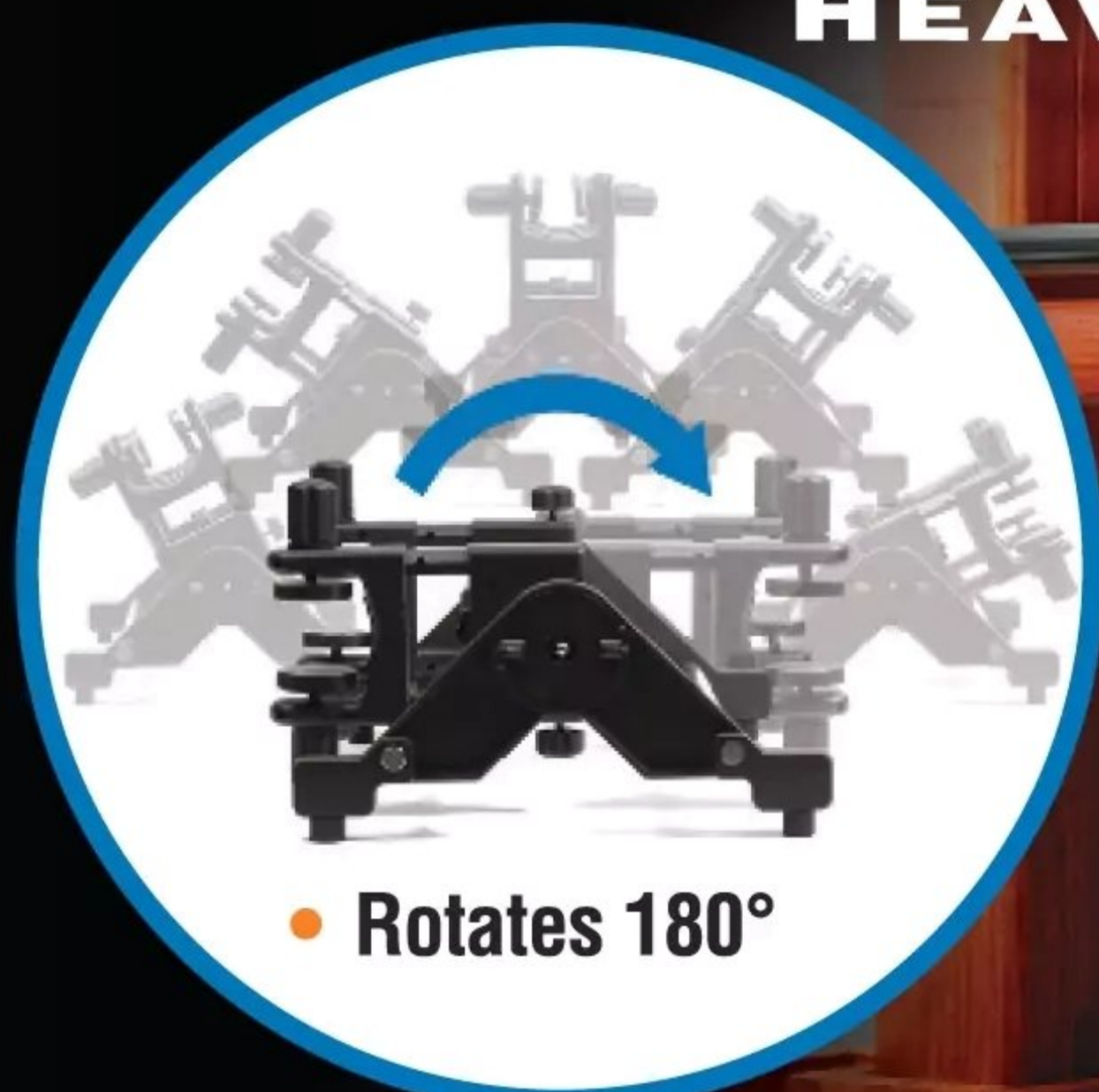
Ultimately, this is a solid American-

made bolt action that shoots as well as some more expensive guns and will serve as a suitable hunting rifle for almost anyone—especially since it's available in so many chamberings and configurations. ■

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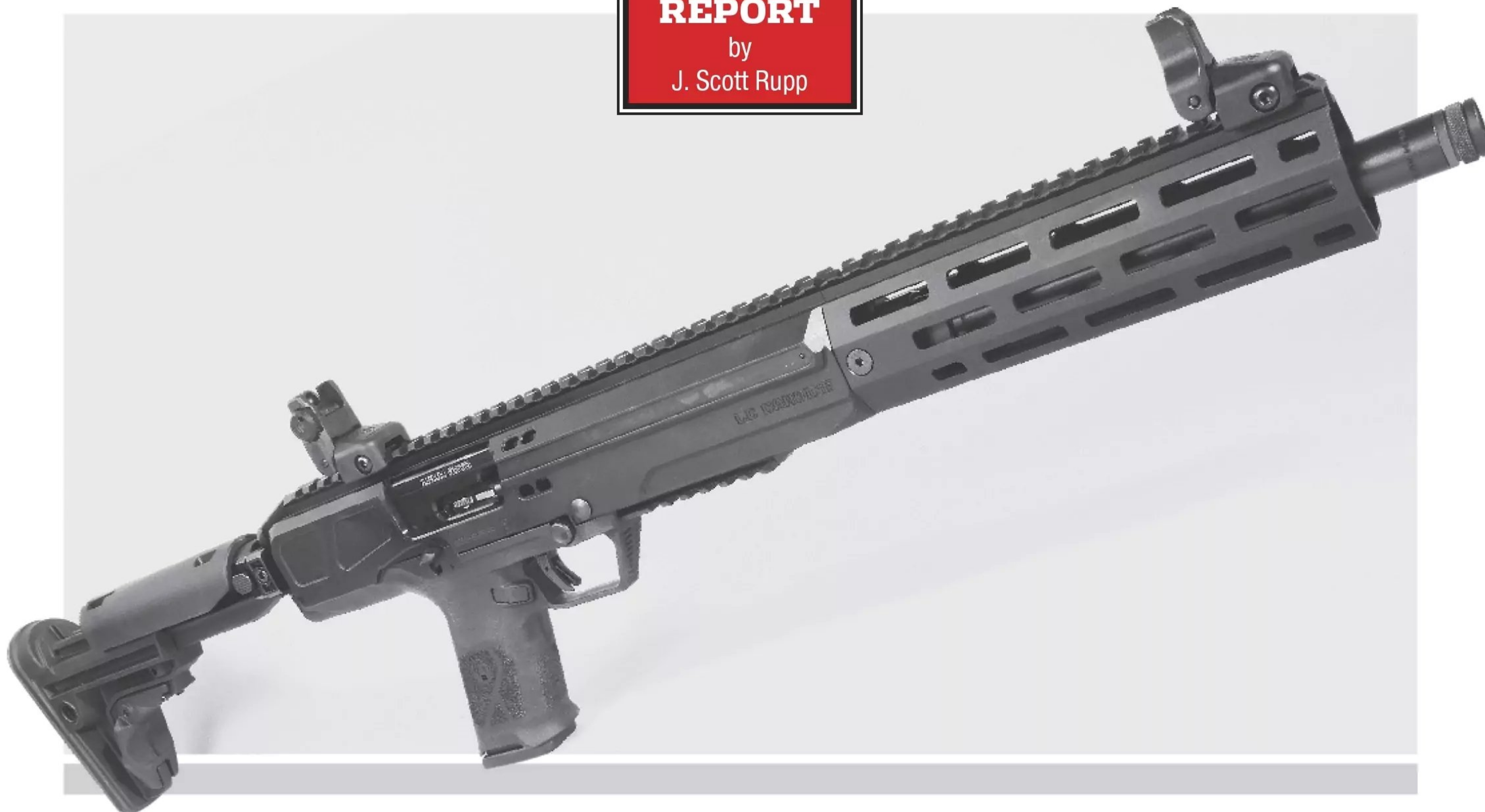
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Ruger LC Carbine 10mm

When you've got a hot product, you run with it, and that's exactly what Ruger is doing with its LC Carbine line. The latest addition is a 10mm model, and if you've been looking for a handy and powerful self-defense carbine, this might be the one.

The LC Carbine is highly adaptable. The charging handle and magazine release can be relatively easily changed from the left side to the right. The gun ships with these controls on the left side, which is how most right-handers would shoot it.

A thumb safety is located on both sides of the aluminum-alloy receiver. The bolt hold-back lever is on the left only. You can use it as a release or, simpler for righties, activate the right-side bolt release button just above the trigger guard with your trigger finger. You can also pull back on the charging handle to chamber a round.

The folding stock can be converted to fold to the left or right; it comes set up to fold to the left. To fold the stock,

press the locking button and swing the stock closed. To unfold it, pull up on the stock slightly to compress the hinge and unfold until it locks in place. When folded, the hinge acts as a detent and doesn't fully lock it closed.

The stock is adjustable for length of pull by compressing the buttstock lever and sliding it in or out. The comfortable cheek rest is fixed. The entire buttstock is easily removed by turning out a hex-head screw, and if you do that you'll find a through-hole that allows the carbine to be cleaned with a cleaning rod—once you disassemble the action, which is easily done.

The 7.5-inch handguard is CNC-machined, Type III hard-coat anodized aluminum and features rows of M-Lok slots at two, three, four, six, eight, nine and 10 o'clock. Ruger supplies an M-Lok QD sling socket, and there are QD sockets on either side of the buttstock as well.

The LC Carbine features a full-length Picatinny optics rail, attached to which are Ruger's excellent Rapid Deploy flip-up aperture sights. The

SPECIFICATIONS

RUGER LC CARBINE

TYPE	pistol-caliber carbine
CALIBER	5.7x28, 10mm Auto (tested), .45 ACP
CAPACITY	30-round magazine supplied; takes full-size Glock-pattern mags
BARREL	16.25 in. alloy steel, 1:16 twist; threaded .578x28
OVERALL LENGTH	30.6 in., 22 in. folded
WEIGHT	7.4 lb.
CONSTRUCTION	aluminum alloy receiver, hard-coat anodized aluminum handguard, polymer pistol grip, adjustable folding buttstock
TRIGGER	Ruger Secure Action; 6 lb., 5 oz. pull (measured)
SIGHTS	Ruger Rapid Deploy flip-up adjustable; full-length optics rail
SAFETY	ambidextrous thumb, trigger lever
PRICE	\$1,049
MANUFACTURER	Ruger, RUGER.COM

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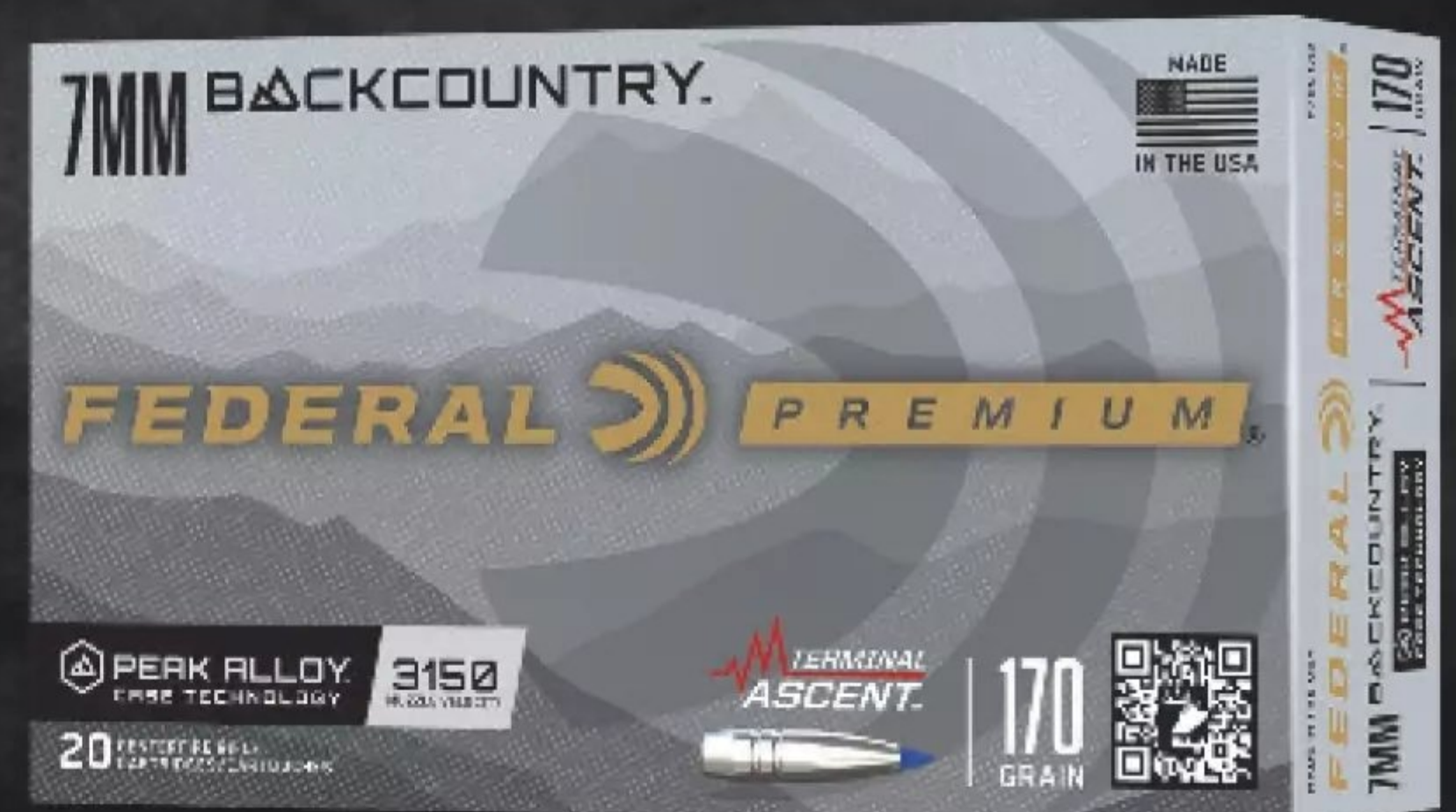


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rear is adjustable for windage by turning a thumb wheel on the right side. Elevation adjustments are accomplished by rotating the front sight, and Ruger supplies a four-pronged sight adjustment tool for this.

The LC Carbine employs a bolt-over-barrel design. The barrel is 16.25 inches long and has a 1:16 twist. The muzzle is threaded .578x28 for adding a muzzle device, and the supplied thread protector is knurled for easy removal and installation; an O-ring helps keep it secure.

The Secure Action trigger has a safety blade in its face. While it has a rather hefty pull of six pounds, five ounces on average with a good bit of overtravel, it's perfectly serviceable for a defensive arm.

The LC accepts standard Glock magazines—in this case, full-size mags designed for the Glock 20 and 40. One 30-round polymer SGM Tactical magazine is supplied. Because of where I live, I picked up a 15-round Glock 20 mag at the local gun store for testing.

I mounted an Aimpoint Micro H2 on the rail for formal accuracy testing. Yes, you'll have to add a riser block to a red dot in order to be able to get your eye behind the sight. The flip-up iron sights co-witnessed with the red dot, but just barely.

The grip and control layout will be familiar to any pistol shooter. I could reach the safety with my thumb from a firing grip, but not the magazine release. The bolt release on the right side is in just the right spot for easy operation with the trigger finger.

I also experimented with working all the controls with my support hand, leaving my gun hand in place on the grip. This worked fairly well, especially for operating the mag release and then hitting the bolt-lock lever on a fresh mag to chamber a round.

Accuracy results are shown in the accompanying chart. That's solid bench accuracy for a gun of its kind when paired with a red dot. I also shot rapid fire at 25 yards with the iron sights. While I do wish the rear aperture was large enough to be able to see the entire front sight—wings and



The carbine features a bolt-over-barrel design, which helps make the gun easy to shoot. While the Secure Action trigger isn't light, it's fine for a gun like this.



The aluminum handguard features plenty of M-Lok slots for accessories, and the muzzle is threaded. Ruger supplies a tool to adjust the front sight for elevation.



The folding stock makes the gun easy to transport and store. The charging handle is reversible, and the carbine sports a full-length optics rail—although the flip-up aperture sights are excellent in their own right.

ACCURACY RESULTS				
RUGER LC CARBINE				
10mm Auto	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Federal Punch JHP	200	1,104	14	1.41
Hornady Critical Duty FlexLock	175	1,146	12	1.48
SIG Sauer FMJ	180	1,469	16	1.70
Fiocchi Defense Dynamics JHP	180	1,378	25	1.90
Notes: Accuracy results are averages of three five-shot groups at 50 yards from a Caldwell Fire Control rest with an Aimpoint Micro H2 red dot. Velocities are averages of 15 shots recorded 10 feet from the muzzle with a ProChrono DLX. Temperature, 22 degrees; elevation, 4,900 feet. Abbreviations: FMJ, full metal jacket; JHP, jacketed hollowpoint				

all—the Rapid Deploy irons are fast and easy to use. The LC Carbine is really controllable. Wrapping my hand around the fore-end and placing my thumb against the non-reciprocating charging handle as a hand stop kept muzzle rise to a minimum.

This new LC Carbine represents an excellent balance of power, accuracy and handling, and the folding stock makes it convenient for transport and storage. If I didn't already have a Ruger PC Carbine, I'd buy the LC Carbine 10mm in a heartbeat.

Twenty years ago, I was involved in almost all the introductions of the too-many short, long and fat-cased unbelted magnums. Lately, not so much. In the last several years, on my own nickel, I've hunted with various new rifles and most of the latest cartridges: all the PRCs, both Legends, the 6.8 Western. These have been the makings for several articles, hopefully some of them good ones, but let's be honest: Taking a new rifle, cartridge or load on a couple of hunts validates nothing.

We have general knowledge of what it takes to reliably take game, but no two animals react exactly alike. And flukes can be good or bad. Seemingly poor performance by a new cartridge on a couple of animals proves nothing. Likewise, apparently spectacular results may give the wrong message. All writers can offer is our impressions based on our experience, which may be significant or limited. Since I go back farther than many, I'm likely to offer comparisons against old favorites.

This is probably meaningless to younger readers who don't know my old favorites—and perhaps equally meaningless to the many readers today who are serious rifle shooters but are not hunters. Hopefully, all of these readers understand and accept that hunting remains a valid purpose for sporting rifles and cartridges.

I make no apologies. Hunting remains a primary purpose for me. Seasons and opportunities are what they are, so taking stuff afield depends on timing. When I have an opportunity to write about new products with sporting application, I will take them hunting if I can. I understand the results cannot be definitive, and I appreciate that many have minimal interest in that application. It doesn't matter to me. It's the way I like to do my job.

Part of the fun to take new products afield and writing about that field use is also part of the fun. However, sometimes, on my hunts, I ignore the new whiz-bangs and go back to old favorites. So long as I do my part, I already know they're going to work. ■



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Confessions of a Rifle Writer

Once upon a time in America, hunting—putting food on the table—was the most essential sporting use for firearms. No longer. There are at least 12 million American hunters, while firearms owners are estimated at 30 million. Not all own rifles, and not all who hunt own centerfire rifles. There are lots of bowhunters, bird hunters and deer hunters who use shotguns and muzzleloaders.

Hunting is a legitimate use for a rifle, but I concede it's not the most common use today. I love rifle accuracy for its own sake, and I do much reloading just to wring out performance. Although I'm not a collector, I have rifles I don't hunt with, owning them purely for historical or personal interest. Still, hunting with rifles is a primary passion, closely followed by writing about using them.

You don't have to be a rifle guy to be a hunter. Several friends are serious and successful hunters, but they consider their chosen arms tools, of little more intrinsic interest than a shovel. I get it. I've dabbled in most methods of take—bows, muzzleloaders, handguns. They're effective tools, but sporting rifles hold my lasting interest.

Come to think of it, in this era of specialization, you don't have to be a hunter or a rifle guy to be a successful gun writer. Some of my colleagues and peers are mostly handgun guys, tactical guys or technical guys. They have my respect and stay busy.

Some live in great hunting states but rarely participate. I can't imagine having good hunting close to home and not taking advantage. Our Kansas rifle season is inviolate. Every year, I pass up or turn down opportunities that occur at the same time. It's not

always good business, but I rarely miss a day of my short rifle season.

To say that my passion for hunting has been good business is an exaggeration. No way I can write enough to break even on hunts. Fifty years ago, when I was a new lieutenant at Camp Pendleton attempting some freelance writing, *Gun World* magazine was headquartered just outside the northern gate. Editor Jack Lewis, also a Marine, called me in, gave me some invaluable pointers on fundamental things I was doing wrong. Also, some advice: "Obviously you love to hunt. If you approach it as a business, you may find business interferes."

It was wise counsel. At this stage in life, I guess it's worked out. At various periods I was a full-time Marine, and for 15 years I had a real job as a

load that will make the best story. Fortunately, there are usually lots of good choices. Sometimes, I have no choice. Since fewer shooters are hunters, it follows that fewer new production firearms are intended as hunting arms. It follows further that there are fewer "industry hunts" than when I was a young writer. And since I'm older and less hungry than I once was, such invitations are few and far between these days.

It didn't matter then and doesn't matter now. I'm going to hunt so long as I'm able, and I've never waited around for the phone to ring. Part of the fun of writing is writing about new stuff. I've always embraced opportunities to try out new stuff—or created my own.

As Jack O'Connor wrote in *The Last*

AS JACK O'CONNOR WROTE IN "THE LAST BOOK," "THE BEST HUNTS ARE THE ONES YOU PAY FOR."

magazine editor in the hunting/shooting field. For most of the past 30 years, my primary business has been writing about this stuff.

On some level, I do approach it as a business, though not always a good business. Had I set out to pursue a career as an outdoor writer, I'd have planted myself in a good whitetail and turkey state with long seasons. I never would've hunted out of the country. I'd probably be ahead on money. Instead, I wanted to see and do as much as I could. I've pretty much done that, but it is a business, so I approach any hunt not with adventure or size of animal as priority, but with the story foremost.

Since I'm also a gun guy, and mostly a rifle guy, I spend inordinate time conjuring up the rifle, cartridge and

load that will make the best story. When it's my own hunt, I have free choice. My first thought is always to take an old favorite, probably not the newest whiz-bang—but there haven't been any real breakthroughs in rifle performance since before I was born. And there won't be as long as we're using nitrocellulose propellants.

My old rifles may not be chambered to exciting new cartridges, but they do the job. Lately, I've felt bad that I haven't used my 7x57 or my .264 Win. Mag. Except I know what they will do, and since I'm a rifle guy and still curious—and also a journalist—I can't write about it if I have tried it. And I still want to write about new stuff.

Continued on page 63



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