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BAR Mk3

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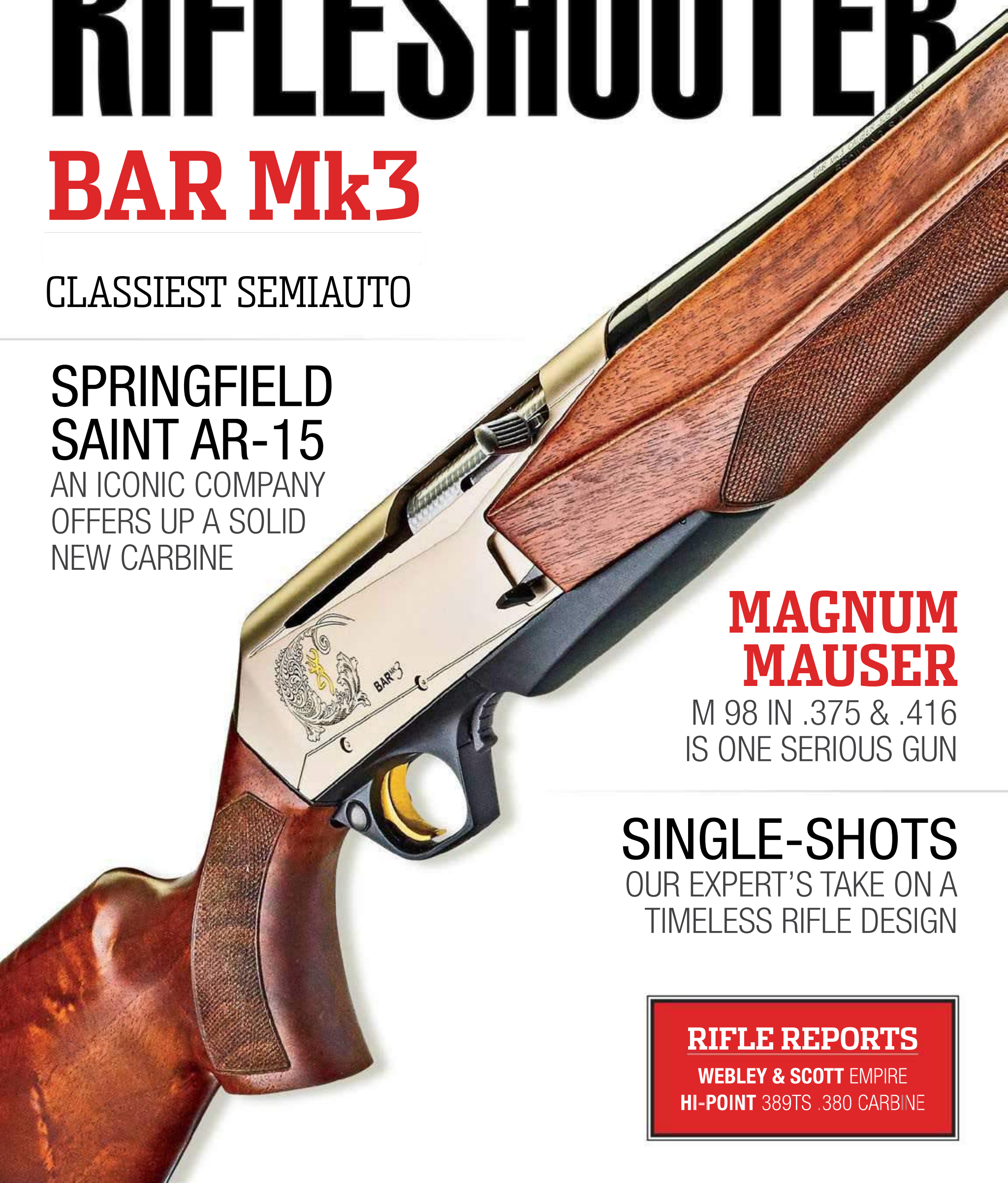

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WEBLEY & SCOTT EMPIRE

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INSIDE

VOLUME 19 - ISSUE 2
March/April 2017

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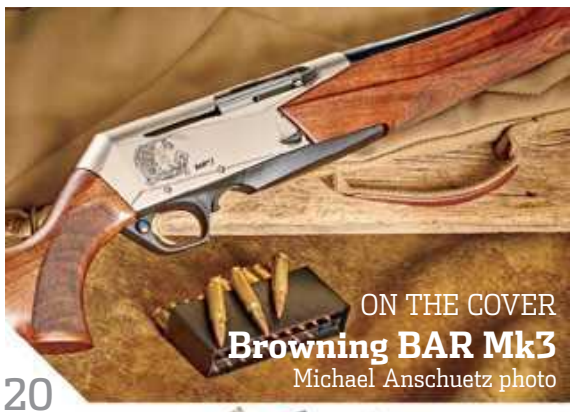
FEATURES



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"Going Big" with Brad

After having an exhausting week of work I settled into my chair to read the November/December 2016 issue. Brad Fitzpatrick's "Lands & Grooves" recollection of .416 recoil leaving him blind in one eye only because the "in the midst of the heavy recoil those relic headphones had spun around my head and covered my right eye completely" left me laughing to the point of tears. I felt as though I had been there watching the whole event. What a great story and such a great writer. I look forward to every issue and have never been disappointed. Keep up the good work all of you at *RifleShooter*.

Robert Giroux
Saskatchewan, Canada

Higher Math

Since Craig Boddington is one of my favorite gun writers, it pains me to point out an error that has appeared consistently throughout his (and others) books and articles. This is illustrated in the first couple of paragraphs in his article "Splitting Hairs" in the January/February issue. Craig writes, "As in '7x57' means a 7mm (.284-inch) bullet with a 57mm (2.235-inch) case." This is simply incorrect.

A little time with a calculator will show that 7mm equals .276-inch. The 7mm in "7x57" is the bore diameter, not the bullet diameter. Since the rifling groves are .004-inch deep, the bullet diameter is .284-inch (.276+.004+.004). If "precise" means expressing bullet diameter, then the .284 Win. wins hands down; it actually is named for its bullet diameter. The British and Europeans in Craig's example both name the bore diameter, not the bullet diameter. I'll grant I may be splitting hairs, but this has been a pet peeve of mine for years.

Jim Carlson
Hillsboro, OR

You Gotta Shoot

In 1990, early in my career, I attended a law enforcement sniper class in Raleigh, North Carolina. One of the instructors was Gunnery Sgt. Carlos N. Hathcock II. He was an NRA long-range competitor and shot constantly while on the Marine Corps shooting team. In August 1965, Gunny Hathcock won the Wimbledon Cup, shot at 1,000 yards, during the NRA National Matches at Camp Perry, Ohio.

Later in life, after being horribly burned in Vietnam, Gunny Hathcock was allowed by his doctor to fire only three shots a year because of the tension on his skin grafts by the shooting coat and sling—not to work on other skill sets as represented in the second paragraph of Brad Fitzpatrick's article in the September/October 2016 issue. While we dry-fire all the time, any long-range competitor shoots a lot of ammo (Hathcock included).

Bob Gibson
Simpsonville, SC

The B Word

I'm sure I'm not the only one who noticed Craig Boddington's mistake on the manufacturer of the Eliminator 3 scope ("The Last Word," January/February). Craig stated that it was made by Bushnell. It is actually made by Burris. I own one of these interesting scopes. It does take a lot of patience to work with it.

Val Otterson
Willows, CA

Having shot with both the original Eliminator and the Eliminator 3, I can't believe I didn't catch the error. My apologies.—Scott

A Goodbye to Camp Perry

This news reached my desk just before we went to press, and I thought some of you would find it of interest. Following last year's relocation of the NRA smallbore conventional prone and 3-P national championships to Indiana's Camp Atterbury, this year the NRA highpower championships will depart Camp Perry, Ohio, as well. Pending final approval of the NRA Board of Directors, across-the-course highpower is slated to begin with a first-shot ceremony at Camp Atterbury on July 7.

Camp Perry has been the home to the National Matches since 1907 (reports indicate the NRA pistol championships will remain). The fierce winds and often brutal weather steaming off Lake Erie made shooting at Perry a true test not just of skill but also endurance. Those of us of a certain age will fondly remember staying in spartan WWII-era POW huts that leaked when it rained, and generations of shooters spent their evenings walking Commercial Row, socializing with our fellow shooters. End of an era.—*Scott*

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A Savage Appreciation

HUNTING WITH AN EXQUISITE PIECE OF AMERICAN FIREARMS HISTORY—THE MODEL 99.

by J. Scott Rupp

When I was a kid, just getting started in hunting, both my dad and my grandfather hunted with Savage Model 99s. I remember Dad's the best. It was the Model 99F, in .308, and it was a real ball-buster. Granted, we had lousy benchrest technique in those days, but, man, did that gun seem to wallop him when doing our annual zero check prior to deer season. Still, Dad liked it for its handiness in the woods, both in carry and in shooting, and I thought it was the coolest gun I had ever seen. I loved how it looked and how it sounded when he worked the action. I thought it was royalty compared to my pedestrian Winchester Model 94.

Dad killed a lot of deer with the rifle, but eventually it "stopped shooting"—a malady that these days I attribute to a scope problem. But the seed was planted with me, and I often thought about the rifle and figured one day I'd own one myself.

Many decades later, I was at my father-in-law Jim Berger's place, and the talk turned as it always does to guns. I mentioned my fascination with the 99, and the next thing I knew he was rummaging through his gun safe—producing a Model 99 built in 1927 and chambered to .300 Savage. It had belonged to his grandfather, in whose hands it had accounted for two black bears and "an even dozen" deer—no small feat in Depression-era Pennsylvania.

The next time we were home for deer season, he was kind enough to let me hunt with it. I'd sent ahead a Marble tang sight, which Jim installed and zeroed, and the folks at Federal supplied a couple boxes of their 150-grain Power-Shok .300 Savage load. I was as excited for the hunt as any I could remember—back on my home turf with a truly classic rifle.

The Savage Model 99 was the brainchild of Arthur Savage himself. Officially the "Savage Repeating Rifle Model 1899," it was introduced in 1899. According to the excellent *The Rifle in America* by Philip B. Sharpe, published in 1938, the Model 1899 (later 99) was a refined version of the 1895 rifle that also brought the world the .303

The Savage Model 99 was born in the age of smokeless-powder cartridges and was a strong design capable of handling high pressures. It handles perfectly for woods hunting.

Savage—a rifle/cartridge combo Mr. Savage had submitted for the U.S. military trials that resulted in the eventual adoption of the Krag-Jorgensen.

Savage was fortunate in that his company came onto the scene when smokeless powder cartridges were already in use, so he didn't have to reengineer blackpowder designs to handle higher pressures. The Model 99 was smokeless-capable right out of the gate.

The Model 99 is a hammerless lever action with a hefty breechblock, the rear of which locks up strongly against the solid receiver when the lever closes. The rifle incorporated innovative features such as a small window on the left side of the receiver that showed how many rounds are in the rotary-style magazine. This rotary magazine permitted the use of spitzer bullets, which competing tubular-magazine rifles could not handle.

While it's of the "hammerless" persuasion, it has an internal hammer as part of the mechanism. Savage added a cocking indicator—on this gun it's a pin in the top of the receiver—a feature that was ahead of its time. The safety is somewhat novel as well. It's located in the bottom metal, right behind the trigger. Sliding it forward locks the lever and the trigger.

According to Sharpe, beginning in 1925 Savage began labeling its 99 versions A through G. My father-in-law's rifle sports a 22-inch barrel and is a takedown, which makes it a Model 99D. (Savage initially introduced a takedown 99 in 1907, when it cost $25, a $5 premium over the standard gun.)

To take down the rifle, remove the fore-end by pushing its latch, then simply unscrew the barrel from the receiver. An indexing notch in the barrel/receiver threads mates with a small metal block in the fore-end so the gun can't be completely assembled unless the threads are fully engaged.

The Model 1899/99 was originally introduced in .303 Savage, and it added numerous chamberings over the years—one of the most significant being the .300 Savage, the highest-pressure lever-action cartridge of its day. Savage's aim was to provide hunters with a medium-length round to compete with the .30-06. The original load pushed a 150-grain bullet at 2,700 fps, according to *Cartridges of the World*. The Federal load I used is a bit slower at 2,630 fps.

I can't think of a better rifle/cartridge combination for woods whitetails. With the Marble tang sight I was able to shoot five-shot groups offhand at 50 yards that measured two to three inches, and the recoil was negligible for a cartridge capable of producing 1,844 ft.-lbs. at 100 yards.

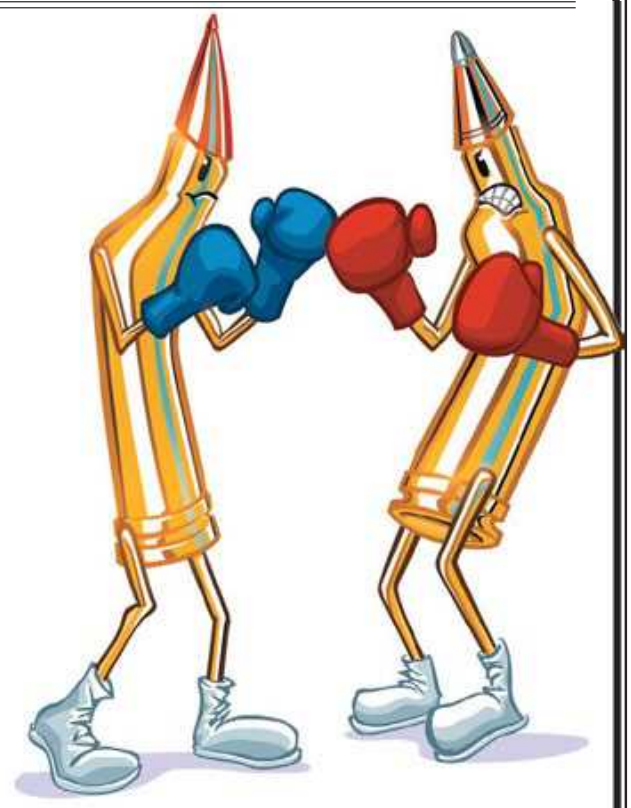
The Model 99 handles like a dream. The balance is perfect for carry, and even though I didn't use a sling (the stock doesn't have sling-swivel studs), toting it all day wasn't a problem. Alas, the deer didn't cooperate, but I frequently threw the rifle to my shoulder for practice, and the sights aligned incredibly quickly.

(From top): The Model 99 incorporates a novel "cartridge counter" in the receiver that allows the shooter to see how many rounds are in the magazine. Unlike tubular magazines, the 99's rotary magazine permits the use of spitzer bullets. The safety, located behind the trigger, slides forward to lock the lever and the trigger.

I'm a fan of lever actions. I started hunting with a Winchester 94, and I have two of those in .30-30 Win. along with a Marlin 39A .22. But my long-ago lust for the Model 99 (and now the .300 Savage cartridge, too) was not misplaced. I think it stands head and shoulders above all other levers, and I can't wait to hunt with one again. ■

CARTRIDGE CLASH » Brad Fitzpatrick

.338 Lapua vs .338 Rem. Ultra Mag



In the 1980s the U.S. military was looking for a long-range cartridge to fill the gap between the 7.62x51 NATO and the .50 BMG, and the decision was made to use a .338-inch projectile because it could fire heavy (250 grains and up) bullets with high ballistic coefficients. Initial development in this country began with the .416 Rigby case, and it was Finnish company Lapua that managed to bring the .338 Lapua to life, although the Rigby case design had to be reengineered to accommodate the 60,000 psi pressures.

The final design was completed in 1987, and the .338 Lapua Mag. proved to be just as capable as hoped, delivering a 250-grain projectile at velocities that could reach 2,900 fps. With high-BC bullets it shot flat and retained enough energy to make it an invaluable weapon for snipers in the late 20th century and early 21st century, and the growing number of long-range shooters has made this cartridge popular with civilians, too.

In 2000 Remington launched the .338 Rem. Ultra Mag or .338 RUM. It was based upon the company's other Ultra Mag cartridges and, as such, used a modified .404 Jeffery case that provided plenty of capacity for driving 250-grain bullets faster than 2,900 fps and generating as much energy at 400 yards as the .30-06 offered at 100.

Adding to its appeal was the fact that Remington was chambering the cartridge in its popular and affordable Model 700 rifles, and these guns were a perfect complement to hunters whose rifle battery already included something in the .270 to .30-06 class. It particularly appealed to those who wanted a gun capable of taking any North American big game animal—as long as the hunter could stand the ample recoil generated by the Ultra Mag cartridge.

Despite the fact that these two cartridges were aimed at different markets—the Lapua at military and long-range shooters, the Ultra Mag to the power-craving hunting crowd—they are close in terms of ballistics.

The primary difference has to do with bolt face diameter. The .338 RUM uses a .534-inch bolt face while the LAPUA requires a .588-inch bolt. This difference makes actions capable of accommodating the Lapua more expensive to build. In addition, the weight of the rifle will be greater, which is of little consequence for long-range target shooting but a real concern if your itinerary involves high country hunting.

The long list of available .338-inch bullets means both of these cartridges have the potential to make effective long-range hunting or target rifles, and accuracy potential is excellent with both rounds.

Obviously, there are used Model 700 rifles floating around at an affordable price, but new .338 Lapua rifles—specifically Savage's 112 Magnum Target ($1,177)—are closing the cost gap. Remington currently offers two .338 Lapuas in its production lineup—the Model 700 XCR Tactical and the Model 700 Tactical Chassis—but no .338 RUMs. In fact, there currently are no production .338 RUMs.

Federal's American Eagle recently launched an affordable (at least by the standards of these cartridges) .338 Lapua—$2 per round, about half of what most .338 RUM factory rounds cost.

Both of these cartridges have savage recoil, although most Lapua-chambered rifles feature muzzle brakes. There are some used Model 700 XCR II .338 RUM rifles floating around, and they weigh under eight pounds unscoped, making them great hunting rifles that you can carry all day—but they don't have brakes and you'll get no relief from the recoil.

The current uptick in the Lapua's popularity bodes well for the future of this cartridge, and there are currently more factory options available.

.338 LAPUA

HITS
- More rifle, ammo options
- Newer low-cost rifles, ammo showing up
- Can do double competition/hunt duty

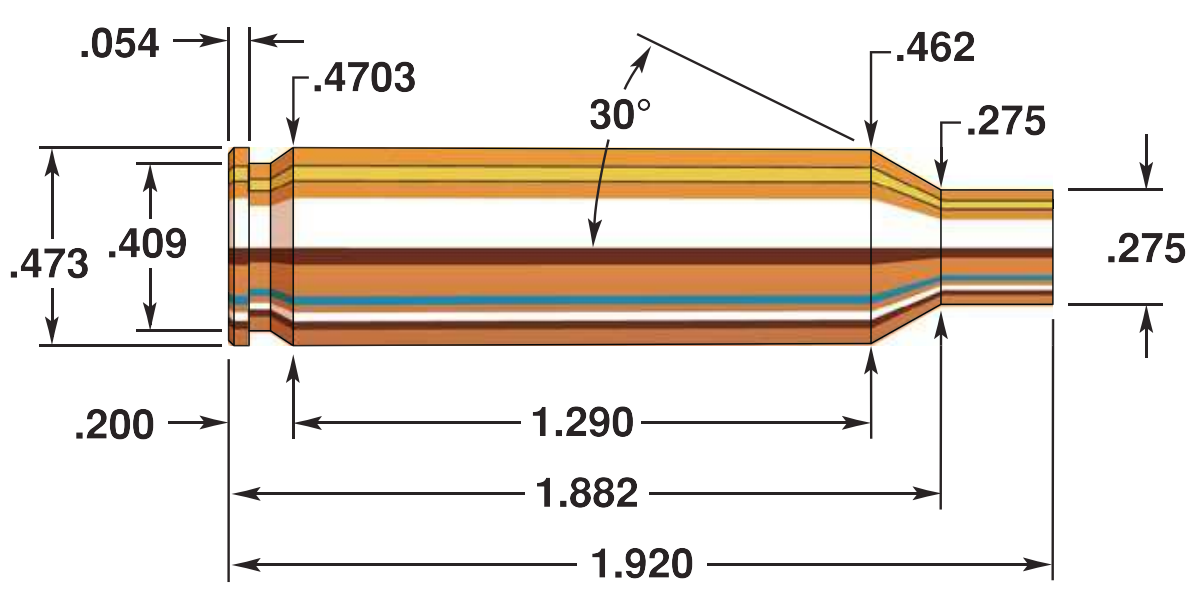
MISSES
- Too heavy for all-day carry
- Larger action brings higher cost
- Not many bargains on used market

.338 ULTRA MAG

HITS
- Versatile worldwide big game round
- Decent prices on used 700s
- Lighter-weight rifles better for field use

MISSES
- Few factory ammo offerings
- No current factory rifles available
- Light rifle/no brake equals big recoil

Hornady Unveils 6mm Creedmoor



Surely by now you've heard about or even shot the 6.5 Creedmoor, a cartridge that's gained a big following in both the long-range shooting game and with hunters. Now, a decade after its introduction, Hornady has introduced the 6mm Creedmoor.

A quick background for those who don't know the parent cartridge. The 6.5 Creedmoor was initially developed as an "across the course" cartridge for NRA highpower. The round is based on the .30 TC, which itself has an interesting backstory.

"The .308 Marlin was actually the first case that spawned all of this," says Hornady's senior ballistician Dave Emary. "It's a shortened .307 Win. case, which allows a much sleeker bullet in a Marlin 336-length action. The .30 TC is simply the .308 Marlin with the rim removed and a slightly heavier web to account for the higher operating pressure (62,000 psi)."

The 6mm Creedmoor is a necked-down 6.5 Creedmoor, and it began as a joint project between the company and George Gardner of GA Precision, who convinced Hornady's brass department to manufacture headstamped 6mm Creedmoor brass to meet the huge demand for the then-wildcat in long-range competitions.

While the 6.5 Creedmoor and 6.5x47 Lapua dominate in Precision Rifle Series matches, many top shooters prefer the 6mm diameter because its lower recoil makes it easier for them to spot their own shots and make corrections—especially when used in conjunction with a muzzle brake. That led to wildcatting the Creedmoor cartridge as a 6mm.

Still, you don't get something for nothing. Even heavy-for-caliber, aerodynamic 6mm projectiles are relatively light, and they don't have as much on-impact energy as 6.5mm bullets. Shooters have been known to get cheated out of points because the light 6mm bullet didn't move a steel plate sufficiently to enable the scoring spotter to proclaim a hit. Plus, misses can be harder to pinpoint because the 6mm bullets don't kick up as much dust as their heavier 6.5mm cousins.

Although the 6mm starts much faster, the 6.5mm bullets have somewhat higher BCs. When zeroed at 100 yards and fired in standard sea-level conditions with a 10 mph crosswind, a 6mm Creedmoor loaded with a 105-grain Berger Target Hybrid at 3,050 fps drops 263.5 inches and drifts 69.6 inches at 1,000 yards. Retained energy is 564 ft.-lbs.

The 6.5 Creedmoor loaded with a 140-grain Berger Target Hybrid pushed to 2,800 fps drops 298.8 inches, drifts 67.0 inches, and retains 726 ft.-lbs. of energy at 1,000 yards. The difference in drift is academic, while the 6mm drops significantly less—although the 6.5mm impacts with significantly more energy.

The most popular propellant among the PRS crowd is Hodgdon's H4350, followed by Varget. Hornady's new commercial load for the 6mm Creedmoor pushes a 108-grain ELD Match at 2,960 fps muzzle velocity.

Like the 6.5 before it, the 6mm Creedmoor is starting life as a competition cartridge. But the 6.5 quickly became a hit among hunters, and it's logical to assume that at some point Hornady will offer a 6mm Creedmoor load for hunters. So we asked Hornady marketing director Neil Davies what advantages the new cartridge might have over the time-tested .243 Win.

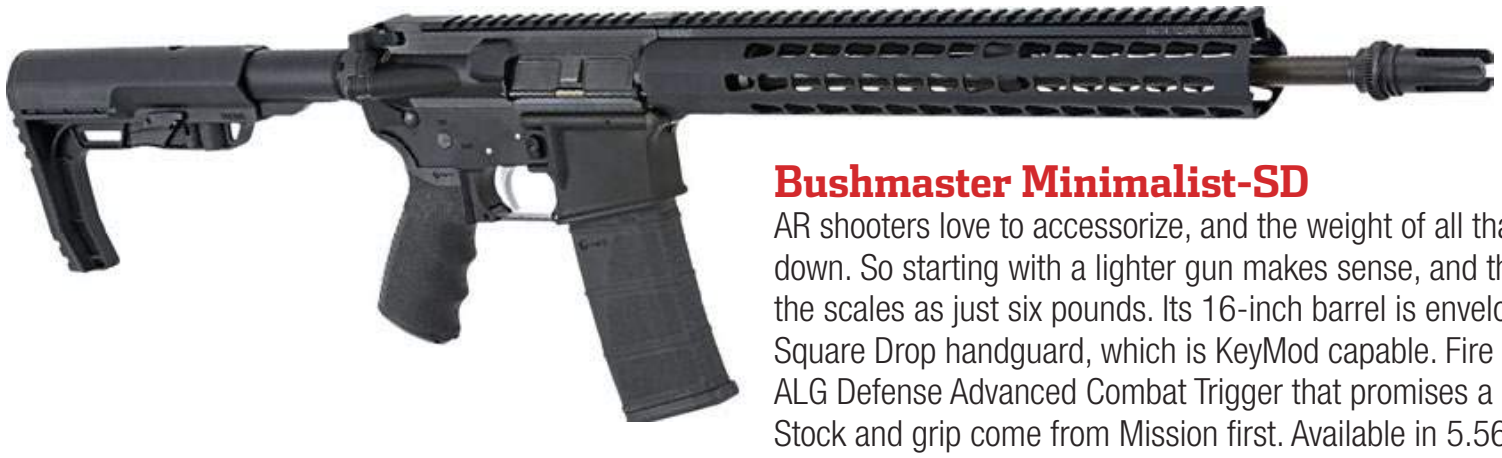
"You can shoot sleek, long-for-caliber, high-BC bullets due to the faster twist rate and chamber design. It would make an excellent extended-range varmint cartridge—particularly for coyotes and the like when they hang up outside of conventional range," he said. "With hunting bullets of 105 grains and heavier, their higher BC and sectional density would mean more retained velocity and energy compared to the .243 Win. for deer-size game."

"The 6mm Creedmoor is more efficient than the .243 and will produce higher velocities by about 75 to 100 fps, and out of the box it will accommodate heavier, long-ogive projectiles without the need for a rebarrel," Emary says. "Because of its increased efficiency, you'd probably get 200 to 300 rounds more accurate barrel life over the .243."

Davies was also quick to point out that the company isn't planning for the 6mm Creedmoor to become a ".243 killer." The Winchester round is too well established. However, the new Creedmoor will appeal to some hunters, in addition to the long-range crowd. At press time we confirmed Ruger will be chambering the new cartridge in its Precision Rifle. A Savage rep told us the company does plan to chamber the 6mm Creedmoor but had yet to determine in which models.

—Joseph von Benedikt & J. Scott Rupp

NEW GEAR » J. Scott Rupp



Bushmaster Minimalist-SD

AR shooters love to accessorize, and the weight of all that gear can bog you down. So starting with a lighter gun makes sense, and the new Minimalist tips the scales as just six pounds. Its 16-inch barrel is enveloped in a rifle-length AAC Square Drop handguard, which is KeyMod capable. Fire control is courtesy of an ALG Defense Advanced Combat Trigger that promises a 5.5-pound trigger pull. Stock and grip come from Mission first. Available in 5.56 and .300 BLK.
>>$1,169, BUSHMASTER.COM

Federal Fusion 6.5 Creedmoor

The 6.5 Creedmoor continues to make inroads as a factory cartridge, and now there's a 140-grain Fusion load. The Fusion is a chemically bonded bullet for the budget-minded, and it's designed specifically for deer hunters with big expansion and high weight retention. And I've found other Fusion loads to be accurate, so chances are it will shoot well.
>>$33, FEDERALPREMIUM.COM

Meopta ZD 6-24x56

The milliradian system is popular with long-range shooters, and the Meopta ZD 6-24 RD is capitalizing on that with new mil turrets and an illuminated mildot reticle. it's built on a one-piece 30mm tube, and the MilDot II reticle is in the second focal plane. It's calibrated for range estimation for 7.62 NATO and .338 Win. Mag. Lenses have a MeoBright light-transmission and scratch-resistant MeoShield coatings for top field performance.
>>$2,185, MEOPTAUSA.COM

HornadyRapidSafe AR Wall Lock

Keep your AR secure but ready to roll with this RFID-operated safe. Can be mounted vertically or horizontally, and out of sight behind doors or in closets if you want. RFID options include a wristband, key forb or stickers, and it also has a keypad and a manual key lock.
>>$203, HORNADY.COM

TetraGun Triple Action

I'm a sucker for chemicals that do more than one thing, and the Triple Action spray is just what I'm talking about. Spray it on to clean metal surfaces, and it then evaporates—leaving behind a light lubricant film that both lubricates and protects from corrosion. It's also gentle and can be used safely around polymer stocks.
>>$10 (12 oz. can), TETRAGUNCARE.COM

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***** Some rifles may not be available in all states and locales due to laws limiting magazine capacity and feature-based restrictions. Please check with your local law enforcement agency prior to purchasing this firearm to verify that it may legally be purchased and/or possessed in your particular state and locale.

****** State compliant model 8502 is offered with a fixed stock, heavy contour barrel, no bayonet lug or flash suppressor and includes one, 10-round magazine.

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RUGER®

by David Fortier

A Short Solution

HORNADY BRINGS OUT A NEW LOAD SPECIFICALLY FOR SBRs.

Hornady's SBR Black load features a 75-grain boattail hollowpoint with exposed lead tip, propelled by low-flash spherical powder. The load meets FBI specs for penetration and expansion, even from Short Barrel Rifles.

With the growing interest in Short Barrel Rifles and Personal Defense Weapons, there's an equal growing demand for hard information on their performance. Sure, short-barrel carbines handle well, carry easily and stow in tight spaces, but are their trade-offs worth it? Plus, just how short can you go while maintaining adequate terminal performance? Will your caliber of choice perform adequately from an 11.5-,10.5- or even a 7.5-inch barrel?

These are the questions Hornady addressed when it developed a 5.56 NATO load specifically for use in short barrels. Called the 5.56 InterLock HD SBR, this 75-grain load is part of the company's recently introduced Black line.

Standard ammunition fired from very short barrels produces excessive muzzle flash, blast and report. These can distract, disorient and even impair the shooter—particularly inside a room or vehicle in low/no light in a self-defense scenario with no hearing protection. The muzzle flash off short barrels typically large and bright even in full daylight.

The blast from shooting prone in dirt/sand/gravel can cause issues, especially if you're using a muzzle brake. Typically, the report is also noticeably louder than with a 16- or 20-inch gun.

Performance can be problematic as well. In a defensive situation, you need a load that can deliver adequate penetration and expansion at the much reduced velocity. Further, depending on your defensive requirements the ammo needs to be able to handle barriers like as windshields or walls.

Hornady designers incorporated a number of features to make this ammo the best it could be. For starters, they crimped the primer in place and sealed the annulus for reliable function. Next they tested a variety of powders and charge weights to reduce flash, blast and report while providing the desired exterior ballistics.

PERFORMANCE RESULTS

HORNADY SBR BLACK

Hornady Load	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)
7.5-INCH BARREL			
.223 REM. TAP URBAN	60	2,231	42
5.56 NATO TAP T2	75	2,185	36
5.56 INTERLOCK HD SBR BLACK	75	1,953	15
16-INCH BARREL			
.223 REM. TAP URBAN	60	2,828	15
5.56 NATO TAP T2	75	2,713	19
5.56 INTERLOCK HD SBR BLACK	75	2,505	15

NOTES: Velocities are averages of 10 shots measured using a LabRadar Doppler Radar system at 1,030 feet above sea level at an ambient temperature of 75 degrees.

Perhaps the most important element of this load though was the development of an entirely new projectile, one that would meet the FBI protocols for penetration: a bullet that would reliably expand and provide a minimum of 12 inches of penetration, even after encountering an intermediate barrier.

The end result of this work is the InterLock HD, a 75-grain softpoint flat-base bullet with an exposed lead tip. The HD stands for heavy duty, and the the InterLock band that binds the jacket to the lead core is deeper than in the regular InterLock. It's the same approach the company uses in its Critical Duty bullet—although the latter is a hollowpoint with a polymer insert.

The InterLock HD is designed to provide controlled expansion as well as high weight retention. Hornady claims a G1 ballistic coefficient of .230 and a sectional density of .214.

The engineering team at Hornady optimized this load for use in 10.5- and 11.5-inch Short Barrel Rifles. Hornady claims this load averages approximately 2,320 fps when fired from an 11.5-inch barrel and 2,200 fps when fired from a 10.5-inch barrel. While these velocities sound a bit ho-hum, the ammo is designed to eliminate flash and dramatically reduce the sound signature. It also claims this load will not foul or overheat suppressors.

I got my hands on a small amount before its official release and decided to compare it with two Hornady loads available to the military and law enforcement: .223 Rem. 60-grain TAP Urban and 5.56 75-grain TAP T2. Comparisons were made with a "worst case" AR barrel length of just 7.5 inches and one with a 16-inch barrel.

Both my 16- and 7.5-inch ARs ran flawlessly with the 75-grain InterLock HD SBR Black load. Rounds chambered smoothly, extracted and ejected without issue to three o'clock. Report and blast were noticeably reduced when compared to the 60-grain TAP Urban load, especially on the 7.5-inch gun. It was much more pleasant to fire. Flash seemed to be all but eliminated.

Velocity was also consistent round to round. I noted a 64.9 fps loss per inch of barrel going from 16 inches down to 7.5 inches. All my shooting was done on steel at 100 yards with red dot sights, and accuracy was in the two-inch range. Practical accuracy seemed more than acceptable for this load's intended SBR purpose.

The bullet's terminal performance looks good as well. All too often .223 Rem and 5.56 expanding loads have relatively shallow penetration. Some are surprisingly shallow. As an example, Hornady's 75-grain TAP T2 load in testing conducted by Hornady's ballistic laboratory penetrated to an average depth of 10.5 inches in bare 10 percent ordnance gel; 10 inches when the gel was behind FBI protocol steel and wall board barriers; and just seven to 7.5 inches when behind auto glass and plywood barriers.

The .223 Rem. 60-grain TAP Urban load penetrates even less through FBI protocol barriers and averages between 5.5 and 9.75 inches. Testing of both of these loads was conducted using a 16-inch barrel.

Hornady's new 5.56 75-grain InterLock HD SBR Black load penetrates very well while reliably expanding. Hornady's testing using an 11.5 inch barrel showed it to penetrate to an average depth of 17 inches in bare 10 percent ordnance gel; 14.7 inches when the gel was protected by FBI protocol steel barrier; 17.2 inches after penetrating a wall board barrier; 16.7 inches through a plywood barrier; and 15.2 inches through an auto glass barrier. In bare gel it expanded to .46 inch and had a retained weight of 69.5 grains, or 93 percent.

Hornady's SBR load stayed within the FBI recommended parameters of 12 to 18 inches of penetration through all the barriers, which is impressive. I think Hornady's engineers struck a nice balance of acceptable exterior ballistics and great terminal performance. Not only that but they did it while reducing the blast and sound signature and all but eliminating the flash. And this load is very suppressor friendly.

If short barrels are your thing, you'll want to look into Hornady's new 75-grain InterLock HD SBR Black load.

by Joseph von Benedikt

Water Works

HYDROFORMING CASES IS A GREAT ALTERNATIVE TO FIRE-FORMING.

Hydraulic pressure utilizing only water and a simple form die will create custom cases without cost or wear and tear on your barrel. To create his .280 Ackley cases, von Benedikt starts with a .280 Rem. case (l.). When hydroformed (c.), the resulting shoulder is high, so the case is then full-length resized to proper dimensions (r.).

Hydraulically forming modified cartridge cases out of parent cases accomplishes much the same thing as fire-forming, but with a lot less cost in components, time and barrel wear. Just for the sake of comparison, let's do a quick breakdown on fire-forming first, using the popular .280 Ackley Improved as a case study.

When fire-forming, a reloader typically begins with new or once-fired parent-case brass. In this example we'll use .280 Rem. brass, priming it and charging it with a mild charge of a propellant that is relatively fast-burning for the cartridge. Then we add a basic, inexpensive .284-diameter bullet and fire it at the range. Detonating the gunpowder causes sudden internal pressure, the malleable brass case walls and shoulder stretch, flowing into the path of least resistance, and *voila*—a perfectly formed .280 Ackley Improved case emerges.

Aside from the time it takes to assemble and shoot all these mild loads, each and every fire-formed case accrues a cost. You're paying three or four cents for the primer, 30 cents for the projectile and about 20 cents for powder. Round down and call it a half-dollar per fire-formed case. Plus, even mild loads cause barrel erosion.

There's a better way, and one that—once you've made the initial investment of $180 to $200 for a custom hydroforming die—costs you only time, and not much of that. Hydroforming dies are special dies that utilize hydraulic pressure to swage out the walls and shoulder of your cartridge cases. A few different companies produce them for various cartridges, but the one I've used most is a .280 Ackley Improved hydroform die by Hornady, so I'll stick with what I know for this discussion.

In addition to a hydroforming die, you'll need a special shell holder without a priming hole, a handful of spent primers, a bit of case lube, a container of water and a method of filling cases without spilling. A medical syringe works well for this.

The hydroform die screws into the top of your press like any other die. It's worth noting that since you'll be whanging away on the top of the die, your press should be mounted to a solid, non-flexible bench. If your press gives every time you smack the hydraulic plunger, you'll work a lot harder to accomplish clean, crisp case forming.

Use a bench-mounted or hand priming tool to seat spent(!) primers in the pockets of your new, unformed cases. Grease them lightly; I typically use a case wax applied with my fingers rather than a spray- or roll-on lube, but any lube system should work. You just don't want your newly formed cases getting stuck inside the die.

Insert the special shell holder without a priming hole atop the press's ram and you're ready to begin.

Using a syringe, or whatever else you've figured out, fill a case with water. Fill it right to the top, place it in the

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SAFETY NOTE: Always wear ear and eye protection when shooting firearms.
(Images shown are for marketing purposes only and are not intended as safe firearm handling examples.)

special shell holder and run it up into the hydroform die.

Insert the hydroform plunger into the top of the die and let it settle for a few seconds. Tiny air bubbles should bubble out around the plunger as it slowly settles. You want the air pocket gone and the plunger down against the water inside the case. Air is compressible and will reduce the water's hydraulic action if you whack the plunger top before the air oozes out.

In my experience, you don't need a big hammer, and you don't need to strike the plunger a heavy blow. Instead, use a medium-small ball peen or finish hammer and crack the plunger about three fast, sharp blows.

You'll note that during the first blow—under which most of the forming occurs—the plunger feels almost spongy beneath the hammer as the brass forms. Following blows encounter much more solid resistance and serve to complete the brass swaging process.

It's important to wear safety glasses during the operation because small amounts of water tend to spray with each blow. And you're striking steel with steel, so you never know when a metal shard or even a spark could accompany the water.

When you go to remove the formed cartridge from the die, be sure to first lift the plunger out of the top of the die. If you don't, it will follow the case down, and when the hydraulic seal between case and die is broken water will run all over the case, shell holder, press base and ram.

As an aside, it's worth applying a good rust preventive lube such as RCBS's Press and Die Storage protectant to your press before beginning. I live in an arid climate and don't have to worry about rust for the most part, but water is bound to get into your press and it's just better to be safe than sorry.

Back the formed case out of the die and lift it from the shell holder. You'll note a couple of apparent oddities. First, the case may not stand straight on its base, since the spent primer you used to seal the primer pocket will likely have bumped down a bit until

ORDERING A HYDROFORMING DIE

They hydroform die I used is available through Hornady's custom die shop. Common calibers such as the .280 Ackley Improved die can simply be ordered by cartridge. However, unique one-off dies may also also be ordered.

When ordering a non-standard hydroforming die from Hornady, the company needs the cartridge name, bullet diameter, parent case, three fired cases, chamber reamer drawings and how you want the die marked (up to 12 characters including spaces). Prices for hydroforming dies range from $180 to $200.—*JVB*

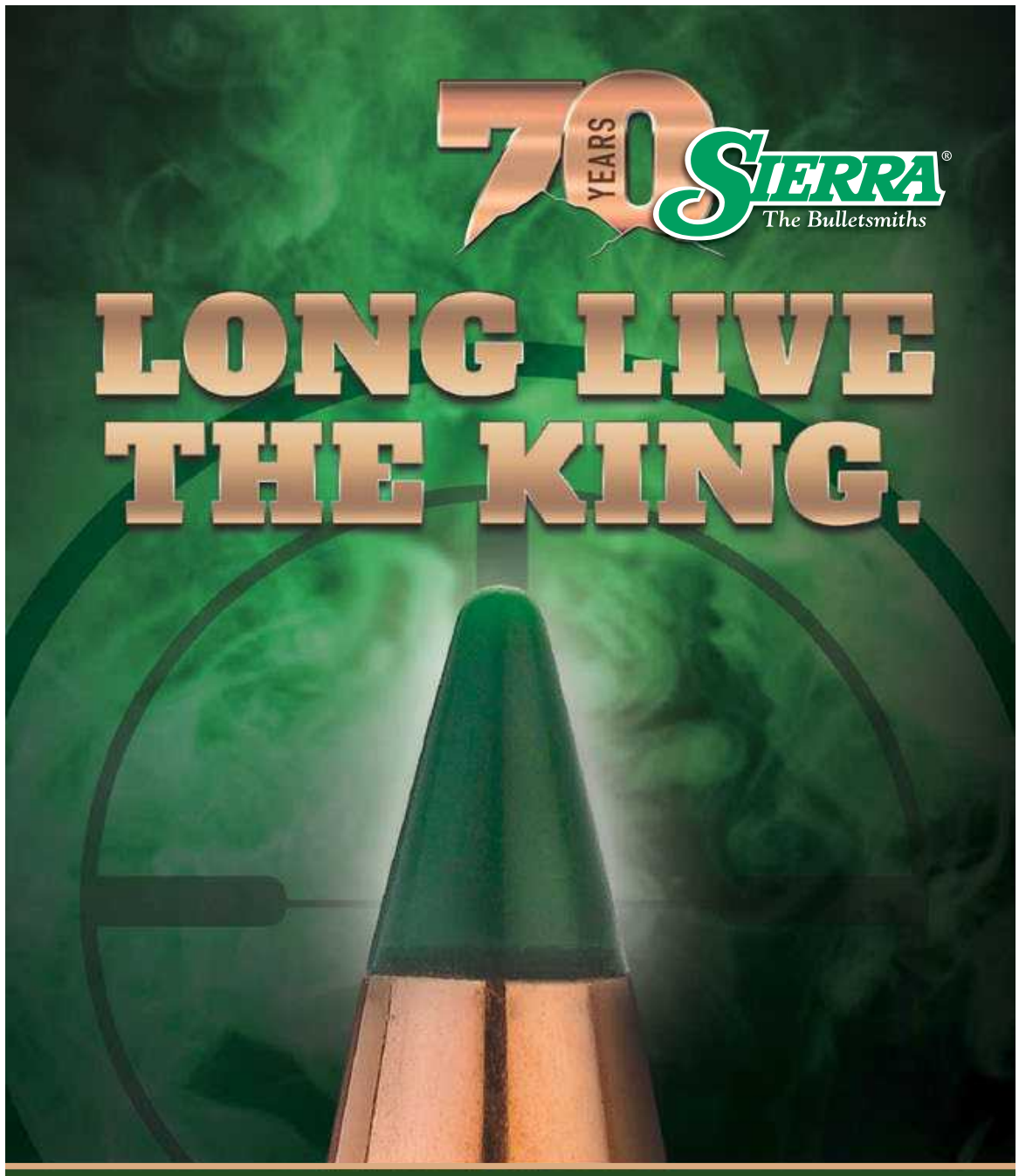
it contacted the inside bottom of the shell holder—and even shell holders without priming holes have a shallow relief channel machined to accommodate cartridge cases with high primers.

Also, the shoulder of the case will seem a bit soft or rounded. That's intentional. The hydraulic case form die has a bit of excess built in, so if you place the newly formed case beside a finished case, you'll note the shoulder appears to be a whisker high. Not to worry. Run it through your standard full-length sizing die and it will come out in crisp-shouldered perfection.

Running it through the standard full-length sizing die also pops the spent primer from the primer pocket, making it ready to load. However, don't jump right to priming the case with your favorite match-grade primer, because there's likely a little moisture left in that primer pocket.

I prefer to leave my newly formed, full-length-sized and de-primed cases in a sunny windowsill for an hour or two or above a heater vent overnight to be sure all moisture evaporates from the interior of the case and primer pocket before priming and loading. Or, of course, you can toss them in your handy case dryer.

Once the relatively simple process is mastered, you should be able to form a case per minute or so. And aside from the hydroforming die, it doesn't cost you a cent or put any wear and tear on your barrel. ■



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A CLASSIC UPDATE

BROWNING TROTS OUT A NEW BAR MARK 3 IN TIME FOR THE GUN'S 50TH ANNIVERSARY.

by Layne Simpson

I grew up in the Southeast during an era when semiautomatic rifles were extremely popular among deer hunters. In those days just about every pickup truck you saw had a rifle rack mounted in its rear window, and most held either an autoloader or a lever action. The Remington 742 was king, but it was not uncommon to see hunters in the woods toting Winchester 100s and Browning BARs.

The Winchester is long gone, and after a century of producing semiautomatic centerfires, Remington recently dropped the axe on its latest, the Model 7400. Hunters who prefer a classic sporting rifle that shoots each time its trigger is squeezed are now left with the Benelli R1 and the Browning BAR.

The BAR sporting rifle—not to be confused with the totally different military rifle of the same name covered in the accompanying sidebar—was designed by Marcel Olinger and John Browning's grandson, Bruce Warren Browning. When introduced in 1967, it had a 22-inch barrel and was initially chambered to .243 Win., .270 Win., .308 Win. and .30-06. It was priced at $165 while its competitors, the Remington Model 742 and Winchester Model 100, sold for $160. The BAR was originally built in Belgium, and while all parts are still made there, they are now shipped to a Browning facility in Viana, Portugal, for assembly. Servicing and warranty work are handled by Browning's Arnold, Missouri, shop.

In 1969, Browning one-upped the competition by offering a magnum

version of the BAR with a 24-inch barrel in 7mm Rem. Mag., .300 Win. Mag. and .338 Win. Mag. It was about a pound heavier than the standard version. All rifles at the time were built on a long action, but a shorter action was eventually introduced for the .243 Win., .308 Win. and other short cartridges.

Something that makes the BAR unique among rifles of its type is a staggered magazine box attached to a hinged floorplate. You can charge the rifle by hinging down the magazine and filling it with cartridges or by quickly replacing it with a loaded magazine. It is an excellent design, one shared by the Browning A-Bolt rifle of yesteryear. Magazine capacities are four standard cartridges or three magnum cartridges.

The Mark 2 version of the BAR was introduced in 1993, and with it came several modifications. The addition of exposed cross pins in the receiver made the trigger assembly easy to remove for cleaning, and a redesigned slide stop lever allowed the bolt to be locked back with the magazine removed. A friend of mine who has hunted with several BARs through the years is convinced that accuracy and reliability were also improved.

The BAR has a piston-driven gas system and a bolt with seven rotating locking lugs. Lockup of the bolt with an extension of the barrel allows the use of either a steel or an aluminum receiver.

The gas cylinder is dovetailed to the bottom of the barrel about six inches forward of its chamber. Propellant gas flowing into the cylinder during firing drives the piston rearward about half an inch, where energy is transferred to a steel inertia block measuring just over three inches long. As the piston reaches the limit of its travel, excess propellant gas is dumped through a vent at the bottom of the cylinder.

The forward ends of right-side and left-side steel action bars are connected to the inertia block while their rear ends engage the bolt carrier. During its 4.25-inch travel to the rear, the inertia bar rides on a steel rod containing the action spring. Once the bolt carrier reaches the limit of its rearward travel during firing, forward pressure by the spring on the inertia block pushes it forward, drawing the carrier forward to engage the locking lugs of the bolt with the barrel extension.

A red dot at the bottom edge of the ejection port serves as a bolt position indicator. The dot is in view only when the bolt is fully forward in its locked position.

A spring-loaded bolt catch is located on the right-hand, bottom edge of the receiver. As the bolt chambers the last cartridge from the magazine,

The profile of the aluminum receiver on the Mark 3 is slightly changed, and there were tweaks to the buttstock and fore-end as well.

The BAR is unique with its swing-down floorplate to which a detachable magazine is attached. You can either top off the mag or swap it out for a full one.

SPECIFICATIONS

BROWNING BAR MARK 3

TYPE	piston-driven, gas-operated, rotating bolt semiauto
CALIBER	.243, .270 Win., .270 WSM, 7mm-08, 7mm Rem. Mag, .308, .30-06 (tested), .300 Win. Mag.
CAPACITY	4+1 (standard), 3+1 (magnum)
BARREL	22 in. (as tested)
OVERALL LENGTH	43 in. (as tested)
WEIGHT	7.1 lb. (as tested)
FURNITURE	oil-finished walnut with cut checkering
FINISH	barrel blued, receiver satin nickel
TRIGGER	nonadjustable two-stage,
SIGHTS	none; drilled and tapped
PRICE	$1,240 (as tested)
MANUFACTURER	Browning, BROWNING.COM

the follower pushes the catch against the bottom of the right-hand action bar. Then as the fired case is ejected and the carrier reaches the limit of its rearward travel, the catch engages a deep notch in the bottom edge of the action bar.

The carrier is released by pushing down on the large tab of the latch or, if one or more rounds are in the magazine, by pulling and releasing the bolt handle. The bolt can also be locked back with the magazine removed by retracting it while pushing up on the latch.

The owner's manual does not explain how to access the gas handling system, but I have taken apart the FNAR, which is basically the same rifle sold by FN America. Removal of the gas piston and associated parts of the gas-handling system is quite easy. The first step is removal of the fore-end, which is held in place by a bolt at its front. If a rifle has a front sling swivel post, it also will have to be removed.

During takedown, keep in mind that side pressure from the fore-end holds the two action bars in place. If the fore-end is removed while the bolt is forward in its locked position, the action bars can become disengaged from the carrier and inertia block and fall from the rifle. Placing them back into position is not difficult although there is a short learning curve. This won't happen if the fore-end is removed while the bolt and its carrier are locked to the rear. One hand then eases the bolt forward as the other holds the action bars in position.

The fire control group is also easily removed for cleaning. With the bolt forward on an empty chamber, a nylon dowel is used to push two transverse retention pins from the receiver. A downward pull on the front of the trigger guard removes the assembly from the receiver.

As this is written, the all-steel BAR Mark 2 is available only in Safari Grade. It has a blued steel receiver and barrel and checkered walnut with nice contrasting figure. This one has the original classic appearance that many BAR lovers have long preferred. Caliber options are .270 Win., .30-06, .300 Win. Mag. and .338 Win. Mag.

It comes with or without the Ballistic Optimizing Shooting System (BOSS) attached to the muzzle of its barrel. For the benefit of those who are not familiar with the BOSS, it is a combination muzzle brake and barrel harmonics modifier. Trial-and-error adjustment to its sweet spot for a particular load can have a very positive affect on accuracy. Availability of the Mark 2 Safari will continue into this year.

The Mark 3 version of the BAR was introduced in early 2016, but it actually didn't become available until late last year. The Mark 3 differs from the Mark 2 mainly by a slightly different receiver profile and a new stock and fore-end design. Six shims are included for adjusting drop and cast in the stock, the latter reversible for left-handed shooters. A bit of weight was trimmed away by the use of a trigger group

A shim kit that comes with the rifle allows shooters to customize their BARs for drop and cast, including options for lefties.

Removing the fore-end provides access to the gas system for cleaning.

ACCURACY RESULTS

BROWNING BAR MARK 3

.30-06	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)	Avg. Group (in.)
REMINGTON PREMIER CORE-LOKT ULTRA	168	2,655	37	1.72
HORNADY CUSTOM SST	150	2,845	18	1.86
FEDERAL HIGH ENERGY TROPHY BONDED TIP	180	2,791	19	1.94
WINCHESTER SUPER-X POWER-POINT	180	2,644	33	2.02
HORNADY SUPERFORMANCE SST	150	3,016	41	2.24
REMINGTON PREMIER ACCUTIP	150	2,862	24	2.34

NOTES: Accuracy results are averages of five three-shot groups at 100 yards off sandbags. Velocities are averages of 10 shots on an Oehler 33 chronograph placed 12 feet from muzzle.

housing and hinged floorplate made of a synthetic material. This particular detail first appeared years ago on BARs built for the European market.

The wood is Grade II walnut with an oil finish and 20-line cut checkering. Drilled and tapped for scope mounting, the aluminum receiver has a satin nickel finish highlighted by a touch of scroll engraving along with the ever-familiar Buckmark in gold. The Mark 3 is offered in .243 Win., 7mm-08, .308, .270 Win. and .30-06 with a 22-inch barrel, .270 WSM and .300 WSM (23-inch barrel) and 7mm Rem. Mag. and .300 Win. Mag. (24-inch barrel).

The BAR Mark 3 you see in this report was in .30-06 and weighed exactly seven pounds. Adding four cartridges and a Trijicon 3-9x40 scope in a Talley lightweight mount increased heft to eight pounds, 8.4 ounces. Wood to metal fit was quite good.

Some Mark 3s I have examined had beautiful wood while others were rather plain. The one I shot had a gorgeous fore-end but very little figure in its buttstock. Checkering was professionally executed with no border run-overs or diamonds left begging to be pointed up. The oil finish won't hold up to as many sloppy weather hunts as a synthetic, but it sure looks nice.

As I discovered while accuracy testing over sandbags, the Mark 3's weight and gas operation make it quite comfortable to shoot. That makes it an excellent choice for those who are sensitive to recoil. Some autoloaders mangle cartridge cases, but handloaders will be happy to know they emerge from the BAR in excellent condition. And some autoloaders become unruly when fed Hornady Superformance and Federal High Energy ammo, but the BAR gobbles up both and begs for more. I wish it had a better trigger but otherwise the rifle gets a clean bill of health.

New BAR additions for 2017 include a Mark 3 Stalker with a matte black aluminum receiver and a Dura-Touch coating on the stock and fore-end for a no-slip grip during a rainy day hunt. Also new is a Mark 3 dressed in Mossy Oak Break-Up Country camo. Both models will be available in the same chamberings as the standard Mark 3.

Feral pig shooters will be thrilled to see the upcoming Mark 3 DBM with 18-inch barrel, integrated Picatinny scope mount, black composite stock and fore-end and detachable box magazine that holds 10 .308 Winchester cartridges. Suggested retail on it will be $1,470.

That other BAR, the one designed by John Browning, will be 100 years old in 2017, and to commemorate that, a limited run of 100 of today's BAR Safari Grade rifles will be offered with special 100th Anniversary markings. The caliber is .30-06, and suggested retail is $2,700.

The BAR sporting rifle is celebrating its 50th anniversary this year. Specially marked rifles will be built for the occasion, but as of this writing, no details were available.

THE OTHER BROWNING BAR

When the United States entered World War I on April 6, 1917, the few machine guns in inventory were of foreign manufacture, and some were chambered for cartridges of foreign design. The decision was made to replace them with guns of domestic design and build, and when John Browning demonstrated his select-fire, automatic rifle in February 1918, military leaders were impressed enough to immediately adopt it and press it into service. It was chambered for the .30-06 Springfield service cartridge.

The Model 1918 Browning Automatic Rifle (BAR for short) served faithfully in both world wars and was still alive and well during the Korean War. A few even saw action during the Vietnam War.

BARs were manufactured by Winchester, Colt, Marlin-Rockwell, International Business Machines and a number of other companies—not only in the U.S. but also in other countries. During the 1920s, Colt obtained the rights to manufacture the BAR for law enforcement and civilian markets, but it discontinued production during the 1950s.

In 1986, Ohio Ordnance Works of Chardon, Ohio, began building a semiautomatic-only version of the BAR under license from Colt. Whereas the original fired from an open bolt, the first shot from the Ohio Ordnance rifle is from the closed-bolt position.

The company now offers the Colt 1918 BAR/SLR Commemorative Edition. It has all the correct markings, including the Rampant Colt, and comes with 20-round magazines, leather sling, cleaning kit and instruction manual, all in a leather presentation case, at just under $9,000.—*LS*

photo courtesy Paul Scarlata

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22 NOSLER

The Ruger No. 1 led the renaissance of single-shots in America, and over the years this rifle has been available in a wide variety of calibers and configurations.

SINGLED OUT

by Craig Boddington

SINGLE-SHOT RIFLES AREN'T FOR EVERYONE, BUT TO THEIR FANS THE APPEAL IS IRRESISTIBLE.

Winchester's Model 1885 was the last of the great 19th-century single-shot actions. Designed by John Browning in 1878, about 600 were manufactured by Browning (price them babies!) before Winchester bought the manufacturing rights. About 140,000 were made in about 60 known chamberings, but the rifle was discontinued in 1920, following the Ballard, Remington Rolling Block, Sharps, and all the others into oblivion.

In the latter 19th century the single-shot centerfire competed well with even the largest lever actions. It was considered more accurate, and even John Browning's great '86 Winchester couldn't accept cartridges as large as the big single-shot actions could handle. But in the early 20th century the bolt action began its ascendancy. It was equally accurate, could be sized to handle the most powerful cartridges and was a repeater. The age of the single-shot sporting rifle was seemingly over.

Word of a brand-new single-shot designed by Bill Ruger was leaked through the subtle means of a *Guns & Ammo* cover in October 1966, with the actual Ruger No. 1 hitting the market in early 1967. Fully 47 years had passed since a major American manufacturer had offered a single-shot centerfire, and no new single-shot action had been developed in the 20th century. No wonder a lot of folks thought Bill Ruger had lost his mind.

Ruger knew his single-shot wouldn't appeal to everyone, and it does not. It was, however, his kind of rifle: sleek and classic. He believed it would appeal to a certain cadre of rifle shooters who would appreciate the look and feel and also be attracted to the ethos of the one-shot rifle.

Apparently, he was correct across the board. Expensive to manufacture and thus costlier than most Ruger firearms, it has never been a huge seller, but its fans are avid. It has now been in continuous production for 50 years and has just recently exceeded the Winchester 1885 in number of chamberings.

Aesthetics and nostalgia aside, what does the single-shot offer today's shooters. First is strength. The falling-block action is one of the strongest known; the massive breechblock rises and is fully locked within the solid receiver. It simply cannot go anywhere, and while it is theoretically possible to detonate any action—whether through barrel obstruction or a grossly negligent overload, such as substituting pistol powder for rifle propellant—the falling-block action will be the last to go. (Also, not all single-shots are created equal, and it's worth noting that break-open actions, though adequately strong, are not as strong as falling blocks.)

Second is overall length. Lacking the moving bolt of any repeater, a single-shot starts out as much as four inches shorter. This advantage can be utilized in two ways, depending on what you want. A single-shot with a standard 22-inch barrel is already several inches shorter than a repeater with the same barrel, carbine length if you will. It is shorter and handier and can be built lighter.

If you prefer the increased velocity of a longer tube, you can have a 26-inch-barreled single-shot for about the same overall length as a repeater with a 22-inch barrel. Most of the time the longer barrel is my preference, but that's up to you.

There is also some savings in overall weight, but as always, this depends a whole lot on the stock and even more on the barrel contour. The Ruger No. 1-A (Light Sporter) with a short, slender barrel is light. The 1-H (Tropical) has a longer barrel of much stouter contour and is quite a bit heavier. Although the 1-H looks great, I have always suspected the heavier barrel is supplied largely to add gun weight in the more powerful cartridges. In chamberings such as .458 Lott and .450-3¼ Nitro Express, the No. 1 needs every ounce it has, and to be honest it could use a few more.

Versatility

The single-shot action is incredibly versatile. No repeating action of any type has ever been offered in nearly as many chamberings as the Winchester Model 1885, Ruger No. 1, Dakota Model 10 or Thompson/Center Contender. While the Ruger and Dakota are centerfire actions, the Winchester '85 (both historically and today) can be either rimfire or centerfire, and the clever switch-barrel Thompson/Center can be both.

Across the board, the only limitation is the size of the action. The Ruger No. 1, never offered in more than one action size, has been chambered from .22 Hornet to .450-3¼ Nitro Express, the latter cartridge pretty much maxing out the action without having to hog out the raceway.

The Winchester '85 in smaller Low Wall form and larger High Wall form is currently offered from .17 HMR to .45-70. In the blackpowder era it was chambered to a number of .50-caliber cartridges. Thompson/Center barrels have been made in just about everything imaginable, but the .416 Rigby seems to be about the maximum the action can house.

Let's note here that the hammerless falling block action was primarily a British (okay, Scottish) design going back to the 1870s. In the British gun trade, "custom" was a norm, not an exception, and some of the old British single-shots are truly spectacular. The Scottish Farquharson gave Bill Ruger the concept for his No. 1, and the Dakota Model 10 is also similar to a "Farky." But there were a number of exposed-hammer and break-open British single-shots.

Similarly, it's just a matter of action size. In the blackpowder era there were cartridge-firing single-shots in two, four and eight bore. In the smokeless era there were classic British single-shots big enough to house the .600 Nitro Express. No commercial action today can house such a cartridge, but custom single-shots have been built recently for the .600 and even larger cartridges.

Another advantage, in my opinion, is the safety aspect. The single-shot is either fully loaded or fully unloaded and extremely easy to check. There are no cartridges lurking in the shadows in a magazine, begging to be forgotten. Loading the chamber is a conscious act, and unloading is also simple. Most young hunters, at least in my day, started with a single-shot .22 and/or a single-shot shotgun. The same principles apply with a centerfire rifle.

This last is also a disadvantage in some circumstances: The rifle is either fully loaded or fully unloaded, with no full magazine in reserve. So when getting off a horse or when bundled up in heavy clothes one has to fumble for a cartridge. Serious hunters who use single-shots find all sorts of creative ways to have at least one cartridge handy, but it's something to think about.

The Thompson/Center Encore is a superb utility gun that can be configured in a number of centerfire and rimfire calibers, along with muzzleloader chamberings and shotgun gauges.

This disadvantage is mitigated by the fact that most single-shots can be loaded (and unloaded) much more quietly than most repeating actions. Of course, that one single cartridge can be a disadvantage in some hunting situations, but I'll discuss this in more detail later on.

To me, perhaps the greatest disadvantage is accuracy. In general, the single-shot is often not as accurate as the bolt action (although it's at least equal to, if not superior to, other action types). This is because most single-shots have two-piece stocks, which are not as stable as one-piece stocks. Also, most single-shots have the fore-end secured to the barrel with a mid-barrel screw. This is not a kiss of death, but it does limit bedding options. What I have found is that single-shots with extremely light barrels tend to be finicky, while single-shots with heavier-contour barrels are much more forgiving.

As I mentioned, the Ruger No. 1 breathed new life into the single-shot concept. The T/C Contender followed just a year later, and the Model 1885 has been available again (either from Browning or Winchester) since 1985. Today there are quite a few single-shot rifles, but it seems to me they fall into four categories—five if you count benchrest-type bolt actions that are solid where the magazine would be, but we're not going to include those here.

First are what I think of as "premium grade" single-shots. In my mind, this starts with the Ruger No. 1, not only a great action but also a gorgeous rifle. I am also a long-time admirer of the Dakota Model 10. The action is a bit trimmer than the Ruger, and it is a first-class semi-custom or custom rifle. I've used a couple of them and loved them, but I just recently choked it up and did some trading for a gorgeous Model 10 barrel marked .275 Rigby (aka 7x57).

I am not suggesting the Dakota is a "better" action than the No. 1. The No. 1 has a wonderfully reliable ejector, while the Model 10—like older English guns on the Farquharson-type action—is an extractor gun. But the Dakota represents a serious upgrade in fit and finish. Mine sure is beautiful, and it shoots extremely well.

Also, the Europeans never abandoned the single-shot concept to the extent we did, so most of the better European brands offer really good-looking (and accurate) single-shots, usually break-open actions. Although rarely seen in this country, they are available from Blaser, Merkel and more. The most classic European type is short-barreled with a full stock and is very attractive; this configuration is often referred to as a "stutzen."

Finally, as "first class" single-shots, let's not overlook the newly manufactured Model 1885. It is a reproduction of an older action, which is the fourth of my categories, but the 1885 straddles both worlds because it's available chambered to modern cartridges and can readily and easily be scoped. It's also an upgraded modern single-shot, stocked in good wood with gorgeous bluing.

My third category is a much more basic and less expensive rifle. The

Single-shots can be accurate, but the separate fore-end complicates things. The Ruger No. 1's fore-end attaches to a forward extension of the ejector spring housing.

H&R 1871 offers up the Buffalo Special, a simple and inexpensive break-open rifle chambered to the good ol' .45-70 and featuring a 32-inch barrel with a globe aperture front sight.

most basic is the H&R Handi-Rifle, an exposed-hammer, break-open rifle similar to a good old break-open single-barrel shotgun. It's inexpensive and offered in a wide array of chamberings, and additional barrels are available. I have one of H&R's Buffalo Classic rifles in .45-70 with a 32-inch barrel, and it's very cool.

The Thompson/Center Contender Carbine is a step up, and its Encore is yet another step up, but they're still very affordable. The basic rifles are, again, break-open, exposed-hammer single shots, but the heart of the T/C system is its interchangeable barrel platform—with T/C as much in the barrel business as the rifle business. And they must make good barrels; I've never had a problem with accuracy.

One comment about exposed-hammer designs: Most can be used with scopes, and hammer extensions make it easier, but you're going to fumble a bit getting your thumb underneath the ocular bell to cock the rifle (except maybe on the T/C Encore Pro Hunter, which has a swinging hammer you can position to the left or right to make it easy to operate with a scope on board). Plan on plenty of time at the range getting used to reaching for the hammer. Obviously, this is not a problem with internal-hammer designs.

My fourth category of single-shots includes the reproductions of older actions, all of which go back to the blackpowder era, long before scopes were in common use. These include the Sharps, Remington Rolling Block and the trapdoor Springfield. Depending on the maker (and, of course, on the price) many of these are spectacular rifles, but most are poorly suited to scope use, and they're not often chambered to modern high-intensity cartridges. No disrespect to good rifles that are fun to shoot, but like the single-shot bolt actions, I think they are beyond the scope of this discussion.

So what about their practicality in the field? You know, the "one shot, one kill" creed isn't just for military snipers; it's also the mantra of every ethical hunter. Unfortunately, we all know it doesn't always work out that way. Ideally, hunting with any given platform should be preceded by a lot of range time, including rapid reloading. With practice the single-shot can be fairly fast.

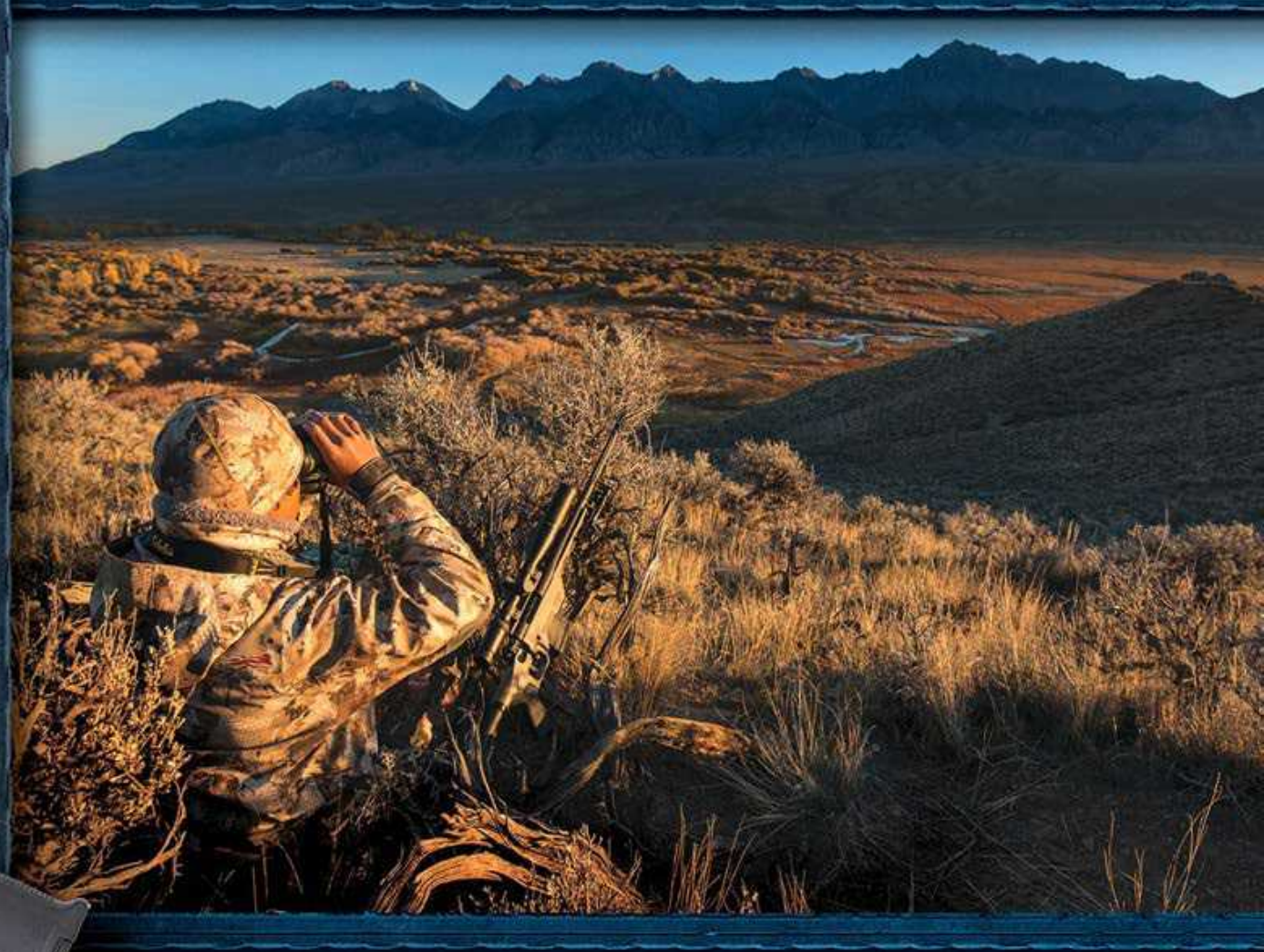
The falling blocks are generally faster to reload than break-open designs and require considerably less movement off the target. Exposed hammers that must be cocked also require a few extra split seconds and are a bit slower than hammerless designs. That said, when you're hunting with a single-shot, you should accept that there will be many situations when there simply won't be time to get off an additional shot.

For this reason I think it's a really bad idea to hunt dangerous game alone with a single-shot, but that's not a situation available to the vast majority of hunters. I've taken a lot of African buffalo and other assorted dangerous animals with single-shots, as well as a whole bunch of other game in various places. There are situations where fumbling for a cartridge can be a hassle, but the single-shot is generally a viable option because I can't honestly say the lack of a fast backup shot from a one-shooter has ever cost me an animal. Sometimes, no matter what you're using, there just isn't time for a second shot—and sometimes you have all day.

But here's the real secret about using a modern, accurate single-shot rifle: It offers a huge psychological advantage in that you know that, in all likelihood, you have just one chance. You have to make it good. This knowledge makes you extra careful, and that's not a bad thing at all.

Single-shots present hunters with certain limits when it comes to follow-up shots, but they also essentially force people to make that first shot count.

HARD WORKING GUNS ALL THE TIME



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OLÉ!

by Brad Fitzpatrick

THE B-14 HUNTER FROM SPANISH MAKER BERGARA DELIVERS ACCURACY WITH A FLOURISH—AND A DECENT PRICE TAG.

If you know anything of the history of bullfighting in Spain, you are familiar with the name Manolete. The greatest of the Spanish matadors, Manolete (actually Manuel Laureano Rodriguez Sánchez) was known for his stern and grave demeanor as well as his finesse for the *suerte de matar*, the killing of the bull. Above all, he was known as one of the most mechanically precise and utterly fearless bullfighters to ever set foot in the ring.

Tossing your hat into the current American bolt-action rifle market takes *cajones* like a matador's, but Spanish barrel maker Bergara is doing just that. As more and more manufacturers jump into the bolt-gun competition, the market is bound to start looking like the streets of Pamplona after the festival of San Fermin. There's going to be blood, and not everyone can make it out alive.

Why, then, would Bergara want to take the risk of spending time and money to launch a hunting rifle in the United States? Because the company thinks its new B-14 line can stand up favorably to the competition.

Since 2003 Georgia-based BPI, Bergara's parent company, has been making barrels in its Spanish factory for muzzleloader company CVA and other brands. But these weren't just any barrels. BPI enlisted the help of

Michael Anschuetz photo

famous barrel maker Ed Shilen, whose own barrels have amassed 13 world records.

With Shilen's expertise and BPI's state-of-the-art new factory and modern machining technology, Bergara started producing barrels that caught the attention of shooters because they were affordable yet accurate. These barrels inspired Bergara to build its own rifle to showcase just how accurate these pipes really were. That was the genesis of the B-14 line.

Bergara needed more than just a barrel, though. The company didn't source an existing action but rather built its very own, a push-feed design with dual opposed lugs up front. Instead of using a traditional tab-style extractor, Bergara went with a Sako-style extractor and a coned bolt nose and breech.

Lockup is extraordinarily smooth, and the bolt body itself, which is brightly polished stainless steel, is slightly wider in diameter than many counterparts. This all means the Bergara action is silky smooth and as precise as the turns of a bullfighter during the *pase de pecho* maneuver.

The rear of the Bergara action features an enclosed bolt shroud with a narrow horseshoe-shaped cocking indicator that extends beneath the shroud when the rifle is ready to fire. There's a two-position safety lever located on the right rear side of the receiver, and like everything else on this action, it's smooth and well made.

It's the only rifle safety I've used that could be engaged and disengaged without making a sound, and the first time I made ready to fire the B-14 I had to double-check to be sure that the safety was indeed pushed all the way forward because there was no audible indicator. If you're a hunter—and most people who buy this rifle will be—that's a handy feature when the game is close and the woods are still.

The bolt arm is quite straight, the bolt knob large and perfectly rounded—a classic yet functional design that has worked well since the days of the original Peter Paul Mauser 98s. The top of the receiver is drilled and tapped to accept Remington 700 bases, which makes mounting an optic convenient.

The trigger is Bergara's own design,

The Bergara's short action is lightweight, and the bolt stroke is smooth. Scope base configuration is the same as the Remington 700's, so bases will be easy to find.

Bergara offers hinged floorplate or detachable magazine options in the B-14, although some calibers like the 6.5 Creedmoor Fitzpatrick tested are only available with a hinged floorplate.

SPECIFICATIONS

BERGARA B-14 HUNTER

TYPE	bolt-action centerfire
CALIBER	6.5 Creedmoor (tested), .270 Win., .308, .30-06, 7mm Rem. Mag., .300 Win. Mag.
CAPACITY	4+1 (as tested)
BARREL	22 in., 4140 chrome moly, 1:8 twist (as tested)
OVERALL LENGTH	41.5 in.
WEIGHT	7.05 lb.
STOCK	green glass-fiber-reinforced polymer
FINISH	matte blue
TRIGGER	3.0 lb. (measured)
SIGHTS	none; drilled and tapped for Remington 700-type bases
PRICE	$825
MANUFACTURER	Bergara, BergaraUSA.com

and it's a good one thanks to years of barrel testing using high-end trigger mechanisms. It is crisp and clean and breaks right at the advertised three pounds.

Most B-14 Hunter rifles are available with either a detachable box or a hinged steel floorplate magazine. The particular rifle I tested was chambered in 6.5 Creedmoor, and the only option for that caliber is the floorplate model, which I actually prefer. The floorplate release is located just ahead of the trigger guard, and there's a rocker-style bolt release button on the left rear portion of the action.

As the price of bolt guns has dropped, the accompanying injection-molded rifle stocks these guns wear have become more and more spartan. Bergara opted to go another direction. The B-14 Hunter has a molded synthetic stock made of glass-fiber-reinforced polymer stock, green with flecks of black and tan. The exterior of the stock is coated with SoftTouch for a slightly tacky feel, and integral steel pillars are molded into the stock for enhanced accuracy.

The comb profile is straight with no rollover, although this isn't true of all B-14s; the wood-stocked Timber has a raised comb. The pistol grip is properly sized for an easy grip. The rear portion of the pistol grip is flattened so you can rest your thumb comfortably and naturally. The wrist and the fore-end of the stock are checkered, but against the tri-colored stock it's hardly visible.

The 6.5 Creedmoor rifle I tested came with a No. 3 contour 4140 chrome moly barrel that was 22 inches long, which gave the rifle an unloaded weight of just 7.05 pounds.

In a world of $500 rifles, the $825 B-14 isn't cheap, but it's unquestionably a bargain. For starters, it doesn't look or feel like a rifle in this price category. Without knowing the price I would have guessed it at about $1,500, and I would have been shocked that it was under $1,000. The silky-smooth action, polished exterior lines and ultra-crisp trigger belie this gun's asking price.

Some people care how a rifle looks, but everyone cares how it shoots. To that end, Bergara has promised the B-14 will group under an inch with factory match ammunition. I hoped it would do better, for this gun had all the trimmings to be a tack driver, and I wasn't disappointed.

It was midday in summer and the temperature was well above 90 degrees. The 200-yard target at my local range was awash with a current of mirage, and if it hadn't been for the canopy overtop of the 100-yard shooting bench I would have had to wait for a cooler day. But I was anxious to see if the Spanish rifle could deliver.

I topped the Bergara with Trijicon's new AccuPower 3-9x40 scope with battery-operated illumination. The first string of three Hornady 129-grain American Whitetail bullets printed a respectable group that was just over an inch. The second group was a bit larger, and the third was right back at an inch. The B-14 did even better with Hornady's SST ammo, and Nosler's Custom Competition proved to be the most accurate load, delivering groups measuring from .59 to .72 inch. The rifle certainly met its promise with not only the Nosler match ammo but also the Hornady SST. Results are shown in the accompanying chart.

At seven pounds the Bergara strikes the balance between portability and recoil reduction, although the mild-mannered 6.5 spoils the shooter with big performance and minimal push-

The B-14 Hunter's stock is glass-reinforced polymer with SoftTouch finish and bedding pillars. It's certainly a standout among rifles in its class where aesthetics are concerned.

ACCURACY RESULTS

BERGARA B-14 HUNTER

6.5 CREEDMOOR	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)	Avg. Group (in.)
NOSLER CUSTOM COMPETITION HPBT	140	2,627	16.7	0.67
HORNADY SUPERFORMANCE SST	129	2,956	15.4	0.93
HORNADY AMERICAN WHITETAIL	129	2,758	16.2	1.17

NOTES: Accuracy results are averages of three three-shot groups at 100 yards from a fixed rest. Velocities are averages of 10 shots measured on a Shooting Chrony F-1 digital chronograph placed 10 feet from the muzzle. Abbreviation: HPBT, hollowpoint boattail

back. Bergara's CrushZone recoil pad helps, offering a dense layer of rubber between your shoulder and the stock. The straight comb design, balance of the rifle and density of the stock mean that even in magnum calibers the B-14 shouldn't be abusive.

Currently, the B-14 Hunter is chambered in 6.5 Creedmoor, .270 Win., .308 Win., .30-06, 7mm Rem. Mag. and .300 Win. Mag. and covers the needs of just about any hunter. The two magnum offerings have 24-inch barrels and weigh an additional three-tenths of a pound more than standard-action rifles.

Bergara's barrels were designed with help from famed barrel maker Ed Shilen. The proof is in the pudding.

The action is Bergara's own design, and the company opted to go with a Sako-style extractor on its two-lug, push-feed bolt.

Magazine capacity is four for standard calibers and three for magnums with the hinged floorplate; it's three and two, respectively, for the detachable box magazine.

In addition to the Hunter line, Bergara is offering two wood-stocked versions, the Woodsman, which look much like the Hunter dressed with a walnut stock, and the Timber, which has a Monte Carlo wood stock. The European walnut stocks of these rifles are oil finished, and both lines are chambered in the same seven calibers (except you can't get a Timber rifle in 7mm Rem. Mag.).

Suggested retail on these wood-stocked rifles is $945—still a bargain. Look for additional B-14 actioned rifles to follow, presumably a long-range or competition variant.

Fitzpatrick's sample met Bergara's one-inch guarantee with Hornady Superformance SST (c.) and Nosler match (r.); Hornady American Whitetail (l.) was just a touch over an inch.

Honestly, when I heard that Bergara was launching a new line of bolt guns, I didn't hold out much hope that there would be room in this market for another new rifle from a company that doesn't enjoy the same brand recognition as Ruger, Remington, Savage, Winchester or Browning. The market for $500 sub-m.o.a. guns is flooded, but you won't find many $800 rifles of this quality. And while shooting 40 or 50 rounds through a new gun doesn't tell you about a rifle longevity, I think it's pretty apparent based on the button-down look and feel of this gun that it isn't going to fall apart.

The workmanship is excellent, the fit and metal finish superb. The matte bluing is tough enough to stand up to some abuse and the stock looks and feels expensive. The only way that this rifle will fail is if it goes ignored by the shooting public. I don't think that's going to happen. With the boldness of Manolete, the B-14 has walked into the bullring of new bolt rifles, and I think that this matador has what it takes to avoid the horns. ■

THE SAINT COMES MARCHING IN

SPRINGFIELD ARMORY ENTERS THE AR-15 FRAY WITH THE SAINT, A FINELY APPOINTED CARBINE COSTING LESS THAN $1,000.

by Joseph von Benedikt

Springfield Armory—a name steeped in American firearms and combat history—has begun building AR-15 rifles. Before diving into the technical nuts and bolts of the new model, let's take a look at the company's motivation.

According to media liaison Jeremy Rosenberg, it's a move the company has been contemplating for some time. Why now? Many firearm enthusiasts will question the timing, particularly the prudence of what many may view as bringing just another AR to an already-saturated market.

When you read this, the 2016 presidential election will be in the very recent past, and by no coincidence Springfield Armory will have already lavishly stocked dealers' shelves across the nation with its new Saint, the rather evocative moniker the company chose for its first AR-15—counting on uncertainty to help drive sales. So Springfield's timing is actually reasonably good.

Additionally, Rosenberg indicated the dynamics of today's shooter demographics influenced the decision to move forward with an AR-15 introduction. A strong media campaign issued by the company says, "Springfield Armory will champion the untapped market of the youthful, aspirational, unapologetic civilian."

I'm not convinced the market mentioned is actually untapped because just about every AR-15 company in the market sells to it, but I do think it isn't satiated. Moreover, I find the term "unapologetic civilian" both interesting and inspiring. Although this is an era of significant political unrest and ideological disparity, in many people that unrest is bringing to the surface a strength of character and willingness to stand and be recognized as proud supporters of the Second Amendment.

Springfield's marketing campaign adds detail to the intended demographic: "They are forward-thinking, independent men and women who believe their safety is their responsibility." A new marketing surge of tremendous scope (see sidebar) accompanies the launch of the AR-15 Saint, and its catch phrase—Defend Your Legacy—pretty well sums up what it's all about.

Enough philosophy. Let's take a look at the new Saint carbine. It's intended to fill the niche between basic budget-type AR-15s priced around $600 or $700 and upper-crust AR-15s tricked out with all the bells and whistles and priced from $1,200 up. The Saint offers stem-to-stern quality without lavishness, and with a suggested retail price of $899, it will probably actually sell for around $850 or even less. At the same time, it's enough gun that many shooters will never feel the need to upgrade parts.

The heart of the Saint is a flattop receiver set forged of aircraft-grade 7075 T6 aluminum, Type III hard-coat anodized, with M4 feed ramps and a forward assist. The lower is fit with a proprietary Accu-Tite Tension System, which is a nylon-tipped tension setscrew in the lower that removes all slop from the receiver fit, which benefits accuracy.

The interiors of the bore of the upper receiver and the receiver extension are coated with a dry film lubricant after anodizing, which aids function if the carbine lacks lube.

Into the receiver is fit a 16-inch barrel. It's rather ho-hum in appearance but offers some outstanding invisible features. For starters, it's rifled with a twist rate of 1:8, which is slowly but surely replacing

the old twist rate of 1:9 as the civilian standard because it stabilizes heavy match-grade bullets more effectively, increasing the AR-15 platform's range. (As an aside, the faster twist does not adversely affect accuracy with light .223 bullets. I've shot half-m.o.a. five-shot groups with Hornady's 40-grain V-Max bullet out of multiple different 1:8-twist match-grade ARs.)

Every surface on the chrome moly vanadium barrel—5.56 NATO chamber, bore, exterior and even the front sight base—are finished with Melonite, which is an extraordinarily hard, durable, corrosion-resistant surface considered by many to be superior to both Parkerizing and hard chrome plating.

To provide the smoothest function practical with a 16-inch barrel, the Saint employs a mid-length gas system, which provides a slower, less-aggressive cycle than the common carbine-length (CAR) gas system. The shorter CAR system was originally tuned to perfection with 14.5-inch barrels on military M4 carbines, and 16-inch barrels fit with a CAR gas system are usually over-gassed. In addition to a smoother feel, the mid-length gas system reduces wear and tear and offers a slightly longer sight radius.

At the forward end a classic birdcage-type muzzle device with five vents in the upper half functions to reduce flash and, in a small way, muzzle jump. An A2-type front sight complete with bayonet lug and sling swivel graces the barrel. Why you'd need a bayonet I can't answer, but hey, if you want one you should be able to properly fix it to your carbine.

I'm a big fan of the pinned A2-type front sight. For those who intend to stick with iron sights, it's extremely robust and resists getting bumped out of alignment even under excessive abuse.

Plus, if you're handy with a hacksaw, grinder and file, it's really adaptable. For instance, if you want to install one of the long free-float handguards so deservedly popular today, just lop the sight portion, swivel and bayonet lug off of the gas block portion with the saw, grind away excess material, and file it to comeliness and you've got an extraordinarily strong, low-profile, pinned-in-place steel gas block. Warning: Doing so will void the limited lifetime warranty, but so will simply replacing the sight with a low-profile gas block.

Each Saint also comes with Springfield Armory's Low Profile Flip-Up rear sight, which offers large and small dual apertures and click-adjustable windage, and it locks into the upright position to prevent you from accidentally folding the sight.

The Saint's handguard is a new PKMR model by Bravo Company exclusively provided to Springfield Armory for the Saint. Although it is mounted fore and aft, meaning the barrel is not free-floated, it's likely the most ergonomic polymer handguard I've had the pleasure to use on an AR-15.

Secured via a typical Delta ring arrangement at the rear, it's got a moderate hand stop at the forward end, vents to aid barrel cooling and KeyMod slots at six, 11 and one o'clock in the forward two-thirds of the handguard. Formed in a modified octagon, taller than it is wide, the PKMR is particularly comfortable in the hand. Full-length stippled panels in the two side flats provide a nonslip grip.

Springfield partnered with Bravo Company for several other parts as well, specifically the stock, pistol grip and

The trigger is definitely a step up from mil spec—it's not gritty and it's consistent—and the stamping on the mag well tells you Springfield isn't treating this as just another AR.

The Saint's M4-profile, 16-inch, 1:8 twist barrel is Melonite coated and fit with a pinned A2-type front sight. The muzzle device is an A2-type birdcage flash suppressor.

SPECIFICATIONS

SPRINGFIELD ARMORY SAINT

TYPE	AR-15
CALIBER	5.56 NATO
CAPACITY	30-round P-Mag
BARREL	16 in., 1:8 twist, M4 contour, Melonite-coated chrome moly vanadium steel
OVERALL LENGTH	32.25–35.5 in.
WEIGHT	6 lb., 11 oz.
STOCK	Bravo Company 6-position stock, Bravo Company PKMR KeyMod handguard
FINISH	Type III hard-coat anodized
TRIGGER	single stage; nickel boron coated; 6 lb., 7 oz. pull (measured)
SIGHTS	F-height A2-type front; Springfield Armory Low Profile Flip-Up, Dual Aperture, 0.5 m.o.a. Windage Adj. rear
PRICE	$899
MANUFACTURER	Springfield, SPRINGFIELD-ARMORY.COM

trigger guard. The latter is polymer, an oversize version compatible with gloves. The Bravo Mod 0 grip features a reduced angle, which positions the shooting hand slightly forward for more ergonomic use when in today's squared-up shooting stances. A hinged floorplate provides a bit of water-resistant storage inside the grip.

The buttstock doesn't have what I'd consider sleek lines, but in every other way it's outstanding. Its shape offers a comfortable cheek weld, a rubber buttpad provides nonslip contact with your shoulder and in the kitchen corner when on chicken-coop overwatch. Several sling attachment points are available, including a QD cup on each side and a robust slot for fixed sling attachment.

Finally—and one of my favorite characteristics—it doesn't rattle. The six-position collapsing stock is fit with a stout, streamlined latch, which takes a firm grip to depress in order to adjust length. Not only is the stock well-fit to the mil spec diameter buffer tube, the latch itself locks the stock in place so securely there is no noise-producing slop present. And if you have any questions as to the gun's origin, the words "Proudly American Made" are molded into the heel of the stock.

In a clear signal the Saint is beautifully thought out, the buffer—an oft-ignored critical link to smooth, reliable function with minimal vibration—is a heavy H buffer with tungsten weights.

Housing a proper shot-peened, magnetic-particle-inspected Carpenter 158 mil spec steel bolt with an O-ring tensioner installed with the extractor spring, the M16 carrier is slightly heavier than a typical AR-15 carrier, and it offers a slight edge in durability and reliability for shooters that intend to put thousands of rounds through their carbines. The hardened gas key is well staked, so you should never end up with loose carrier parts rattling around.

Apart from the handguard, the single most-replaced part on stock AR-15s is the trigger. While that in the Saint isn't a match-grade model, it's significantly better than the standard mil spec travesties that masquerade as triggers. All the interfacing surfaces have been micro-polished and nickel boron coated.

I'm not sure what the micro-polishing procedure or criteria is, but the resulting trigger has a glass-smooth feel to the little creep it does have, and when it breaks it does so cleanly. There's none of the inconsistent grittiness that plagues so many mil spec AR triggers.

As an open-type (not housed in any type of cassette) trigger assembly, it should shrug off grit, dust, lint and other trigger-choking debris. Springfield says it has the correct spring tension required to reliably fire NATO ammunition.

All other fire controls—safety selector, bolt catch, magazine catch—and charging handle are standard parts.

At a pre-launch event in Wyoming, several writers and I were introduced to the Saint and had the opportunity to put it through its paces in a set of timed walkthrough shooting courses, each with 50 steel plates positioned at undisclosed locations along the course. We were armed with a Saint carbine topped with a well-sighted Trijicon RMO red dot and two fully loaded 30-round magazines. With only 60 cartridges with which to engage the 50 plates, shot execution was critical.

Nominated to go first on the initial quarter-mile course, I slung the carbine I'd been handed, prayed it was sighted in, and headed out. Steel plates ranged from five yards to 250 yards, and the ones I initially encountered were inside of 50 yards, and my impact smears appeared well centered. Gaining confidence in the carbine, I jogged through the course as fast as I could while still being able to

Bravo Company's six-position collapsible stock is comfortable, sturdy and very quiet. It offers a sling attachment slot as well as QD cups.

A BIG PUSH

In addition to adding AR-15 firearms to its lineup, Springfield Armory has launched a massive new marketing campaign far beyond the scope of anything the company has done in the past. Primarily digital in nature, it makes the most of social media outlets and intends to drive awareness and, of course, gun sales.

"Defend Your Legacy" is the main catchphrase, and the company has developed a standalone website for it: DefendYourLegacy.com. Among other features the site includes an ambitious competition-themed series of short films that enable enthusiasts to follow the company's search for the face or faces of the new program.

Initially, six women were selected and invited to participate in a week-long course taught by instructor and retired Navy Seal Eric Frohardt, after which the competitors were challenged with five vastly different scenarios.

Videos of these competitions should be on the company's website by the time you read this. The video of the finale that will determine the winner among the six women will be screened at the gun industry's annual Shooting and Hunting Outdoor Trade Show in mid-January, where the winner will be announced.—*JVB*

hit each target. I managed to hit all the targets but one—which I'd never even seen—and I had a handful of cartridges left. The experience left me thoroughly impressed with the carbine.

Clearly, the Saint provides capable practical performance. To evaluate precision accuracy, I obtained one of the first production carbines off of Springfield's line, mounted a Leupold VX-7 4.5-14x50mm scope in a Safariland cantilever mount and tested several types of ammunition from the prone position and using Sinclair front rest. Because of its intended purpose, I usually don't baby an AR-15, preferring to fire a series of three consecutive five-shot groups without allowing the barrel to cool with each type of ammunition on my test list. That way, I can better evaluate two critical elements of performance: hot-barrel point-of-impact shift (if any) and group size expansion as the bore becomes hot. Ideally, neither occurs.

To provide insight into the Saint's accuracy with a range of bullet weights, I shot several loads with bullet weights ranging from 40 to 77 grains. Results are shown in the accompanying table. Even though a strong crosswind was gusting to 12 mph the Saint averaged groups of less than 1.5 m.o.a. with four of the six loads, and one—Black Hills's 77-grain match load—averaged 1.05 inches. For practical purposes, that's essentially one m.o.a. (which is actually 1.047 inches at 100 yards).

Interestingly, group size actually tightened a bit as the barrel heated. As far as I could tell, there was no discernible point of impact shift from cold-bore groups to hot-barrel groups. What I did notice, however, was a tendency to throw the occasional flier—not really wide but enough to open a nice group up by an additional inch or so. My best guess is the fliers were caused either by the fickle wind or by some slight inconsistency in my prone position. Much as I like the feel and look of the handguard, it is not a free-float version, and I've seen point of impact shifts and fliers caused by positional inconsistencies in the past when using non-free-floated handguards.

Although I got along with it fine, the nickel-boron coated trigger was no lightweight, measuring six pounds, seven ounces on my Lyman digital trigger gauge with three ounces of variation over a series of five measurements. It was at least smooth and predictable, and I don't think it adversely affected my group size average. It could be a bit problematic while attempting to get a clean shot off during a fleeting opportunity at a coyote, for instance, but for defensive-type shooting, it's a great trigger.

As with the Saint with which I shot multiple 50-target courses in Wyoming, my test carbine never even threatened to hiccup. But that sort of reliability is to be expected from a Springfield Armory gun.

Although it's not a revolutionary new type of gun, Springfield Armory's AR-15 Saint is undoubtedly one of the best values on the market today, featuring a laudable list of premium-performance features at a very affordable price. Quite frankly, I don't think there's another sub-$1,000 carbine available that can touch it.

ACCURACY RESULTS

SPRINGFIELD ARMORY SAINT

Cartridge	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)	Avg. Group (in.)
.223 REM.				
BLACK HILLS/ SIERRA MATCHKING	77	2,597	20	1.05
WINCHESTER MATCH	69	2,434	15	1.17
HORNADY V-MAX	40	3,490	14	1.40
REMINGTON JHP	50	3,126	29	2.55
AMERICAN EAGLE FMJ	55	2,949	26	2.93
5.56 NATO				
AMERICAN EAGLE FMJ	62	3,014	15	1.35

NOTES: Accuracy figures are averages of three consecutive five-shot groups fired from a bipod at 100 yards. Velocities are averages of five rounds measured by a Shooting Chrony chronograph at 12 feet. Abbreviations: FMJ, full metal jacket; JHP, jacketed hollowpoint

After running the Saint through a steel plate course, von Benedikt found the carbine to be a nice-handling, good-shooting and reliable AR-15.

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THE MIGHTIEST MAUSER

THE M 98 MAGNUM IS A GORGEOUS, CLASSIC RIFLE BUILT FOR THE WORLD'S DANGEROUS GAME. CHEAP IT IS NOT.

by Brad Fitzpatrick

Odds are if you're reading this you have some familiarity with sporting rifles, and that means you've probably heard of the Mauser 98 action. Peter Paul Mauser's design—patented in September of 1895 and produced three years later—was the successor to the M1893 Mauser bolt design, which itself was an improvement of the 1889 Mauser that had proven far superior to the Springfield trapdoor and Krag rifles used by American forces in the Spanish-American War.

The 98, like its predecessor, proved to be robust and reliable, capable of handling higher-pressure loads than other designs while offering excellent accuracy at long ranges. And since its inception, the Mauser 98 has become one of the world's most cloned and copied gun designs, providing inspiration for some of America's most beloved rifle designs like the 1903 Springfield and Winchester's Model 54 and Model 70.

The Mauser design centered around a bolt with two front lugs and a large non-rotating claw extractor that takes hold of a cartridge as it leaves the magazine and holds it firmly until the cartridge strikes the receiver-mounted ejector blade and is sent whirring from the action. The 98 design has a third lug, set at the rear, that acts as a safety lug in the event of a catastrophic case failure.

Mauser of Germany has offered its original Model 98 rifles for decades, but the company is now importing production guns in significant volumes for the U.S. market. These aren't the austere military weapons designed for mass production during wartime. New is the Mauser M 98 Magnum, so called because it houses a massive double square bridge magnum action (a reference to the shape of the front and rear receiver rings; in a double square bridge rifle both the front and rear rings are square).

The rifle is dressed to kill and is chambered in two of the greatest dangerous game cartridges of all time: the .375 H&H Magnum and the .416 Rigby. In fact, the latter cartridge may have been the original inspiration for the double square bridge M 98 Magnum. During the early 20th century, before a spat known as World War I interrupted things, England's John Rigby & Co. and Germany's Mauser brand were quite close, and Mauser supplied Rigby with actions. Rigby's sleek new .416 needed a beefy action with a lot of space, and Mauser obliged with what we know today as the M 98 Magnum action.

The whopping claw extractor proved reliable in war, but it's also a machined steel life insurance policy to protect you against goring, trampling and mauling. For this reason, Magnum Mauser actions are a favorite of professional dangerous game hunters, and the latest M 98 has all the features you might want in a charge-stopping rifle.

There's an extended magazine, which design allows for an increased capacity (5+1 in .375 H&H Magnum, 4+1 in .416 Rigby), and a quarter-rib express rear sight with a fixed V and two leaves. Big bores need robust

sights, and both the front and rear on this gun are beefy. They aren't screwed into the barrel but are soldered directly to the metal, meaning you could beat a buffalo across the head with this rifle and it would probably still shoot to the original point of aim. Not that you'd actually want to do such a thing.

The rear V is regulated for 50 yards, and it's accurate at that range. The front leaves are regulated for 100 and 150 yards. Although it's pushing the limits of a big bore with iron sights, if your scope goes kaput on safari and you need to smack your buffalo at 100 yards with irons, these are the sights to use. Plus, having 50-, 100- and 150-yard irons makes far more sense than having leaves that go up to, say, 300 yards.

Big Up Front

The front bead is rather large, white and easy to see in any light. The Mauser's sights are coarser than what many American shooters are accustomed to, but once you learn your placement of the bead in the shallow V, they are remarkably accurate. If you really do get into the kind of kill-or-be-killed scenario where seconds matter, you probably will focus on snap shooting, and in that case, a big, bold white dot is a whole lot easier to locate than a teensy bead.

The double square bridge design utilizes classic tip-off scope bases that are machined directly into the receiver. These features combine to make this an ideal dangerous game rig. You can securely mount an optic for increased magnification, but in a few seconds you can strip the scope and use the irons for a nasty follow-up in thick cover.

The M 98 Magnum sports a beefy all-steel receiver, and the straight bolt handle is true to the original design. The pistol grip is longer and not as steep as what you might find in a more modern sporting rifle, but it's true to the original design and, at least to my thinking, more comfortable. The angled grip fits more naturally in my hand, and the long, 14.75-inch length of pull makes this gun point more like a fine shotgun than a traditional bolt gun.

That may be off-putting to those

The grade 5 walnut on Fitzpatrick's stock didn't disappoint, with lots of flame and figure. This is the base grade of wood, and you can upgrade it if you wish.

The express rear sights are regulated for 50 yards but also feature leaves for 100 and 150 yards. Integral bases for tip-off mounts are also machined into receiver.

SPECIFICATIONS

MAUSER M98 MAGNUM

TYPE	controlled-round feed, bolt-action centerfire
CALIBER	.375 H&H Mag. (tested), .416 Rigby
CAPACITY	5+1 (as tested)
BARREL	24.4 in., 0.69-in. diameter
OVERALL LENGTH	46.7 in.
WEIGHT	9.7 lb.
STOCK	grade 5 walnut
FINISH	plasma nitride
TRIGGER	3 lb. pull (measured)
SIGHTS	express sights with two folding leaves; integral bases for tip-off mounts machined into receiver
PRICE	$13,495
MANUFACTURER	Mauser, MAUSER.COM/EN

who grew up with American guns and American stock geometry, but for quick offhand shots, the design is as functional as it is elegant. Both the .375 and .416 Rigby models are available with a standard .69-inch heavy barrel, and the .416 offers the option of an even heavier .80-inch profile barrel version that further helps reduce recoil.

In keeping with the classic look of the old Bond Street guns, the Mauser has a 25-inch barrel that allows it to shoot these older cartridges most efficiently. It also gives the rifle excellent balance. That bit of extra metal on the end makes this gun shoulder like the finest sporting clays gun—a sporting clays gun designed to swat lions and elephants.

Manufacturing practices have improved in the last 118 years, and the engineers at Mauser took advantage wherever they could to upgrade such a classic design. The original 98 was a successful design in an era when tolerances were not as tight as they are in the age of CNC precision machining. Improved tolerances take an already good action and make it stupendous, and the fit and finish are superb.

As you might suspect, there are no burrs or rough edges in this action. It's slick and smooth and clean throughout, and lockup is smooth and secure. All the metalwork on the M 98 Magnum has been treated with plasma nitriding for maximum wear resistance, and aside from providing excellent defense against corrosion, it gives the metal a deep, beautiful shine. Not that you would, but you could take this gun through the Georgia swamps in search of hogs and gators and it would come out none the worse for wear.

Gone is the traditional rear-mounted three-position flag safety, replaced by a wing-type three-position model that is much simpler to use and more compact. Ironically, this safety setup is borrowed heavily from the Model 70—a gun that is the design offspring of the 98.

Although the wing safety is not new, it is improved over the Model 70. It's slightly larger and, when in the Safe position, is almost parallel to the barrel so there is less chance it will hang up and accidentally move to Fire.

The trigger mechanism has been improved as well, although "improved" is probably an undersell. The original Mauser 98 was a great design, but the trigger mechanism was quite heavy because the trigger doubled as a bolt stop.

The new Mauser has a modern three-pound trigger that would rival target guns, and it has no creep or overtravel. A good trigger wrings the true accuracy potential from the 98 action, and it's a detail forgotten on most dangerous game rifles. Just because a rifle is intended for use at relatively close ranges doesn't mean it shouldn't be capable of accuracy farther downrange.

The barrel is bedded, and dual steel crossbolts help secure the action during recoil. Befitting a dangerous-game rifle chambered in hard-hitting cartridges, the front sling stud has been moved to the barrel so it won't jab you when you press the trigger.

Speaking of recoil, it's not as bad as you might think. This rifle weighs in at just under 10 pounds without a scope, has a long length of pull, a straight comb and a cushy Decelerator pad. With such a rifle the recoil from a .375 is more of a strong push than a stab.

About the same time I tested this rifle I tested a seven-pound rifle in .375 Ruger, and the latter was pretty

The three-position safety has been moved from the rear of the bolt to a wing-type a la the Winchester Model 70. Other changes from the original 98 include a much better trigger.

ACCURACY RESULTS

MAUSER M 98 MAGNUM

.375 H&H Mag.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)	Avg. Group (in.)
FEDERAL CAPE-SHOK/ SWIFT A-FRAME	300	2,389	17.7	1.70
FEDERAL CAPE-SHOK/ WOODLEIGH HYDRO SOLID	300	2,420	23.8	1.88
NORMA AFRICAN PH/ WOODLEIGH SN	350	2,210	19.4	1.98

NOTES: Accuracy results are averages of three three-shot groups at 100 yards off a fixed rest. Velocities are averages of 10 shots measured on a ProChrono digital chronograph set 10 feet from the muzzle. Abbreviation: SN, softnose.

brutal. By comparison the Mauser was quite comfortable, and if it came down to having one gun or the other on a dangerous game hunt, I know the Mauser would be my choice because I could deliver follow-up shots more quickly. But with the Mauser's genteel nature and excellent accuracy potential, there's a good chance that the first bullet will go where you need it to and there won't be a follow-up anyway.

The front sight is bright and easy to see even in bright light, an essential element on a dangerous game rifle.

Good Wood

You'd expect a flagship rifle like this to have excellent walnut, and the M 98 Magnum does not disappoint. The grade 5 wood is oil-finished and full of feather and flame, certainly as good as any production gun I've run across.

Mauser's website says this is the base walnut and you can order an upgrade, but I can't imagine anyone would be disappointed with the slab of walnut on this standard version of the rifle. Still, if only the absolute best will do, you can have a select piece of exhibition-grade walnut installed on your rifle.

Accuracy was excellent for a big-bore rifle, with groups averaging anywhere from just over an inch to just under an inch and a half. Before you shake your head at those figures, bear in mind most rifles with a one-inch guarantee won't support that on rifles above .300. Consistency was good with all three loads tested, and I have no doubts that with a little load experimentation or by working up handloads you could turn this into a sub-m.o.a. rifle.

At $13,495, the M 98 Magnum isn't a cheap gun, but rifles of this ilk never are. If you adjust for inflation, these rifles cost just about the same as the original dangerous game Mausers during the Golden Age of safari. That big, sturdy Mauser action has never been cheap to build, but no one can—after almost 120 years of faithful service—call into question the design.

What's more, Mauser has taken this storied action and wrapped it in all the accoutrements needed to create what could quite possibly be the finest classic dangerous game rifle ever built: a near-perfect trigger, posh wood and a great barrel.

Indeed, this is not a rifle for everyone, but if you're a professional hunter who needs a rifle to back up his clients or a serious collector, you won't be disappointed, for the M 98 Magnum looks great, shoots great and handles great. Peter Paul would be most impressed. I'm not sure even he could improve upon this design. ■

The M 98 Magnum's recoil was quite tolerable, which would allow quick follow-up shots in the field—something that takes on added importance with dangerous game.

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THE NEW ANVIL FROM CMMG PROMISES TO GET THE MOST OUT OF THE .458 SOCOM.

by James Tarr

America has a love for alternative-caliber ARs, but traditionally, those caliber conversions have been designed to work inside the relatively small AR-15 envelope. This is engineers "thinking inside the box," so to speak. However, in the past few years a few companies have decided to pursue a solution by working from the other end of the problem.

LWRC built a slightly larger AR around a completely new magazine purpose-built for the 6.8 SPC. For its Gen II .308 rifle, DPMS basically stuck an upgraded AR-10 bolt in an AR-15-size bolt carrier to reduce reciprocating weight and thus reduce recoil. And rather than hogging out the face of an AR-15 bolt like everyone else, CMMG developed a "midsize" receiver to properly handle the 7.62x39 cartridge in its Mutant rifle. Now CMMG is at it again, using its midsize receiver to develop a rifle specifically designed to handle the big .458 SOCOM cartridge: the CMMG Anvil.

CMMG currently offers three similar versions of the Anvil. The base model MkW-15 T sports a GI stock and A2 pistol grip. The midgrade MkW-15 XBE replaces the GI furniture of the T model with a Magpul CTR stock and MOE pistol grip. The top-of-the-line MkW-15 XBE2 replaces the government-grade trigger components of the XBE with a premium two-stage Geissele SSA trigger.

For testing I secured an XBE model. This rifle sports a 16.1-inch medium-taper barrel made of 416 stainless steel with a nitride coating. It has a 1:14 twist. The barrel is tipped with CMMG's SV brake with 5/8x32 threads. Every model of the Anvil sports SLR Rifleworks's excellent adjustable gas block, which CMMG added because there is such a huge range of ammo types for the .458 SOCOM.

The barrel is free-floated inside CMMG's RKM15 handguard, a 15-inch aluminum handguard with KeyMod mounting slots at three, six and nine o'clock. The rifle tips the scales at 7.5 pounds and is 33.5 inches long with the stock collapsed—a bit longer and heavier than an AR-15, but shorter and lighter than a .308 AR-10.

The Anvil takes all standard AR-15 parts except for the bolt/carrier and charging handle. And the following parts have .308/AR-10 dimensions: barrel, handguard and the takedown and pivot pins. The upper and lower receivers are machined from billet 7075-T6 aluminum, and the lower features an integrated, enlarged trigger guard.

From the outside, the magazine well appears to match the dimensions of a .308 AR-10 mag well, but flip it over and you'll see the hole for the magazine is much smaller than expected and is meant for an AR-15 magazine. As a result, you get a nice beveled/flared magazine well for your converted AR-15 magazine (more on that in a bit).

From the rear of the magazine well to the rear of the receiver, the Anvil

is the length of an AR-15. CMMG has gone with an angular look on the lower receiver, with the corners rounded just enough to keep them from causing pain.

The Anvil sports what CMMG calls its PowerBolt. It's based on an AR-10-size bolt but is a bit lighter and shorter to fit in the midsize platform. It is just as wide as a standard .308 bolt, so there is a lot of steel around the rim of the case, which is important.

The .458 SOCOM is a big cartridge that was designed to work in the AR-15 platform, but the marriage of the two has never been quite trouble-free. First, even though the cartridge has a rebated rim, it has the diameter of a .308 Win. (.473 inch compared to the .378-inch diameter of the 5.56/.223). To get that to work with an AR-15 bolt, you have to dramatically enlarge the bolt face, producing thin bolt walls. As a result, AR-15 bolts hogged out to fire .458 SOCOM tend to have short lifespans. With the PowerBolt, CMMG plans to end that and, it says, "harness the full potential of the cartridge."

To get the .458 SOCOM to work with a standard AR-15 bolt (l.), the walls of the bolt have to be thinned, which shortens service life. CMMG developed the PowerBolt (r.), essentially a shortened AR-10 bolt, to ensure there is sufficient steel around the cartridge rim.

ACCURACY RESULTS

CMMG MKW-15 XBE ANVIL

.458 SOCOM	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (in.)	Avg. Group (in.)
SBR/BARNES TSX	250	1,922	29	1.24
WILSON COMBAT/BARNES TTSX	300	1,822	16	1.65
WILSON COMBAT HP	300	1,842	12	1.88
SBR FMJ SUBSONIC	500	981	21	1.97
SBR FMJ	350	1,651	34	2.08
POLYCASE ARX	200	2,179	25	2.13
SBR JSP	350	1,662	31	2.34
POLYCASE ARX	140	2,469	33	2.42
UNDERWOOD XTREME PEN	300	1,870	18	2.55
CORBON T-DPX	300	1,903	22	3.39

NOTES: Accuracy results are averages of four five-shot groups at 100 yards off a sandbag rest. Velocities are averages of 10 shots measured with an Oehler Model 35P 12 feet from the muzzle. Abbreviations: FMJ, full metal jacket; HP, hollowpoint; JSP, jacketed softpoint

The first time I showed my two teenage sons a .458 SOCOM cartridge, they thought it looked like something out of a cartoon. It's a miniature brass cigar in shape: short and fat. The cartridge was the brainchild of Special Forces types who weren't happy with the performance of the 5.56 NATO round—specifically its performance in Somalia. They wanted something big that hit hard but would fit into the M4 envelope.

The parent cartridge of the .458 SOCOM is the .50 Action Express, and the SOCOM is basically a stretched and necked-down version of the .50 AE, with the same rebated rim.

There are no official SAAMI pressure specs for the .458 SOCOM cartridge. Combine that with the thin bolt walls on the standard AR-15-based .458s and the engineers at CMMG saw that many loads in this caliber weren't as uniform or as stout as perhaps they could be. Not only did CMMG work with a number of ammunition companies to help in the development of this rifle, it also helped develop proposed SAAMI proof loads for the .458 SOCOM cartridge.

Standard .458 SOCOM loads run at about 36,000 psi, which really is low for a modern rifle cartridge. By contrast, the 5.56 NATO has a max chamber pressure of 55,000 psi. How-

While the .458 SOCOM is the same length as a .223/5.56, making the beefy and higher-thrust round fit and function in the AR-15 envelope has always been tricky.

ever, the 5.56 is throwing out a much smaller bullet (55 to 62 grains). When compared to the 250- to 350-grain bullets sent downrange in the .458 SOCOM, the SOCOM has much more bolt thrust—the amount of rearward force exerted by the propellant gas on the bolt or breech face.

The average .458 SOCOM round produces more bolt thrust—more than 5,800 pounds—than an overpressure "proof" 5.56 NATO cartridge (5,184 pounds). And that is what causes problems for those thin-machined AR-15 bolts converted to .458.

CMMG is proposing SAAMI specs for the .458 SOCOM include proof rounds. Ironically, its proposed .458 proof loads produce more than 7,800 pounds of bolt thrust, which is almost 50 percent more thrust than a 5.56 proof load.

Any wonder why it wants a bolt (and a rifle) that can handle those pressures? The company is intent on building a better mousetrap—or in this case, a better hammer, which brings me to really the only problem I have with the Anvil. Its name.

While the name "Anvil" is cool, it irritates me. Anvils get hit by big hammers. Anvils sit there and get abused. In my opinion, a more apt name for this rifle would be the Hammer. Maybe even the CMMG Mjölnir, which all Marvel comics fans know is the name of Thor's lightning-throwing hammer. CMMG's Anvil is the embodiment of the admonition "bring a bigger hammer." This is America, where we super-size everything. Because we can, dammit.

The size of the .458 SOCOM cartridge allows for a huge variation in both projectile weight and size, but it is not unique in that aspect. And this brings us to another question. There are other big-bore AR cartridges, so why did CMMG go with the .458 SOCOM and not the .450 Bushmaster? Primarily, because the latter uses pistol bullets, which really do not perform acceptably at carbine velocity levels.

I once watched a gun writer pound five .450 Bushmaster rounds into a 1,600-pound Indonesian water buffalo—good hits all—but because that cartridge uses pistol bullets, only one of the rounds penetrated the animal's vital organs and that just barely. That's why he fired five times; he suspected the bullets were not going to perform as they needed to. That won't be an issue with the .458 SOCOM.

Ammo Choices

While there aren't a large number of manufacturers offering .458 SOCOM ammo, the ones that do sell a wide variety of loads. To test this rifle, I secured ammo from CorBon, SBR, Wilson Combat, Underwood Ammo and PolyCase.

Some of the these ammunition manufacturers might be unknown to you, but all of the them helped CMMG when it started this project. CorBon asked to run proof loads through a preproduction model before participating, and when it held up to the abusive testing the company jumped on board.

SBR (Southern Ballistic Research) out of Brunswick, Georgia, is the leading manufacturer of .458 SOCOM ammo, producing more than a million rounds a year. From the inception of the cartridge, SBR has worked with Teppo Jutsu (inventors of the cartridge) on ammo development and continuing R&D, and they have a .458 SOCOM loading guide coming out soon. SBR even offers a military/law enforcement line of .458 SOCOM ammo, including high-explosive, armor-piercing and armor-piercing incendiary rounds. I promised to behave, but they still wouldn't send me any of those.

SPECIFICATIONS

CMMG MKW-15 XBE ANVIL

TYPE	direct-gas impingement AR
CALIBER	.458 SOCOM
CAPACITY	10-round Lancer magazines
BARREL	16.1 in., stainless, 1:14 twist, SV brake
OVERALL LENGTH	33.5–37 in.
WEIGHT	7.5 lb.
RECEIVER	7075-T6 billet aluminum
FURNITURE	Magpul CTR stock, Magpul MOE pistol grip, CMMG RKM15 fore-end
TRIGGER	single stage, 5.75 lb. pull (measured)
SIGHTS	none
PRICE	$1,950
MANUFACTURER	CMMG, CMMGINC.COM

The exterior of the Anvil's mag well looks like an AR-10's, but the interior has dimensions that allow the rifle to accept AR-15-size magazines.

AR-15 magazines are designed around the .223 Rem./5.56 NATO cartridge. While the .458 SOCOM round is the same length, it is much wider. The narrow tip of a .223/5.56 round clears the front of a standard AR magazine, but .458 SOCOM rounds (depending on bullet profile) can sometimes dead-end into the front of the magazine. To fix that problem, CMMG went with Lancer L5 AWM magazines.

Lancer L5 AWM magazines have polymer bodies with steel feed lips. To improve the feeding of the .458 SOCOM cartridge, the folks at CMMG did just one minor tweak. They widened the front of the feed lips just slightly, so the cartridge sits at more of an up angle. The difference is small and not noticeable unless you put rounds in both and see where they sit. The .458 SOCOM Lancer magazines worked just fine in my other ARs when loaded with .223/5.56 rounds.

These magazines are dimensionally identical to 30-round 5.56 magazines, and even use standard .223 followers, but they hold 10 ten rounds of .458 SOCOM in a single stack. The magazines are marked "458 SOCOM" at the top.

It's been a long time since I fired a bruiser out of an AR-15, and I wasn't quite sure how much recoil I'd be dealing with. Recoil in a standard AR-15 is next to nothing. The combination bullet weight/velocity of a .458 SOCOM, on the other hand, is approaching that of a 12-gauge slug. You will definitely notice the gun going off, but that's the point of this cartridge: sending a lot of foot-pounds downrange. Brute force diplomacy. When I started pulling the trigger, I was pleasantly surprised. Recoil was closer to that of a .308 AR than a 12 gauge with slugs—noticeable, but not abusive.

Range Testing

For testing, I chose bullets from 140 to 500 grains That's a huge range, which is why equipping the rifle with an adjustable gas block is a pretty smart idea. However, most people don't want to mess with their gas block, so I wanted to see how much of the ammo would run reliably on just the factory setting.

Two weeks before I hit the range with my Anvil, I was talking to the editor of one of *RifleShooter*'s sister publications. He told me the Anvil they tested ran just fine at the factory gas block setting with every kind of ammo except PolyCase. PolyCase ammo features very light-for-caliber bullets (140 and 200 grains) and didn't cycle the gun unless they adjusted the gas setting.

So I was pleasantly surprised when my Anvil sample ran perfectly with the factory gas block setting no matter which ammo I fed it. The PolyCase ammo gave me a big fireball out of the muzzle brake, but it ran as well in the rifle as any other brand/bullet type. I even fired a number of rounds of various types of ammo using only one hand, with the stock barely touching my shoulder, to see if I could get the rifle to choke. Nope.

CMMG puts its SV muzzle brake on just about every rifle it makes. I presume the company does this to meet customer demand. It is quite effective, but I still wish CMMG would offer just a plain flash hider on some models, especially those aimed at the tactical crowd. Standard rifles are loud outdoors, but use one equipped with a muzzle brake indoors when you're not wearing hearing protection and hearing loss is guaranteed.

I'd also love to see an SBR version of the Anvil. I suspect the .458 SOCOM wouldn't give up a whole lot of velocity in shorter barrels.

Admittedly, while I've fired a .50 Beowulf and .450 Bushmaster, I had no experience with the .458 SOCOM cartridge before working with the Anvil. In the end I found that I really liked the rifle and cartridge combo, but I'm not sure what I would do with one of these.

In addition to direct anti-personnel use, spec-ops types like the .458 SOCOM for disabling engine blocks and blowing hinges off doors. I live near Detroit, and those are useful attributes in a cartridge here, but most people don't have much need for that. Then again, what the hell does "need" have to do with anything? We live in a country where "want" is all that is necessary.

That said, for hunting appropriate game at short to medium ranges, the CMMG Anvil and the .458 SOCOM should work very well. Wilson Combat makes ammo for the .458 SOCOM because Bill Wilson thinks this caliber is great for killing pigs, one of his favorite pastimes. With the right projectile this cartridge can handle animals a lot bigger than the average pig. ■

All versions of the Anvil incorporate a 16.1-inch barrel with CMMG's SV muzzle brake and its 15-inch KeyMod free-float fore-end. Tarr wishes CMMG would offer a flash-hider option.

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INTO THE GREAT UNKNOWN

THINK YOU CAN'T HIT LONG-RANGE TARGETS WITHOUT THE AID OF ELECTRONICS? THINK AGAIN.

by Brad Fitzpatrick

Rain was pouring off the edges of the shooting canopy as I lay prone, my head resting on the stock of the Kimber 84 Montana. I could see the target—a 12 inch-square piece of steel recessed within a grove of pine trees—as I waited with my finger resting on the trigger guard. Leupold's David Domin, seated to my right, had a much harder task than I did. He had to determine the distance to the target without any electronic assistance, figure out the elevation hold based on the notes in my range book, account for wind and hope I delivered the shot with some level of precision. All I had to do was pull the trigger.

After a few minutes Domin gave me an elevation adjustment in mils. The previous day we'd been practicing wind dope using mirage, but rain had rolled in and swallowed our view of Mt. Hood behind us, requiring us to change tactics for wind estimation. He was left to use the grass, sage, the rain itself and any other clues he could gather—known collectively as environmentals—to gauge wind at the target a half-mile away. It was no accident that the steel plate was nested in a group of pines. With so much interference from branches, it would have been impossible to get an accurate reading with a handheld rangefinder.

"One and-one-quarter right," he said. That was my dope as well as my go-ahead command to fire when ready. I settled, down behind the gun, checked my body and hand position and started my breathing sequence. When I was settled, the last, faint movement in the reticle was the product of my own heartbeat. I timed my shot and pressed the trigger.

Every long-range shooter knows how satisfying the sound of a ringing steel plate can be, but when I heard the clap of the bullet on metal on that day in Oregon, there was an even greater sense of accomplishment—not with my shooting (which, if you are familiar with long-range shooting, should be the easy part of the equation) but for our team's ability to estimate ranges and wind drift using old-fashioned skill. It's the lost art of unknown distance shooting.

Over the past two decades shooters became increasingly reliant on technology, and new electronic gadgets have made shooting less about skill and more about digital data. That's not entirely a bad thing since many shooters want and need a little technical support to aid in their shooting. Humans are notoriously bad at estimating distance, and few shooters actually take the time to study the nuances of wind speed estimation.

If you are a hunter you owe it to the game you are pursuing to do your absolute best to make accurate shots that place the bullet where it needs to go so that the animal expires as quickly as possible. If electronics help you accomplish this—and in most cases they do—then that's the best option for you.

But it's not the only option, and it's not always the best option. If that steel plate had been, say, a deer or an elk tucked deep in the cover of trees, the electronic rangefinder would be at a disadvantage. Why? Because all of those limbs, stumps and waving branches are going to limit a rangefinder's ability to give you an accurate reading—not because of the rangefinder's limitations but because of our own human failings. Your shaking hands can send back laser range estimations that vary greatly as objects clutter your field of view.

Domin used a much older technique taught during Discover Courage's UKD (Unknown Distance) course, which teaches shooters the fundamental skills necessary to deliver long shots without electronic assistance. In that particular case, he used a topographical map to determine range, but that's just one method for accurate range diagnosis.

The ability to place shots at long ranges unaided by technology is a lost art, but the team at Discover Courage is teaching shooters that you can make those long shots without relying on electronic devices to do the work.

It may seem counterintuitive, but the key to shooting at unknown distances is to not shoot at an unknown distance. To accomplish this, you must rely on the same time-tested methods used by military snipers, long-range competitive shooters and hunters for generations prior to the electronic age.

It starts with eliminating variables, the first of which is attaining proper shooting technique. Practice is the key, and that training has to include attaining field positions that provide as stable a platform as possible—as opposed to spending your time shooting off a benchrest.

Admittedly, this wasn't my strong suit before attending the Discover Courage school, and I can think of at least one field shot I messed up in the past simply because I was in a terrible position and didn't properly stabilize my rifle prior to pulling the trigger.

The optimum field position is to lie prone with your body behind the rifle to manage recoil and a firm rest to reduce muzzle movement. A bipod works well, but in the field you'll have to be creative with your use of packs and terrain if you can't rely on your bipod. Oftentimes, though, you won't be able to get into a prone position—either because the terrain doesn't allow it or because grass, stumps, brush and trees limit your field of view. In such cases you'll have to try something else.

Sitting and kneeling are the two most common solutions, but no matter which one you choose, you must work to stabilize your body at every possible point. The key is to use the gear that you carry or landscape features to help solidify your position.

In a sitting position you can stuff your pack under your back leg to stabilize that side of your body and reduce movement. In a kneeling position the rear foot can act as a brace, resting between the ground and the shooter's backside to create a sturdier platform.

Avoid bone-on-bone contact when possible; the front support arm should rest on the knee rather than using your elbow as a brace against the kneecap (an example of bone-on-bone contact). Place the triceps muscle on the top of the knee.

Slings are valuable tools as well. Rather than simply viewing your sling as a strap to carry your gun, instead wrap your arm in the sling for support or, when possible, detach the rear of the sling, wrap it around the leg of the shooting stick once, and pull tight. This provides a secure contact point between the front of your rifle and the ground and eliminates barrel motion.

It's much simpler to make long shots with a shooter/spotter team, but that's not always an option. If you are set up in one position and anticipate a shot (such as when you are in a stand or when glassing an open patch of ground), begin by developing a range card. This tool has been used by snipers for generations, and it's one of the most effective methods for identifying distances quickly.

Plus, if you keep your range card in your ballistic field notebook, you'll have all of your dope (in case you didn't know it, even though "dope" isn't usually capitalized, it is actually an acronym: Data Obtained from Previous Engagements, notes you have taken while shooting at the range) handy for windage and elevation adjustments.

Whether or not you're using a rangefinder, this is a good idea when hunting because you won't have to range an animal if it suddenly and unexpectedly appears in the plotted area on your range card, which allows you to

While shooting is perhaps the easy part of unknown-distance marksmanship, you certainly have to practice to the point that your technique isn't a factor.

In this electronic age, many people have forgotten (if they ever knew) that a topographical map can be used to measure distance.

make fast, accurate shots.

There are three primary methods of UKD range estimation used in the Discover Courage course. The first is known as comparative range estimation. This is the most basic method, and with some practice, shooters can actually become quite skilled using this method out to moderate ranges. The key is to choose an object at a distance that can be accurately estimated—say, a bush that you are certain is 100 yards away from your position. That range is multiplied to estimate 200-, 300- and 400-yard ranges.

These estimations can then be verified using a different method, such as topographical mapping. Topo maps were once considered a valuable tool in range estimation, but as the popularity of GPS increased, the use of topo maps declined. Nevertheless, topo maps are a valuable tool for range determination. Using the rise and fall of the landscape and coordinating that with distances on your map allows the shooter to make an accurate estimation of how far an object is from your current position because all topo maps have a scale.

This may seem rudimentary, but it's actually a precise method if you understand the map's details and take the time to carefully plot ranges. In two instances (including the example above) topo range estimation was actually more accurate than rangefinder calculations. Adding this to your range card helps you build a mathematical grid of the landscape.

Topographical mapping is referred to as deliberate target estimation. Another deliberate method is triangulation. Although it is more involved, triangulation is an accurate means by which shooters can verify the distance to a target. It works by using a right triangle to mathematically determine range.

To start, the shooter identifies the target and, using a compass, takes a degree measurement on the compass. The shooter then stretches a line (the Discover Courage team uses parachute cord) at a right angle to the target and measures 10 yards (in this example). From that right-angle position 10 yards away, the shooter then takes another compass reading, and those two numbers provide the data needed to give accurate range estimations.

Here's an example. You spot a target at an unknown range and measure its bearing in degrees using your compass. Let's say the result is 340 degrees. After stretching the cord 10 yards, exactly 90 degrees to your first bearing, you take another reading to the target from the end of the cord, and find that the compass is now measuring 338 degrees.

The difference between 340 and 338 is two degrees, the tangent of which is 0.035. Because your "base leg" measures 10 yards, your range estimation is obtained by dividing 10 yards by 0.035, which gives you 285 yards, the estimated distance to your target.

And then there's the wind, which is something even a rangefinder can't help you with—although today's handheld wind meters can at least tell you the speed where you are. However, even in flat terrain wind speed can vary significantly over a couple hundred yards, and this problem is exacerbated as the topography of the landscape changes.

Uneven ground can cause wind currents to change dramatically, so every shooter needs a basic understanding of how to read wind speed. It's not a skill that comes easily or quickly, but learning the basic tenets can help you improve quickly.

For starters, don't be fooled into thinking that what the wind speed at your position is automatically the same as wind speed at the target. You need to learn to judge environmental clues closer to your target. The primary method is the use of mirage, which is the result of disparities between the earth's surface temperature and the surrounding air temperature.

In dead-calm conditions mirage lines will rise straight up If the mirage close to your target is behaving this way, it's a safe bet the wind speed is less than four mph. Wind speeds between four and eight mph cause mirage lines to shift with wind direction, so a roughly 45-degree mirage rise at the target indicates a wind speed in this range. Faster wind speeds cause lateral mirage movement to increase even more, and above 10 mph the mirage current will begin to flow horizontally to the ground.

Bear in mind that wind currents vary with just a few feet of rise above the earth's surface, so you need to watch for mirage details at the height of the target. There may be a slow wind speed close to the ground, but it may double at the height of an elk's shoulder.

Depending upon a variety of external conditions, mirage readings may not be an option. In that case, you'll have to use other environmentals like the movement of grass, leaves, tree limbs, insects, dust or rain to dope the wind. The key is to bracket wind into increments of four or five mph and use a wind dope card for your particular load to determine hold-off value.

Learning to dope wind takes time, but don't limit your practice to the range. Improve your wind-doping skills by reading environmentals everywhere you go. Learn to recognize mirage, study foliage movement and interpret other clues to wind speed during your daily activities. This will make you a better shooter and will result in fewer misses on windy days.

A range card is critical to making shots at distance, providing drops and wind drifts for your particular rifle and load.

HODGDON CFE BLK

CFE powder includes additives that drastically reduce copper fouling, and now there's a new formulation tailored for the .300 BLK. It provides full function in ARs, and it's great for BLK subsonic loads. It's also a terrific option for varmint cartridges such as the .17 Hornet (and Ackley Hornet), .218 Bee, .221 Fireball—as well as the 6.8mm SPC and 7.62x39.

» HODGDON.COM

HORNADY LOCK-N-LOAD CARTRIDGE GAUGES

Check your handloads to ensure they meet SAAMI-spec chambers. Rifle options include .223, .22-250, .243, 6.5 Creedmoor, .270 Win., 7mm-08, 7mm Rem. Mag., .300 BLK, .30-30, .308, .30-06, .300 Win. Mag.

» $23, HORNADY.COM

HORNADY M-1 CASE TUMBLER

Holds up to 180 .30-06 cases and uses "cyclonic and vibratory action" to get a high shine on your cases. A sifter is included for separating finished cases from media.

» $75 (110 volt), $83 (220 volt); HORNADY.COM

RCBS ROTARY CASE CLEANER

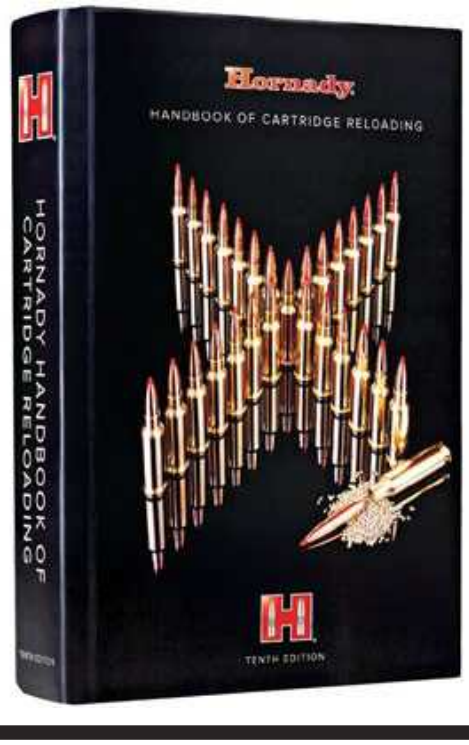
The constant rotating action is driven by a quiet, belt-driven motor that runs at 60 rpm, cleaning cases inside and out. A rubber-lined drum also helps keep things quiet. Timer permits cleaning for up to three hours. Quick-locking lid and integral handle. Includes five pounds of magnetic stainless steel media.

» $200 (120 volt), $220 (240 volt); RCBS.COM

RCBS CHARGEMASTER LITE SCALE

With a dispensing range of two to 300 grains, the one-piece Chargemaster Lite boasts 0.1-grain accuracy. It has an LCD touch-screen for controlling charges and a built-in bubble level as well as a wind cover. The scale pan is ambidextrous. Hopper holds nearly a pound of smokeless powder.

» $300, RCBS.COM



HORNADY HANDBOOK 10TH EDITION

More than 1,000 pages of data, bullet info and reloading advice covering more than 200 different calibers. Of course, the big update is coverage of the company's ELD bullet lineup, but there are also new cartridge adds like the .280 Ackley Improved, 7x64 Brenneke and .338 Federal.

» $42, HORNADY.COM

2017 HODGDON ANNUAL MANUAL

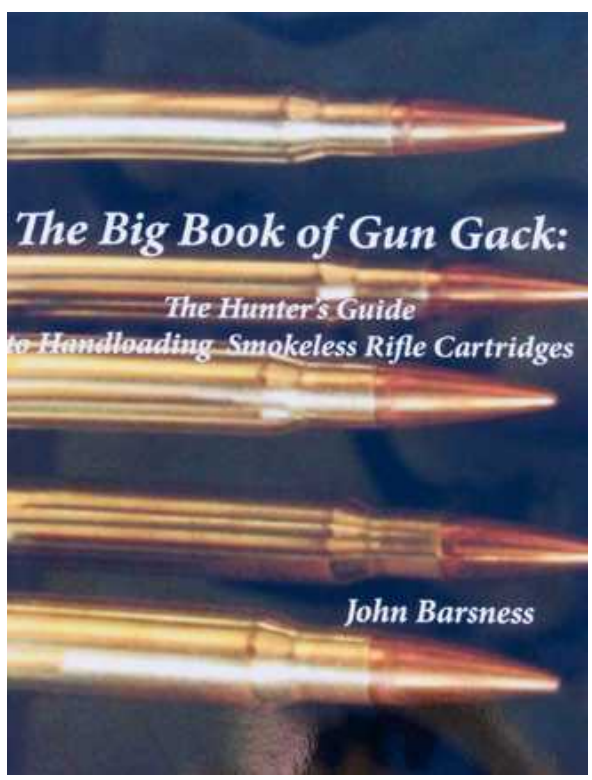
If you can't find a good load in this comprehensive annual guide…well, I don't know what to tell you. With more than 5,000 loads, this year's edition includes data for the new CFE BLK (profiled elsewhere in this section) and updates for a number of calibers. Available directly from the company and also on newsstands.

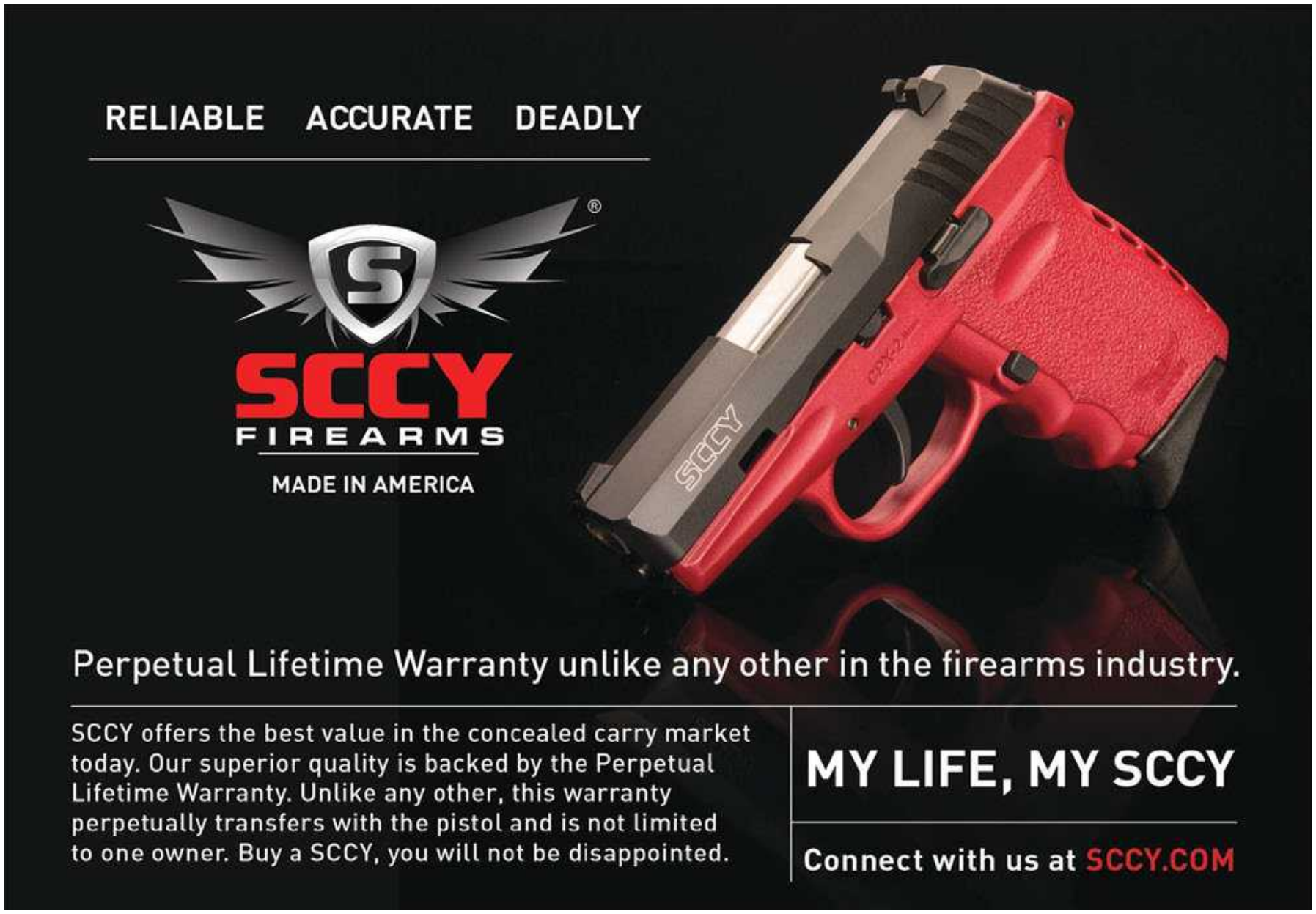
» $9, HODGDON.COM

REVIEW: BIG BOOK OF GUN GACK

Subtitled *The Hunter's Guide to Handloading Smokeless Rifle Cartridges*, I think hunting-oriented reloaders at all levels will get a lot of out this 436-page tome. Entertainingly written by John Barsness, one of the most knowledgeable rifle guys I know, it goes beyond the basics to look at key elements involved in producing safe, accurate handloads. For instance, he devotes entire chapters to primers and achieving straight sized cases. He also delves deeply into bullet selection for big game and varmints. The balance of the book, though, concentrates on specific cartridges and cartridge classes—from the .17s all the way up to the .400s. He hooked me with chapters on some of my favorites, including the .25-06, 6.5 Creedmoor, .280 Rem. and .300 H&H, but most all the biggies (and a few relatively obscure rounds) get their due. These cartridge chapters cover history, adventures with said cartridges, load recipes and more.—*JSR*

» $33, RIFLESANDRECIPES.COM





REVIEW: HORNADY G2-1500 SCALE

I've been using Hornady's GS-1500 scale for a couple years, and it works fine, but I didn't like that it wasn't trickle compatible. The new G2-1500 is, and it's also easier to operate. Instead of having to enter Tare mode to weigh charges in a powder pan, the G2 allows you to simply zero with the powder pan on top. Then fast-trickle in a charge or remove the powder pan, dump in your charge and replace the powder pan—trickling to finish if necessary. The readout is super-fast, which is what makes it work so great for trickling. Runs on AAA batteries (included), it weighs charges up to 500 grains with 0.1-grain accuracy, and its auto shut-off feature can be programmed in 30-second intervals from 30 to 180 seconds. My only criticism: The GS came in a flip-top cardboard box containing the scale, calibrating weight and powder pan, and there was a quick reference guide on the scale's hinged lid. The G2 lacks this storage-box/fast reference feature, although the scale's body does have a slot for the calibration weight. Regardless, you can't beat the price for such a handy, useful scale.—*JSR*

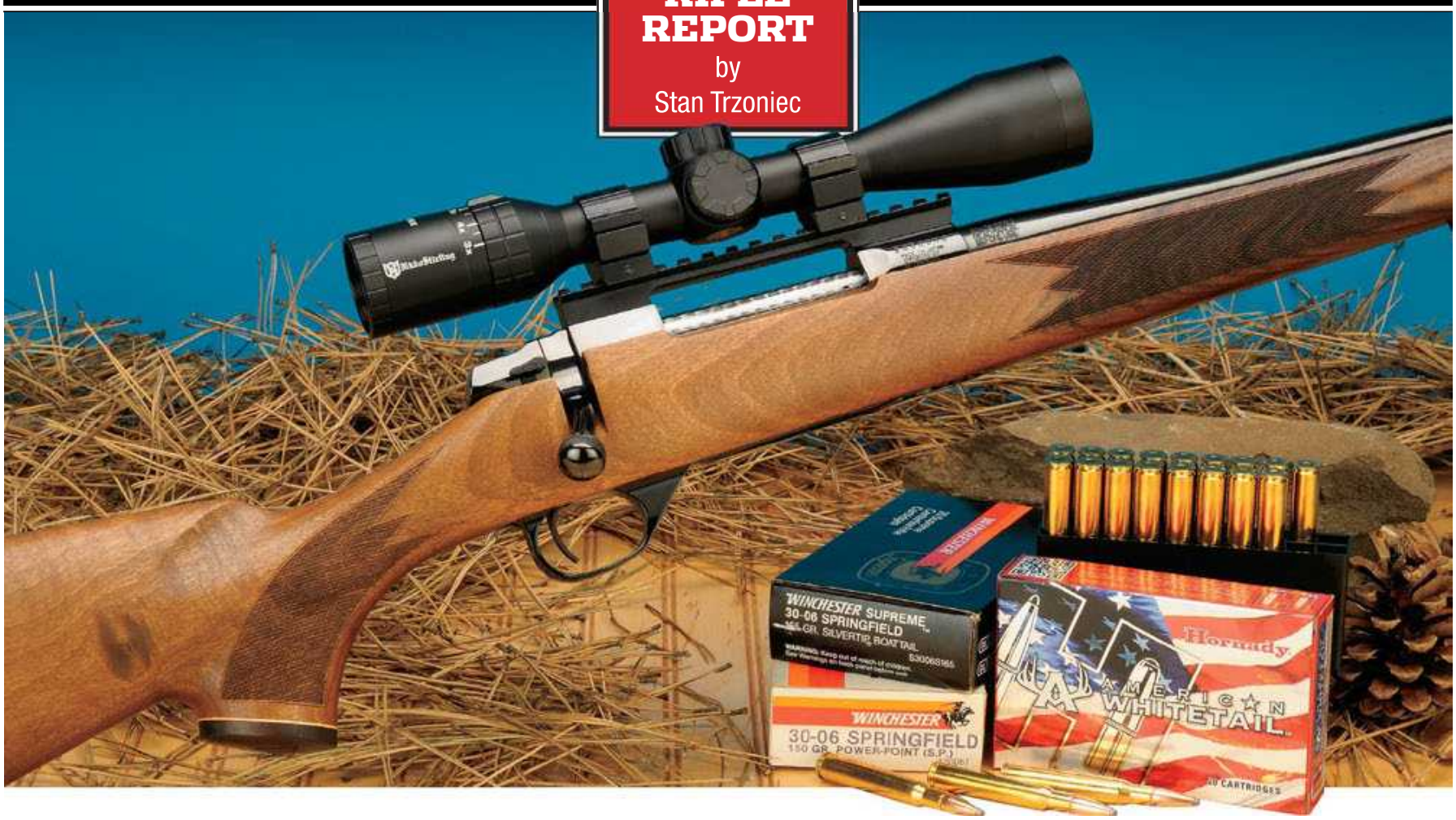
» $39, HORNADY.COM

RCBS ULTRASONIC CASE CLEANER 2

This new version comes with some big, and I mean big, changes. For one, it's 100 percent larger with a 6.3-quart capacity. It also has a second ceramic heater and transducer for better cleaning. It has an LCD control panel, and the timer can be set for up to half an hour of operation.

» $400 (120 volt), $430 (240 volt), RCBS.COM

RIFLE REPORT
by
Stan Trzoniec



Webley & Scott Empire

Webley & Scott is a name in the English firearms trade that traces its history to 1790. Now U.S. importer Legacy Sports International, in conjunction with Howa and Webley & Scott, has introduced a rifle worthy of this almost-forgotten name in traditional firearms: the Empire.

On the Webley & Scott website (WEBLEY.CO.UK), the walnut-stocked version of the Empire is listed in a dozen chamberings from .223 Rem. to .338 Win. Mag., but on Legacy Sports International's website, only .270 Win. and .30-06 are currently offered—although it notes additional calibers are "coming soon."

As an option, any rifle in the line is available as a "package" that includes a Nikko Stirling 3-9x40mm scope in a Picatinny mount and four-screw bases. I tested a package version in .30-06.

The Empire features a handsome stock with robust dimensions, which is great for shooting the larger cartridges but also boosts its weight, with scope, to more than eight pounds. I find the fore-end has a nice feel to it, and it's checkered in a point pattern with ample coverage, no overruns and a custom-looking border.

The pistol grip has a nice sweep to it, and it's also checkered with a point pattern and shows perfect coverage. The base of the grip cap is rosewood, but here I think Legacy should consider placing a black—not white—spacer to keep the looks classic. The Webley & Scott logo is laser engraved in the cap, a nice touch.

The Empire's buttstock has a well-defined cheekpiece with a sharp, almost custom edge tapering back to a traditional rubber buttpad that measures almost a full two inches in width. The pad is set off with a black spacer.

The wood itself is Italian walnut, with a hint of figure spreading out from the pistol grip. The wood on my sample is light colored, similar to what I've seen in other specimens, and except for a huge knot on the right side, it's pleasing to the eye. The wood has a satin finish that adds some

SPECIFICATIONS

WEBLEY & SCOTT EMPIRE	
TYPE	centerfire bolt action
CALIBER	importer currently lists .270 Win., .30-06 (tested)
CAPACITY	5-round detachable magazine
BARREL	22 in.
OVERALL LENGTH	43 in.
WEIGHT	7.8 lb.
STOCK	oil-finished Italian walnut
FINISH	polished blue
TRIGGER	two-stage, adjustable HACT; 3.0 lb. pull (measured)
SIGHTS	Nikko Stirling 3-9x40mm mounted on Picatinny rail (as tested)
PRICE:	$1,087 (as tested)
MANUFACTURER	Howa Manufacturing
IMPORTER	Legacy Sports International, LEGACYSPORTS.COM

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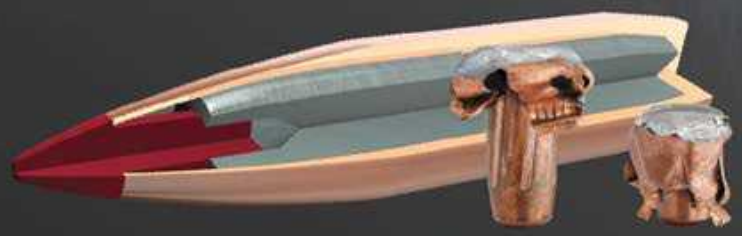
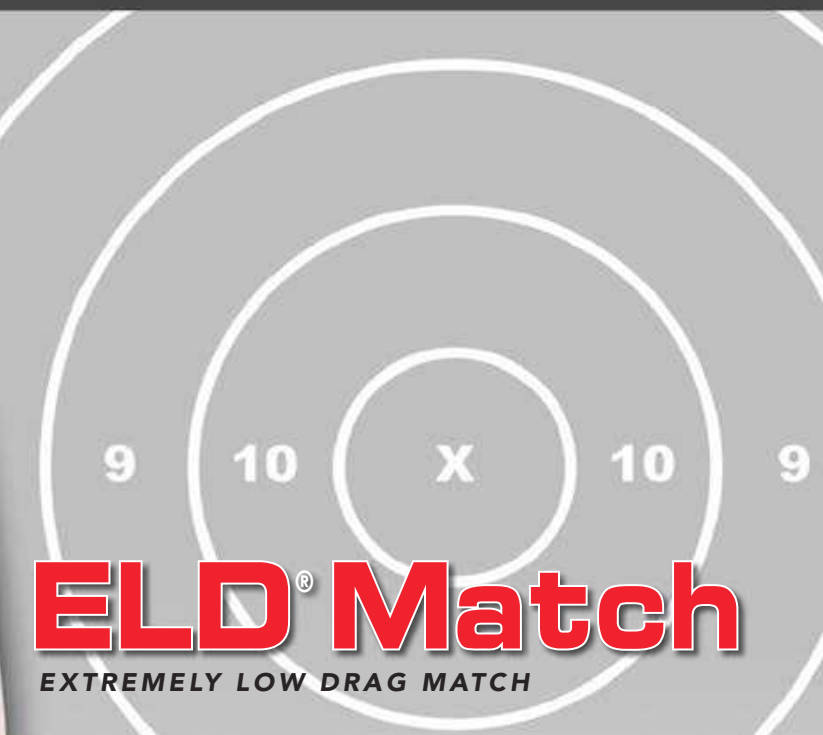


Available as component bullets or in factory-loaded Precision Hunter™ ammunition



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depth to the color of the stock. It's worth noting the checkering was cut after the finish was applied and then recoated with a light brushing of the finish for weather protection.

The barreled action is made by Howa. The 22-inch barrel has a No. 2 contour; it is hammer forged and free-floated. It is 22 inches long regardless of chambering. In my .30-06 sample the rate of twist is 1:10 with a barrel taper ending at a sporting weight diameter of .620 inch. None of the barrels in the Empire line have sights.

The front bridge of the receiver is rounded off and pillar bedded to the stock, and from the ejection port rearward, the sides of the action are flat. There is one gas escape hole on the front of the receiver, and "Webley & Scott Empire" is engraved on the left flank. Like the rest of the hardware, the receiver is polished and finished with a bright blue.

The jeweled bolt has a pair of opposing locking lugs up front with an anti-drag slot on the right lug, and it features three gas-escape holes in the bottom. The face has the typical plunger ejector and blade extractor. The handle is knurled, and the bolt shroud has a cocking indictor with flats on each side to match the lines of the receiver. The bolt release is located on the left side of the rifle for easy access.

It's a long bolt—7.5 inches from the rear of the shroud to the face—so you have to guard against "short shucking" it on the longer cartridges. The rifle feeds from an easy-to-load five-round detachable magazine. It's easily accessed via a release on the front of the floorplate assembly. Push the release to the rear and the magazine falls out easily.

The trigger guard has the distinctive Howa profile, and it encloses Howa's proprietary HACT trigger. For a hunting rifle, this two-stage trigger is a good choice, and mine, out of the box, broke at crisp three pounds and is user adjustable down to 2.5 pounds. It's a nice addition. The three-position safety is a sliding lever on the right side: Forward is Fire; middle is Safe, but allows bolt operation; and rearmost Safe locks bolt and sear.

At the range, both the Empire and Nikko Stirling scope were easy to use, and the gun was enjoyable to shoot even with a cartridge like the .30-06 thanks to the design of the stock and the wider than normal recoil pad. I liked the HACT trigger as well. Accuracy results are found in the accompanying chart.

While the rifle by itself has an attractive base price of $965, I would opt for the package deal. For only $122 more, you get the scope, rings and a base all mounted on the rifle. In a world of synthetic stocks, this rifle is certainly a breath of fresh air for the traditionalist out there that likes wood and blued steel. Besides the name, the rifle has an elegant look to it—all at a reasonable price.

The fore-end is tipped with a rosewood cap and thin black spacer, and the light-colored wood is treated to ample, good-looking checkering.

The metal finish is a polished bright blue, and the sliding safety is a three-position. The scope package comes with a Nikko Stirling variable for only $122 more.

The rifle feeds from a five-round detachable magazine that is released via a lever at the front of the magazine well.

ACCURACY RESULTS

WEBLEY & SCOTT EMPIRE

.30-06	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)	Avg. Group (in.)
Winchester Power-Point	150	2,833	9	1.85
Hornady InterLock	150	1,943	19	2.00
Winchester Ballistic Silvertip	168	2,762	18	2.50

Notes: Accuracy results are averages of three three-shot groups at 100 yards off a sandbag rest. Velocities are averages of five shots measured on an Oehler Model 35P chronograph.

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Hi-Point 389TS

Hi-Point is an Ohio company perhaps best known for its handguns, but I'm actually a bigger fan of its pistol-caliber carbines. It has had versions chambered in 9mm, .40 S&W and .45 ACP for a while, but brand new is the Model 389TS chambered in .380 ACP. Hi-Point carbines are value priced, and the base model 389TS I tested has a suggested retail of only $297. And it's 100 percent American-made.

The 389TS is a simple, straight blowback gun with a 16.5-inch barrel. It is available in black or, for an extra $60 or so, Muddy Girl camo. Every other carbine Hi-Point makes is fed by the same magazines used in its pistols, but due to the length of its grip, the .380 carbine does not accept Hi-Point's shorter pistol magazines. The carbine comes with a 10-round magazine, and you can buy spares directly from Hi-Point. Overall length of the carbine is 31 inches, and its weight is 6.25 pounds.

The 389TS comes with Hi-Point's standard adjustable sights: a protected post front adjustable for elevation and a fully adjustable ghost ring rear inside protective steel ears. There is a polymer rail forward of the rear sight if you would like to mount an optic and another rail underneath the barrel if you choose to mount a light or a laser. The rail underneath the handguard is meant for the optional vertical foregrip Hi-Point offers.

The controls on the Hi-Point are simple. The charging handle screws directly into the bolt and can be switched from one side of the receiver to the other, depending on your preference. The safety is a lever on the left side of the receiver above the grip—up for Safe, down for Fire. As it is a pistol-style magazine, the magazine release is on the grip just behind the trigger guard where you'd expect to find it on a pistol. The bolt does lock back on an empty magazine.

Trigger pull on my sample was 6.25 pounds. It is a single-stage pull with

SPECIFICATIONS

HI-POINT 389TS	
TYPE	straight blowback semi-automatic
CALIBER	.380 ACP
CAPACITY	10-round magazine
BARREL	16.5 in.
OVERALL LENGTH	31 in.
WEIGHT	6.25 lb. (w/o magazine)
FURNITURE	skeleton frame w/integral recoil buffer
TRIGGER	single-stage, 6.25 lb. pull (measured)
SIGHTS	fully adjustable ghost ring rear, elevation adjustable front
PRICE	$297
MANUFACTURER	Hi-Point Firearms
DISTRIBUTOR	MKS Supply, Hi-PointFirearms.com

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a bit of length to it, but it is smooth. The only surprising thing to me was the "internal recoil buffer" in the stock. The buttplate of the stock is separated from the rest of it by about half an inch. Push in on the butt and you'll find it's spring-loaded to soak up recoil. The only problem with that is that the recoil of the .380 ACP in a 6.25-pound carbine is so negligible the springs in the stock barely get any use.

A carbine chambered in .380 may seem odd, but many of the pistols Hi-Point sells are chambered in .380. Many of Hi-Point's customers don't have a lot of cash, so offering them a carbine in the same caliber was a logical step.

Out of the carbine's longer barrel, the .380 ACP provides nearly 9mm performance, while being a lot easier to aim, with near zero recoil. (I'm not exaggerating when I say it recoils about like a .22 rifle.) My 14-year-old son loved shooting it, which is exactly what you want to happen when you take your kids to the range.

And it's not only kids. At a recent industry event, gun writers stood in line to shoot the Hi-Point .380 while other guns received only passing interest. The carbine was used to great effect on the plate rack.

Hi-Point is one of those companies where the mere mention of its name among gun people can start arguments. One thing I notice is that the people who don't like Hi-Points either don't like their appearance or look down on them because they're "clunky" or because they're inexpensive.

But nobody, and I mean nobody, claims they don't work. To me and a lot of other people who take self-defense seriously, any gun is better than no gun in a gunfight, and a reliable gun that is simple to operate—which pretty much defines everything that Hi-Point makes—might just save your life some day. Plus, all Hi-Points have a lifetime, no-questions-asked warranty.

Actually, I have a soft spot in my heart for Hi-Point carbines because of a recent news report. A local Detroit woman ran off three armed home invaders with what the TV station called an "assault rifle," which she'd bought at a pawnshop. Video revealed the "assault rifle" to be a rusty Hi-Point carbine. Straight blowback actions are reliable and resistant to abuse and, apparently, rust—but, please, keep your guns properly lubed.

If you own a Hi-Point .380 pistol for personal or home defense and are looking for something in the same caliber that's easier to aim while providing a little more power, the Hi-Point 389TS is a great choice. But don't forget: It's also just plain fun to shoot. ■

The stock has a spring-loaded "internal recoil buffer" in the stock, although with the carbine's negligible recoil, it doesn't get much of a workout.

Unlike other Hi-Points, the 389TS doesn't use pistol magazines but rather one specifically designed for the carbine. The operating handle can be swapped to either side.

The carbine features a fully adjustable ghost ring rear sight that's protected by wings. The front is also protected by wings and is adjustable for elevation.

ACCURACY RESULTS

HI-POINT 389TS

.380 ACP	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation (fps)	Avg. Group (in.)
Hornady XTP	90	1,094	15	2.3
Barnes TAC-XPD	80	1,123	11	2.8
Federal HST	99	1,082	18	3.0
SIG Elite FMJ	100	1,132	26	4.0

Notes: Accuracy results are averages of five five-shot groups at 50 yards off a sandbag rest. Velocities are averages of 10 shots measured with an Oehler Model 35P 12 feet from the muzzle. Abbreviations: FMJ, full metal jacket

Continued from page 72

combinations of shotgun barrels and rifle chamberings. Complicated? You bet. Also getting kinda heavy. Drillings usually shave a bit of weight with shorter barrels, and the bottom rifle barrel is usually slender, achieving stability through mutual support.

Neither three nor four is the limit. Hollywood is great for "gimmick guns," and my generation will remember that, as James Bowie, Richard Widmark wielded a Nock seven-barrel "volley gun" in John Wayne's rendition of "The Alamo." There were no Nock guns in San Antonio in 1836, but the flintlock Nock was real—a seven-barrel musket designed for shipboard use that, hopefully, discharged all seven barrels at once.

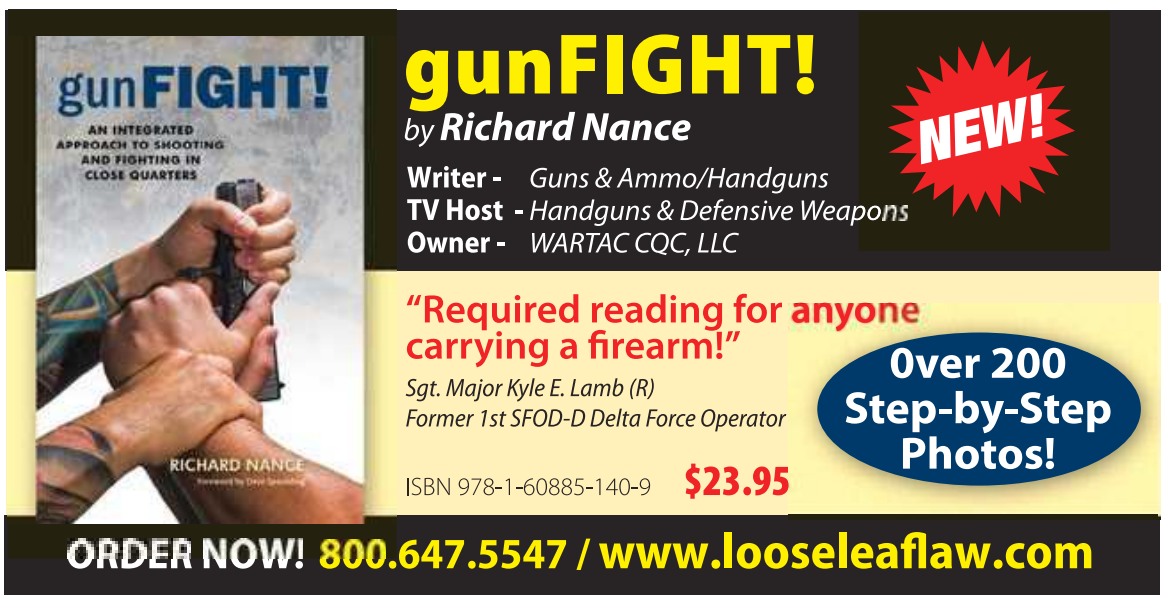
The Royal Navy tried it but gave up because the recoil was horrendous if all barrels fired. If they didn't, it took too much time to figure out which barrel misfired. And the Nock was an extreme fire hazard on wooden ships.

So let's back off to three barrels, which are interesting for reliable speed—if you know which trigger to press and when. As for two barrels, I have long thought a double rifle in medium caliber would be ideal for some whitetail, elk and moose hunting and a lot of bear and boar hunting.

There are two problems. The first is cost versus gain. Double rifles are pricey, and while doubles in lighter calibers are cheaper than in larger calibers (which is inexplicable since the work is the same), it's a lot to pay for an instantaneous second shot.

Then there's the accuracy issue. A double-barrel's barrels, if properly regulated, shoot together at only one distance. It doesn't matter so much on buffalo within 100 yards because the animal has a vital zone the size of a medicine ball. It matters a lot on North American big game, where the animals are smaller and the distances vary widely.

So, for me, excepting extremely specialized situations, a one-barreled rifle is still the way to go. Beyond that, two may be company, but three or more seems very much a crowd. ■



by Craig Boddington

A Numbers Game

At a recent fundraising banquet, a gentleman told me he had a three-barreled 9.3x74R and wondered if I thought it would be adequate for buffalo. The premise was weird enough that I totally misunderstood. I assumed his gun was a conventional drilling: two shotgun barrels over a rifle barrel. Although seen little over here, the drilling is fairly common in Europe, where many shooters are limited on the number of firearms they can own, so the versatility of the drilling is useful. In most cases, the same firearm can be used for birds and big game in the same minute, and of course, there's always driven boar hunting, where the upper barrels might be loaded with buckshot or slugs and the rifle barrel used for longer shots.

In this case, I figured the gun in question was essentially a single-shot rifle with useless shotgun barrels above, so I told him that while the 9.3x74R made the legal requirement in most African countries, the rig was probably a minimal choice for buffalo.

Except this wasn't a conventional drilling. He went home and brought the rifle back to show me. It was literally a three-barreled rifle, all three barrels chambered to 9.3x74R. Apparently, Sauer has made two of these, and his dad bought one of them.

The firing arrangement was also unusual. It was a two-trigger gun, with the front trigger firing the top barrels in succession and the rear trigger firing the bottom barrel. Hey, the 9.3x74R is not a .375 H&H by any measure, but it's a potent cartridge, and I simply can't imagine any way to hit a buffalo three times more quickly. So, yes, in his dad's memory, why not give it a try?

Regulating multiple-barrel rifles—getting the barrels to shoot together—is a difficult and painstaking operation. Two is bad enough, and I can't even imagine the challenge of getting three barrels to shoot together, but this rifle's owner insisted it shot all three barrels into one tight group at 100 yards.

Regulation is one issue; raw accuracy is a whole different story. As an American, I have relatively little experience with drillings, but I have noticed the bottom rifle barrel tends to be super-accurate, almost certainly because it's fully supported by the upper barrels.

> THIS RIFLE'S OWNER INSISTED IT SHOT ALL THREE BARRELS INTO ONE TIGHT GROUP AT 100 YARDS.

Actually, the same seems to apply to double-barreled rifles, which I have a lot more experience with. Separate groups from each barrel tend to be tight—again, at least theoretically, because of the mutual support of one barrel to the other. But with double rifles we don't care much about how each barrel groups; we care the barrels shoot together closely enough to provide adequate accuracy for the game to be hunted at the ranges at which said game is to be hunted. We'll come back to that thought.

Meantime, back to this gentleman's drilling. Shooting it required pressing the front trigger twice, then go for the rear trigger. The safety was a conventional tang safety, which is unusual for a drilling. Drillings typically have a safety on the side, and the tang "safety" raises a rear sight on the rib and activates the rifle barrel. It takes a lot of practice to be familiar with the drill, but it's not an unsound concept if you practice. My old friend and Alaskan master guide Jake Jacobson often carried a drilling—12-gauge slugs on top, 9.3x74R rifle on bottom—for backup on brown bears in thick cover.

Multi-barreled guns have been made in almost every imaginable configuration. A buddy of mine, European by birth, does a lot of self-guided hunting in Africa's forest zone. He found his concept of the perfect "forest gun" with three barrels: one shotgun, one .22 Hornet, one 9.3x74R. With the shotgun he was ready for snakes or small game, with the Hornet he was ready for small antelope, and with the 9.3 he could take on a buffalo—and just maybe save himself from an elephant.

It was a great idea but not so perfect in execution. We were hunting together here when he meant to shoot a wild hog with the 9.3 but sprayed it with bird shot instead.

Theoretically at least, if the multi-barreled arrangement was the only firearm one had, one would eventually get used to it. But such guns are indeed complex, and three barrels is not the limit. *RifleShooter* founder Bob Petersen had at least one vierling that I got to handle. In German, *drei* is three; *vier* is four, so you can figure correctly that a vierling is a four-barreled gun.

As I recall, Petersen's was a shotgun with the four barrels intended to discharge in sequence, but there have also been a few four-barreled guns with

Continued on page 71

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