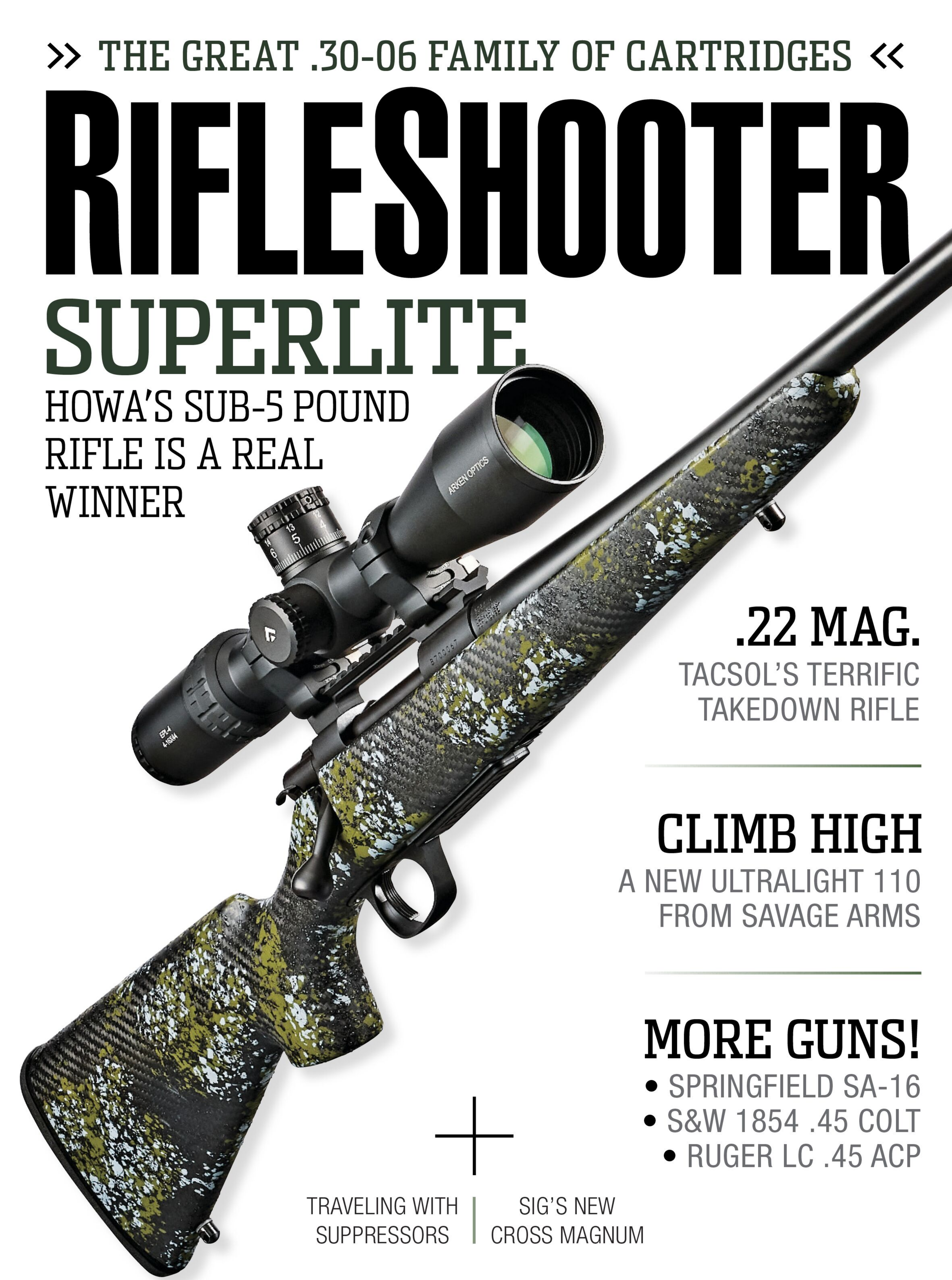
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Africa Plains Game Rifles on Steroids

I enjoyed Craig Boddington's plains game article in the November/December issue. I have done one safari, and my plains game rifle was a .338 Win. Mag. with the 225-grain Barnes TTSX load. I had no problems on any plains game encountered, but I was also glad I had my .416 Rem. Mag. and 400-grain Barnes TSX loads for a through-and-through shot on a Cape buffalo and one through and through on a zebra. That convinced me the .416 is the ultimate driving machine!

Jim Britton, Texas

3-Rifle Batteries

In case you missed November/December's "Last Page," we asked readers what their favorite rifle batteries are if they were limited to just three. Following are a few responses.

Never having had a desire to hunt Africa, my battery would be with only North America in mind. My big rifle is a Model 70 Winchester in .338 Win. Mag. Intermediate would be either my Browning .270 Win. or my .257 Roberts Ackley Improved. The light would be either my 5.56 Colt AR or my H&R .223 bull barrel. Of course I am not counting my rimfire .22 LR Colt Colteer.

Garry Benner

My answer is simple. I only have three-ish rifles. I own the Ruger 10-22, just because. After having exhaustively researched game rifles, I purchased a Weatherby Vanguard in 7mm-08. And I own a Mossberg 500 which is my dedicated slug gun. The recoil causes me to flinch just thinking about shooting it, but the wood is so beautiful. It was my first gun. There are some things that you just can't let go of.

Ron Cohen, Illinois

Like Craig, for a one-rifle battery, I would choose a .375 H&H, as I am not recoil shy. However, for a two-rifle battery I would keep the .375 H&H and add a 7mm Rem. Mag. as it will do anything a .30 caliber will do at short and medium range, but is way better for long range—and good for even very long range. The rifle I would add to those two is an M1 carbine. I find .22 rimfires boring, but the M1 carbine is a blast for plinking, as the recoil is mild. It would double for home defense, as it is short and handy with a larger bullet than a .223 so less likely to overpenetrate.

Dave Palmer, Maryland

2024 OLYMPICS/PARALYMPICS RIFLE WRAP-UP

[Editor's note: I realize this is well after the fact, but the Games hadn't ended when our previous issue went to press, and I still wanted to recognize our athletes for their talent and dedication to reach this level of the sport.]



Joshua Schave photo

Sagen Maddalena won a silver in three-position smallbore.

Sgt. Sagen Maddalena of Groveland, California, and a member of the U.S. Army Marksmanship Unit captured the lone rifle medal for the United States at the Paris Games, earning a silver in 50-meter women's three-position smallbore. She topped the field in the qualifying round and finished 1.4 points out of first place in the finals round. (Eight shooters from the qualification round move on to the finals. Qualification scores are tossed out, and medals are awarded solely on finals scores.)

Maddalena also qualified for the women's 10-meter air rifle final and finished fourth—missing the dais by less than two points. Fellow U.S. shooter **Mary Tucker** came in 32nd in women's air rifle and 25th in three-position. Tucker teamed up with **Rylan Kissell** to take 13th place in mixed air rifle, with the pairing of Maddalena and **Ivan Roe** coming in 25th. In men's individual competition, Roe notched a 20th place finish and Kissell came in 38th in three-position smallbore. They wound up back to back in air rifle—with Roe's tally good for 34th and Kissell's for 35th.

U.S. parathletes didn't make any of the final rounds but had a good showing. In the SH1 division, **John Joss II** and **Kevin Nguyen** were 14th and 15th respectively in mixed smallbore prone, while Nguyen's performance in mixed air rifle prone was good for 27th place. In the SH2 division, **McKenna Geer** finished 13th in mixed smallbore prone, 33rd in mixed air rifle prone and 23rd in air rifle standing. **Jazmin Almlie** likewise competed in multiple events, with a 27th place in mixed smallbore prone and 26th in mixed air rifle standing.

Coming Next Issue



CZ 600 American



Red Dots on Rifles

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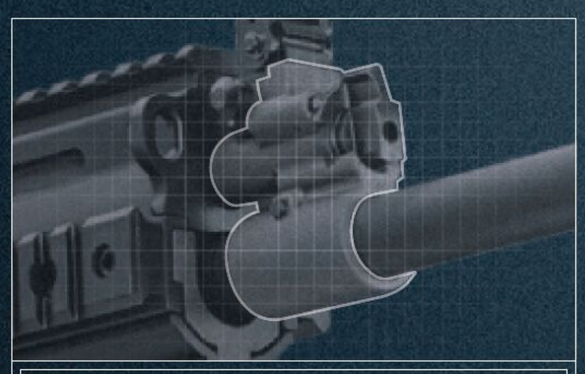
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Have Can, Will Travel

THE INS AND OUTS OF HITTING THE ROAD WHEN A SUPPRESSOR IS PART OF YOUR GEAR.

by Brad Fitzpatrick

A higher percentage of shooters own suppressors than ever before, and that's a good thing. Suppressors—or silencers or cans, if you prefer—are a fantastic tools for hunters and shooters because they cut down on recoil and muzzle blast, the primary catalysts for developing a flinch. It's more fun to shoot suppressed, and most shooters find that their accuracy improves with a can in place. Last but not least, they're quieter to your neighbors at the range and fellow hunters in the field.

Since suppressors make shooting so much more enjoyable, it only follows that shooters should want to carry suppressors with them wherever they travel. But while companies like Silencer Central have demystified the rules for owning a suppressor, there are still some unknowns when traveling with a suppressor.

I went to Silencer Central's president and founder Brandon Maddox for answers about traveling with suppressors. Maddox is an avid hunter and shooter himself, and he spends a great deal of time on the road, generally with one or more suppressors in tow. When I asked him about the regulations regarding suppressors he told me that you must understand the regulations in states you plan to travel to and through.

"Forty-two states allow suppressor ownership, and you can hunt with a suppressor in 41 states," Maddox told me. Only Connecticut allows suppressor ownership but does not allow suppressors to be used while hunting.

There are nine jurisdictions that don't permit suppressors at all: California, Delaware, Hawaii, Illinois, Massachusetts, New Jersey, New York, Rhode Island and Washington, DC.

Let's say you have to travel through one of them. Then what? Silencer Central's Brandon Maddox told me that the application required to transport or export NFA items is not required for suppressors, which is a good thing, and the 1986 Firearms Owners Protection Act should, at least in theory, protect drivers who are traveling on federal highways.

However, the wording of state laws—or the interpretation of the wording of state law by law enforcement officers—can have an impact on what happens if you find yourself in a state where suppressors are illegal. The best bet is to avoid these areas if at all possible, and no matter where you go

your suppressor should remain out of sight and safely locked.

Other than those places, traveling with a suppressor is not an issue, Maddox says. He also told me that, according to law, only the Bureau of Alcohol, Tobacco, Firearms and Explosives criminal division and federal tax office can request your tax stamp paperwork. But oftentimes law enforcement or even game wardens will ask for the paperwork. Maddox advises that all tax forms be kept safely at home and digital copies be stored on your phone.

Flying domestically with a suppressor is rather simple, he says, and that has been my experience as well—although I have never flown to or connected through states where suppressors were illegal. You must declare a suppressor to the airline and carry it inside a locked checked bag.

Things become more complicated when flying internationally or into states with restrictions on suppressors. For example, one of the shortest and cheapest flights to South Africa travels through Newark, New Jersey—a state where suppressors are banned. Theoretically, as a passenger in transit you would be all right with a suppressor.

But what happens if you have to overnight because of a canceled flight? Or what happens if you're flying to Europe through Philadelphia for a hunt and suddenly find yourself rerouted through New York or New Jersey?

There's a potential for problems, to be sure. The best option, Maddox says, is to have the airlines hold onto the bags if possible. In such an unfortunate situation, you're basically helpless to avoid traveling to a state where the item is prohibited, and your best hope is to make certain that the bags remain at the airport and under airline control.

International laws vary widely on suppressors, Maddox says, and that's what I've found to be true, too. Take, for instance, New Zealand—a country where bringing in a gun is difficult but suppressor ownership is unregulated. I jumped through the requisite bureaucratic hoops to get my rifle into the country, but bringing a suppressor was no issue at all.

The same has been true of sub-Saharan African countries where I have hunted, although Maddox told me Zimbabwe regulates suppressors. In many places in Europe, hunting without a suppressor is viewed as rude.

Canada does not allow any hunting with suppressors, but in other countries the rules are less black-and-white and could be open to interpretation. That's why if you're traveling internationally, going through a booking agent experienced in traveling with firearms can be a good idea.

"We steer clients with suppressors away from the Newark flights to Africa," says Darren Ginn of Travel Express in Montana.

Instead, he sends people on alternate routes. He does note that travelers going to Frankfurt need to list their suppressor on their firearms application. Booking agents will often handle paperwork like that for you, but I would ask the outfitter or PH in addition to the travel agency about traveling with suppressors.



Keep your tax-stamp paperwork at home in a safe place, but store a digital copy of it on your phone when you travel.

Both Ginn and Maddox emphasized that hunters and shooters need to fill out a Form 4457 that includes their suppressors before traveling abroad—just like they do their firearms. This assures customs and immigration professionals you have your suppressor legally and did not ship it internationally prior to your departure.

Traveling with a suppressor is not difficult in most cases. Stay away from countries like Canada and U.S. states that don't allow suppressors; check local laws; and have digital copies of your tax-stamp forms available to you. International travelers will also want to have a 4457 on hand when reentering the United States. Otherwise, travel with a suppressor is straightforward and simple. And it's well worth the effort. ■

Fiocchi KnockDown

The new KnockDown line from Fiocchi USA features an all-copper hollowpoint that is Fiocchi's own design: a boattail with two cannelures forward of the boattail to assist in compression and reduce bore fouling. KnockDown is part of Fiocchi's EnviroShield program, an effort to produce zero-polluting ammunition without sacrificing performance. KnockDown features a lead-free primer in addition to the non-lead bullet.

I don't believe it's fair to evaluate ammunition for accuracy out of a single rifle, and I had only one .243 on hand, so I just measured velocity: A 10-round average through a 22-inch barrel yielded 3,211 fps with an extreme spread of 65 fps and a standard deviation of 19 fps. I also measured runout and weight on 10 cartridges. Runout was a tiny .0013 inch on average, and weight standard deviation was a minuscule 0.6 grain.

KnockDown is available in .243 (80 grains, 3,415 fps), 6.5 Creedmoor (120, 2,900), .270 Win. (130, 3,100), 7mm-08 (140, 2,825), 7mm Rem. Mag. (160, 2,935), .308 (150, 2,900), .30-06 (150, 2,950) and .300 Win. Mag. (165, 3,100).—*J. Scott Rupp*



CARTRIDGE CLASH » Brad Fitzpatrick

.240 Wby. Mag. vs 6mm Creedmoor

Roy Weatherby was the king of fast cartridges, and he was an instrumental player in the magnum craze of the mid-20th century. Weatherby began designing cartridges in the 1940s, but it wasn't until 1968 that he took aim at the 6mm market.

Heretofore Weatherby had based his hyper-velocity cartridges on the .375 H&H Mag., shortening, necking down and applying his signature Venturi shoulder. But for the .240 Wby. Mag., introduced in 1968, he designed a unique case. It looked very Weatherby with its belt and rounded shoulder, but the rim diameter was 0.473 inch, and case length was reasonably close to a .30-06 so the new .240 Wby. Mag. could fit in a .30-06-length action.

The .243 Win. and 6mm Rem. Mag., both released in 1955, had beat the .240 Wby. to market by more than a decade. However, the .240 bested the velocity of both cartridges by at least 300 fps. Winchester's .243 Win. Super Short Mag. threatened the Weatherby's velocity record for a while, but that cartridge has largely disappeared, leaving the .240 Wby. to lead in 6mm speed.

Modern ballistics science shined a light on high bullet ballistic coefficients—rather than sheer speed—as the way to shoot farther, with Hornady's 6.5 Creedmoor leading the charge. It wasn't long before shooters began toying with the 6.5 Creedmoor, and *Outdoor Life* editor John Snow and George Gardner of GA Precision worked to neck down a 6.5 Creedmoor to 6mm, and the 6mm Creedmoor was born. While it started life as a target cartridge, hunters—myself included—found it to be an excellent performer on game.

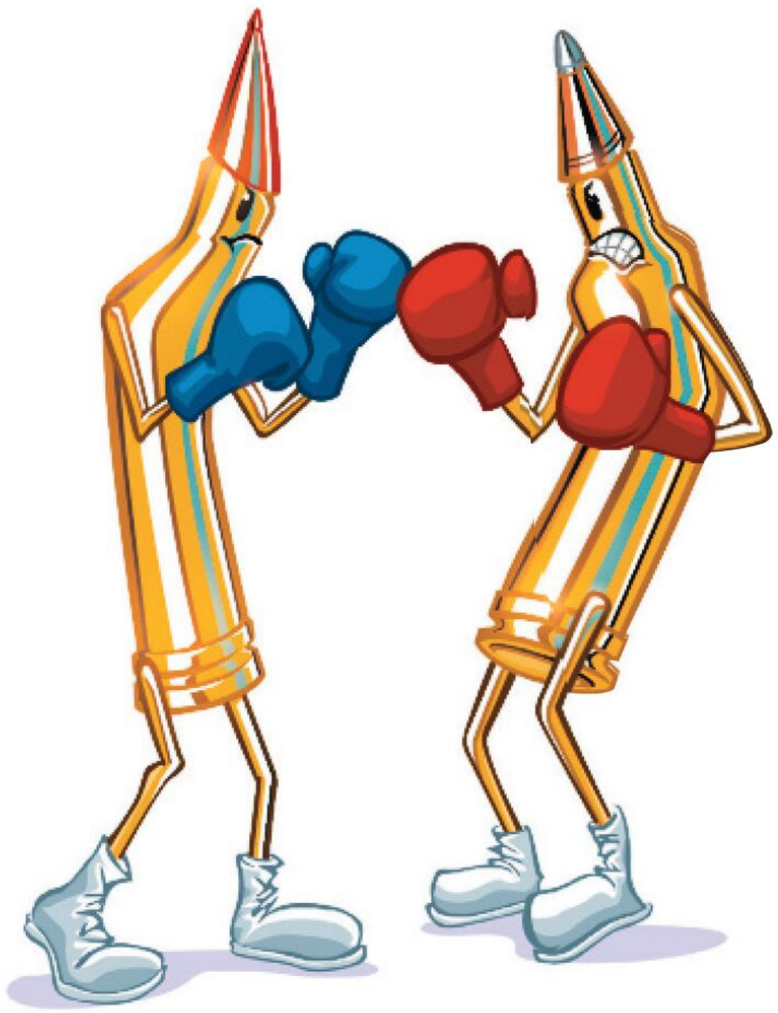
Aside from their bullet and case rim diameters, the .240 Wby. and 6mm Creedmoor have little in common. The 1.92-inch Creedmoor case lacks a belt, has a 30-degree shoulder, and the chamber is designed with virtually no freebore. Weatherby's case measures 2.5 inches long, features a radiused shoulder and a belt, and chambers have substantial freebore.

Most 6mm Creedmoor rifle barrels feature twist rates between 1:7 and 1:8 to stabilize bullets that may weigh up to 115 grains, whereas the Weatherby features an older 1:10 twist.

The Creedmoor will push an 80-grain bullet up to 3,400 fps, but the cartridge was truly envisioned for higher BC bullets of 95 to 105 grains to be pushed 3,000 and 3,200 fps. A .240 Wby. will propel an 80-grain bullet upwards of 3,500 fps, and Weatherby factory ammo includes 72-grain bullets at 3,700 fps and a 100-grain load at 3,275.

Let's compare two popular loads side by side: Weatherby's 80-grain Barnes TTSX at 3,440 fps and Hornady's 103-grain ELD-X Precision Hunter at 3,050 fps. When sighted in at 100 yards, the Weatherby has 1.8 inches less drop at 300 yards than the Creedmoor and almost five inches less drop than the Creedmoor at 600 yards. At about 800 yards, though, the Creedmoor's high BC bullet shoots 1.4 inches flatter than the Weatherby, and at 1,000 the Creedmoor drops almost 30 inches less than the Weatherby.

Wind drift dramatically favors the 6mm Creedmoor's higher BC bullet,



too. At 800 yards the .240 Wby. load drifts more than 68 inches in a 10-mph crosswind compared to 45 inches for the Creedmoor.

There are lots more ammunition and rifle options for the 6mm Creedmoor, including some less expensive ones. You can get ammo for about $2 per round. Weatherby is the sole provider of rifles and ammunition for the .240 among major brands, with ammo prices starting at around $3.75 a round.

The 6mm Creedmoor, clearly, is more versatile, but for hunters who like the Weatherby's laser-flat trajectory out to about a quarter-mile, that round is still as versatile and deadly as it was in 1968.

.240 WBY. MAG.

HITS
- Shoots flatter at typical hunting distances
- Long history of performance
- A unique choice

MISSES
- Substantial muzzle blast
- Limited rifle and ammo options
- Belted cases are no longer hip

6MM CREEDMOOR

HITS
- Proven track record on game and targets
- Better in wind and at extreme range
- Plenty of rifles and good load selection

MISSES
- Only long-range shooters reap max benefit
- Not as flat-shooting out to 400 yards
- Lacks the Weatherby cachet

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Warne Skyline Pro

Bipods are the hot ticket among rifle accessories these days, both with hunters and the competition set. Warne's new Skyline Pro has a lot to offer both.

Built of aircraft-grade aluminum, it's available with Lite or Precision legs and with Arca rail or QD Picatinny rail head. My sample incorporated the Lite legs and Pic head, a configuration weighing just one pound, four ounces. This version had an introductory price of $450 at press time.

I think the key feature here is the ability to quickly set the stance at 22, 48 or 72 degrees—both legs moving simultaneously with the push of a single button. That's a really fast way to get the right position, whether you're dealing with terrain in the field or scenarios at a match.

Locking leg positions are at zero, 45 and 90 degrees, and they quick-deploy from zero to 90 simply by pulling back until they lock in place. The Lite legs offer 13 height adjustments, with a minimum height of 4.2 inches and a max of 13.2 inches. The feet have rubber tips and are threaded to accept Atlas-style feet if you want to swap to a different design or need to replace them due to wear.

The Skyline Pro provides 44 degrees of cant, and a large red lever gives you plenty of leverage to tighten or loosen the tension quickly.

The QD Picatinny head clamps easily and locks down fast. It's also reversible. Further, say you buy the Pic version but later want to switch to Arca—or want the option to swap back and forth between rifles with different systems—you can buy an Arca head for $85 and have both at your disposal.







The Skyline Pro is a light, strong, full-featured bipod. The stance can be quickly adjusted to three different angles with the push of a button, both legs moving simultaneously. Cant tension comes courtesy of a large red lever, and the Lite version legs offer 13 positions and a height of up to 13.2 inches. The feet are replaceable Atlas-style.





The QD Picatinny version (l.) clamps quickly and securely, and an Arca version of the Skyline Pro is also available. Because both head types (r.) attach to the bipod the same way, by buying a separate head you could have one bipod that works with both styles.

While I didn't get to shoot a match or do a hunt with the Skyline Pro, I experimented with it a great deal at the range. Clamping it on a Browning X-Bolt Target Max, I set up target- and hunting-type scenarios and practiced getting set up quickly. I love the gear design that allows the stance angle to change by pushing one button. That alone made me faster to get the right height than other bipods I've tried. Adjusting the leg height is super easy to do with one hand, and in some of the situations, the ability to reach up and crank the cant tensioner was a godsend.

Overall I found the Skyline Pro to be a rock-solid bipod that's extremely well designed and fast and easy to use. It's a great option for hunters and competitive shooters alike.—*J. Scott Rupp*

JEB BURTON
HUNT AMBASSADOR

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Mossberg Patriot .400 Legend

Mossberg's workhorse hunting rifle adds the .400 Legend, the harder-hitting big brother to the .350 and better suited to bigger game like bears. Available in walnut (shown) and synthetic versions, it sports a 20-inch barrel that's threaded 11/16x24 and comes with Weaver-style bases installed. The walnut version weighs seven pounds, the synthetic 6.5. Both feed from four-round detachable magazines and feature the excellent Lightning Bolt Action Trigger that's adjustable from two to seven pounds.

>>$669 (walnut), $484 (synthetic); MOSSBERG.COM

Federal Fusion Tipped



The Fusion bullet's claim to fame is its electro-chemically bonded construction, which provides toughness without the high cost of other bonding methods, but it's not the most aerodynamic kid on the block. Federal has addressed that with the new polymer-tipped version, which boosts ballistic coefficients for a flatter trajectory and less wind drift. Initial offerings include 6.5 Creedmoor (140 grains, 2,700 fps); 6.5 PRC (140, 2,975); .270 Win. (150, 2,850); 7mm Rem. Mag. (175, 2,860), 7mm PRC (175, 3,000); .300 BLK subsonic (190, 1,050); .308 Win. (180, 2,600); .30-06 (180, 2,700) and .300 Win. Mag. (180, 2,950).

>>$45–$82, FEDERALPREMIUM.COM

Hornady Mobilis Modular Safe Double Door Max



The big daddy of Hornady's Mobilis line—which offers welded-safe strength in a modular design—is 46 inches wide, 31 inches deep and 71 inches high. It can be transported and assembled piece by piece, so it will fit in more places than traditional safes. Assembled weight is over 1,000 pounds. The exterior walls are nine-gauge two-ply steel while the doors are 3/16-inch steel with a non-breach seal and steel locking bolts. The door opening is 37x64 inches. The Square-Lok interior allows a ton of customization, and the Double Door Max comes with three shelf assemblies, a divider/wall support, four 4U gun racks and two 6U gun racks.

>>$6,414, HORNADY.COM

RCBS .22 ARC Dies



This caliber really seems to be taking off among .22 centerfire fans, and now RCBS is giving enthusiasts two die sets for reloading it. One is the two-die Group A full-length sizer die set—your traditional sizer and bullet seating dies. The other is a small-base taper-crimp set from the company's AR series. It has a sizing die that sizes the brass smaller than SAAMI specs for sure feeding, plus a seater die that provides a seven-degree crimp so bullets stay put during recoil.

>>$52 (Group A), $64 (AR series); RCBS.COM

Warne HyperLite Rings



At just 2.8 ounces per pair, these scope rings are made of MagnaFusion alloy, which results in a ring that's 35 percent lighter than aluminum without sacrificing strength or stability. They're CNC machined and treated to a Cerakote finish, and the NATO-standard 4694 interface promises rigidity and a better return to zero. They feature an integral recoil lug and dual-screw clamps, and they fit both Picatinny- and Weaver-style bases. Hyper-Lites are available in one-inch, 30mm and 34mm tube sizes in low, medium and high.

>>$100–$110, WARNESCOPEMOUNTS.COM

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by Jeff John

Sailing with the Lee Navy

OUR FIRST MILITARY "SMALLBORE" RIFLE WAS MUCH TOO FAR AHEAD OF ITS TIME.



The U.S. Navy adopted the unique smallbore 6mm Winchester Lee straight-pull rifle in 1895. Some 15,000 rifles were made and issued to Bluejackets and Marines. A sporting version is shown above, a military rifle below.



Morphy Auctions photo

The smokeless powder revolution caused rapid rearming worldwide. The 6mm Lee Navy grew out of the U.S. Navy's early enthusiasm for the 6.5 Mannlicher-Schonauer in the early 1890s. A logical discovery was there is no task a 6.5 does that a 6mm can't do better while using fewer resources in making ammo, and the ammo weighing less while shooting flatter with less recoil. The Navy eschewed the Army's .30-40 Krag for the same reasons. A flat-shooting cartridge was paramount if sharpshooters were to engage enemies ship to ship or ship to shore.

Still, a 6.5 was adopted by Japan, Italy and Sweden to name a few. Only the U.S. Navy went smaller by adopting the .236 USN or 6mm Lee Navy as it was called commercially.

The Model 1895 Lee Navy rifle was a unique, fast-operating straight-pull bolt action designed by James Paris Lee of Lee-Enfield fame. Built by Winchester, the Lee Navy featured a Mannlicher-style magazine loaded via a five-shot clip. Better, the Lee magazine could be loaded singly since the clip was not necessary to ensure feeding as with the Mannlicher system. Like the Mannlicher, the open bottom of the Lee's magazine well left the action susceptible to clogging fired prone.

The Lee clip itself was a two-piece contraption with a locking spring in the clip body that was tripped when inserted, allowing the spring and clip to fall free out the bottom.

The Lee Navy used a fast-twist barrel of 1:6.5. Experiments proved a 112-grain full-metal-jacket round-nose bullet shot best. It started out as a semi-rimmed case, but the Navy soon specified a rimless case—making it a modern round although not particularly flat-shooting by modern standards.

Cartridges of the World lists the factory velocity with the 112-grain bullet at a respectable 2,560 fps at a time when most cartridges loped along at 2,000 to 2,300 fps. Everything changed once Germany adopted the aerodynamic flat-shooting spitzer bullet at higher velocity around the turn of the century. That should have ensured a cozy future for the 6mm Lee, but it was not to be.

The Navy initially ordered 10,000 Model 1895 rifles for delivery beginning in 1896. Of the some 20,000 rifles made, about 15,000 were Navy rifles, several thousand were military-style rifles for commercial sales and the balance were true sporting rifles. Manufacture was completed in 1902.

The Navy rifle had a long, 28-inch barrel in a full-length pistol-grip walnut stock with a half-handguard ending at the center barrel band. The overall length was 47 inches with a weight of 8.5 pounds, using a compact 8.25-inch blade bayonet.





Lyman designed the Model 25 aperture sight (l.) for the Lee. When the bolt is worked, the aperture plate tilts out of the way of the rising bolt. This sporter has the longer 1st Model safety that protrudes above the receiver in the Safe position. The two-piece Lee clip (r.) had a flat-wire spring with a catch protruding from the center of the clip body that was tripped when the clip was inserted, allowing spring and clip to fall free.

Receivers of Navy rifles are marked "U.S.N." over an anchor over the serial number, with the Navy inspector's initials underneath. The Navy Lee served with Marines and Bluejackets in notable actions from the Boxer Rebellion to Cuba.

The action operates quickly and smoothly. When the bolt handle is pulled, it rotates a short way back and up to the rear tilting a cam on the nose of the handle down to lift the bolt's locking block up out of the receiver to open the action. Pushing the handle forward strips a fresh cartridge out of the magazine, and the handle/cam rotates forward and up into the receiver, locking the bolt closed.

Three controls on the left side of the receiver include a bolt lock pressed out and down to initiate disassembly, a bolt release and safety. The safety is pushed up to engage and pushed straight down to unlock. It is awkward to apply but easily released by the thumb of the shooting hand.

Early safeties were hard to apply and if not fully engaged could lead to an accidental discharge. On the 1st Model, safeties rose above the receiver about a quarter-inch and were prone to accidental release.

The redesigned 2nd pattern safety was easier to apply and sat flush with the top of the receiver when applied. The bolt is locked when cocked. To open the bolt without squeezing the trigger, pressing the bolt release pops open the bolt.

Sadly, the Winchester Lee Navy had numerous other flaws. The biggest one was if the bolt stop was accidentally engaged, the bolt came out and the extractor would fall off—rendering the gun useless if the extractor was lost, of course.

Early smokeless powder combined with mercuric priming eroded barrels quickly. The springs powering the extractor, trigger and magazine lifter were weak. Many fixes were incorporated into the second batch, and most of the first batch upgraded.

In 1899, a joint board from the Army, Navy and Marine Corps concluded all services share the same small arms in a common caliber for handguns, rifles and machine guns. The Navy began issuing the Krag-Jorgensen in .30 U.S. Army—mostly known today as the .30-40 Krag—in 1899 alongside the Lee Navy. One ship's arms locker had a mix of Trapdoor Springfields and Remington Lees in .45-70 alongside .30-40 Krags and 6mm Winchester Lees.

The Lee Navy rifles were slowly withdrawn over the next decade and sold as surplus.

A mere 1,784—plus about 100 not in the records—of the svelte, 7.5-pound Lee sporting rifles were produced, most with 24-inch round barrels. Sales were slow, and the last ones shipped in 1916. Sporting models only have the serial number on the receiver ring, and the caliber marked on the barrel as ".236 U.S.N." Sporting rifles often have a mix of early and late parts.

Sporting models were fitted with the standard Winchester semi-buckhorn rear sights as found on the lever action rifles. Aperture and telescopic sights proved problematic.

Lyman created a special No. 25 receiver sight with a hinged aperture plate that tilted out of the way as the bolt arose during cycling. On special order, Winchester fitted the pencil-thin 5A telescopic sight, but these riflescopes were comically high over the Lee's action.

Ammunition—still topped with a 112-grain roundnose full metal jacket or softpoint bullet—was discontinued just before World War II. Today, components for authentic 6mm Lee ammunition are no longer available. Fortunately, Buffalo Arms offers redrawn brass with the correct dimensions.

Cases can be made from .220 Swift—the 6mm Lee is the Swift's parent case after all—but the necks will be short. Discontinued are the Barnes 115-grain roundnose and Hornady 100-grain roundnose, leaving us no options for recreating original ammunition. The fast-twist barrel should easily stabilize today's long-range bullets, and the long magazine box has room, but performance will be limited by the iron sights. Dies are available only from 4D-Ch.

The proud promise of the 6mm Lee Navy never materialized. Its once groundbreaking ballistics remained moribund for more than 100 years and today is exceeded by Hornady's 6mm Creedmoor and 6mm ARC. I suggest the Navy's reasoning in the early 1890s for adopting a 6mm instead of a 6.5 will eventually prevail, and slowly but surely the modern 6mms will supplant today's 6.5s.

The Lee Navy rifle remains a rare collectible, albeit one whose value is still reasonable compared to many other martial arms. A survey of prices realized at MorphyAuctions.com shows Lee Navy rifles—whether Navy or sporting—selling in the $2,000 to $2,650 range. ■

by Joseph von Benedikt

Compression Impressions

WHAT YOU NEED TO KNOW ABOUT HANDLOADING COMPRESSED CHARGES.



Compressed charges of gunpowder can result in best-possible performance, but it's necessary to understand the potential downsides before working up a compressed load.

Compressed propellant charges in your handloads can be good, bad or ugly. A compressed charge is basically exactly what it sounds like. There's more gunpowder than there is room inside the cartridge case once the bullet is seated. The act of seating the bullet in the case neck compresses the gunpowder down into the case.

Let's start with the benefits of compressed loads, and then address the disadvantages. You'll find some rules of thumb for loading compressed charges in the accompanying sidebar.

Compressed powder granules are held securely in place, and there's no empty space inside the case. According to Hornady ballistician Jayden Quinlan, eliminating propellant ullage (free space in the cartridge case) is particularly helpful when shooting up or down at steep angles. Compression keeps the propellant from shifting forward or rearward as the rifle is aimed steeply down or up. That means it always ignites consistently.

Even when shooting on level ground, a lightly compressed powder charge will usually provide more consistent velocity than a powder charge that only partially fills the case. When there's a lot of empty space inside a cartridge case, the primer flash sometimes does not penetrate and permeate the gunpowder as effectively, resulting in less consistent velocity.

To visualize why, imagine a mesh bag filled with dry autumn leaves being hit with a blast from a propane flame-thrower. The leaves represent gunpowder granules, and the flame-thrower the primer flash. They're contained, and the blast ignites them nearly instantaneously. Now imagine those same leaves in a loose pile. Blast them with the flame-thrower, and half of them will dance out of the way without catching alight.

"We generally achieve impressive results with compressed loads," Barnes Bullets R&D supervisor Gregg Sloan told me. "As long as we are operating within safe pressure limits, we have measured and seen more consistent velocity and pressure, meaning lower standard deviation and extreme spread on both."

Here's an advantage that mostly applies to heavy-recoiling cartridges. When the base of a bullet is sitting on a compressed propellant charge, it's very unlikely to "set back"—a phenomenon that sometimes occurs when a cartridge in the magazine takes several thumps on the nose of the bullet caused by recoil. This can make the bullet migrate down into the cartridge case.

Set-back can also occur when a cartridge is aggressively chambered. When the nose of the bullet slams into a steep feed ramp, it can push the bullet back into the case—slightly or significantly.

Both of these situations can cause malfunctions. That's why, particularly with big-bore cartridges often used on dangerous game, eliminating set-back can be such a significant advantage that ammunition is intentionally loaded with compressed charges.

"Compressed charges are sometimes used—especially in large dangerous game loads—to create very

high-quality ammunition," Nosler's Mike Lake said.

Compressed charges can also lead to increased velocity. For instance, slow-burning propellants ideal for magnum rifle cartridges are way below maximum when the charge reaches 100 percent fill. Consistency is probably good, but velocity still leaves something to be desired. Adding powder to the point of compression can bring velocities up to snuff.

Accuracy often increases with a lightly compressed load as well.

"We have seen good accuracy results in many loads that would be considered compressed, and have many times achieved an improvement when compared to the same set of components at a lower case fill and charge," Sloan said.

But compressing charges isn't always a bed of roses.

"Compressing propellant in a cartridge case too much can have different adverse effects with a range of severity," Quinlan said. "The least consequential could be damage to the bullet while seating. The additional compression of the propellant may leave scuffs, rings or gouges in the ogive of the bullet during seating and could have a negative aerodynamic effect."

Quinlan also cautioned against compressing propellant to the point where you cause cracking or breaking of the powder granules. This changes the grain structure and can alter the burn rate characteristics. The result? Potentially higher pressures.

"Although not common, it is possible," Quinlan said. "Increased muzzle velocity variation or increased dispersion could also be observed with too compressed of a load."

According to Steve Faintich, Hodgdon's vice president of research and development, the two main drawbacks of a compressed load are ignition and cleanliness of burn.

"Modern smokeless rifle propellants are designed to include air in the case to provide oxygen for ignition," he said. "When you compress the propellant, you squeeze the air out of the case and make for more inconsistent ignition. Also, the additional propellant may not completely ignite, which could cause residue in the barrel."

Compression can also lead to difficulty in seating bullets. In some cases you can't get to the desired seating depth because the compressed powder won't allow the bullet to go deeply enough. Attempting to push past a certain point can cause the case to distort or bulge, and as Quinlan and Lake both noted, the bullet itself can distort. Both are bad.

Lake also noted that even a single powder kernel wedged in by a long-taper bullet boattail can distort the case neck. This can prevent a cartridge from chambering.

Another issue that can come from higher case fill and compressed loads is inconsistent overall length. Too much propellant compression can actually cause loaded bullets to migrate outward from the case over time, leading to variation in overall lengths. ■

Rules of Thumb

- Don't exceed more than five percent compression, also calculated as 105 percent case fill.
- Stick (extruded) powders compress more easily than ball (spherical) powders because there is more room between the kernels of stick powders.
- Powder choice is not set in stone, though. Some engineers consider spherical powders more suitable for compressed loads because their grain structure is less likely to fracture or fragment.
- While slightly compressing a load will not raise pressures, the wrong combination of adding more powder and seating more deeply that reduces case capacity *will* raise pressures. "Very generally speaking, if a load is aggressively compressed, you are working with the wrong powder for that particular cartridge/bullet combination," Nosler's Mike Lake said.
- If you're going to go with a compressed load, follow reloading data exactly to avoid ignition problems or unsafe pressures. Always use data from reputable sources.—*JvB*



Staff Report

Outdoors on Demand



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

It's a resource like no other, a curated treasure trove of outdoor-oriented television shows and videos. Think of it like your own personal Neftlix, with episodes of "Gun Stories" with Joe Montegna, the gun restoration show "The Gunfather," "Guns & Ammo," "Shooting USA" and more. The universe of content is even bigger when it somes to hunting, and I know a lot if not most of you enjoy your time in the field. Check out "Petersen's Hunting Adventures," shows by hunting legends Fred Eichler and Jim Shockey, "Meat Easter" and many, many more. Plus there is a ton of fishing as well, including live streams of various angling competitions.

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

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

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

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

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

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NO GRAVEL. LESS TRAVEL.

by Brad Fitzpatrick

The Full Effect

BURRIS MAKES A COMPELLING CASE THAT THE E1 THE BEST OPTION IN AFFORDABLE ALL-AROUND OPTICS.



Designed by founder Don Burris himself, Fullfield scopes have been in production for almost 50 years. The Fullfield E1 is the latest in a line, a one-inch scope with a handy etched reticle with holdover points to 500 yards and wind-hold marks.

Don Burris began working as an engineer for Redfield scopes in the early 1960s, but after a decade he decided to break away from Redfield and start his own optics company. Known simply as Burris Optics, his company focused on rugged riflescopes designed specifically for hunters. One of its first successful products was the Fullfield, which debuted in 1975.

Few of the riflescopes that existed in the 1970s are still around, but the Fullfield is one of them. The latest addition to the Fullfield family of scopes is the E1, an optic that's the product of almost five decades of innovation. But can a scope with roots going back to the age of disco really make an impact on today's optics market?

The Fullfield E1 line consists of the 3-9x40mm, the 4.5-14x42mm I tested, and 6.5-20x50mm models. All of these have a one-inch main tube, which is rare these days; 30mm and larger tubes have gained prominence as shooters look for more elevation travel. Windage and elevation travel range for the Fullfield is just 40 m.o.a. for windage and elevation. Compare that to a 34mm tube scope that might offer three times as much.

While a smaller tube might have its disadvantages, it has its benefits, too. A one-inch tube means less weight. The Burris weighs just 15.3 ounces, much lighter than many competing 30mm hunting scopes like the company's own Veracity PH 2-10x42mm, which is 7.5 ounces heavier.

Large scopes also mean more cost. The Veracity PH 2-10x42mm carries a suggested retail price of $804. Fullfield E1s range in price from $192 to $359, and the 4.5-14x42mm I tested costs $287. Price-wise this puts the Fullfield E1 up against one-inch scopes from companies like Vortex, Leupold and Riton.

The Fullfield E1 has the Burris Ballistic Plex E1 etched reticle, which is among my favorite features of the scope. This isn't a scope designed specifically for long-range shooting, but the E1 reticle offers just enough data points in the reticle to be useful without seeming cluttered.

SPECIFICATIONS

BURRIS FULLFIELD E1	
POWER x OBJ.	4.5-14x42mm (tested)
LENGTH, WEIGHT	12.6 in., 15.3 oz.
MAIN TUBE	1 inch
RETICLE	etched Ballistic Plex E1; 2nd focal plane; non-illuminated
ADJUSTMENTS	capped turret; 0.25 m.o.a.; 40 m.o.a. travel
PARALLAX	50 yds. to infinity
EYE RELIEF	3.1–3.8 in.
PRICE	$287
MANUFACTURER	Burris, BurrisOptics.com

There are four stadia lines on the lower vertical crosshair that are designed to represent 200-, 300-, 400- and 500-yard holdover points when the center of the reticle is zeroed at 100 yards for "most big game cartridges." That's a bit ambitious, but it does offer

quick reference points and it's ideal for a scope with capped elevation turrets. You can also plug your ballistic data into the BurrisConnect app, and it will provide more accurate holdover data based on the load and conditions.

I do find that, for most shooters who don't routinely practice with exposed dials and who do not carry a DOPE card, a holdover/BDC reticle like the Ballistic Plex E1 is easy to use. The wind-hold dots on the side represent an average hold for a 10 mph crosswind, so they can be halved for a five mph crosswind or doubled for a 20 mph wind hold.

Again, this isn't as advanced as built-in ballistic solvers, but the E1 works in most hunting situations. There are also cartridge-specific Fullfield E1 models designed especially for rounds like the .350 Legend and .450 Bushmaster, but these cartridge-specific reticles are not etched.

Eye relief ranges from 3.1 to 3.8 inches, which is less than some competing scopes. I did notice that the Burris performed better when moved closer to the shooter, though I never felt that sharp thump against my eyebrow while shooting the Fullfield E1 on a 6.5 Creedmoor.

The focus ring is easy to adjust, but the magnification ring can be a bit hard to turn. Scopes in this price range can show wear pretty quickly, but the Fullfield E1 didn't show excessive wear on the tube despite being mounted and zeroed multiple times. One other seemingly minor but nonetheless important feature is the clean, positive threads on the turrets and turret caps. Affordable scopes often have thin threads that are easy to cross-thread, but not the Burris.

I actually had three of these scopes to mount on a Winchester XPR, Browning AB3 and Weatherby Vanguard Obsidian—all in 6.5 Creedmoor. Testing occurred on a blistering hot August day in Ohio, so it was nice to have three different scopes on three guns because the barrels heated quickly. With this test each rifle had ample time to cool between test shots, so barrel heating wasn't an issue.



Unlike some competing scopes at this price level, the Burris offers side parallax adjustment, and the 4.5-14X power range makes it a very capable hunting scope.

All three scopes tracked accurately, although I did a formal scope test only with the Winchester XPR because it was the most accurate. Instead of the standard box test, I did a click-tracking test that resulted in a cross: initial/zero shot, eight clicks up for the next shot, then eight more up for a third shot; then return to zero and repeat the process down, left and right.

If the scope is tracking accurately, the cross pattern should have, in the case of 1/4 m.o.a. adjustments, shots spaced two inches apart. For the Fullfield E1 the smallest interval was 1.35 inches and the largest was 2.2 inches. There were a couple points that were within a 0.1 inch of what should have been a two-inch adjustment. So the Burris tracks well, better than some more expensive scopes.

The Burris offers excellent clarity in a range of light conditions thanks to the Hi-Lume multicoated lenses, which are excellent have been for a long time.

I developed my own test that seems to give an accurate picture of an optic's low-light performance. What I do is use a 100-watt floodlight in front of my house. It casts light for about 60 yards at night. I set small colored cones—the ones used for soccer drills—right at the edge of where I can't see anything outside of them. I place them at 15, 30, 45 and 60 yards and, starting at the last



cone, any scope that picks up objects like grass, fallen tree branches and rocks between the 60- and 45-yard cones gets an A; a scope that only lets me see objects between the 45- and 30-yard cones gets a B; if I can't make out objects inside the 30-yard cone I consider the scope to have poor light performance. The Burris scored in the A range, which is impressive performance from a $287 scope.

The Burris Fullfield E1 feels like a robust scope. Jordan Egli, Burris's director of marketing, told me he is amazed at how few Fullfields ever come in for warranty repairs—a byproduct of a robust design that has been perfected over five decades.

The Fullfield E1 isn't perfect, but it's a solid scope that will serve most shooters and hunters well. Don Burris set out to build better scopes, and that's what he did with the Fullfield. It's certainly one of the best optics for the money. ■


EPL-4
4-16X44
RITON
HD

LIGHTER THAN LIGHT

HOWA'S SUPERLITE TIPS THE SCALES AT ABOUT 4.5 POUNDS, AND IT'S THE PERFECT COMPANION WHEN PORTABILITY COUNTS.

by Keith Wood

Michael Anschuetz photo

Thanks, no doubt, to the obsession with all things long range, rifles seem to be getting longer and longer these days. Add a suppressor and they're longer still. This is fine when you're in the great wide-open, but how about when climbing in and out of a pickup or on and off a horse? How about in a tree stand or in thick timber?

The reality is that there are times when a compact rifle or carbine is a far superior choice than a cumbersome long-range rig. For such an occasion, the Howa Superlite is hard to beat. Weighing well under 4.5 pounds and only 35.25 inches long, this bolt action is about as light and portable as it gets.

The Superlite is currently available in .243 Win., 6.5 Creedmoor, 7mm-08 and .308 Win. My test sample was cham-

bered in the latter. While dimensionally the compact Superlite would make an ideal youth rifle, the cartridge-to-weight ratio means that recoil, without a suppressor installed, would likely make it impractical for this role. But it's a small rifle capable of doing big things.

Howa Machinery has been producing firearms in Japan since 1940. The company has produced M1 Garands for Japan's own defense forces, AR-18s under contract for Armalite, and various other arms for military use. On the civilian side, Howa has produced firearms and components for several U.S. companies.

Ironically, some of Howa's best-known firearms never bore the company's name. Whether engraved with the Howa logo or that of another firm, the firm's firearms have a reputation for excellent quality. Japan may not have a gun culture of its own, but that doesn't stop it from producing great guns for ours.

The Superlite starts with the proven Howa 1500 short action. This two-lug push-feed action is perhaps best known for serving as the basis for the Weatherby Vanguard. The 1500's receiver is machined from a forging that includes an integral recoil lug with a tapered front face. The bottom of the action is flat, which provides a solid bedding surface.

The bolt is designed with safety in mind; the case head is supported by a recessed bolt face in the style of the Remington 700. Additionally, three gas vent holes are cut through the bolt body so propellant gases are vented downward and away from the shooter's face in the event of a case failure or blown primer. The bolt handle is integrally forged to the body.

The 1500 uses an M16-style extractor and a plunger-style ejector. The trigger is a two-stage that is adjustable for pull weight. Mine came from the factory tuned to break at a very crisp 2.5 pounds.

The safety is a three-position lever located on the right side of the tang. In the forward position the rifle is ready to fire. The middle position is Safe but allows for the bolt to be cycled, while the rearmost position is Safe and locks the bolt. The bolt stop is opposite the safety lever on the left side of the tang.

The Superlite feeds from Howa's own detachable box magazine, which fits nearly flush with the one-piece polymer trigger guard assembly. The magazine latch sits just forward of the box and is released with a rearward pull.

The magazine itself is simple and rigid while also made from polymer. The box holds three rounds, and an additional cartridge can be loaded into the chamber for a capacity of four. My sample fed, fired and ejected reliably.

The Superlite is available with either



The Superlite is built on Howa's excellent 1500 action, and it weighs less than five pounds bare and just 6.5 pounds even with a relatively large optic aboard.



The Superlite uses a detachable box magazine that sits nearly flush with the polymer trigger guard assembly.

SPECIFICATIONS

HOWA 1500 SUPERLITE

TYPE	bolt-action centerfire
CALIBER	.243 Win., 6.5 Creedmoor, 7mm-08, .308 Win. (tested)
CAPACITY	3+1
BARREL	16.5 in., 1:10 twist; threaded 1/2x28
OVERALL LENGTH	35.25 in.
WEIGHT	4 lb., 3 oz.
FINISH	satin blue
STOCK	Stocky's carbon fiber
SIGHTS	none, drilled and tapped; Picatinny rail installed
SAFETY	three-position
TRIGGER	two-stage, 2.5 lb. pull (measured)
PRICE	$1,099
MANUFACTURER	Howa, HowaUSA.com

a 16.5- or 20-inch cold-hammer-forged barrel. Although both are threaded, the former is preferable when maintaining the compact overall length with a suppressor is important. My test rifle came with the shorter 16.5-inch barrel, which is threaded 1/2x28. Both the barrel and action are finished in a satin blue.

This 1/2x28 is a thread pattern usually reserved for smaller cartridges like .223 and .22 rimfires. The reason for using this pattern on the Superlite comes down to weight. A 5/8x24 thread would require a barrel contour at least 0.125 inch heavier than the 0.600-inch muzzle diameter required for the 1/2x28. With the light barrel contour on the Superlite, the smaller thread pattern was the only way to go.

With a modular suppressor such as a SilencerCo Omega, Hybrid or Scythe, simply choosing the proper thread adapter plate will make a 5/8x24 suppressor compatible with the Superlite. The threads are covered with a thread protector when not in use.

The stock on the Superlite is produced by Stocky's Stocks. This carbon-fiber lay-up stock is built specifically for the Howa 1500. The petite stock complements the metal work nicely and weighs just 17 ounces.

Despite being light, it is extremely rigid, which is a welcome change from many of the unstable Tupperware-style stocks on the market these days. Underneath the carbon shell is Stocky's AccuBlock, a patented system that provides a stable bedding platform for the barreled action.

The sporter-style design has a straight comb with no cheekpiece. The fore-end is slim and tapered. Two sling swivel studs are installed, and there is a LimbSaver pad installed at the butt. The camo pattern on mine was mottled gray and green over exposed carbon fiber with black webbing. The stock's textured finish provides a non-slick surface that is easy to grip. A wood-stocked version is also available.

The Superlite comes with a Picatinny rail installed, but it can be removed if you want a different mounting solution. Two-piece bases designed for the Remington 700 are compatible with the Howa 1500. I mounted an Arken EPL-4 4-16x44mm optic directly to the rail in Arken titanium rings.

This is a relatively large scope for such a tiny rifle, but that is the direction that consumers are going. With the optic mounted, the total weight was six pounds, 7.2 ounces. A big scope on a light rifle can be a recipe for trashing the erector system under recoil but, despite being a relatively inexpensive optic, this one held up just fine.

While I'm on the topic of recoil, recoil on a 6.5-pound .308 rig is a little



The Howa Superlite's 1500 flat-bottom action has an integral recoil lug. The trigger is excellent, breaking at 2.5 pounds.



The Superlight uses a rigid carbon-fiber stock made by Stocky's, and its AccuBlock feature provides a rock-solid bedding platform without adding undue weight.

ACCURACY RESULTS

HOWA SUPERLITE

.308 Win.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Hornady American Gunner BTHP	150	2,500	29	0.6
Federal Gold Medal Center Strike OTM	175	2,371	11	0.7
Nosler Ballistic Tip Hunting	165	2,618	9	2.7

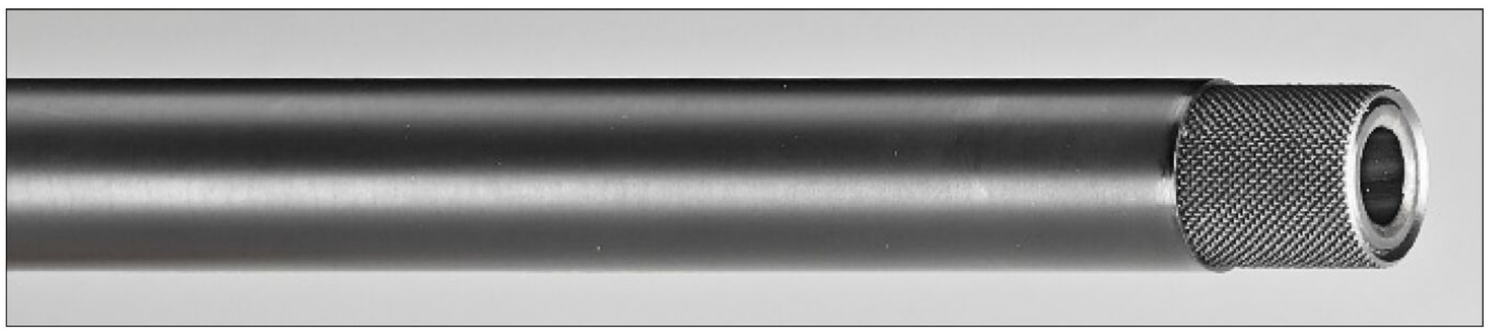
Notes: Accuracy results are averages of three three-shot groups at 100 yards from a benchrest. Velocities are averages of 10 shots recorded on a Garmin Xero C1 chronograph placed adjacent to the muzzle. Temperature, 79 degrees; elevation, 194 feet. Abbreviations: BTHP, boattail hollowpoint; OTM, open-tip match

snappy, as you would expect. It's not obscene, but it's not a rifle you should hand to an inexperienced shooter. A suppressor would help a lot, but I did not have a 1/2x28 adapter on hand.

Extremely light rifles can be very finicky to shoot from the bench and often require a great deal of consistency in technique to group well. Instead of using my left hand to hold the rear bag, I held the rifle at the fore-end and wrapped my hand almost completely around the barrel, both to control recoil and because I've found that to work well with light rifles.

In my experience, the Howa Superlite seemed less temperamental than other flyweights when it came to shooting it well. I credit the stock design, which made repeatable holds very doable. Accuracy was excellent with two of the three loads I tested.

Several years ago, I went through a phase where I sought out the lightest rifle possible. I built two with that goal in mind, going to extreme measures to cut weight. Those rifles were fantastic for carrying in the backcountry but, when it came time to shoot them at game, I realized that there was a real trade-off when it came to practical shootability.



Because of the thin barrel profile, the Superlite is threaded 1/2x28 instead of the 5/8x24 you find on most rifles larger than rimfires or .22 centerfires.

I still value lightweight rifles, but experience has taught me that they are not ideal for every application. When used with a grain of common sense, the Superlite could be a very useful tool. Where I live, most hunting is done in tree stands, often climbers. Carrying a large rifle in such a situation can be a real albatross. The Superlite would be just the ticket and is chambered in cartridges with plenty of power to get things done.

The Howa Superlite is one of the most compact and lightweight bolt-action centerfire rifles on the market. If there is a lighter production bolt-action .308 out there, I'm not aware of it. One could spend many thousands of dollars on a custom ultra-light rifle and most likely walk away with a heavier rifle than this one.

If sheer portability is your aim, there really is no substitute for the Howa Superlite. This rifle is more than simply light and compact, though. It is well-built and capable of great performance. For situations where an extremely lightweight rifle is practical, the Superlite is ideal. ■



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ALL IN THE FAMILY

by Craig Boddington

THE .30-06 HAS SPAWNED A LONG LIST OF SOLID HUNTING CARTRIDGES.



Most of us reading this magazine know that ".30-06" is short for "Cartridge, Ball, Caliber .30, Model of 1906." In 1900, the U.S. military began developing a new rimless-cartridge bolt-action rifle—loaded via stripper clip—to replace the side-loading Krag-Jorgensen and its rimmed .30-40. Essentially, we wanted to keep pace with the European powers. There was an experimental .30-01, and in 1903 we adopted the 1903 Springfield and the .30-03 cartridge with a 220-grain roundnose bullet.

The 1903 Springfield served us well for decades, but the .30-03 cartridge was a blunder, largely because of its roundnose bullet. European powers had already shifted to spitzers. The subsequent Model of 1906 round was shorter, with .046 inch removed from the neck. The .30-03 case was 2.54 inches, while the .30-06 case is 2.494 inches. The original 1906 loading was a 150-grain spitzer at 2,700 fps.

Where did those cartridge dimensions come from? Our '03 Springfield rifle is a Mauser clone, so close to Peter Paul Mauser's patents that the U.S. government paid Mauser a royalty until World War I. Mauser's signature 8x57 case, at 2.44 inches, is shorter than the .30-06. Mauser's base and rim are .470 inch. The .30-06 has a rim of .473, while the base is a slightly smaller .471. Maybe a bit too close to be random coincidence?

Anyway, the .30-06 was America's service cartridge for 50 years and became the most popular sporting cartridge to the world's largest hunting public. Because it's expensive to create an altogether new cartridge case, the .30-06 case has been necked up and down for a century, yielding a series of useful and mostly popular factory cartridges. Let's meet the family.

.25-06 Remington

Early experimenters tried to neck down the .30-06 to 6mm and even .22, but the case is too big, creating grossly overbore capacity. The .25 caliber is about as small as you can go. The .25-06 was developed at Frankford Arsenal during World War I but didn't get past the experimental stage.

In the 1920s there were several wildcat versions: .25 Niedner, .25 Hi-Power, .25 Whelen and .25-100-3000. In 1915, Savage's .250-3000 was the first commercial cartridge to break 3,000 fps but could only do it with 87-grain bullets. Using the .30-06 case, the .25-100-3000 could do it with 100-grain bullets.

With 1920s propellants, overbore capacity was a problem. Actual improvements over the .250-3000 Savage and 1934's .257 Roberts were questionable. Propellants got better, and the .25-06 remained a popular wildcat. Remington finally standardized it in 1969.



Today, .25-06 is the most popular .25 caliber cartridge. Fast and flat-shooting with mild recoil, it is probably the largest cartridge that makes sense as a crossover varmint/big game round, although its primary use is for deer-size game. I am simply not a .25 caliber guy, but thems as loves .25s defend them to the death. Shooters I respect who are or were .25 caliber fans include *Rifle-Shooter* editor, Winchester's great Mike Jordan and late, great gun writers Bob Milek and Gary Sitton.

Tastes in rifles are often regional, based on local hunting conditions. Texas is the great stronghold of the .25-06. It is near perfect in power for their medium-size whitetails and also perfect for their conditions. The huge South Texas brush country is crisscrossed with open lanes, the famous senderos. When a buck steps into a sendero there's no time to dither. Fast look at antlers, take the shot. This is why the .25-06 is so popular in Texas. I've taken only a few deer with a .25-06, just not my thing. But I can say each one dropped in its tracks.



The family of factory cartridges based more or less on the .30-06 case is extensive. (L.-r.): .25-06 Rem, .270 Win., .280 Rem., .280 Al, .30-06, .35 Whelen, .370 Sako Mag.

.270 Winchester

As a factory cartridge, 1925's .270 Win. is the .30-06's first-born. Except, despite legend, the .270 Win. isn't exactly based on the .30-06. Instead, Winchester's engineers went back to the slightly longer .30-03 version. Yes, the .270 Win. case is 2.54 inches, same as the .30-03.

Well, as Ransom Stoddard (played by Jimmy Stewart) says in "The Man Who Shot Liberty Valance," "When legend interferes with fact, print the legend." In 1925, Winchester was a lever-action company, and Savage Arms's 99 Savage was serious competition—especially its super-fast .250-3000 and 1920's .300 Savage. Winchester clearly wanted to wring all the velocity it could out of the company's new cartridge, so it used that slightly longer .30-03 case.

It was introduced in the Model 54, Winchester's first centerfire bolt action. The initial load featured a 130-grain bullet at a sizzling 3,140 fps, which was later downlisted to 3,060, where it remains to this day. Bullet diameter is .277. That was unheard of in 1925—except for a 6.8x57 Mauser cartridge developed for China but never produced. It seems Winchester's engineers knew about it, though.

We all know the .270 was gun writer Jack O'Connor's favorite, and that's still helping sales almost a half-century after his passing. O'Connor legend aside, the .270 Win. was, is and always will be a great hunting cartridge. Winchester wanted a fast cartridge but also an effective, versatile hunting cartridge with less recoil than the mighty .30-06.

I am not as staunch a .270 guy as Professor O'Connor was, but I do love it. If there's a fly in the .270 ointment, it's rifling twist. At 1:10 it is perfect for a 130-grain bullet but barely able to stabilize the 150-grain bullet that came later. New ".270s" such as 6.8 Western and .27 Nosler solve these problems with heavier bullets and faster twists, but you can't use the heavier bullets in an existing .270 Win.

It doesn't matter to me. The .270 Win. shoots flat enough for me and hits hard enough. I see it as one of our best all-around deer cartridges—it accounted for the big Alberta mule deer pictured in the lead photograph for this article—and ideal for pronghorns, adequate for elk. And, just like Professor O'Connor told us, awesome for mountain game.



Winchester's Mike Jordan and Boddington with a Wyoming pronghorn taken with Jordan's .25-06. Mild in recoil and shooting flat as a string, the .25-06 is a fine choice for wide-open country, and it can do double-duty as a varmint cartridge.

.280 Remington

With its 2.54-inch case, 1957's .280 Rem. is also based on the .30-03 case. Or, if you prefer, it's based on the .270 Win. case necked up to take a .284-inch bullet. Remington moved the shoulder forward .050 inch, ensuring that a .280 cartridge could not chamber in a .270 rifle.

With slightly greater case capacity, the .280 is faster than the .270 Win. with 140- or 150-grain bullets. However, the great strength of the .280 is that it uses the wonderful bullet weight range of the 7mm—from 140 up to 175 grains. I love my .270s, but for larger game the 150-grain .270 cannot compete with 160- to 175-grain 7mm bullets. I have often written that the .280 Rem. is the most versatile cartridge based on the .30-06 case.

No one can love (or use) all cartridges equally. I have had several torrid affairs with the .280 Rem., fragrant memories, but I haven't used it all that much. Its real fans are loyal and have included some of our most astute rifle-

men. It was gun writer Jim Carmichel's darling. Until recently, Steve Hornady took almost all his mountain game with a .280. Frequent hunting buddy Terry Moore, long of Leica, swore by his .280. So does current hunting buddy John Stucker. Stucker is a contrarian. He concedes that he chose the .280 "because it was different."

The .280 Rem. has never been as popular as it deserves—in part due to one marketing blunder after another. Early on, Remington focused on milder loads to ensure smooth functioning in its semiautos. Before the .280, the 7mm-06 was a popular wildcat round. In 1978, to revive .280 sales, the company decided to rename it 7mm-06 Rem. A few months later the brass changed their minds and renamed it 7mm Express Rem. That caused huge confusion with 7mm Rem. Mag. Quietly, it was renamed back to .280 Rem, where it remains.

Only .007 inch separates the .270's .277 bullet from the .280's .284. There is no argument to be made there, but the heavier 7mm bullets make the .280 more versatile than the .270 can ever be.

.280 Ackley Improved

Yes, I wrote that the .280 Rem. was the most versatile cartridge on the .30-06 case. That was true—until the .280 Ackley Improved (AI) became available in factory form. By removing body taper and steepening shoulder angle, Parker Otto Ackley "improved" almost any cartridge you can think of. Not all of his improvements yield significant velocity increases, but his .280 AI does, and it is the only Ackley Improved cartridge that has progressed to a genuine factory cartridge. It was first loaded by Nosler, later by Federal and Hornady.

Ackley's improvements were not exactly wildcats because his rule was that standard factory ammo could be safely shot in his improved cartridges, which had the added benefit of fire-formed cases ready to reload.

Like its parent .280 Rem., the .280 AI has the full suite of 7mm bullets to work with, in an unbelted case that's more compact than a belted 7mm magnum. I have a Ruger No. 1 in .280 AI, and so far I have hunted Coues deer and aoudad with it, and I intend to use it more. It is essentially a 7mm Rem. Mag. without all the magnum fuss.

.30-06 Springfield

The patriarch of the family. In my view, it's still the king. After multiple magnum crazes and so many cartridges to pick from, the .30-06 is no longer America's most popular hunting cartridge. I keep saying this, but it's a foot-stomping point: The .30-06 is the most powerful cartridge ever adopted by a major military. It has a lot of recoil, is not a cartridge for kids and it's perhaps needlessly powerful for deer-size game. Never mind all that; it works.

With nearly 125 years of ammo and load development, the .30-06 is one of the world's most versatile cartridges. It's probably a better elk cartridge than a deer cartridge, but few cartridges are better for the full run of Africa's non-dangerous species. With the standard 1:10 twist, a .30-06 rifle will stabilize fast 150-grain bullets and the deep-penetrating 220-grain slugs.

It's an article of faith that the .308 Win.—which is, after all, just a shortened .30-06—is more accurate. I'm not so sure about that. I've seen awesome accuracy from the .30-06. In our magnumized world, we think of the .30-06 as slow. Not! Its 180-grain bullet is standard at 2,700 fps, but it's no trick to handload a 180-grain bullet to 2,800 and more with current powders.

Although I've advocated for .33s for elk, I've taken more elk with a .30-06 than anything else, including some long shots. Perhaps the longest was in Nevada in 1978, before the advent of rangefinders, on the last day of a tough hunt. I



A .280 Rem. accounted for this desert mule deer. Boddington feels the .280 and the .280 AI—the latter all but a 7mm magnum without the magnum fuss—are two great deer rounds.

BALLISTIC COMPARISON

.30-06 FAMILY CARTRIDGES

Cartridge	Bullet Weight (gr.)	Muzzle Velocity (fps)	Muzzle Energy (ft.-lbs.)	300 Yd. Energy (ft.-lbs.)	300 Yd. Drop (in.)
.25-06 Rem.	100	3,230	2,316	1,161	-6.6
.270 Win.	130	3,060	2,702	1,565	-7.1
.280 Rem.	140	3,000	2,797	1,840	-6.5
.280 Ackley Imp.	140	3,200	3,183	2,105	-5.7
.30-06	180	2,700	2,913	1,765	-8.7
.35 Whelen	200	2,675	3,177	1,506	-10.3
.370 Sako Mag.	286	2,550	4,129	2,481	-8.9

Notes: 200-yard zero. Published data with standard loads, spitzer or semi-spitzer lead-core bullets.

jumped an awesome elk in a canyon, flopped down and figured the distance at 450 yards. I got the worst scope cut of my life, but it looked like a hit, and I found a great bull dead on the far rim. The .30-06 is a force to reckon with.

.35 Whelen

Remington had an excellent track record for legitimizing veteran wildcat cartridges. The .22-250 and .25-06 were runaway winners, and while the .280 was a sales disappointment, the .35 Whelen was a solid success.

The cartridge is named after career soldier and gun writer Col. Townsend Whelen. "Townie" himself wrote that the cartridge was developed in 1922 by James Howe of Griffin & Howe (G&H) and named for him, with his permission. There's not much huge game in America, so above-.30 caliber sales drop like a thrown rock, but G&H catered to the few traveling sportsmen of the day who had a unique interest in cartridges for bigger game. Still, the cartridge languished as a known wildcat until Remington adopted it in 1988.

Based on the .30-06 case necked up to take a .358-inch bullet, the .35 Whelen propels a 250-grain bullet at around 2,500 fps, a significant edge over its parent .30-06 in both bullet weight and frontal area—but not in effective range.

I probably took the first game animal with Remington's "new" cartridge, a big Alaskan moose turned upside down by a 250-grain Core-Lokt roundnose. Since then, I've used the .35 Whelen for black bears, elk, wild hogs and some deer hunting. It's a great cartridge.



The .35 Whelen is a hard-hitting and mild-kicking cartridge that's an excellent choice for large North American game like this nilgai, an introduced species found in Texas.

.370 Sako Magnum

American descriptions of the .370 Sako Mag. call it a "lengthened .30-06 case." The .370 Sako has a 2.598-inch case, a tenth of an inch longer than the .30-06, and the Sako's .470-inch rim diameter is larger than the .30-06's .473, so maybe it's not direct progeny but rather extended family. Bullet diameter is 9.33mm, or .366 inch.

The .370 Sako Mag. was introduced in Finland in 2002 and was soon loaded by Federal. In addition to its longer case, the shoulder is pushed forward, so it has greater case capacity than the old 9.3x62. As a new cartridge, it is also loaded to higher pressure than the 9.3. Combining these two advantages, the .370 Sako runs faster, with Federal's 286-grain load rated at 2,550 fps for 4,147 ft.-lbs. This makes it the ballistic equal of the .375 H&H.

When it was first introduced, I was part of a group that shot a number of Cape buffaloes and tuskless elephants. I'm convinced the .370 Sako is indistinguishable from the .375 H&H performance-wise—but in a shorter action with more compact ammo and greater magazine capacity. It has not become popular, perhaps because in its limited niche the 9.3x62 is so long established. Also, unlike our European friends, most Americans aren't familiar with the 9.3mm bullet diameter. ■

Long-Lost Siblings

The 6.5-06 is a perennial wildcat with a loyal following. It's touted for accuracy, and velocity is about the same as the 6.5 PRC or .264 Win. Mag. After World War II the 8mm-06 wildcat became a popular rechambering for surplus Mausers, allowing handloading with available cases. The 8mm-06 runs considerably faster than the 8x57 Mauser, but despite the real attributes of the .323-inch bullets, the 8mm has never been popular in America.

The .338-06 is a different story, with a lineage that goes back to the Keith-O'Neil-Hopkins .333 OKH. The .338-06 is technically a factory cartridge, standardized by SAAMI in 1998 as the .338-06 A-Square.

Nosler loaded it for a time, and although there is no current factory ammo, it remains a popular wildcat. The .338-06 is impressive, developing significant velocity without the recoil of the magnum .33s. My buddy Chub Eastman was a .338-06 proponent, using it for much of his North American hunting.

Attempts to go big-bore on the .30-06 case have included the .400 Whelen, which uses the .405 Win.'s .411 bullet. Like the .35 Whelen, the .400 Whelen was a Griffin & Howe specialty, and rifles are still out there.

The Swiss-designed 10.3 Capra uses a .416 bullet, and 10.3 rifles and ammo are offered by Capra Outdoor in Switzerland. Although most case dimensions are familiar, the 10.3 Capra uses a rebated rim. It was developed to solve a different problem: In some Swiss cantons (counties), there's a .40 caliber minimum for hunting big game.

My wife, Donna, used a 10.3 Capra to take a fine alpine ibex in Switzerland. Both the Capra and the .400 Whelen represent the maximum necking up of the .30-06 case and are fully adequate for moose and bears, and could be loaded up for Cape buffalo.—*CB*

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BUILT TO SURVIVE

THE NEW TACTICAL SOLUTIONS OWYHEE .22 MAG. RAISES THE BAR FOR SURVIVAL RIFLES.

by Brad Fitzpatrick

Survival weapons have been in use with the military for almost a century. During World War II, U.S. aircrews were issued M6 .22 Hornet/.410 survival guns. In the event of a crash, such guns would provide survivors a simple, reliable firearm suitable for foraging for wild game.

Since then, a number of survival rifles have been offered for civilians, all of which offered austere designs that were reliable and lightweight. Many of these rifles could be broken down for easy transport on a boat, in a pack, or under the seat of a plane.

They were designed to work when called upon, and they were certainly better for food procurement—and possibly self-defense—than a pointy stick. But most of these guns had some rough edges.

The TacSol Owyhee Takedown is a bit different. It checks all the survival rifle boxes: light to carry, easy to break down and store, rugged and reliable. However, the Tactical Solutions Owyhee offers something few survival rifles have ever brought to the table,

namely premium build quality and superb accuracy.

Tactical Solutions is based in Boise, Idaho, and just south of the city lies the wild Owyhee mountain range. I've hunted in the Owyhees and can assure you that it's difficult terrain, with hot, dry winds that rob moisture in the summer and bitterly cold winters. It's the type of place where having a survival rifle could save your life, and it's a fitting name for TacSol's new breakdown bolt action.

The Owyhee Takedown is chambered in .17 HMR, .22 LR and .22 Mag. It's actually the only collapsible .22 Mag. bolt-action survival rifle available, and I think this chambering is the ideal choice for a wilderness rifle. Ammunition for the .22 Mag. is affordable, widely available and light enough so you can carry lots of rounds, and it offers substantially more energy than the .22 LR. It's not a bear-stopper, but it's sufficient for shooting birds and small game for the pot and protecting yourself against other four-legged predators and even the two-legged kind.



The bolt-action rifle breaks down easily in front of the receiver, and an adjustment ring on the front of the receiver ensures that the rifle returns to zero after disassembly and reassembly.



The fore-end/barrel assembly fits securely into the buttstock for easy, compact transportation. It's only 19.5 inches long in the folded configuration.

It's loud enough that the report of a single round can be heard for some distance, a valuable benefit when you're lost in the woods and want to relay your position to rescuers. Then again, the Owyhee's threaded barrel allows you to squelch the report of the rifle when you're hunting small game by adding a suppressor.

The rifle weighs just four pounds, 1.6 ounces. The 16.5-inch barrel features a chrome-moly steel bore with an aluminum shroud. It has a diameter of .920 inch and an 11-degree target crown. It's threaded 1/2x28, and a thread protector is included.

The Owyhee Takedown models are equipped with a modified Magpul X-22 stock with storage in the pistol grip and the comb, and a cutout in the stock that acts as a bag rider when the rifle is assembled. The stock is also designed so you can secure the fore-end and barrel to the underside of the buttstock/receiver when the gun is disassembled.

The process of breaking down the Owyhee for transport is as easy as any survival rifle I've seen. With the gun unloaded and the bolt open, simply press forward on the recessed takedown lever on the underside of the fore-end. This releases the spring-powered locking mechanism that holds the fore-end and receiver assemblies together and allows you to rotate the barrel assembly counterclockwise 45 degrees.

There's a cutout in the rear portion of the barrel assembly, and when the assembly is rotated counterclockwise the cutout no longer engages with the matching piece in the receiver assembly, allowing the two halves of the gun to be separated. The process is fast, simple and efficient.

Once the front and rear halves of the rifle are separated, you can store the firearm/barrel assembly underneath the stock/receiver assembly. The barrel assembly is oriented with the fore-end facing up toward the bottom of the receiver.

The steel barrel extension slides into a hole in the polymer stock, and then the fore-end can be pressed up

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until a cutout in the fore-end mates with a "fin" in the underside of the stock cutout. Pressing the two together allows the fin to lock into place in the fore-end, and it will not release until both the buttons on the fore-end are pressed simultaneously. You can then reinsert the steel chamber of the barrel into the opening in the receiver, press the front and rear halves together, and rotate the barrel counterclockwise until the two halves lock back together.

SPECIFICATIONS

TACSOL OWYHEE TAKEDOWN

TYPE	bolt-action rimfire
CALIBER	.17 HMR, .22 LR, .22 Mag. (tested)
CAPACITY	9
BARREL	16.5 in., 1:14 twist; threaded 1/2x28
OVERALL LENGTH	34.1 in.; 19.5 in folded
WEIGHT	4 lb., 1.6 oz.
STOCK	polymer Magpul X-22
FINISH	black anodized
TRIGGER	3 lb. pull (measured)
SIGHTS	adjustable fiber-optic rear and front
PRICE	$1,274
MANUFACTURER	Tactical Solutions, TACTICALSOL.COM



The rifle uses Ruger's reliable rotary-feed magazines, and the paddle-style magazine release is located in front of the trigger guard.

It may sound slightly complex, but disassembling the rifle takes a matter of seconds and reduces the gun's overall length from 34.1 inches to 19.5 inches. And the Owyhee measures only about six inches tall when broken down. That allows the gun to fit in a daypack or under the seat of a boat or vehicle.

The two halves lock securely together so there is no rattling or risk of parts breaking while you're bouncing over logging roads in your 4x4, but within 10 seconds you can have this rifle assembled and ready to fire. There's an adjustment ring on the front of the receiver that should be finger tightened when the rifle is initially assembled, but once it is set the gun should fit together perfectly every time.

The Magpul stock's hinged cheekpiece with internal water-resistant storage is a nice concept, but I could not get the .22 Mag. magazine to fit in the mag slot inside the stock because the slot was designed for .22 LR mags. Internal space within the stock is divided by polymer spacers, and you can store items like spare ammunition or a tube of waterproof matches without issue.

The storage in the pistol grip was sufficient to carry my fire steel, and the O-ring waterproofing seal on the grip cap prevents moisture from entering.

Last but not least, the stock comes with an extra comb piece, so you have interchangeable high and low combs depending on what sight system you plan on using.

Tactical Solutions simplified magazine selection by designing the Owyhee to accept Ruger rotary magazines in the appropriate caliber. To my thinking that's a very smart move, since Ruger's magazines have proven reliable and are widely available.

The .22 Mag. version I tested holds nine rounds—the same as the .17 HMR—while .22 LR models hold 10. TacSol outfits the Owyhee with a quick-release magazine paddle at the front of the trigger guard. It's a simple and straightforward design that's more efficient than competing mag release layouts—unless, like me, you're so conditioned to releasing the magazine at the front in 10/22 fashion that you have to retrain your brain.

As I mentioned, the Owyhee TD's barrel is threaded 1/2x28, but there's also an SBX version with a 12.38-inch barrel with a permanently attached shroud that increases overall barrel length to 16.63 inches. A one-inch-diameter suppressor will fit inside the shroud of the SBX version, which keeps overall length down even when the gun is disassembled.

The test rifle came with an optional top rail ($55), so mounting an optic was easy. However, the company equips these guns with quality fiber-optic three-dot sights. The rear sight is fully adjustable, and the fiber optic functions in just about any light conditions without the need for batteries. The sights do sit rather low, and with the rail in place and the high comb I had to get as low on the rifle as possible to see the irons.

The Owyhee comes with a bladed trigger that has a bit of travel but a very light, crisp, three-pound break. With its stainless steel bolt and durable polymer stock, the Owyhee is designed to hold up well in the elements, and there are dual extractors that mate up with cutouts in the barrel extension.

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Ammo for the .22 Mag. is notoriously sticky, but the dual extractors did a fine job clearing out the chamber after each shot and the fixed ejector tossed the empties an impressive distance.

Because the extractors fit into the cutouts on the barrel extension/chamber there's a possibility of damaging the rifle if you decide to crank too hard on the barrel assembly with the bolt closed. I don't know what type of force would be required to cause damage to the gun and had no desire to experiment in that regard.

The .22 Mag. cartridge was never designed to win accuracy contests, but the Owyhee performed pretty well with this round, certainly better than the .22 Mag. autoloaders I've shot.

From 50 yards—with a Leupold DeltaPoint Pro with rail mount attached—it managed lots of three-shot groups at or under two inches while shooting from sandbags on a bench. Later I shot a couple more groups and disassembled and reassembled the rifle between shots. The groups returned to zero each time.

The rifle's manual crossbolt safety lies behind the trigger, which keeps it nicely separated from the extended mag release paddle on the front of the trigger guard. The trigger itself is an interesting design, a TacSol original. It's light enough, but the travel is more than I prefer. I think the rifle could perform better with a better trigger, but the Tac-Sol design seems robust.

After initial range testing I reeled in the target to 25 yards and fired some more groups, which were mostly between 1.2 and 1.4 inches. As a test of practical accuracy, I went eight for nine on soda can-size targets at 25 yards. If I can hit a soda can at that range offhand I can probably pot grouse or ground squirrels for the fire or amuse myself shooting walnut shells and pine cones.

Fit and finish on the Owyhee is excellent. It may be a tool, but it's a well-crafted tool capable of precise work. Everything from assembly and disassembly to materials selection and finish is excellent, which is more than I can say for most survival rifles.

TacSol did a good job on the stock geometry of the rifle. The pistol grip is rather vertical and trim and although the fore-end is squared-off in cross section, it's a relatively comfortable design that's more conducive to accuracy than other survival guns.

It's kind of a bummer that the .22 Mag. magazines won't fit inside the storage space within the stock. The rear panel separating the compartments within the stock is removable, but even then I couldn't wedge an extra mag in there.

However, the added space is nice, although it wouldn't be a wise idea to store waterproof items inside because it likely won't keep matches or tinder dry in the event of a canoe flipping or downpours that last for days unless there's an extra layer of protection against moisture. Depending on what fire-starting system you use, though, you might be able to make the O-ring-sealed grip storage work for this.

If you're one of those people who like to get way off the beaten path, this gun is a good option for you. But you don't have to be a survivalist studying bushcraft to appreciate this rifle. It's a great camp gun or even a range toy, albeit a pretty pricey one at $1,274. It would also be an ideal gun for those who still run trap lines or follow coon-hounds into the night.

The Owyhee's real home, though, is tucked under a boat or airplane seat or nestled into a pack. It's a gun that's built for adventures—wherever those adventures take you. ■



The Owyhee's hinged comb compartment provides storage but did not accommodate the .22 Mag. magazines. Additional waterproof storage for small items is located in the grip.

ACCURACY RESULTS

TACTICAL SOLUTIONS OWYHEE TAKEDOWN

.22 Mag.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
CCI VNT	30	2,223	17	1.53
Hornady Critical Defense FTX	45	1,545	13	1.75
Remington JHP	40	1,876	20	1.81
Fiocchi JSP	40	1,846	23	2.05

Notes: Accuracy results are averages of three three-shot groups at 50 yards from a fixed rest. Velocities are 10-shot averages recorded on a LabRadar located at the muzzle. Temperature, 94 degrees; elevation, 1,020 feet. Abbreviations: JHP, jacketed hollowpoint; JSP, jacketed softpoint

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BATTLE TESTED

SPRINGFIELD'S SA-16 IS A MODERN TAKE ON A NOW-CLASSIC MILITARY RIFLE: THE M16A2.

by Keith Wood



Stylistic trends in AR-type rifles and carbines seem to change faster than women's fashions. What is cool and cutting-edge one month seems to be internet-obsolete merely months later. One could quickly go broke trying to keep up with the latest trends in AR accessories.

Perhaps it is this fickle reality that has helped create the nostalgic demand for "retro" rifles and carbines. The latest big entry into the retro market is from Springfield Armory, which recently released the SA-16 rifle—a modern adaptation of the M16A2 rifle that helped the U.S. military bridge the gap from the Cold War to the Global War on Terror.

The SA-16 is an almost exact clone of the M16A2, and its design elements mirror those of the classic service rifle. Like Eugene Stoner's original M16, the SA-16's forged 7075-T6 aluminum upper receiver uses an integral carry handle.

On the A2 and the SA-16, that carry handle is partially cut away to allow for a fully adjustable rear sight. The sights on the A2 were a significant improvement over the A1; likewise on the SA-16. The flat front post, rear aperture and long sight radius are capable of impressive performance.

There are actually two rear sight apertures, a larger one designed for use at night and at shorter ranges (marked 0-2) and a smaller aperture designed for more precise shooting at longer distances. Flipping the rear aperture forward and backward allows the shooter to select the right size for the task at hand.

Windage adjustments are made using a dial on the right side of the sight, and each click represents a half-inch at 100 meters. Although the rear sight is adjustable for elevation, it is not intended to adjust zero.

To zero the SA-16, the front sight post is rotated upward or downward. A spring-loaded detent holds the sight in position so an object, i.e. a bullet tip, must be used to depress the detent and dial the post to its desired position. Once a zero has been established, the rear elevation knob can be used to make adjustments based on the distance to the target. One could call it a mechanical bullet-drop compensator.

I grew up shooting an A2-style Colt HBAR and qualified often with the M16A2 as an ROTC cadet, so I'm reasonably familiar with the sight system, but it is far from intuitive. My recommendation is to download the Army or Marine Corps field manual and follow the instructions. Establish a 25 meter zero before moving out to greater distances.

The polymer furniture on the SA-16 matches that of the A2, which was also a departure from earlier models. The fixed buttstock is a half-inch longer than that of the M16/M16A1, which brings the length of pull to 13.5 inches. In hindsight, this may have been a mistake given the widespread adoption of body armor during the same time period.

A cavity inside the stock can be used to store a G.I. cleaning kit. The A1's distinctive triangular handguard was replaced with a round guard on the A2, with an aluminum heat shield between the barrel and the polymer exterior. The pistol grip was also replaced with one that uses a distinctive finger groove. Other than standard sling swivels, there are no Picatinny rails or other accessory attachment points on the SA-16.



While the SA-16 is a semiautomatic, the lower receiver is marked with a "BURST" setting on the safety selector, a nod to the M16A2. The selector will not move to this setting.



The bolt is 9310 steel and is high-pressure and magnetic-particle tested. The inside of the bolt carrier is chrome-lined, and the exterior sports the Springfield logo.

ACCURACY RESULTS

SPRINGFIELD ARMORY SA-16

Cartridge	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
5.56 NATO				
Federal American Eagle XM855 FMJ	62	3,125	25	2.8
Hornady Black FMJ	62	2,975	30	2.6
.223 Rem.				
Prime Match/Sierra MatchKing SMK BTHP	77	2,708	13	1.8

Notes: Accuracy results are averages of three five-shot groups at 100 yards from a benchrest. Velocities are averages of 10 shots recorded on a Garmin Xero C1 chronograph placed adjacent to the muzzle. Temperature, 87 degrees; elevation, 194 feet. Abbreviations: BTHP, boattail hollowpoint; FMJ, full metal jacket

An A2 flash hider, which is slotted at the top and sides but not the bottom, is attached to the muzzle. The front sight tower, which doubles as a gas block, is pinned to the barrel and is also home to a bayonet mount.

The SA-16 uses a rifle-length direct-impingement gas system, so it is very forgiving in terms of function and mechanical recoil. The gas that bleeds off the barrel and into the gas tube cycles an enhanced M16 bolt carrier assembly, which differs slightly from that of an AR-15. The bolt is made from 9310 steel and is high-pressure and magnetic-particle tested. The inside of the bolt carrier is chrome-lined. The only obvious departure from an issued bolt carrier group is the Springfield Armory logo, which is visible when the ejection port cover is open.

Like the upper, the SA-16's lower receiver is forged from 7075-T6 aluminum and Type III hard-coat anodized. The M16A2's lower differed little from its predecessor in terms of cosmetics,

the most notable difference being the "BURST" setting on the selector switch, which replaced "AUTO." While the SA-16 is a semiautomatic, it has the "BURST" marking on the receiver as well—but the selector will not move to that position—it is purely cosmetic.

The trigger on my test sample broke at 5.6 pounds. Although it is a single-stage trigger, there was a significant amount of creep and no defined wall before the break. The trigger reset was positive and audible. The trigger wasn't perfect, but there are endless aftermarket options that could be dropped in.

My rifle shipped with a 30-round black aluminum magazine made by DuraMag. I also function-tested the SA-16 with two other magazines: a polymer 30-round Magpul PMag and a 20-round aluminum G.I. mag. The rifle functioned well with all three magazines, but with the 20-rounder the bolt stop would not release the carrier group, and I had to use the charging handle to lower the bolt.

I began shooting M16A2-style rifles as a teenager, and while it had been many years since I'd fired one, doing so was like riding a bike. Unfortunately, my eyesight isn't what it was 30 years ago, and my dependence upon optics became clear when I got the SA-16 to the range. To remain true to the rifle's roots, I decided to use the iron sights for our accuracy testing. I have no doubt that this rifle's mechanical accuracy potential far exceeds what I was able to accomplish using irons, so take the accuracy results with a grain of salt.

Mounting an optic to the handguard



Like the M16A2, the SA-16 has a fully adjustable rear sight. There are two apertures, one for shorter ranges and a smaller one for more precise shooting.

A2 Timeline

Roughly 20 years after its adoption, the M16 was ready for an upgrade. While the lightweight and full-auto-capable M16 and M16A1 had, by most accounts, served admirably, the Army and Marine Corps were looking for a weapon that was better suited for a potential land war in Europe. They wanted a rifle that was more accurate and capable of lethality at longer ranges, firing a bullet that prioritized penetration. Ironically, they wanted the M16 to be more like the M14 it had replaced.

The M16A2 was designed to be compatible with the M855/SS109 NATO cartridge, also known as "green tip." This Belgian-designed ammunition uses a 62-grain bullet with a steel core, providing better external ballistics and penetrating ability than the older 55-grain M193 load.

Compared to the A1, the M16A2 has a fully adjustable rear sight, a brass deflector, a heavier barrel with a 1:7 twist, different furniture and a three-round burst capability. The changes added nearly a pound of weight, with the M16A2 tipping the scales at 7.5 pounds unloaded.

The Marines, being more marksmanship-focused, adopted the A2 in 1983 and the Army followed in 1986.

As has been the case with any newly issued weapon, the M16A2 was hotly debated at the time. Much of that debate revolved around the lack of full-auto capability.

Ironically, the Soviet threat that the A2 was designed to face evaporated almost immediately after it was fielded. Instead, the M16A2 served in several regional conflicts including the invasion of Panama, Operation Desert Shield/Storm, and the operations in Somalia that culminated with Task Force Ranger's well-documented battle that became known as Black Hawk Down.

Jeff Struecker carried the M16A2 during combat operations in Panama, Kuwait, Iraq and Somalia. He was a Ranger non-commissioned officer in Mogadishu, and actor Brian Van Holt portrayed him in the 2001 film "Black Hawk Down."

"I joined the U.S. Army when they were phasing out the M16A1," he told me. "When I was issued the M16A2, I was given the chance to put the weapon through the rigors of combat in many different environments. With some maintenance on the bolt and barrel, the M16A2 worked flawlessly in the arctic snows, desert sands and jungles worldwide.

"I had total confidence in this weapon. Its longer barrel made it possible to engage the enemy from 700 to 900 meters, something my CAR-15 could never do. While fighting in Somalia, I put a scope on my M16A2 and used it as my long-range weapon system."—*KW*

SPECIFICATIONS

SPRINGFIELD ARMORY SA-16	
TYPE	AR-15
CALIBER	5.56 NATO
CAPACITY	30+1
BARREL	20 in., 1:7 twist
OVERALL LENGTH	39.5 in.
WEIGHT	7 lb., 8 oz.
FINISH	Type III hard-coat anodized, mil-spec phosphate
STOCK	A2 synthetic
SIGHTS	fully adjustable dual-aperture rear, adjustable post front
SAFETY	two-position selector
TRIGGER	single-stage, 5.6 lb. pull
PRICE	$1,249
MANUFACTURER	Springfield Armory; SPRINGFIELD-ARMORY.COM

isn't ideal due to the height above the bore, but it is possible. To test this, I acquired a Trijicon ACOG 4x32mm BAC riflescope with a top-mounted RMR. This particular optic was designed to fit into the top of the carry handle and lock into place via a special fastener. The optic sat very high, so I added a nylon cheekpiece to the stock to achieve proper eye alignment. I'm over six feet tall and have a relatively long neck, but I still had to really stretch to get proper eye relief with this setup. An adjustable stock would have been a real asset.

Traditional rifle marksmanship is, in some ways, a dying art. It seems that most shooters these days either blaze away with their carbines at handgun distances or engage long-range targets with rifles that wear heavily magnified optics.

I'm a fan of both, but I also believe that there is a place for an iron-sighted rifle capable of making hits at intermediate-range targets. For that role, the SA-16 is ideal. It is accurate and reliable, with low recoil and quality sights.



The SA-16's unmistakable front sight tower doubles as a gas block, which is pinned to the barrel. A bayonet lug sits beneath.

Spending time on the range with this rifle has reminded me that I don't do enough of this type of shooting, which is something I need to rectify.

The M16A2 fills an important slot in the history of U.S. service rifles, having served from the waning days of the Cold War into the beginnings of the wars in Afghanistan and Iraq. Springfield Armory's SA-16 is an accurate and fitting tribute to that rifle, a nearly perfect clone but for a few tiny details. The SA-16 is well-built, nicely finished and comes in a high-quality nylon case.





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CLIMBING HIGH

SAVAGE'S 110 KLYM IS A SUPER-LIGHT-WEIGHT RIFLE READY TO TAKE ON THE TOUGH HUNTS.

by Joseph von Benedikt

Named with a subliminal message, Savage's new Klym rifle is built for mountain country. Made with a skeletonized lightweight receiver, composite and carbon-fiber stock, and carbon-fiber-wrapped barrel, it tips the scales at just five pounds, 15 ounces. It's light enough to take into the most rigorous terrain on earth.

Savage Arms cut no corners on the Model 110 Klym. Its lightweight receiver is factory blueprinted, meaning it's squared and trued like a custom action. It's made of Blackout Cerakote-finished stainless steel for an action that's as impervious to corrosion and abrasion as any action can be.

In order to keep the Klym as light as possible, Savage fluted the bolt with a unique series of spiral grooves in a crosshatch diamond pattern. Where the metal bolt knob usually is, there's an oversize (and awesome) knob of carbon fiber.

Even the bottom "metal" is made of a high-impact composite, which weighs considerably less than Savage's usual metal version. The magazine itself still features a reliability-enhancing steel body and feed lips, but the follower and floorplate are composite.

Engineering is classic Model 110, with a floating bolt head that finds equal-bearing, accuracy-enhancing contact with both of the dual locking lugs.

Fire controls, too, are familiar. Savage's renowned AccuTrigger serves as the go switch, and it releases at a clean, crisp two pounds, six ounces. It's terrific. The safety is a three-position sliding affair located on the action tang. Forward to Fire, rearward to engage the safety and lock the bolt, and middle to unlock the bolt but stay on Safe so you can clear the chamber.

Up top, the 110 action is factory-mounted with a Picatinny optic rail with 20 m.o.a. of angle built in. I'm not a big fan of optic rails because they make it hard to mount the scope nice and close to the top of the action, but a rail does make it mighty easy to mount a scope—and to position it just right so eye relief is perfect for the shooter.

The business end of the Model 110 Klym features a Proof Research carbon-fiber-wrapped barrel. It's got a stainless steel core that's single-point cut rifled. The muzzle has 5/8x24 threads, and it's factory-fitted with a slim radial-ported Omniport muzzle brake. Interestingly, the diameter and taper of the Proof Research barrel are more slender than I've seen previously, starting at about 1.10 inches at the breech rather than the more common 1.20 inches, and tapering to 0.76 at the muzzle.

Like all Savage Model 110s, the Klym utilizes a barrel nut to set headspacing and secure the barrel to the action. For those equipped with a barrel vise, this makes it easy to switch out barrels should you ever want to. Quite a few companies offer pre-fitted barrels for the Savage 110. Point is, if you decide you want to turn your Klym into a predator rifle when the fall seasons are over and big game hunting is on pause until bear season, you can buy a 6mm or .22 Creedmoor barrel—or whatever floats your boat—and install it yourself.

Initially the 110 Klym is available in six popular cartridges. Four have 22-inch barrels, including the 6.5 Creedmoor, 6.5 PRC, 7mm PRC and .308 Win., which I tested. The .300 WSM and .300 Win. Mag. are fitted with 24-inch barrels.



The Klym is built on the legendary 110 action, which is blueprinted at the factory. A 20 m.o.a. optics rail makes scope mounting easy, if a bit high.



The FBT thumbhole stock has a super-light cheek rest that's adjustable for elevation via the push of a button.

This isn't the first Savage rifle to come with a Proof Research barrel, but as far as I know it's the first with a stock made primarily of carbon fiber. Made in Austria by a company called FBT—for Fine Ballistic Tools—the stock is a marriage of a composite action bed and a fore-end and buttstock made of carbon fiber. With Savage's composite bottom metal in place and including the adjustable cheek rest, the FBT stock weighs 26 ounces. Adding the magazine brings overall stock weight up to 28 ounces.

Several distinctive features set the FBT stock apart. Up front there's a permanent socket for Spartan Precision's MagnaSwitch bipods and shooting tripods. Being built in, it's unobtrusive and non-snagging yet enables the owner to install or remove a bipod in less than a second.

Aft, the buttstock has a thin carbon-fiber cheek rest that's adjustable for height. Just firmly press the button on the right side of the stock, adjust height to preference, and release the catch. It's an extremely light system and looks and feels good—with one caveat. I think the cheek rest could sit a little farther forward so stock crawlers like myself don't end up with our cheek weld perched half off the forward edge of the rest.

The buttstock is capped with a firm rubber recoil pad. Uniquely, rather than a brand name embossed into the rubber, there are latitude and longitude numbers. I entered the coordinates into a GPS. The location that came up is the town of Gröbming, Austria—the headquarters of stock maker FBT. This conjures up images of hunters climbing high into the Austrian Alps in pursuit of chamois and other mountain game.

Under the toe of the stock is a brief parallel section that easily perches atop a rear sandbag. Forward of that there's a small step down, and there a sling swivel stud is mounted on the sleek angled understock.

FBT makes stocks with several different profiles. Savage chose a thumbhole variant, and once I'd shouldered the 110 Klym, I knew why. I'm not typically a fan of thumbhole stocks, but the FBT is incredibly comfortable. It's also good-looking, with rather racy lines.

The literature was ambiguous about whether all components of the stock are made of carbon fiber, so I took the barreled action out of the receiver to look. The composite middle section appears to be 3D printed—a first in my experience. The carbon-fiber fore-end and buttstock sections are glued together with the midsection.

Inside, just a trace of bedding compound cradles each side of the 110 action's recoil lug. Curious, I placed the action in the stock and checked for play. There is just a trace of forward and rearward movement without the action screws in place.

Were I to give the stock a rigidity score, it would rank about a six on a scale of one to 10. It's better than any injection-molded stock, but in my opinion the fore-end has a bit too much flex. It's not easy to pinch the stock up enough to contact the barrel at six o'clock, but light pressure from the side flexes the fore-end sideways enough to touch the barrel. Does that matter? Not a whole lot, unless you tend to put unequal pressure on a bipod while contorted into an awkward field position.

Mounting one of Burris's new 4-20x50mm Veracity PH scopes atop the rail and gathering a stack of .308 ammo boxes, I headed to the range. With a Spartan Javelin Pro bipod up front and a bunny-ear sandbag under the stock, I bore-sighted the scope and got shots on paper at 100 yards.

With all systems go, I began firing three consecutive three-shot groups for averages, with each different type



The fore-end features a factory-installed MagnaSwitch socket for Spartan Precision bipods and tripods. The sling swivel stud resides in the nose of the fore-end.



The barrel has a slim profile for a carbon-fiber model, and the Omniport radial muzzle brake tames recoil—helpful when shooting an ultra-light rifle.

SPECIFICATIONS

SAVAGE 110 KLYM

TYPE	bolt-action centerfire
CALIBER	6.5 Creedmoor, 6.5 PRC, 7mm PRC, .308 Win. (tested), .300 WSM, .300 Win. Mag.
CAPACITY	4+1
BARREL	Proof Research 22 in. carbon fiber, 1:10 twist; threaded 5/8x24
OVERALL LENGTH	44.62 in.
WEIGHT	5 lb. 15 oz.
FINISH	Blackout Cerakote
STOCK	FBT carbon fiber/composite thumbhole
SIGHTS	none; 20 m.o.a. optics rail
TRIGGER	AccuTrigger, 2 lbs. 6 oz. (measured, as received)
SAFETY	tang-mounted 3-position
PRICE	$2,699
MANUFACTURER	Savage Arms, SavageArms.com

of ammo. Accuracy was about par for a lightweight mountain rifle. As you can see from the accompanying chart, top honors went to Hornady's 168-grain ELD Match ammo, which averaged 1.05 inches. That's close enough to the 1.047 that is a true minute of arc that I'm comfortable calling the 110 Klym a minute-of-angle rifle with this ammo.

Other loads averaged from 1.17 inches up to 2.53 inches. The latter was with Remington's classic 180-grain Core-Lokt hunting ammo. For whatever reason the rifle disliked the Black Hills 175-grain TMK Match ammo so much that I did not finish testing it. Shots patterned like a shotgun rather than grouping at 100 yards, which is odd because that load is typically very accurate.

Candidly, I expected a bit more accuracy from the Klym. After all, it's a $2,699 rifle. Proof Research barrels are usually extremely accurate, and most shooters know of Savage's reputation for accuracy. After stewing on it for a bit, I concluded that this particular rifle is still a one-m.o.a. shooter, and it's probably just at the bottom end of the spectrum of accuracy potential that the Klym model will offer. I wouldn't be surprised to see 6.5mm versions shoot closer to one-half m.o.a. than one m.o.a.

On the plus side, reliability was stellar. The 110 Klym fed every round of every different type of ammo I tried perfectly, and it extracted and ejected the fired cases with boring consistency.

Ergonomics at the bench were extremely comfortable, and the Accu-Trigger made it easy to execute clean, consistent shots. The oversize carbon-fiber bolt knob felt good in the hand and provided plenty of grasp and leverage, making operating the bolt easy.

Because modern precision shooting technique largely relies on laying the shooting-hand thumb along the side of the stock rather than wrapping it over the wrist or around the rear of a vertical grip, I spent some time shooting with my thumb laid down on the upper right edge of the thumbhole stock, parallel to the tang safety. This worked fine and allowed quicker access to the safety. That said, the Klym was more comfortable and felt more controllable when my shooting hand grasped the thumbhole stock as designed.

Tang safeties are notoriously hard to function quickly when paired with a thumbhole stock, but I found that if I used my trigger finger to work the safety rather than my thumb, I got along with it just fine. And I do really like the fact that it's a three-position safety that locks the bolt closed when in the rearmost Safe position.

Only one ergonomic characteristic of the Klym surprised me, and that was recoil. For a .308, it kicks with gusto. Most likely that's due to the rifle's light weight and the firm rubber the recoil pad is made of. I think a bit more squish in the recoil pad would have taken more of the bite out of the rifle.

All things considered, the Model 110 Klym is both the coolest and the most upper-crust Savage Arms rifle I've ever fired. It's racy, it feels good in the hands and at the shoulder, and it's crazy light. The company has really brought its bolt-action hunting firearms into the premium world, and I think the 110 Klym provides a look into the future of high-tech hunting rifles. ■



The bolt body features diamond-pattern fluting, and there's an oversize carbon-fiber bolt knob. Both help reduce weight, plus they look cool.

ACCURACY RESULTS

SAVAGE 110 KLYM

.308 Win.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Hornady ELD Match	168	2,702	12	1.05
Federal Gold Medal OTM	175	2,590	12	1.17
Barnes Vor-TX TTSX	150	2,823	13	1.48
Sako Powerhead	162	2,623	12	1.60
Norma Bondstrike	180	2,576	19	1.72
Remington Core-Lokt PSP	180	2,608	32	2.53

Notes: Accuracy results are averages of three three-shot groups fired from a bipod at 100 yards. Velocities are averages of nine rounds measured at 10 feet with a Garmin Xero C1 Pro. Temperature, 75 degrees; elevation, 4,400 feet. Abbreviations: OTM, open-tip match; PSP, pointed softpoint

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THE GREAT EIGHT

REMINGTON'S FIRST AUTOLOADERS, THE MODELS 8 AND 81, WERE RELIABLE AND HANDY FIELD COMPANIONS.

by Layne Simpson



During the final years of the 19th century, more than one designer believed that a self-loading big game rifle chambered for a powerful cartridge capable of sending a bullet with each squeeze of the trigger would make all other designs obsolete. Blackpowder kept the creation of such an engine only a distant dream, and then came the development of smokeless. Winchester dealt the first hand with the blowback-operated Models 1905, 1907 and 1910 rifles chambered for the .32, .35, .351 and .401 Self-Loading cartridges. All but the .401 were marginal in power for taking game as large as deer and black bears.

Remington entered the race in 1906 with the Autoloading Repeating Rifle, as it was originally called, and it went on to become the most successful of the early centerfire autoloaders. The rifle had a 22-inch barrel, and four equally new rimless cartridges were designed specifically for it.

The .25 Rem., .30 Rem. and .32 Rem. were ballistic twins of the .25-35 Win., .30-30 Win. and .32 Win. Spl., respectively, while the .35 Rem. pretty much duplicated the performance of the .33 Win. In 1911 the name of the rifle was changed to Model 8.

Designed by John Browning, the Model 8 uses the same long-travel, recoil-operating system as Browning's Auto 5 shotgun, with one big exception. Whereas the recoil spring of the shotgun is positioned beneath the barrel, it wraps around the outside of the barrel of the Model 8, with both enclosed by a steel jacket extending to the muzzle. The fat appearance of the barrel, along with the humpback shape of the receiver, caused those who were not familiar with the Model 8 to mistake it for the Browning shotgun.

An extremely shrewd businessman, John Browning sold the European manufacturing rights for his quick-firing rifle to the Belgian firm Fabrique

Nationale, where it was called the Model 1900 "Fusil Automatique (Automatic Rifle) Browning Cal. 35." Just over 4,000 were built.

During firing, two lugs on the rotating bolt head of the Model 8 remain engaged with recesses in an extension of the barrel as the two travel together to the rear while compressing the recoil spring. Once the bolt and barrel reach the limit of their rearward travel inside the receiver, they separate and the bolt is momentarily held in place while the compressed recoil spring shoves the barrel forward. The bolt then speeds forward, strips a cartridge from the magazine and chambers it as the rotating lugs again engage shoulders in the barrel extension.

Despite the fact that the Model 8 action was quite complex, hunters of yesteryear boasted about its ability to function reliably when subjected to harsh environmental conditions. Part of this was due to the fact that its receiver had no openings for snow, dust, dirt or field debris to reach the inner workings.

Those who wore heavy gloves while hunting in extremely cold weather appreciated how easy it was to operate that big safety lever on the side of the receiver. In addition to blocking trigger and firing-pin movements, the safety prevents the bolt from moving to the rear while in its forward position.

The fixed, single-stack magazine is loaded one cartridge at a time, or with a stripper clip. Magazine capacity is five rounds for the .25, .30 and .32 Rem. and four rounds for the .35 Rem. As the last round is fired, the bolt remains in a locked-back position.

With the magazine empty and the rifle ready to be stowed, pushing a small lever on the left-hand side of the receiver releases the bolt, allowing it to move forward on an empty chamber. If the magazine contains one or more cartridges, the locked-back bolt can be released by pushing the lever, or by pulling back and then releasing the bolt to chamber a round.

Taking down the Model 8 is easy, and that made a lot of sense during a time when hunters often traveled by horse and buggy and train. A rifle that could be taken down to fit inside a short carrying case was quite appealing. This also allowed the bore to be cleaned from its chamber end.

After a coin is used to loosen the fore-end retention screw, it is detached from the barrel. Doing so exposes a takedown lever at the front of the receiver. When this lever is rotated counterclockwise about seven complete revolutions, the shank of the barrel can be pulled forward and out of the receiver. In addition to being extremely user-friendly, the takedown system also compensates for wear. Through the decades I have examined many Model 8 rifles—some showing signs of extremely hard use—and not a single one revealed any looseness between barrel and receiver.

In its heyday the Model 8 in .35 Rem. was considered by many experienced hunters to be plenty of medicine for all North American game including moose, elk and grizzly bears. In early advertisements Remington touted the cartridge as capable of penetrating a 5/16-inch steel plate at 100 yards.

Its firepower also attracted atten-



After a coin is used to remove the fore-end of the Model 81, turning a lever several revolutions releases the barrel for removal from the receiver.



The recoil spring that's wrapped around the barrel is held in place by a steel jacket that extends to the muzzle.

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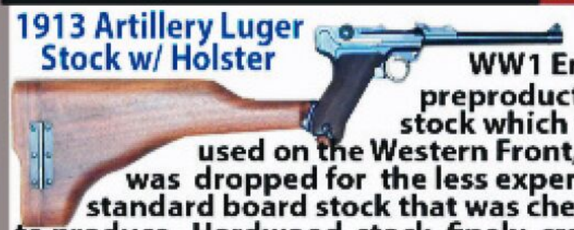


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tion from various law enforcement agencies. This held especially true when the rifle had been converted to use a 15-round magazine sold by the Peace Officer Equipment Co. Perhaps the most famous of those conversions was the .35 caliber Model 8 that former Texas Ranger Frank Hamer used in the 1934 Louisiana ambush that ended the crime spree of Bonnie Parker and Clyde Barrow. The Model 8 Special Police edition—offered soon thereafter by Remington—went on to become highly sought after by collectors.

The Model 8 might also be thought of as a military veteran. Before the advent of a synchronizing device that allowed a World War I pilot to fire his forward-aimed machine gun at a distant enemy plane without its bullets striking the blades of his own propeller, some American pilots just fired away with a 1911 pistol fitted with a small cage that prevented ejected cases from damaging the delicate fabric skin of the aircraft.

A pistol's range and power were greatly limited, so Gen. John Pershing filed a request for Remington Model 8 rifles—along with a supply of .35 Rem. ammo loaded with metal-piercing bullets—for the pilots to shoot instead. Army officers requisitioned a number of rifles in .25 Rem., but it is doubtful that they were ever actually used in combat.

Sales of the Model 8 gradually diminished through the years, and by 1936 about 81,000 had been built. That year, Remington assigned the rifle's overhaul to company engineer Crawford C. Loomis. He must have been quite busy with other projects because the few changes made were mostly to the wood. In addition to decreasing the amount of drop in the stock, the grip was changed from straight to curved and increased in diameter for greater strength. The fore-end was also increased a bit in size and checkering was added to it and the stock.

With those changes, the name was changed to Model 81 Woodsmaster, and the .25 Rem. was dropped. The .30 Rem., .32 Rem. and .35 Rem. lived on, and in 1941 they were joined by the .300 Savage. Production ground to a halt during World War II, and after the war only the .300 Savage and .35 Rem. remained. Model 81 production ended in 1950 with about 56,000 built.

Despite its rather homely appearance, I have long had a soft spot for the Model 81. The one I have owned for a very long time was built in 1947. I have not killed many deer with it, but I have bagged enough to become convinced that performance of the grand old .300 Savage for which it is chambered is close on the heels of its offspring, the .308 Win.

My rifle averages around 3.5 inches at 100 yards although it does occasionally surprise me by squeezing three bullets inside two inches. That won't win a benchrest match but is plenty accurate for shooting a deer or feral hog as far away as I feel confident with its open sights.

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Hornady® Manufacturing Company is recalling **ALL** lots of **item #81199, 350 Legend 150 gr. SP Hornady BLACK® ammunition**. These lots were shipped between the dates of November 2, 2023, and August 19, 2024.

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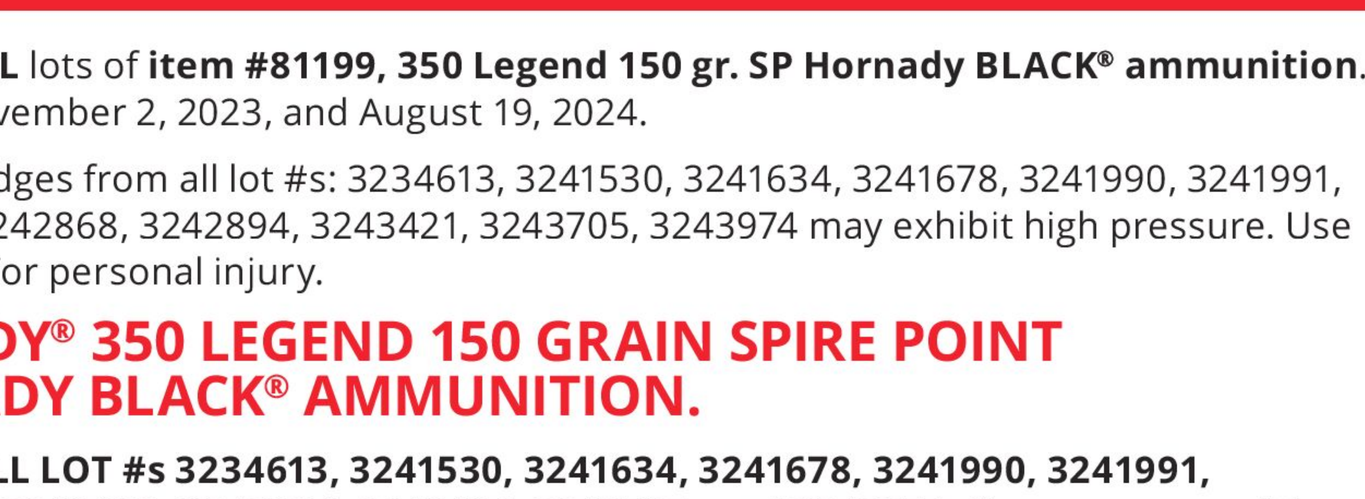
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Lyman, Marble Arms and other companies used to make adjustable aperture sights that attach to the backside of the receiver, where my rifle was drilled and tapped at the factory. Someday I may get around to rounding one up.

We will never again see the likes of Remington's first autoloading deer rifle, simply because the intricate machining and hand-fitting of its parts would price it far beyond what most hunters would be willing to pay.

Luckily for those of us who occasionally enjoy leaving our synthetic clothing and plastic-stocked rifles at home—and heading to the woods in Filson wool and Leon L. Bean's leather-topped/rubber-bottomed Maine hunting shoes while carrying a classic hunting rifle of yesteryear—Remington Model 8 and Model 81 semiautos can still be found on the used gun market at affordable prices. The 81, for example, can be found for under $1,000. ■



Remington's first autoloader had an excellent reputation for reliability in harsh conditions, and hunters loved the large, easily reached safety lever.





SIG Sauer Cross Magnum

There's been a shift toward hybrid rifles in recent years, guns that combine elements of target/tactical models and traditional sporters. Perhaps no guns typify this more than SIG's Cross series rifles, which debuted in 2019. In 2022 SIG released its PRS model, which leaned more toward competition, and for 2024 the company is launching the Cross Magnum.

As the name suggests, it's a beefed-up version of the standard Cross rifle with a larger chamber and magazine to accommodate magnum cartridges like the .300 Win. Mag., which is currently the only chambering. It borrows its overall design from previous Cross rifles and features a SIG Precision adjustable folding stock, an aluminum receiver and a full-length handguard with M-Lok attachment points and a full-length Arca rail.

The Cross Magnum is a bolt gun, but it also offers some features more commonly associated with AR rifles. The 24-inch stainless steel 5R rifled barrel—which has a 1:9 twist rate, a 5/8x24 threaded muzzle and radial brake—threads into the receiver and can be easily swapped out. The three-lug bolt locks into an extension on the barrel, thus allowing the receiver to be made from lightweight aluminum. The full-length 20 m.o.a. top rail offers ample space for mounting optics and other accessories.

Fire controls include a two-stage flat-face target-style trigger, and the ambidextrous AR-style safety selector features a right-side thumb rest. An oversize bolt knob makes it easy to cycle the action, and the rifle accepts AICS-pattern magazines. One steel six-round mag is included. Since the magazine release is located at the front of the trigger guard, it's easy to access, and the trigger guard is sufficiently large to accommodate gloved fingers.

The buttstock design shares little with traditional sporters, but it's extremely versatile and shooter-friendly. The cheek rest is secured with a locking lever and, when released, it rises up to full height. You can position the cheek riser exactly where you want it instead of selecting presets and hoping they're correct, and it's fast and intuitive. Ditto for the length-of-pull adjustment, which can be loosened so the butt pad moves forward or rearward, then retightened. Even the angle of the buttpad is adjustable.

There's a PRS polymer pistol grip, and the handguard is held in position by six screws that secure to the receiver, making it easy to remove. The stock

SPECIFICATIONS

SIG SAUER CROSS MAGNUM	
TYPE	bolt-action centerfire
CALIBER	.300 Win. Mag.
CAPACITY	6
BARREL	24-inch steel, 1:7 twist; threaded 5/8x24, radial brake
OVERALL LENGTH	45.2 in., 36 in. folded
WEIGHT	8 lb., 14 oz.
STOCK	SIG Precision adjustable for cheek height, length of pull, recoil pad cant
FINISH	coyote anodized, black nitride
TRIGGER	two-stage, 3.1 lb. pull (measured)
SIGHTS	none; 20 m.o.a. Picatinny rail
PRICE	$2,500
MANUFACTURER	SIG Sauer, SIGSAUER.COM

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#358610
168 Grain Sierra MatchKing Jacketed Hollow Point
20 ROUNDS

Sale prices valid starting October 15, 2024, and ending when promotional quantities are sold, but not later than January 3, 2025. Prices and availability may vary.

also folds with the push of a button, and when folded its overall length is 36 inches. That's good for backpacking and traveling. However, it's stiff and requires effort to operate, although it locks in place securely when folded or deployed.

At the range, the gun proved to be accurate with a mix of hunting and target loads. The SIG managed groups as small as 0.6 inch, and it consistently grouped at or under an inch. The flat-face trigger is outstanding. It's user-adjustable and came from the factory set right at three pounds. I like the two-stage design, and once you're familiar with the trigger it's very predictable.

The muzzle brake also does an excellent job dampening recoil. Combined with the rifle's 8.9-pound weight—scoped and loaded it will weigh around 10.5 pounds, depending upon your scope option—this is a precision hunting rifle that doesn't beat you up in the field.

The bolt handle projects directly from the side of the rifle and is easy to access, thanks especially to the oversize knob, and I like the right-side safety/thumb rest. It's hard not to love the stock, too, although traditionalists may find its many buttons and rails a bit industrial for their tastes.

The ability to use AICS magazine makes this rifle quite versatile, but I suspect the magazine release will be a contentious point for some shooters. It's not as easy to access as the larger paddle-style designs. It's protected inside the trigger guard, and while it's on the small side—and hence theoretically there's less chance it will contact rests or debris—it's functional.

The receiver design can make it challenging to single-load the rifle should you choose to do so, and while reliability was good—there's an extractor mounted on the outboard lug of the bolt and a plunger-type ejector—the rounds would sometimes hang up on their way out the receiver if the bolt was not cycled with gusto.

The real question is whether a nine-pound rifle is something that will truly attract hunters. SIG makes clear that this rifle was designed for hunters, and depending upon the circumstances it could work quite well. However, there are a lot of lighter guns out there, and with the Cross Magnum's unfolded overall length of 45.2 inches, even a relatively short suppressor will put overall length above 50 inches.

If the SIG Cross Magnum does fit with your hunting style, though, it's an excellent gun. It's also better suited for long-range shooting than light mountain rifles. Is it an ideal hunting rifle? That depends on the nature of your hunt. ■



The stock's adjustments allow for perfect comb riser height, length of pull and recoil pad cast. The push-button stock folds, clicking into place for transport.



The two-stage trigger is excellent, and the magazine release is protected inside a trigger guard that's large enough to accommodate gloved fingers.



The bolt sticks out and has an oversize knob for fast handling, and the ambidextrous safety selector has a shelf on the right side that acts as a thumb rest.

ACCURACY RESULTS

SIG SAUER CROSS MAGNUM

.300 Win. Mag.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
SIG Elite Copper HT	165	3,077	19	0.87
Remington Premier/ Swift A-Frame	200	2,815	11	1.15
Winchester/Nosler AccuBond Long Range	190	2,855	13	1.22

Notes: Accuracy results are averages of three three-shot groups at 100 yards from a fixed rest. Velocity figures are 10-shot averages recorded on a LabRadar placed at the muzzle. Temperature, 44 degrees; elevation 1,020 feet

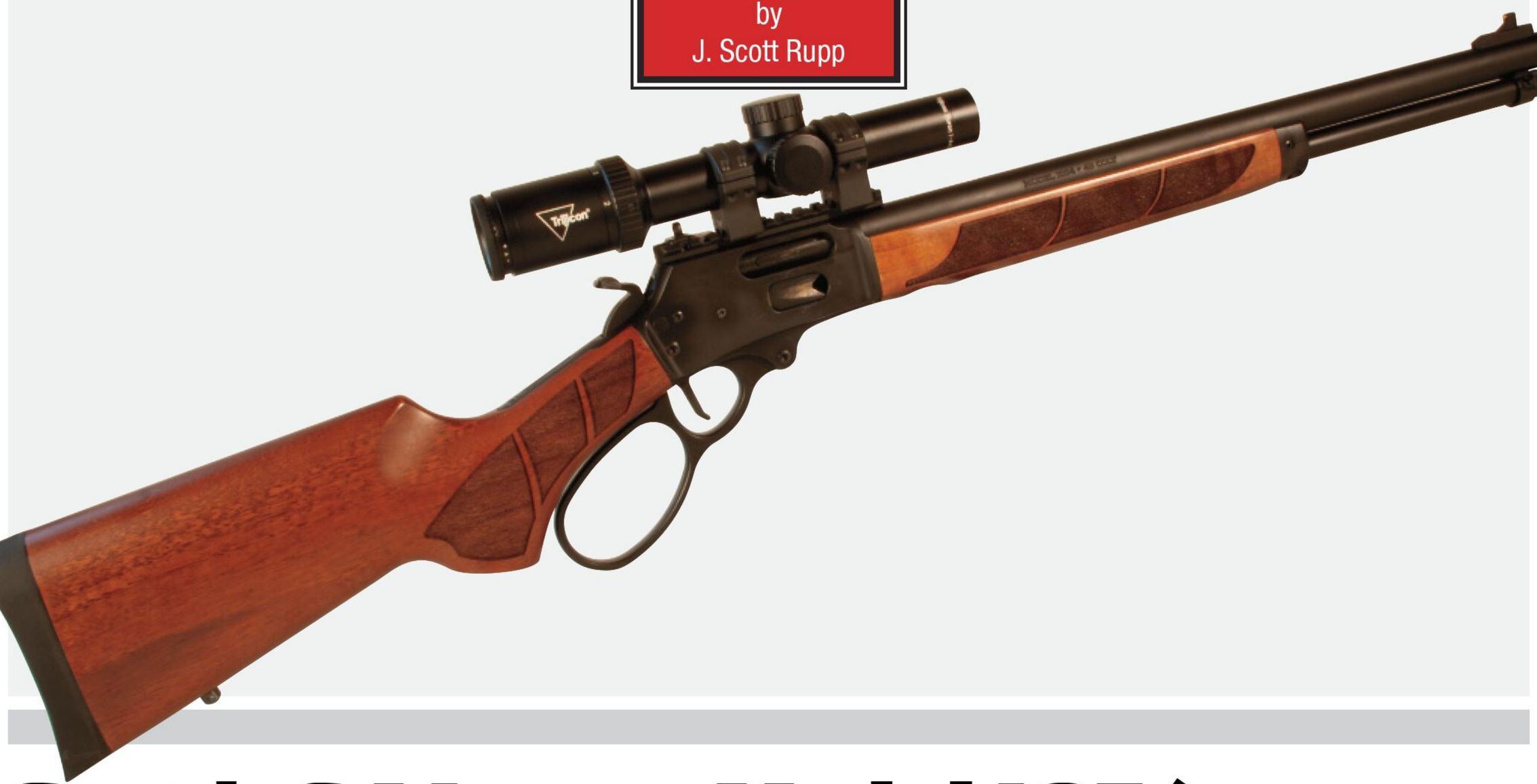
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Smith & Wesson Model 1854 Traditional .45 Colt

Smith & Wesson was quick to follow up its .44 Mag.-chambered Model 1854 lever action with a .45 Colt version. It's a rifle that will appeal to hunters, plinkers and Cowboy Action competitors because it's a handy, fast-handling and light-recoiling carbine.

When Keith Wood reviewed the initial rifle in this line in our July/August 2024 issue, he had the synthetic model. When the .45 version came out, I requested the 1854 Traditional because I know a lot of *RifleShooter* readers appreciate wood stocks.

The Traditional's is a good-looking checkered walnut, with textured grip panels on the wrist and fore-end. The butt is capped with a relatively hard black rubber recoil pad and includes a sling swivel stud. The fore-end's texturing coverage is nice and full, and there's a hole for a sling swivel in the black metal fore-end cap.

While it lacks features like the M-Lok slots found on the fore-end of the synthetic version, the Traditional isn't lacking for modern touches. The 19.25-inch barrel is stainless steel with a black Armornite finish, and it's threaded 11/16x24. A Picatinny rail sits atop the receiver for easy scope mounting, although if you prefer other options the holes are drilled and tapped on the Marlin 1894 pattern. Sights include an adjustable XS Sights rear sight and a gold bead front.

The operating lever is a large loop, and in another nod to modernism, the 1854 has a straight trigger. The sample on mine broke at three pounds, seven ounces on average. It's got a loosey-goosey quarter-inch of take-up, but the break is crisp and creep-free.

The rifle incorporates a crossbolt safety as well as a half-cock notch. It also has a trigger block that prevents the rifle from firing unless the lever is fully closed.

The hammer spur is serrated, and the rifle ships with an extension for use with a scope. The extension can be set up for right- or left-hand use.

The tube magazine holds nine rounds of .45 Colt, and it has a bright

SPECIFICATIONS

SMITH & WESSON MODEL 1854 TRADITIONAL

TYPE	large-loop lever-action centerfire
CALIBER	.44 Rem. Mag., .45 Colt (tested)
CAPACITY	9+1
BARREL	19.25 in. stainless steel, 1:20 twist; threaded 11/16x24
OVERALL LENGTH	36 in.
WEIGHT	7.1 lb.
FINISH	black Armornite
STOCK	walnut w/textured panels
SIGHTS	adjustable XS ghost-ring rear, gold bead front; optics rail
TRIGGER	straight; 3 lb. 7 oz. pull (measured)
SAFETIES	crossbolt, half-cock notch, trigger block
PRICE	$1,399
MANUFACTURER	Smith & Wesson, SMITH-WESSON.COM

orange follower that's handy for assessing whether there's another round about to chamber. The tube is designed so it can be slid all the way forward to unload the gun through the front of the fore-end instead of having to lever out all the rounds. The magazine tube cap is knurled for easy turning, and it has an O-ring to seal out moisture and prevent rattles.

For accuracy testing I installed a Trijicon Huron 1-4x24mm scope in Warne's new Hyperlite scope rings. Fifty-yard results are shown in the accompanying table.

I got a real education on how it pays to experiment with loads—especially if you plan to shoot with a can. The Hornady LeverEvolution shot poorly without a suppressor but turned in a stellar performance with a Silencer Central Banish 46 on board. Conversely, Fiocchi's Range Dynamics shot dismally with the suppressor but perfectly fine without it.

Both the Hornady and Federal loads are intended for hunters, and they'd have the accuracy to get the job done at any practical hunting distance. Note that Smith & Wesson discourages the use of .45 Colt +P and expressly says +P+ should not be fired in the Model 1854.

While the Model 1854 has a relatively short barrel, it's fairly beefy at 0.85-inch diameter. Rifle weight is 7.1 pounds bare and just over eight pounds with the Trijicon scope. Couple that with .45 Colt ammo and you've got one soft-shooting rifle.

It's got a really sweet balance for shooting offhand, too, and the action cycles smoothly and reliably. My only gripe was that the inside edges of the loop could be a little smoother.

The XS Sights are terrific. The rear is a true ghost ring, presenting an aperture of 0.185 inch and plenty of daylight for fast shooting or accurate fire in low light. It's adjustable for windage courtesy of opposing screws, and loosening them also allows the aperture to be rotated up or down for elevation.

I shot the gun offhand at 50 yards with the irons, and placing shots inside the breadth of a palm was no problem. That gold-bead front shows up great. An added benefit is that the sights were usable even with the Banish 46, which has a 1.75-inch diameter, threaded onto the muzzle. The can did intrude into the sight picture, but I could still hit the target easily.

With lever guns experiencing something of a renaissance—thanks in part to straight-wall cartridges now being legal for deer in many states that were formerly shotgun only—Smith & Wesson's entry is a welcome new option. And in the new .45 Colt chambering the 1854 offers something for just about any shooter or hunter. ■



The rear sight is the XS Sights adjustable ghost-ring aperture. Smith & Wesson supplies a hammer-spur extension that can be set up for right- or left-hand use.



The nine-round tube magazine has a bright orange follower and can be withdrawn so that rounds can be removed from the front of the fore-end.



The large-loop 1854 sports a straight trigger, and if you don't want the optics rail, the receiver is drilled and tapped on the Marlin 1894 pattern.

ACCURACY RESULTS

SMITH & WESSON 1854 TRADITIONAL

.45 Colt	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Hornady LeverEvolution FTX*	255	1,050	13	1.08
Federal Hammer Down JHP	250	982	39	1.45
Hornady Cowboy LFP	255	877	23	1.50
Fiocchi Range Dynamics CMJ	255	997	24	1.53

Notes: (*With Banish 46 suppressor.) Accuracy results are averages of three three-shot groups at 50 yards from a Caldwell Fire Control rest. Velocities are averages of 10 shots recorded 10 feet from the muzzle with a Pro Chrono DLX. Temperature, 70 degrees; elevation, 4,900 feet. Abbreviations: CMJ, complete metal jacket; JHP, jacketed hollowpoint; LFP, lead flatpoint



Ruger LC Carbine .45 ACP

The original LC (Lightweight Compact) Carbine from Ruger was chambered in 5.7x28, and that gun offered such an appealing, shooter-friendly design that it should come as little wonder that Ruger expanded the LC family. I'm not sure anyone outside the company expected the second version of this blowback-operated autoloading carbine to be chambered in .45 ACP, though. Perhaps Ruger didn't want to cannibalize PC carbine sales, or maybe it thought the many fans of the .45 Auto deserved a carbine designed just for them. Regardless, this is a gun you'll quickly grow to love.

Like the 5.7x28, the .45 ACP LC Carbine comes with an aluminum receiver with a black Type III hard-coat anodized finish and a 16.25-inch alloy steel barrel with a .578x28 threaded muzzle. The 7.5-inch free-floating handguard is hard-coat anodized and comes with a top rail and M-Lok slots on all seven sides, from the two o'clock to 10 o'clock positions. That's more than 30 M-Lok attachment points, making this carbine completely customizable. It features a unique blowback system with a two-piece bolt and a clever bolt-over-barrel design to reduce overall length.

The polymer push-button folding stock is adjustable for length of pull and features a rollover cheekpiece that supports the cheek without stabbing or punching. The cheekpiece is sufficiently long so that you won't get your cheek behind it while firing—a mistake the brightest among us only make once.

The folding stock features QD attachment cups and is affixed to a Picatinny rail at the rear of the receiver, which means you can easily remove and swap it for another stock. Ruger has also added a section of Pic rail ahead of the trigger guard on the polymer grip module, so there's no shortage of attachment points for accessories. Ruger has added Rapid Deploy adjustable front and rear flip-up sights on the top rail, which can serve as a primary sighting system or a backup for an optic.

Under the receiver is a polymer grip module comprised of the trigger guard and Secure Action trigger assembly, pistol grip and underside rail. The pistol grip houses the 13-round .45 ACP

SPECIFICATIONS

RUGER LC CARBINE .45 ACP

TYPE	blowback-operated semiauto centerfire
CALIBER	.45 ACP
CAPACITY	13+1
BARREL	16.25 in. alloy steel, 1:16 twist; threaded .578x28
OVERALL LENGTH	28.6–30.6 in.
WEIGHT	7 lb., 1 oz.
STOCK	adjustable folding
FINISH	Black Type III hard-coat anodized receiver, handguard; black nitride barrel
TRIGGER	6 lb., 14 oz
SIGHTS	Ruger Rapid Deploy adjustable rear, front; optics rail
PRICE	$1,009
MANUFACTURER	Ruger, RUGER.COM

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magazine. LC 45 Carbines also work with Glock magazines, so finding spare mags shouldn't be a problem.

Three of the four primary controls are the bolt release, ambidextrous manual safety and extended reversible magazine release. In addition, there's a forward-mounted charging handle that is reversible for left- or right-handed use. Ruger does an exceptional job providing owners with how-to videos on its website that cover everything from disassembly and reassembly to suppressor use and reversing the mag release and charging handle.

The Ruger weighs 7.1 pounds and measures between 28.6 and 30.6 inches. Folding the stock cuts overall length to 22 inches, so this is a gun that you can fit in a backpack. I tested the LC Carbine at 50 yards based on the capabilities of the .45 ACP cartridge and also because this is primarily a defensive carbine that's unlikely to be deployed at longer ranges. But you could if you needed to.

While accuracy testing was done at 50 yards, I also tested the rifle at 25 and 100 yards. Not to bore you with reams of analysis, the LC Carbine frequently produced three-shot groups at 25 yards with all three holes touching, and most groups were in the 0.6- to 0.8-inch range.

At 50 yards, the average opened up to between 1.5 and three inches, which is what you'd expect from a .45 autoloading pistol at half that distance. Groups of 2.5 to five inches were the norm at 100 yards when the rifle was topped with a Viridian RFX green dot sight. Federal's 230-grain Gold Medal full metal jacket proved the most accurate, and those big bullets cruised downrange at subsonic velocities.

The Viridian was mounted on an extended-height see-through mount to allow use of the irons. I also made use of the M-Lok rail space and added a hand stop and front QD cup.

The rifle functioned flawlessly and never failed to feed, extract or eject. Trigger pull weight was a bit heavy—just under seven pounds—but it was predictable and manageable.

The adjustable folding stock is well-designed and easy to use, and the pistol grip is comfortable, although if you're used to running AR carbines there's a good chance you'll find yourself searching for the bolt release and safety selector in the usual spots—so there will be a bit of a learning curve. Recoil is extremely mild from this rifle, and muzzle blast is minimal. With a suppressor in place this gun would be a pussycat.

Ruger impressed everyone with the LC Carbine in 5.7x28, and its .45 stablemate is equally good. If you're searching for a home defense carbine, this one is an excellent option. Suggested retail price for the LC Carbine is $1,009. ■



The carbine's control layout will be familiar to pistol shooters, but maybe not so much to AR folks. The Ruger Secure Action trigger has a heavy but predictable break.



The forward-mounted charging handle is easy to grasp and operate. It's also reversible so it can be easily swapped to the right side of the carbine.



The adjustable stock can be configured to fold to the right or left, and it can be completely replaced with another Picatinny-mounted stock design.

ACCURACY RESULTS

RUGER LC CARBINE

.45 ACP	Bullet Weight (gr.)	Muzzle Velocity (fps)	Std. Dev. (fps)	Avg. Group (in.)
Federal Gold Medal FMJ	230	875	10	1.73
Hornady Critical Defense FTX	185	1,215	14	1.90
SIG Sauer V-Crown JHP	200	1,033	16	2.13
Lehigh XD	135	1,345	20	2.45
Winchester Super Clean FMJ	160	1,141	11	2.42

Notes: Accuracy results are averages of three three-shot groups at 50 yards from a fixed rest. Velocity figures are 10-shot averages recorded on a LabRadar located at the muzzle. Temperature, 78 degrees; elevation 1,020 feet. Abbreviations: FMJ, full metal jacket; JHP, jacketed hollowpoint

Continued from page 72

Messiest of all is what we call .35 caliber. Actual bullet diameters include .348 inch for the .348 Win. and .351 inch for the .35 and .351 Win. Self-Loading. The .348 Win. was and is legendary and is still with us, but all three of these rounds are one-rifle cartridges.

Over the years, most .35 caliber rifle cartridges have used a .358-inch bullet. This started with 1903's .35 Win., 1906's .35 Rem. and the once-popular .350 Rigby Rimless Mag. in 1908. However, the 9x56 Mannlicher and 9x57 Mauser both call for a .356-inch bullet.

Today we have complicated things further. The .357 Mag. revolver cartridge (.357 bullet) is popular in lever actions, and the 9mm Luger (.355 bullet) is popular in semiauto carbines. The relatively new .350 Legend uses a .357-inch bullet, which is undersize for .358-inch rifle bullets and oversize for 9mm pistol bullets that could be loaded for inexpensive practice ammo.

It may be complicated, but the .35s generally fill two niches: low-recoiling brush-busters; and more versatile cartridges like .358 Win. and .35 Whelen. Missing from the mix: Despite both old and recent efforts, no fast .35 magnums ever became popular.

The 9.3mm is literal: 9.3mm equals .366. And since the 9.3x74R and 9.3x62 all 9.3mms have used .366-inch bullets. They're effective for large North American game and generally meet African minimums. They're not as popular in the U.S. as in Europe, but they offer a sound alternative to the .375.

The .375 is also literal. Holland & Holland first used a .375-inch bullet for its .400/.375, then again for its popular .375 H&H Mag. All .375s in the smokeless era use a .375 bullet, although the .38-55 calls for a .377-inch bullet.

Both the mild .38-55 and faster .375 Win. (which uses the .375-inch bullet) are effective short-range, medium game cartridges, but most hunters properly consider the rest of the .375s as powerful cartridges for the largest game— ideal for the biggest bears and baddest buffaloes and, with solids, suitable on up to elephant.



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by Craig Boddington

.30 Something

Although constantly interchanged, "caliber" and "cartridge" aren't the same. Properly, caliber refers only to bullet diameter. Cartridge is the whole ball of wax: a case of specified dimensions, propelling a bullet of certain diameter within a known weight range and loaded to specific maximum pressure. The cartridge and caliber together determine practical uses, based on bullet weight and shape, velocity and energy, thus range.

There are hundreds of unique rifle cartridges, but for America's big game hunters there are just seven primary bullet diameters: .224, .243, .257, .264, .277, .284 and .308. Sure, we can argue the .22 centerfire's efficacy for deer and hogs, but I consider it one of the primary diameters because a lot of people use it, and with heavy bullets and good shot placement, it works.

Among these .30-and-under bullet diameters, some are more popular, and all have loyal followings. Few American rifleshooters have a real need for any caliber larger than .30—even for elk and moose.

Manufacturers know this. In the U.S., ammunition sales for cartridges above .30 caliber drop like a thrown rock. Even so, we have a fascination for large and powerful cartridges, a fascination greatly exceeding their genuine utility: a few .40s, multiple .416s, and a massive slew of .450 and up. Mind you, if you really need a big gun, you might need it bad, so I'm not knocking the big-bores.

In between .30 and .40 caliber, we also have a slew of cartridges, old and new. We can go back to British categorization of rifle cartridges, from the early days of smokeless powder. Back then, .30 and under was considered "smallbore." Over .30 was "medium," and over .450 was "large."

There are holes in this. In 1948's *African Rifles and Cartridges*, John Taylor classified cartridges between .40 and .450 as "large medium." I like that, but in any North American context, I'm hard-pressed to consider 7mms and .30 calibers as small.

Since our most popular rifle bullet diameters stop at .30, I'm okay to consider the next step up as "medium," but I like to call them ".30 somethings": bigger than .30, smaller than .40. Although less popular, with generally less need, there are five primary .30-something calibers: .32, .33, .35, .366 and .375. All of these are available in multiple cartridges, but unlike our popular smaller calibers, actual bullet diameters vary more.

We'll get back to that. First, understand that velocity levels vary with most .30-something cartridges, allowing them to fill at least three niches. First we have the "brush busters"—low velocity, low recoil but large diameter and/or heavy bullets, for hard-hitting effect on deer/hogs/black bears at closer ranges. Then there are the medium- to high-velocity cartridges, and these are of greatest interest to hunters who pursue game larger than deer and who believe in the advantages of bigger bullets.

Last we have cartridges with the velocity, energy and bullet diameter that make them suitable for the world's largest game. I would argue that the faster .33s and .35s are fine for our biggest bears and, with heavy bullets of proper construction, theoretically adequate for big bovines—although here we get into caliber and/or energy minimums in most African jurisdictions. Among our .30 somethings, only the faster 9.3mms and .375s are street-legal for thick-skinned African game.

Let's get back to those five .30-something calibers. A .32 caliber cartridge generally means a .323-inch bullet, what we call 8mm, even though 8mm equals .315 inch. This is not consistent. The old .32-20 uses a .312-inch bullet, and the .32 Win. Spl.—a classic brush buster—calls for a .321-inch bullet.

Modern 8mms, however they're named, use a now-standard .323-inch bullet. The .32 or 8mm is not popular in America, but its fans believe the 8mm's slight increase in frontal area hits harder than a .30 caliber with similar bullet weight and velocity.

Recent .33 caliber cartridges all use .338-inch bullets, a trend that began with Winchester's 1902 .33 WCF. Most .33s are versatile cartridges, ranging from the .338 Federal all the way up to the big .338 Lapua, and including the several hard-hitting magnum .33s. Although they're not essential, I love them for elk, and I consider them the sensible minimum for our largest bears. An exception is Hornady's brand-new .338 ARC, designed for optimum subsonic suppressed performance.

ALTHOUGH LESS POPULAR, WITH GENERALLY LESS NEED, THERE ARE FIVE PRIMARY .30-SOMETHING CALIBERS: .32, .33, .35, .366 AND .375.

Continued on page 71

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