



Smith & Wesson's 460XVR

BY AARON CARTER,
Managing Editor

The Story Behind The "Fastest Production Revolver"

Although much has been written about the 460XVR since its 2005 introduction, it's what's missing, the trials and tribulations, that makes the revolver all the more interesting.

Bored with the industry-wide trend of incrementally trumping the competition in both size and performance of big-bore revolvers, Herb Belin, Smith & Wesson's then-handgun product manager, sought to break that pattern while also asserting the firm's standing by designing the "most powerful *production* revolver"—a goal the company handily achieved with the 2003 introduction of the Model 500 in 500 Smith & Wesson Magnum (May 2003, p. 54). But Belin, who's admittedly greedy, wasn't content with that title alone. Like any addict, he craved more. In this case ... speed.

The Cartridge: 460 Smith & Wesson Magnum

From the outset, Belin's purpose for developing the 460 Smith & Wesson Mag. (and the 460XVR platform) was simple: create the fastest *production* revolver. The first step, designing a cartridge to achieve that goal, proved to be no easy endeavor.

Surveying the field of cartridges for which revolvers were manufactured at production levels, the .454 Casull stood out prominently to Belin, again—as loaded by Cor-Bon, the cartridge's muzzle energy levels served as performance minimums in the development of the 500 S&W Mag. More importantly, though, at least in regard to the 460 S&W Mag., were the velocities the .454 Casull achieved to produce those energy levels.

Approaching the Sporting Arms and Ammunition Manufacturers' Institute (SAAMI) maximum average pressure (MAP) of 65,000 p.s.i., Cor-Bon's 265-gr. bonded-core, hollow-point .454 load attained 1725 f.p.s., producing 1,751 ft.-lbs. of energy at the muzzle. Even the 300-gr. jacketed-soft-point round reached 1650 f.p.s., for 1,814 ft.-lbs. of muzzle energy. To earn the title "fastest *production* revolver," Belin needed to exceed the performance of those loads.

Knowing the problems associated with bottleneck cartridges in revolvers, Belin opted for a straight-walled, rimmed case for the new design. He chose to make the cartridge a .45 caliber because, among other reasons, reducing diameter in a straight-walled case would lessen propellant capacity, not to mention negatively

affect external and terminal ballistics and efficiency.

Wanting to take full advantage of the X-frame's (Extra Large Frame) pressure capability and cylinder length, and aware of the velocities achieved from the .454 Casull's 1.383" case when loaded near its MAP, Belin determined the new cartridge required pressures of 60,000 p.s.i. or higher, as well as additional case length—ultimately, 0.417"—for propellant, to achieve his target velocity: 2500 f.p.s. from the 460XVR's 8³/₈" barrel with a 200-gr. bullet. In addition to the velocity requirement, Belin mandated the 460 S&W Mag./460XVR combination produce 1-m.o.a. or better accuracy.

For cartridge development, he employed the services of Cor-Bon and Hornady; however, neither ammunition company communicated with the other during the process. Instead, Belin relayed performance updates between the two. As it turned out, this helped in the development of the cartridge. How? As each company reached a performance plateau and announced such to Belin, he passed the news along, pitting both in a healthy competition to outdo the other. Sneaky, but effective.

According to Mitch Mittelstaedt, then-project manager for Hornady, shortly after the project began the company encountered a major setback. When using Belin's prescribed 200-gr. bullet weight, the propellants initially tested gave less-than-acceptable performance, forcing the company to consider switching



To handle the additional pressures of the 460 S&W Mag., the entire frame and cylinder of 460XVR revolver are heat-treated.

to heavier bullet weights—upward of 360 grs. Of course, this would be counterproductive to the goal for which the cartridge was envisioned. Thankfully, Hornady's powder supplier had a solution—a propellant with the optimal burn rate for the cartridge. With a burn rate slightly faster than Hodgdon H-110 and a tad slower than Accurate Arms No. 9, the undisclosed, non-canister-grade propellant proved to be ideal.

Had Hornady's engineers not had prior experience loading the .454 Casull, the 460 S&W Mag.'s case would have presented another dilemma. With pressures similar to those of the .454 Casull and production-type revolvers using the new cartridge, Mittelstaedt determined the cases needed to be "cold worked" to the brass' limits, which resulted in maximum strength/hardness, as well as better "spring back." Spring back is the case's ability to, under high pressure, expand to the size of the chamber then retract enough for easy extraction. "Soft" brass doesn't "spring back," making extraction difficult.

Further, although the SAAMI-listed MAP for the 460 S&W Mag. is 65,000 p.s.i., the same as the .454 Casull, like the latter, attempting to attain that pressure is impractical. "Keeping the 460 S&W Mag. to around 55,000 to 56,000 p.s.i. makes extraction far easier, and 57,000 p.s.i. is pretty much the practical limit, but extraction becomes difficult," said Mittelstaedt. Interestingly, Hornady's .454 Casull loads average 54,000 to 56,000 p.s.i.

When selecting the primer for use in the 460 S&W Mag., the choice was easy. Because Hornady had used large rifle primers in the development of the 500 S&W Mag., and propellant charges were comparable, from the outset Mittelstaedt knew that the 460 S&W Mag. would also require them.

While Cor-Bon opted for the all-copper Barnes X Pistol Bullet (XPB) for its 200-gr. introductory load, Hornady chose its Super Shock Tip (SST)—both are spitzer profile to achieve a higher ballistic coefficient for better downrange performance. A descendant of the Barnes X-Bullet, the XPB offers similar expansion, penetration and weight-retention characteristics, making it a good choice for the high-performance cartridge. Featuring a heavy jacket and a 3 percent antimony core, the SST was designed specifically to withstand the 460 S&W Mag.'s pressures and velocity and deliver optimal terminal ballistics on big-game animals.

Within six months of the starting the project, Hornady achieved 2200 f.p.s. with a 200-gr. SST bullet, for 2,149 ft.-lbs. of muzzle energy. The company's competition, Cor-Bon, attained 2300 f.p.s. with its 200-gr. DPX load, which produced 2,350 ft.-lbs. of muzzle energy. Although 2500 f.p.s. wasn't achieved by either company with the 8 $\frac{3}{8}$ "-barreled 460XVR, it was close enough even for the demanding Belin. Interestingly, the 10 $\frac{1}{2}$ "-barreled Performance Center Compensated Hunter did surpass the 2500 f.p.s. mark with both loads.



The Platform: 460XVR

"Going into the project, we thought it was going to be a cake walk, having successfully just completed the Model 500," said Belin, recalling the initial development phase of 460XVR (Xtreme Velocity Revolver). To his chagrin, almost immediately a reliability issue arose. "The 460 S&W Mag. would ring the original X-frame like a bell, with the pressures, recoil and harmonics of the cartridge leading to cracked frames," remembered Belin. "Essentially, it was back to the drawing board."

With the X-frame in its original metallurgical composition deemed unsuitable for the 460XVR, Belin and team began experimenting with various grades of stainless steel, as well as other enhancements to further strengthen the revolver. One of them, a firing pin bushing equal in size to the base of the 460 S&W Mag. cartridge, was dismissed when it was found to be counterproductive—it weakened the frame! The engineers then turned to heat-treating the breech face. Eventually, the entire frame and cylinder received the treatment.

Like its Model 500 sibling, in addition to the cylinder locking at the breech face, the 460XVR's frame features an integral lug containing a spring-loaded, ball-shaped plunger that, when aligned with the corresponding recess in the yoke, results in a strong lockup. The cylinder-release latch is traditionally positioned, and the internal lock mechanism—added to all Smith & Wesson revolvers manufactured since 2001-2002—is directly above it. Using the provided key—two are included—one needs only rotate counterclockwise 90 degrees to lock the hammer. A flag inscribed "Locked" appears alongside the hammer, confirming the gun's condition. Reversing the process readies the 460XVR to fire.

The 460XVR's 2.30"-long stainless steel cylinder is 1.920" in diameter, has five chambers and features five shallow, two-thirds-length flutes. Each chamber is separated by nearly 1/4" of steel, no doubt needed to contain the cartridge's immense pressures, and 72 degrees of rotation indexes the cylinder. Interestingly, loads utilizing spitzer-profile bullets occupy nearly

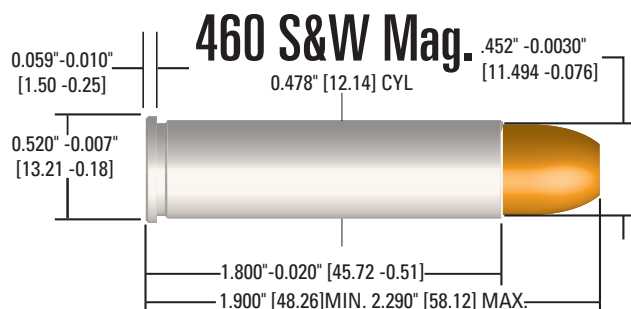
SHOOTING RESULTS (50 YDS.)

460 S&W MAG. CARTRIDGE	MUZZLE VEL. (F.P.S.)	ENERGY (FT.-LBS.)	GROUP SIZE IN INCHES SMALLEST LARGEST AVERAGE		
COR-BON No. HT460SW200 200-GR. DPX	2308 Avg. 17 SD	2,367	0.67	1.55	1.20
FEDERAL No. F460FS1 260-GR. FUSION	1697 Avg. 39 SD	1,662	1.80	2.42	2.00
FEDERAL No. P460XB1 275-GR. BARNES EXPANDER	1881 Avg. 12 SD	2,161	0.67	1.43	1.02
HORNADY No. 9152 200-GR. SST	2265 Avg. 61 SD	2,280	0.92	1.80	1.45
WINCHESTER RR No. X460SW 250-GR. JHP	1528 Avg. 50 SD	1,296	0.67	2.05	1.57
AVERAGE EXTREME SPREAD					1.45

MEASURED AVERAGE VELOCITY FOR 10 ROUNDS FROM AN 8 $\frac{3}{8}$ " BARREL WITH AN OEHLER MODEL 43 CHRONOGRAPH. RANGE TEMPERATURE: 56° F. HUMIDITY 21%. ACCURACY FOR FIVE CONSECUTIVE, FIVE-SHOT GROUPS AT 50 YDS. FROM A SHOOTER'S RIDGE BENCH REST SHOOTING BAG. ABBREVIATIONS: DPX (DEEP PENETRATING X); JHP (JACKETED HOLLOW POINT); RR (REDUCED RECOIL); SD (STANDARD DEVIATION); SST (SUPER SHOCK TIP).

SMITH & WESSON 460XVR

MANUFACTURER: SMITH & WESSON (DEPT. AR), 2100 ROOSEVELT AVE., SPRINGFIELD, MA 01104; (800) 331-0852; WWW.SMITH-WESSON.COM
CALIBER: 460 S&W MAG.
ACTION TYPE: DOUBLE-ACTION/
 SINGLE-ACTION CENTER-FIRE REVOLVER
FRAME: X-FRAME, STAINLESS STEEL
BARREL: 8 $\frac{3}{8}$ ", SHROUDED STAINLESS STEEL
RIFLING: FIVE-GROOVE, GAIN-TWIST (1:100" TO 1:20")
CYLINDER CAPACITY: FIVE
SIGHTS: INTERCHANGEABLE BLACK BLADE WITH GOLD BEAD/GREEN FIBER-OPTIC HI-VIZ FRONT; BLACK WINDAGE- AND ELEVATION-ADJUSTABLE SQUARE-NOTCH REAR; DRILLED AND TAPPED FOR SCOPE BASES
TRIGGER PULL: DOUBLE-ACTION, 12 LBS., 4 OZS.; SINGLE-ACTION, 4 LBS.
OVERALL LENGTH: 15"
WIDTH: 1 $\frac{5}{16}$ "
HEIGHT: 6"
WEIGHT: 72.5 OZS.
ACCESSORIES: BLUE HARD CASE, MANUAL, LEAD BULLET COMPENSATOR, TWO KEYS FOR INTERNAL LOCK MECHANISM, CABLE LOCK
SUGGESTED RETAIL PRICE: \$1,446



Although the X-frame (far l.) is larger than its N-frame predecessor, the grip dimensions match those of the K- and L-frame revolvers and the 460XVR's topstrap is drilled and tapped for mounting an optic (inset, l.). Like all of the company's other currently manufactured revolvers, the 460XVR has an internal lock mechanism (inset, r.), and each gun comes with two keys.

the entire length of the cylinder. As discovered early in the process, extraction with minimal effort required that the chambers be highly polished.

As for the 460XVR's shrouded barrel, Belin chose a length of 8 $\frac{3}{8}$ " (with compensator). Why? First, S&W's in-house equipment at the time dictated length not exceed 8 $\frac{3}{8}$ ". Secondly, Belin was well aware of the Performance Center's intention to introduce a 10"-plus-barreled version of the 460XVR. Finally, although built on the massive X-frame, Belin wanted the 460XVR to maintain handgun-like qualities, not becoming overly long or heavy, thereby hampering sales to hunters.

Instead of traditional rifling, which maintains a consistent twist rate for the barrel's entire length, gain-twist—a.k.a. variable-twist—rifling was chosen for the 460XVR. Gain-twist rifling, which Belin likened to an automobile's transmission, allows the bullet to gradually, albeit in a relatively short distance, quicken in rotation for sufficient stability. Why is this necessary?

According to Belin, "Upon initial contact with rapid-twist rifling, a bullet's tendency is to skid, not immediately take to the rifling. This skidding not only deforms the projectile to an extent, but consumes energy that could be used to reach higher velocities. So, the bullet needs to be eased into the rifling. Further, unlike rifles,

which typically have 16" to 26" barrels to achieve high velocities, the 460XVR has less than half that length to accomplish the same goal. Essentially, it's zero f.p.s. to 2300 f.p.s. in 8 $\frac{3}{8}$ ". It's a violent process, and extremely hard on bullets."

Immediately after the forcing cone, the Electrical Discharge Machining (EDM)-produced rifling begins with a subtle, 1:100"-rate of twist; however, it rapidly progresses to 1:20"—sufficient to stabilize even the heaviest .451"- .452"-projectiles—just shy of the compensator. The breech end of the barrel—behind the forcing cone—is highly polished to enhance longevity.

The hodgepodge of 460 S&W Mag. ammunition available, as well as that of the other compatible .45-cal. cartridges it readily digests, demands that the 460XVR have a barrel shroud with an interchangeable compensator system. Through extensive testing, Smith & Wesson engineers discovered that repeated firing of lead and hard-cast lead bullets through the jacketed-projectile compensator—which has six round ports in its top in addition to an equal number of oblong ones on the sides—effectively locked, or as Belin put it, "welded," it in place, preventing future removal. Accordingly, the 460XVR comes with two compensators—one jacketed-specific and one for lead bullets—though the latter

could be used with jacketed bullets as well.

Switching compensators, or removing them for cleaning, is easy. One can simply insert the provided 2.5 mm hex wrench in the screw head underneath the compensator and rotate clockwise two to three turns. The compensator can then be rotated left or right one-quarter turn, allowing it to be removed.

Topping the 460XVR's barrel are a black, blade-type Hi-Viz front sight fitted with a green fiber-optic strand, and a windage- and elevation-adjustable black rear sight. For those who prefer a traditional-style front sight fitted with a gold bead, one is included with 460XVR and can be easily changed. Removing the rear sight reveals three drilled and tapped holes—only one of which secures the rear sight—for the addition of a scope base.

"Although revolvers continually increase in size, the human hand doesn't, so why make the frame dimensions larger?" asked Belin before explaining his choice of grip area size for the X-frame. "Rather than make the X-frame's grip area larger than that of the N-frame's, which is already too large for many shooters, I chose the company's most comfortable, shooter-friendly size, and that's found on the K- and L-frames."

To further aid comfort and purchase, the X-frame features a rubber Hogue Monogrip with molded-in finger impressions and bumps, as well as a slight palm swell. For additional comfort, beneath the surface, where the web between the trigger finger resides, is a visco-elastic polymer pad.

Shooting The 460XVR

Although 460XVR attained the title "fastest *production* revolver," it was only through the use of full-power ammunition. These loads produce stout recoil and, when combined with the 460XVR's compensator, significant noise—both ear plugs and muffs are recommended, and indoor ranges are best avoided. These undesirable characteristics intimidate most shooters into bad shooting habits, such as flinching, or complete avoidance of the handgun—banishing it to the gun safe. Only through consistent practice, which builds confidence and familiarity, will a shooter become proficient with full-strength 460 S&W Mag. ammunition.

Because the 460 S&W Mag. is essentially a lengthened .454 Casull, cartridges suitable for use in a .454-chambered handgun, including the Casull itself, can be used in the 460XVR. So, the revolver can safely chamber four cartridges: 460 S&W Mag., .454 Casull, .45 Colt and .45 S&W Schofield. This allows the shooter to increase cartridge power, one level at a time, until he or she is comfortable with full-power loads, if so desired. This level of versatility in a revolver—the ability to handle four or more cartridges interchangeably—is duplicated only by the .327 Federal Mag. and the .445 Super Mag.


The lower-recoil loads are beneficial in that they afford the shooter an opportunity to practice proper

grip and trigger control without the abuse dealt out by full-power 460 S&W Mag. ammunition. Although the amount of freebore present will certainly affect accuracy, it is of little concern, as above all else the intent of the loads—particularly .45 S&W Schofield and .45 Colt—is to build familiarity with the 460XVR, not shoot tight groups. Of course, when using the shorter rounds, and especially those with lead projectiles, the shooter must be diligent in removing lead fouling that collects in the chambers.

After mastering technique, the shooter can move up in power; however, reduced-recoil 460 S&W Mag. or full-strength .454 Casull loads are more than sufficient for the majority of hunting, unless personal safety or distance are factors. For large game—such as elk or moose—dangerous animals and shooting at long ranges, the full-power loads are the best choices. These produce the desirable blend of high energy and flat trajectory. For example, with a 100-yd. zero and a 2308 f.p.s. muzzle velocity—for 2,367 ft.-lbs. of energy—as loaded by Cor-Bon, the 200-gr. Barnes XPB drops 2.92" at 150 yds. and 9.23" at 200 yds. With a 125-yd. zero the bullet impacts 0.87" high at 100 yds., 1.61" low at 150 and 7.79" low at 200 yds. With the proper zero, no hold-over is required for big-game out to 200 yds.

Although the 460 S&W Mag./460XVR combination is capable of clean kills in excess of 200 yds., only the accomplished handgun shooter should attempt such shots. For most, the 460XVR's potential far exceeds that of the shooter; so, know your limitations.

Certainly speed, flat trajectory and impressive energy are appealing, but there's another aspect that's equally important: accuracy. The 460 S&W Mag./460XVR combination, topped with a Leupold VX-III 2.5-8X 32 mm handgun scope, produced respectable accuracy, though I couldn't achieve 1-m.o.a. or better groups. Shooting from the prone position, with the frame resting atop a Shooter's Ridge Bench Rest Shooting Bag, at 50 yds. the best groups were produced by Federal's 275-gr. Barnes XPB load, averaging 1.02" for five consecutive, five-shot groups. Not far behind, though, was Cor-Bon's 200-gr. XPB load, which averaged 1.20". Winchester's Super-X Reduced-Recoil 460 S&W Mag. loads were particularly enjoyable to shoot, not to mention reasonably accurate, averaging 1.57". After shooting for accuracy, I spent some time sending .454 Casull, .45 Colt and .45 S&W Schofield loads downrange at Champion DuraSeal spinner targets. These loads are a pleasure to shoot through the 91.1-oz. scoped 460XVR.

Generally, greed and addiction are considered bad things. But, satiating his craving for speed in attempting to earn another title resulted in Belin developing the 460XVR chambered in the new 460 S&W Mag. In doing so, he not only created a revolver unequaled in velocity, but one that's incredibly versatile. One can only wonder where his cravings will take him next ... 

460 S&W Mag. Options

Although the 8 $\frac{3}{4}$ "-barreled 460XVR is the quintessential 460 S&W Mag-chambered revolver, Smith & Wesson has several other offerings in the cartridge, including options in kit form.

The Model 460V, the "V" representing Roman numeral five and denoting the model's 5" barrel, shares many features with the XVR, with the exceptions being overall length (11 $\frac{1}{4}$ "), weight (62.5 ozs.) and sights. The 460V has a black ramp front sight with a red, plastic insert and a fully adjustable, white-outline rear sight (two included).

The *crème de la crème* of the 460 S&W Mag.-chambered revolvers are the 460XVR Compensated Hunter and the 460XVR Hunter, available only through the company's Performance Center. The 460XVR Compensated Hunter has a custom, 10" Lothar-Walther barrel featuring polished, button rifling and ending with a 360-degree compensator. Additionally, it has an integral Weaver-style base, precise barrel/cylinder gap, tuned PC action, flash-chromed hammer and trigger, a traditional pinned sear and Hogue Dual-Density Monogrip. The 460XVR Compensated Hunter's sights mimic those of the standard 460XVR, and the handgun comes with a gun rug and a shoulder sling. Overall length is 18" and weight is 82.5 ozs. The 460XVR Hunter has similar features, except for a 12"-non-compensated barrel and 80.0-oz. weight.

Smith & Wesson has two options in kit form: the 460 OD Green Carry Combo and the 460ES (Emergency Survival). Included in the 460 OD Green Carry Combo is a 5"-barreled revolver—essentially the 460V with an OD Green Hogue Grip—in 460 S&W Mag., a DeSantis Green Digital Camo holster and a matching ammo carrier, all contained within an OD Green, Smith & Wesson gun box. The 460ES features a 2 $\frac{3}{4}$ "-barreled 460XVR, along with a host of survival gear, in a waterproof Storm case.

—AARON CARTER, MANAGING EDITOR




"From the very first gun that I got out of that barn, I've used the longrifle as a mainstay for hunting, especially for small game. I love to squirrel hunt," Hershel said. "But we sure enjoy the guns, and we carry them and use them. And I think being real familiar with the guns and how they were used has helped me make a really nice gun that would fit a hunter or someone who would get it out there and use it. And that's who we really enjoy building rifles for, is people who use them."

But there's something far greater to what the House brothers have. It's not their love of hunting or passion for shooting. It's not even the mastery of skills most of us could only dream to attain. In the case of the Kentucky longrifle, it's not the art they hold dearest, but the canvas itself.

"[The longrifle] was hugely instrumental in winning our independence twice," Frank said. "Not once, but twice. Not only in the Revolutionary War



but also in the War of 1812. [It] also was what secured the whole Texas territory in the war against Mexico. ... [It] is also symbolic of the American spirit, the American's willingness to defend his home, to defend himself against oppression and tyranny, and unjust government practices. It symbolizes and embodies the whole concept of the American spirit in this one individual item. There's nothing else in America that symbolizes that quite like the Kentucky rifle."

In what might prove their crown jewel, this House Brothers rifle is a landmark accomplishment in the world of contemporary longrifles. Unique in every way, it is just like the brothers themselves. 

The House rifle and a period-style knife, tomahawk and powder horn, exemplify the collaborative efforts of Contemporary Longrifle Ass'n artisans who create modern art related to this distinctively American frontier form.

