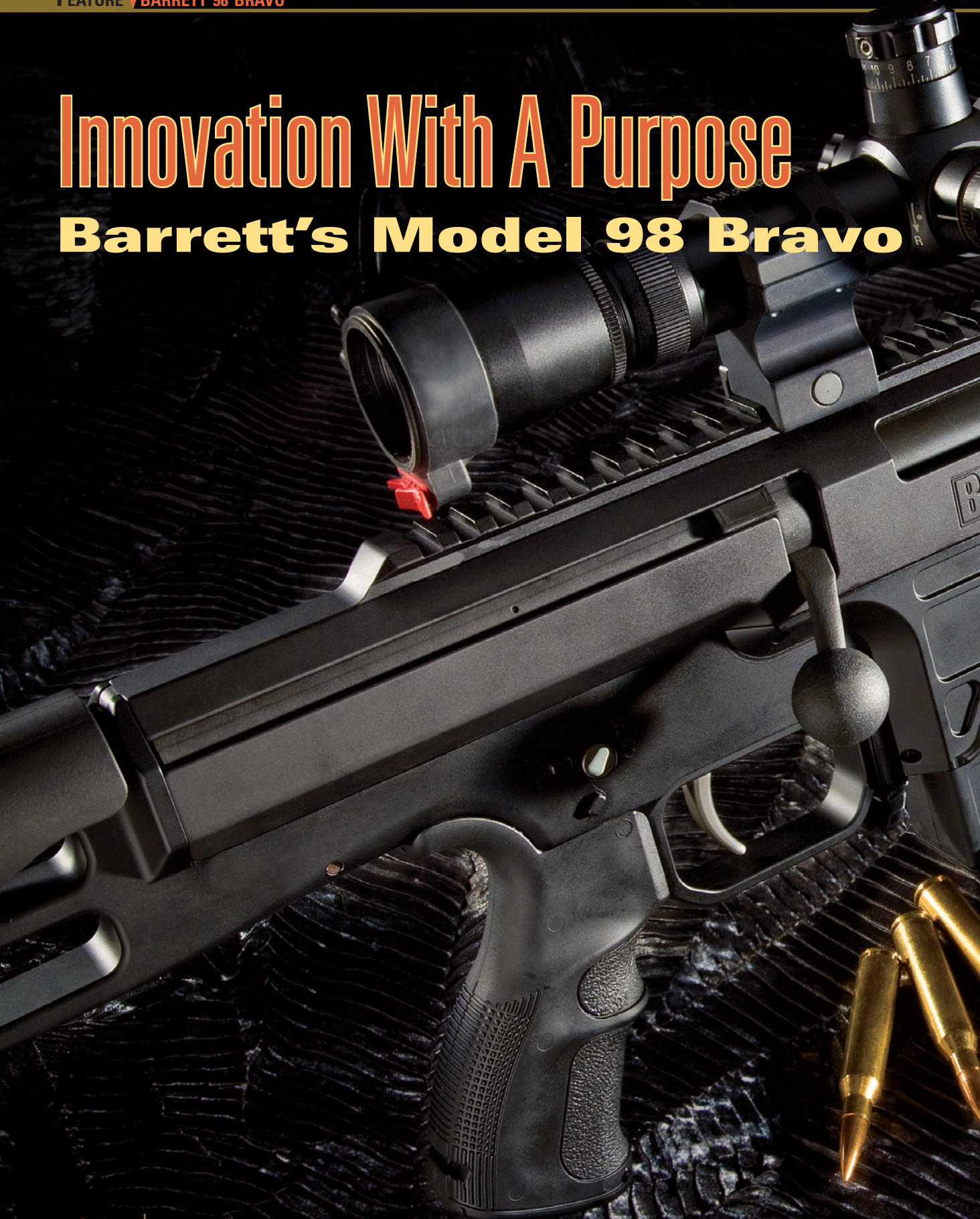


# Innovation With A Purpose

## Barrett's Model 98 Bravo







The bolt-action Model 98 Bravo in .338 Lapua Magnum is one of the most innovative rifles we've ever seen. But the advances weren't made just for the sake of being new and different—they were made with a practical purpose in mind.

STANTON L. WORMLEY, JR., Field Editor

It's hard to believe that more than a quarter-century has passed since a young engineer and shooting enthusiast named Ronnie Barrett unveiled the rifle that became known worldwide as the Barrett Model 82. At the time, it may have seemed that there wouldn't be much of a market for a semi-automatic rifle in .50 BMG. But Barrett's design, which combined simplicity, reliability, low recoil, reasonable weight and ease of manufacture, proved to be such a radical evolutionary leap forward that the military soon found it indispensable. Used for unexploded ordnance disposal, mine clearing, and anti-material and anti-personnel engagement at long range, the M107, as it is now designated, has become one of the most iconic rifles of the 20th century. Barrett's rifles also found a home in long-range target matches.

Barrett Firearms has evolved into one of the best-known marques among contemporary American gunmakers, with models in .50 BMG, 6.8 SPC and its proprietary .416 Barrett cartridge. Yet, just as in 1982, Barrett is once again poised to push the envelope—this time, with the Model 98B, a novel turnbolt rifle in the increasingly popular .338 Lapua Mag.

The advantages of the .338 Lapua Mag.—flat trajectory (thanks to the availability of high-ballistic coefficient bullets), excellent accuracy at long range and high striking energy—have made it popular among military, law-enforcement and precision shooters. So impressive was the potential of .338-caliber cartridges that in 2008 the United States Marine Corps announced its interest in acquiring a new long-range rifle in that caliber. Although the .338 Lapua Mag. was not specifically mentioned, it has been around since 1987 and many foreign militaries have adopted it, making it the frontrunner for selection by the Corps.

## BARRETT 98 BRAVO



A disassembly latch allows the upper receiver to pivot open for disassembly and cleaning (above). Teflon-infused polymer aids smooth travel of the full-diameter bolt body (above, middle). The trigger assembly (above, r.), housed inside the lower receiver, is removable as a unit.



The M98B features a rotating thumb safety (r.) and a detachable, 10-round polymer box magazine (far r.).



Among the Marines' desired characteristics for the new .338 rifle are said to be modular design, light weight, reasonable length, the capability for in-line mounting of night-vision devices with optical scopes, and provisions for both a folding stock and a quick-change barrel. Although its development actually began years ago, the Model 98B meets virtually all these criteria.

Barrett engineers started with a clean sheet of paper in 1997. The goal was to develop a precision .338 Lapua rifle suitable for tactical use that was not a derivative of any sporting arm. An initial semi-automatic design, the Model 98 was unveiled at the 1998 SHOT Show, but failed to reach full production. The idea of a .338-cal. rifle was never abandoned, however. In recent years, lead designer Chris Barrett—son of the company's founder—spearheaded its revival.

According to Barrett, the Model 98B was purpose-built to withstand adverse conditions, to be easily adaptable to any mission using the appropriate accessories, and to take advantage of the ergonomic user interfaces (such as the rotating thumb safety, pistol grip, and so forth) familiar to contemporary soldiers.

Even before the release of the USMC requirements, Barrett engineers were already thinking of military use for the new rifle, and drawing upon the lessons learned during fielding of the M107.

The new rifle departs from the century-old two-lug, steel-receiver Mauser turnbolt pattern in almost every way. Inspired by Eugene Stoner's groundbreaking AR-15/M16 design, Barrett had the Model 98B comprised of aluminum upper and lower receivers hinged at the front. The former houses the bolt and barrel, while the latter contains the trigger mechanism and forms the buttstock and pistol grip mounting point.

The upper receiver is an extrusion of a proprietary 7000-series alloy, with a mil-spec anodized finish. Measuring 1.7" wide and octagonal in cross-section, it extends forward to form the rifle's fore-end, which



## SHOOTING RESULTS (100 YDS.)

.338 LAPUA MAG. CARTRIDGE	VEL. @ 15' (F.P.S.)	ENERGY (FT.-LBS.)	GROUP SIZE IN INCHES		
			SMALLEST	LARGEST	AVERAGE
<b>BLACK HILLS 250-GR. SIERRA MK</b>	2873 AVG. 21 SD	4,583	0.93	1.23	1.10
<b>LAPUA No. GB488 250-GR. SCENAR HPBT</b>	2960 AVG. 18 SD	4,865	0.61	0.84	0.73
<b>LAPUA No. B408 250-GR. LOCK BASE FMJBT</b>	2978 AVG. 19 SD	4,924	0.57	1.03	0.89
<b>RUAG SWISS P TARGET 250-GR. HPBT</b>	2929 AVG. 16 SD		0.61	0.97	0.79
<b>AVERAGE EXTREME SPREAD</b>					0.88
MEASURED AVERAGE VELOCITY FOR 10 ROUNDS FROM A 27" BARREL. RANGE TEMPERATURE: 39° F. HUMIDITY: 44%. ACCURACY FOR FIVE CONSECUTIVE, FIVE-SHOT GROUPS AT 100 YDS. OFF A HARRIS BIPOD AND REAR MONOPOD. ABBREVIATIONS: FMJBT (FULL-METAL-JACKET BOAT-TAIL), HPBT (HOLLOW-POINT BOATTAIL), MK (MATCHKING), SD (STANDARD DEVIATION).					



*The M98B's two-port muzzle brake and fluted, 27" medium-heavy barrel help mitigate the rifle's felt recoil and reduce its overall weight, making it relatively easy to shoot and carry for a .338 Lapua Mag.*

features ventilation holes for barrel cooling. An integral 18.1" Picatinny top rail accommodates the mounting of both long-range optics and night-vision or thermal-imaging devices. Supplied with the rifle are two short rail sections installed on the sides of the upper, which are equipped with flush cups for quick-detachable sling swivels. Under the forward end of the upper is a sling swivel stud for bipod attachment. Threaded holes in the sides and bottom of the upper receiver afford attachment of additional rail sections, and a soon-to-be-released 7"-long upper receiver extension with top rail will provide even more configurational flexibility in mounting optics, bipods and other accessories.

The medium-heavy 27"-long barrel measures 0.875" at the muzzle, and is button-rifled in a six-groove, 1:10" RH twist pattern. Eight deep flutes lighten the tube, which is made of 4150 mil-B-11595 steel, a particularly strong and long-wearing grade that is harder to machine. At the muzzle, a two-port muzzle brake is threaded on and indexed by a hexagonal jam nut.

Like the AR, the barrel features a rear extension that contains the engagement surfaces for the bolt lugs. Direct bolt-to-barrel lockup obviates the need for a heavy steel receiver, while maintaining breeching strength. Moreover, the use of a barrel extension allows more precise headspace control, making barrel replacement quick and easy.

The barrel is installed into the upper receiver from the rear, with the barrel extension seating against a shoulder in the rear of the upper. At the front, the barrel nut threads onto the barrel and clamps against

another shoulder in the forward end of the upper. This system tensions the rear third of the barrel while simultaneously stiffening the fore-end. A barrel lock ring wrench, which will allow quick and easy barrel replacement, will soon be available.

Inside the upper receiver, the rifle's multi-lug bolt rides within two lightweight tubular bolt guides made of a glass-filled polymer infused with Teflon. Both guides enhance bolt travel and reduce the need for lubrication. Additionally, the rear guide, which turns as the bolt is rotated, helps seal the 3.8"-long ejection port and bolt handle slot from the entry of dirt.

The rifle's bolt is of full-diameter design, with the bolt body having the same measurement as the lug circle. The separate bolt head, made of case-hardened 8620 steel, is attached to the bolt body by way of a stout crosspin, and features nine lugs arranged in three banks of three lugs in an interrupted buttress thread pattern. This lug configuration allows the three lugs in each bank to be more closely spaced while maintaining high shear strength in both the bolt lugs and barrel extension. Bolt lift is a handy 60 degrees. Aside from the unusual lug pattern, the rest of the bolt head is fairly conventional, with a 0.16" counterbore, spring-loaded plunger ejector, and a massive 0.45"-wide sliding-plate extractor. The use of a separate bolt head allows simple caliber changes, as well as pre-headspaced barrel and bolt-head sets.

The bolt body proper is a hollowed-out 1.1" tube, with a 0.020"-smaller diameter center section that limits contact with the polymer bolt guide to narrow

## BARRETT MODEL 98B

**MANUFACTURER:** BARRETT FIREARMS MFG., INC. (DEPT. AR), P.O. BOX 1077, MURFREESBORO, TN 37133; (615) 896-2938; WWW.BARRETRIFLES.COM  
**CALIBER:** .338 LAPUA MAG.  
**ACTION TYPE:** BOLT-ACTION, REPEATING CENTER-FIRE RIFLE  
**RECEIVER:** UPPER, 7000-SERIES ALUMINUM EXTRUSION; LOWER, FORGED 7975 ALUMINUM  
**BARREL:** 27", 4150 STEEL, FLUTED  
**RIFLING:** SIX-GROOVE, 1:10" RIGHT-HAND TWIST  
**MAGAZINE:** 10-ROUND POLYMER BOX  
**SIGHTS:** NONE SUPPLIED; INTEGRAL 18.1" PICATINNY RAIL FOR SCOPE MOUNTING  
**TRIGGER:** SINGLE-STAGE, ADJUSTABLE; 2-LB., 4-OZ. PULL  
**STOCK:** LENGTH OF PULL, 13½"; DROP AT HEEL/COMB, 3/8" (CHEEKPIECE FULLY LOWERED)  
**OVERALL LENGTH:** 49¾"  
**WEIGHT:** 12 LBS., 12 OZS. (RIFLE ONLY); 14 LBS., 4 OZS. (WITH BIPOD AND LEUPOLD 4.5-14X 58 MM MK4 SCOPE)  
**ACCESSORIES:** EXTRA MAGAZINE, HARRIS S-BR BIPOD, SLING SWIVELS, MONOPOD, TWO SHORT PICATINNY RAILS, HARD CASE, OWNER'S MANUAL  
**SUGGESTED RETAIL PRICE:** \$4,495

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## BARRETT 98 BRAVO

full-diameter bands at the front and rear. Welded to the rear of the bolt body is a hardened steel ring that contains both the bolt handle, onto which threads a 0.98"-diameter textured polymer bolt knob, and the helical cocking cam, which engages the cocking piece. Firing pin fall is a healthy 0.300", promoting reliable primer ignition. Constructing the bolt of three separate components—bolt head, bolt body and bolt handle ring—allow differential heat-treatment while retaining the strength of a one-piece unit.

The Model 98B's forged 7075 aluminum lower receiver connects to the upper by a removable, 0.250"-diameter steel pivot pin. To the rear of the pin is the magazine well. An ambidextrous magazine latch just forward of the integral trigger guard is pushed forward to drop the gun's 10-round polymer box magazine.

Inside the lower is the rifle's trigger mechanism, which can be taken out as a unit by removing the reversible short-throw thumb safety. Adjustment screws for weight and overtravel are accessible on the front of the unit, and allow pulls of 2 to 4 lbs.

Any type of AR-15/M4 pistol grip can be installed on the lower. To the rear of the pistol grip is the disassembly latch that, when engaged, releases the two receivers, allowing the upper to be pivoted forward. A clever interlock prevents the latch from being fully depressed unless the bolt handle is raised.

The lower receiver terminates in a skeletonized buttstock with a 5/8"-thick Sorbothane buttpad, a saddle-style polymer cheekpiece allowing 3/4" of variance in comb height, and an adjustable monopod. Accessory 1/4"-thick buttpad spacers give up to 2" of additional pull adjustment. Bilateral flush-mounted recesses accommodate the attachment of quick-detachable sling swivels to the butt.

Although the Model 98B is years ahead of its time, new developments are already being planned, including a lighter-weight version with 20" barrel and a folding or collapsible stock.

Barrett Firearms sent a Model 98B to me, along with a Leupold Mark 4 LRT 4.5-14X 58 mm scope, mounted by way of Barrett rings, and a Harris S-BR bipod attached to the fore-end. My first impressions of the rifle were overwhelmingly positive. Not only was it distinctive and businesslike in appearance, but it was also surprisingly lightweight, handling more like a magnum sporter rifle than a tactical rifle in .338 Lapua. Unlike most .338s, the Model 98B can actually be fired comfortably and effectively offhand. Moreover, the rifle balanced just forward of the magazine well, making it easy to carry without a sling.

I used four brands of ammunition to evaluate the Barrett: a 250-gr. Sierra MatchKing load from Black Hills; a Lapua 250-gr. Lock Base FMJBT load; a Lapua 250-gr. Scenar HPBT load; and a 250-gr. HPBT Swiss P Target load from RUAG ([www.ows.ammo.com](http://www.ows.ammo.com)). According to Barrett Firearms, Black Hills' 300-gr. Sierra MK load also works very well in the Model 98B, and is used as the



A swing swivel stud under the fore-end allows for bipod attachment, and threaded holes provide attachment points for additional rails.

company's standard test ammunition.

Range testing was performed using the Harris S-BR bipod attached to the fore-end and, in the rear, both the rifle's integral monopod and a lightweight Red-Tac poly-filled bag, which is popular with tactical shooters. Groups at 100 yds. were excellent, with the best performance being obtained with the Lapua 250-gr. Scenar HPBT match load, which averaged 0.73". Recoil was surprisingly light, and muzzle jump virtually nonexistent—a consequence of the Model 98B's straight-line design. Little effort was required to work the bolt, allowing me to keep on target while cycling the gun, and the 2-lb., 4-oz. trigger allowed every shot to be fired with a controlled break. Stock fit was also good; the standard pull length of 13½" fit my 5'11" frame well, and the cheekpiece, with a little adjustment, put my eye in perfect alignment with the Leupold scope. Although good groups were produced with the Red-Tac bag, best accuracy was realized when I employed the integral monopod. With its micro-adjustable polymer foot, the unit kept the gun rock-steady and made sub-m.o.a. groups rather routine.

Reliability was good, though one magazine tended to bind rounds in the magazine body when loaded to full capacity. This caused the top cartridge to nose-dive when the bolt went forward. Chris Barrett told me this problem had been recognized in early-production magazines, which I had, but that the mold had already been modified to eliminate such issues in the future.

Shooting a .338 Lapua rifle at 100 yds. is all well and good, but it's a bit like driving a Ferrari on a 55-m.p.h. interstate. Thus, I was fortunate to have the opportunity to fire the Model 98B at 1,000 yds.—a more relevant test of its real-world capabilities. To minimize the effects of operator (my) error, the lion's share of the shooting was performed by Tony Gimmellie, a 10-year veteran of the USMC Scout Sniper program

and currently one of the country's top tactical rifle competitors.

Climatic conditions, sadly, didn't cooperate. We had 16 to 21 m.p.h. fishtailing headwinds, as measured on a Kestrel 4000 wind meter, that produced a shivering 21-degree wind chill. As a result, we did not get the sub-m.o.a. groups we felt the gun could produce. Our average accuracy with the various loads was about 1.5 m.o.a., with all of our five-shot groups tight enough to stay well within an 18"-wide NRA D-2 "Bianchi Cup" target. However, given that all shooting was done off bare ground using the Harris bipod and a Red-Tac bag for support, without the benefit of flags or other wind indicators—conditions closely approximating those likely to be encountered by actual military precision shooters—we felt that the M98B and the .338 Lapua test ammunition did pretty well.

Some gun designs appear to be innovative solely for the "innovative" cachet. This is not the case with the Model 98B designers, whose philosophy could be expressed as "innovation with a purpose." Every departure of the new Barrett design from the standard bolt-action rifle pattern was made with a functional objective in mind. As a result, the M98B seems fresh without being flashy, revolutionary without being gratuitously radical.

Innovation does not come cheap, as the Barrett M98B carries a price tag of \$4,495. However, this is not out of line with the suggested retail price of other professional-grade tactical turnbolts in .338 Lapua. And the M98B does a better job of satisfying the USMC's reported criteria for its .338-cal. long-range rifle than just about any current production arm. Regardless of the outcome of the Marine Corps' search, one thing seems certain: the M98B will influence bolt-action designs for years to come. 