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THE INFAMOUS .44 MAGNUM

RELOADER'S PRESS by Dave Scovill

When .44 Magnum handguns came up in a conversation recently, it occurred to me that I had no idea where I was or what I was doing when it came out in 1956. Apparently I was oblivious to it, although I must have read something about it in a gun or hunting-related publication by the late 1960s, because it wasn't a surprise to hear about it from Clarence Beeley, a gunsmith in Eugene, Oregon, shortly before I went on active duty with the U.S. Navy in late 1967. At that, I don't remember ever seeing a Smith & Wesson or Ruger Blackhawk .44 Magnum until I mustered out of the navy, although I would've had to be blind not to notice all the glamorous sto-

ries about those sixguns in various gun publications.

Of course, all the stories were pretty much the same, reciting how the .44 Magnum was the brainchild of Elmer Keith, who along with the ".44 Associates," had been loading the S&W .44 Special with heavy charges of Hercules 2400 under a Keith-type Lyman No. 429421 250-grain cast semiwadcutter at upward of 1,200 fps in those older S&W Triple Locks, every .44 Special N-frame that followed it and pre-World War II Colt Single Actions.

We were also advised how the S&W .44 Special evolved from the most accurate big-bore cartridge to come down the pike, the .44 Russian that was .10 inch shorter than the .44 Special case but used the same 246-grain roundnose lead bullet. That was followed by some gobbledygook about how the .44 Special was originally loaded with some new smokeless powder that bulked up so much it required the use of a .10-inch longer case. No one seemed to know the name of the new mystery powder, but it was, nonetheless, one of the standard talking points in any discussion about the history of the .44s.

At any rate, sometime in the early 1970s a Hawes Western Marshal .44 Magnum with a 6.5-inch barrel showed up on a table at a local gun show, and I took the big .44 home. While the frame of the Hawes was/is a bit larger than a Colt SAA, it handled well enough and seemed to shoot where the sights were pointed. I was shooting a Smith & Wesson Second Model Hand Ejector .44 Target at the time, and the same .44 Special loads used in the S&W, 13.5 grains of 2400 with the Markell cast bullet copy of the Lyman/Keith bullet, were initially used in the Hawes.

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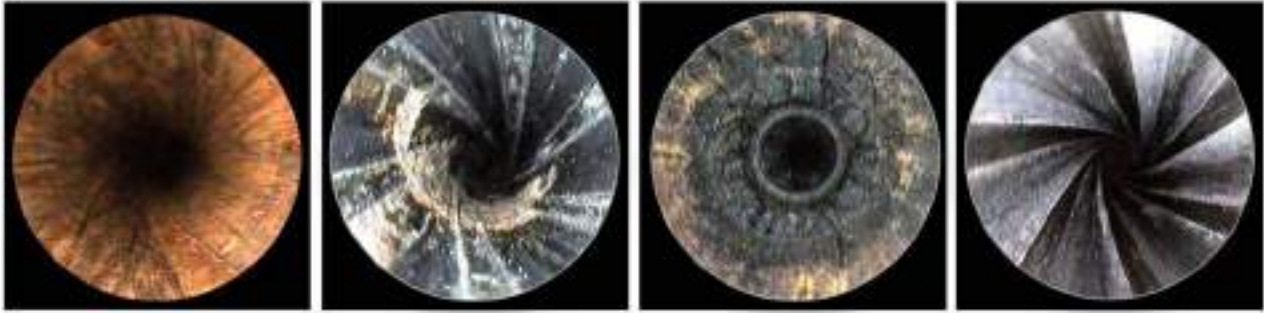


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The Clint Eastwood film *Dirty Harry* came out in late 1971 and was still burning in the minds of some who lusted after the “most powerful handgun in the world,” and you couldn’t find a box of .44 Magnum factory loads or a Smith & Wesson Model 29 anywhere for sale in the country. Ditto for the Ruger .44s. So the logical solution, it seemed, was to work up to Elmer Keith’s load using 16.5 to 17.5 grains of 2400 with the Markell cast bullets in .44 Special cases for the Hawes, and make sure none of those bullets were fired in the old, circa 1916, Second Model, although some handgun experts of the day seemed to think that practice was acceptable.

Well, the inevitable finally happened, and one of the Keith loads found its way into the Second Model. My first reaction to the shot was to look at the gun, to see if all the parts were still attached. They were, and it immediately became standard practice to never stuff .44 S&W Special cases with such

a load again. The problem was I still didn’t have any .44 Magnum brass or factory loads.

Perusing local sporting goods stores and gun shows from the Columbia River to the north and the Oregon/California border to the south, Smith & Wesson .44 Magnums and ammunition remained

illusive for quite some time. I did, however, locate a few boxes of .44 S&W Special factory loads and the occasional box of .44 Russian that apparently had become obsolete almost overnight, but which, prior to the advent of the .44 Magnum, had been somewhat popular target and plinking loads in Smith



The popularity of the Smith & Wesson Model 29 and 629 .44 Magnum has benefited from a long list of factory loads, like the more recent Winchester Razor Back and handloads with a variety of cast bullet designs, such as the Lyman/Keith semiwadcutter. After-market features include Pachmayr presentation stocks and Mag-na-ported barrel to help control recoil with heavy loads.



A five-shot Smith & Wesson Mountain Lite (Air Lite Ti) provides security for Dave's wife, Roberta, at home or on the road with CCI Blazer 200-grain Gold Dot hollowpoint loads.



This stainless steel Smith & Wesson Model 629-2 preceded the Mountain Gun by a couple of years. Carried in a holster or back pocket, it provides a fine everyday companion with a variety of factory loads or handloads.

& Wesson and Colt .44 Specials or relatively rare .44 Russian revolvers. In the meantime, I wound up shooting a lot of .44 Special loads in the Hawes and found it to be capable of excellent accuracy, easily the equal of the Smith & Wesson Second Model Target and later a Colt SAA .44 Special.

While I was basically stuck with the .44 Special and a couple of other sixguns chambered for the .38 Special and .45 Colt, I was more interested in the Special than the Magnum and eventually acquired a few Smith & Wesson reference books, two of which stated that the .44 Special was

originally loaded with 26 grains of black powder – no mention of any bulky smokeless powder. That left Julian Hatcher as the only source known to me at the time that cited the bulky smokeless load that made it necessary to lengthen the .44 Russian case.

Ironically, while research on the .44 Special failed to shed any light on the name of the bulky smokeless powder Hatcher was referring to, it was information provided by Phil Sharpe on page 172 of his *Complete Guide to Handloading* (1937) regarding the development of the 1909 .45 Colt military load that finally shed some light on the matter.

As it turned out, around 1906 or shortly before, automatic loading machines at the government arsenal were dropping an occasional double charge in .45 Colt loads (roughly 12 grains of Bullseye). The result was a wrecked revolver. So the military was looking for a powder that would be bulky enough to prevent a double charge. The solution was based on Schultz shotgun powder dubbed RSQ that would overflow the case in the event of a double charge, but even if the bullet was seated, it wouldn't blow the gun up upon the first firing but might crack it open with the second shot in the same chamber. Either way, the blowup was not nearly so violent as that caused by a double charge of Bullseye.

The first use of RSQ was in the Model 1906 .45 Colt experimental

cartridge and afterward in the Model 1909 .45 Colt, in which it replaced Bullseye. While it would appear that Hatcher was aware of the search to find a bulky smokeless powder to replace Bullseye, which was probably RSQ, he may not have been aware that it was not available to the civilian market until 1909, five years after the .44 S&W Special went public, and was discontinued in 1911.

Eventually, I received a phone call from a friend who worked in a local sporting goods store advising he had just received a couple boxes of Remington .44 Magnum loads. Within an hour of leaving the store with a 50-round box of factory loads, I was out on nearby BLM land and touched off the first round in the Hawes.

Compared to the .44 Special loads I had been shooting for quite some time, the Remington factory loads were, well . . . shocking. My first thought was to wonder how they could harness that kind of power in a handgun. The fireball that erupted from the muzzle of the 6.5-inch Hawes barrel in the evening shade was almost blinding, and recoil . . . simply awe inspiring. It was about like touching off that one shot of 17.5 grains of 2400 with the 250-grain Keith-type cast semiwadcutter in the relatively lightweight Smith & Wesson Second Model .44 Special Target with factory stocks, nasty but controllable.

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ington .44 Magnum factory loads taught me that if there are any discrepancies in shooting technique, they will show up almost immediately, especially in the plow-handled Hawes. So it took a while to get used to handling the revolver consistently and properly while shooting. Beyond that, it soon became easy enough to handle, but since it wasn't legal

to hunt big game with handguns in most states in those days, I adopted the Lyman No. 429421 cast bullet seated over 20 grains of 2400 at roughly 1,200 fps. This was about the same as Elmer Keith's heavier load in a 4-inch barrel, according to the Lyman manual on hand, and was nearly perfect for regular use when hunting varmints or small game.

While it seemed every gun writer in the business was fawning over the .44 Magnum, it appeared that most folks who were lucky enough to latch on to one decided, like I did, that all the power wasn't really necessary for knocking around in the woods and decided to tame it down with handloads. That also produced a shortage of

(Continued on page 67)



Left, the Smith & Wesson New Century (aka Triple Lock) was introduced with the .44 S&W Special in 1906/07. Popular factory loads included (left to right): the 246-grain lead bullet, metal-capped lead bullet and wadcutter target loads. Handloaders preferred the 245-grain Lyman/Keith case semiwadcutter. Below, the Colt New Service .44 Russian Target Model set several world target records in the early 1900s, none of which were surpassed by the .44 Special.





BULLET PULLERS: WHICH TO USE?

PRACTICAL HANDLOADING by Rick Jamison

A bullet puller comes in handy if you find a better load and want to reload previously assembled rounds, or to check whether you put powder in a case simply to make sure; a bullet puller reveals the answer. You might want to pull bullets and replace them with another type. Whatever the reason, a bullet puller is almost a necessity on every loading bench. Depending on the situation, a specific type of bullet puller might be more convenient, or even necessary, over another type. There are basically three types of pullers commonly in use: the inertia puller, the collet puller and the plier-type puller.

The inertia puller uses the weight of a bullet in a hammering motion to “pull itself.” This puller resembles a hammer with a cartridge inserted inside a hollow, impact-resistant plastic head and is held fast by the cartridge’s rim, usually in a three-piece universal shellholder with the parts held together by an encircling rubber O-ring or wire spring. A cap is screwed onto the hammer head to secure the shellholder and cartridge. With the cartridge inserted, sharp, hammering blows pull the bullet from the cartridge. An inertia puller can be convenient for pulling the bullet off a single round. It is a universal type of puller in that it does not require a specific part for a given cartridge, and it works well with heavy bullets. The heavier the bullet, the better it works. It can be difficult to remove a lightweight, .17-caliber bullet for example, because the inertia is lacking. However, for a bullet that is crimped on the ogive or close to the ogive, an inertia puller may be the only way to remove it easily because the bullet does not have to be gripped.

After a bullet is pulled, the powder and bullet are contained within the hollow plastic, so the cap must be unscrewed and the powder and bullet separated. For this reason, the inertia puller is relatively slow to use. Also, this type of puller is noisy due to hammer-



A (1) new Hornady .224-inch V-MAX was used as a control bullet to show the gripping damage caused by an (2) inertia puller, a (3) collet puller and a (4) bullet pulled with pliers.

ing on a hard surface. An inertia puller is used completely separate from a loading press, so any loading die or process does not have to be interrupted to pull a bullet from a single round. In addition, an inertia puller does not deform a bullet’s sides like other types of gripping pullers.

Instead of using the case rim gripper supplied with an inertia puller, it can be replaced with a standard shellholder, which does not come apart when the retaining band becomes weak on the three-piece retainer. However, if heavy pounding is required when pulling a lightweight bullet, a case rim is more likely to be damaged with a standard shellholder.

The second type, a collet puller, is used in a loading press. It has a die body with standard $\frac{7}{8} \times 14$ die threads and is threaded into a loading press. A collet or sleeve with slits allows the lower end of the sleeve to be squeezed tighter by turning a lever on top of the die. This forces the collet into a tapered

.223 Remington Bullet Puller Accuracy Test

puller (type)	bullet (grains)	powder	charge (grains)	group size (inches)	muzzle velocity (fps)	100-yard velocity (fps)	ballistic coefficient (G1)
Control bullet (factory new)	55 Hornady V-MAX	TAC	26.0	1.5	3,192	2,830	.251
Inertia				1.4	3,206	2,841	.250
Collet				1.2	3,176	2,818	.253
Plier				8.9	3,197	2,766	.212

Notes: A Howa .223 Remington with a Wiseman 24-inch barrel and 1:8 rifling twist was used to test all loads. CCI 400 primers and R-P brass were used throughout. Overall loaded length: 2.250 inches. This chart represents a 10-shot, 100-yard string from a machine rest. An Oehler Model 43 PBL with acoustic targets was used to measure group size and ballistic coefficient based on measured muzzle velocity and time of flight.

For more data on this cartridge please visit LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

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housing, reducing the circumference at the lower end and tightening around a bullet. A separate collet size is necessary for each bullet diameter. A cartridge is placed in the press shellholder, the ram is raised to insert the loaded bullet into the collet, the collet is tightened, and then lowering the ram pulls the case off the bullet.

A collet puller is great for pulling bullets from a lot of rounds. It is fast to use once set up. When adjusted, the top lever needs to be moved only a partial turn to grip or release a bullet. When pulled, the bullet is separated from the powder. The powder is contained within the upright case for convenient dumping into a container.

A collet puller does not work well when a bullet is crimped on an ogive, or near it, as is the situation with many pistol cartridges. The reason is that the collet needs a straight section of bullet for gripping. However, since this type of puller does not rely on inertia, it works well for lightweight bullets as well as heavy ones. As long as the collet-tightening force is controlled, bullet deformation is minimal.

The third bullet puller, the one I call the “plier type,” somewhat resembles a pair of pliers. Rather than having the pivot point between the gripping handles and the jaws, however, this puller has the pivot point at the extreme end away from the handles.



A plier-type bullet puller is used with a press.



Once the collet is adjusted, a collet-type bullet puller requires only a short movement of the collet lever.

Advantages and Disadvantages

INERTIA PULLER

Use when a bullet needs to be pulled from a single round and you prefer not to remove the die. Use on a bullet that is seated with the case mouth on or very near the ogive.

ADVANTAGES

- Convenient and quick
- Does not require a press
- Does not require dies to be removed from press
- Does not require a straight section of bullet to be exposed for pulling
- Minimal bullet deformation
- Not caliber-specific

DISADVANTAGES

- Does not work well with lightweight bullets
- Noisy
- Bullet and powder are mixed during pulling
- Shellholder tends to come apart when rubber or spring weakens
- Slow process

COLLET PULLER

Use when several bullets need to be pulled.

ADVANTAGES

- Fast to use for a whole series of bullet pulling
- Powder remains contained in case
- Reduced bullet deformation
- Cartridge and bullet are held square for straight bullet pull

DISADVANTAGES

- Requires specific collet for each caliber
- Cannot pull a bullet that is crimped on or near the ogive
- Can deform a bullet if excessive force is required
- Must install puller in press and adjust

PLIER-TYPE PULLER

Use when a bullet or two needs to be pulled and damaging bullets or case necks isn't important.

ADVANTAGES

- Quick to use
- No special tooling or die installation
- One plier works for several calibers

DISADVANTAGES

- Limited pulling cavities; multiple pliers are required for all calibers
- Can deform a bullet if excessive force is required
- Cannot pull a bullet that is crimped on or near the ogive
- Pull is not precisely straight



These case rims illustrate what can happen when a conventional shellholder is used in an inertia puller to grip a case rim when lightweight bullets are being pulled. The rim is completely broken off on the left and partially broken off on the right.



A conventional shellholder (left) is shown with an inertia puller shellholder (right). Either can be used in an inertia bullet puller.

There are a series of cavities of different circumferences with half of each cavity in each side of the plier handles. In use, a cartridge is placed in a press shellholder, then the ram is raised until the bullet extends through the die receptacle in the press. The bullet is then gripped with the plier-like device using the cavity size appropriate for the diameter of the bullet being pulled. The press ram is then lowered to extract the projectile. This type of puller needs a straight section of bullet for gripping like the collet puller. It cannot grip a bullet on the ogive. Also, since it requires the gripping motion applied with a user's hands, a bullet can be deformed with this type of puller. Its use requires enough gripping force to keep the bullet from slipping while being pulled, but not too much grip force so as to deform the bullet. With practice, the correct pressure is usually determined. This puller does require a press, and a die cannot be installed in the press when the puller is used.

Bullets are expensive and once pulled, a handloader may still want to shoot them. So how does bullet pulling affect accuracy? It depends. I once ran tests using tough bullets designed for big game with a lot of straight section extending from case mouths for gripping. The result was that bullets pulled with all three systems shot well. None of the bullets had been visually damaged to any appreciable extent.

However, it is true that either

the collet puller or the plier-type puller can deform a soft bullet, such as a varmint bullet, when pulling. So how much does this deformation affect accuracy? Thin-jacket and soft lead-core varmint bullets are the easiest and most likely to be deformed, so I chose those for a recent test. I loaded, pulled, and then fired Hornady 55-grain V-MAX bullets from .22-250 Remington cartridges. When these bullets are seated to SAAMI overall length specifications, there is almost no straight section of the bullet remaining above the case mouth. This makes them very difficult to pull with a plier-type puller, and the bullets were notably deformed when pulling with this device. I pulled 10 of them, and also 10 each with a collet puller and an inertia puller. The inertia puller left almost no marks on bullets, while the collet puller deformed bullets slightly.

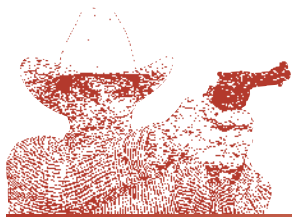
The bullets were reloaded into four batches of .223 Remington cartridges. There were 10 rounds each for the collet, plier and inertia pullers, and another 10 rounds as a control batch using factory-new component bullets. The Hornady 55-grain V-MAX load contained 26.0 grains of TAC propellant with an overall loaded length of 2.250 inches. I then fired a 10-shot string of each batch at 100 yards to see how pulling devices affect accuracy. The results are spelled out in the accompanying table. In summary, the plier-pulled bullets were the only ones affected significantly. They were severely deformed and the results are not surprising. ●

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POWER PISTOL FOR THE .357 AND .44 MAGNUMS

BULLETS & BRASS by Brian Pearce

Q: You often use (and speak highly of) Alliant Power Pistol powder in many of your revolver loads such as .38 Special, .44 Special and .45 Colt. I purchased a quantity of powder and have been very pleased with your data for those cartridges. However, I have not seen you list many loads in .357 Magnum and .44 Magnum using this powder. Can you give me maximum powder charges with the Speer 158-grain Gold Dot HP and Nosler 240-grain JHP bullets in those two cartridges?

- J.J., via e-mail

A: Alliant Power Pistol is a medium burn-rate pistol powder. It thrives when loaded with standard weight bullets (for caliber) and at moderate pressures that typically fall within 12,000 to 20,000 psi. When loaded to magnum-pressure levels that typically reach 35,000 to 36,000 psi, pressure curves can become rather sharp, so maximum loads should be approached with caution.

Using the Speer 158-grain Deep Curl (formerly Gold Dot HP) .357 Magnum bullet, begin with 8.0 grains and work up to a maximum charge of 9.0 grains, which produced 1,259 fps from a Ruger



Loads for the .357 and .44 Magnum containing Alliant Power Pistol require caution when approaching maximum powder charges.

GP100 with a 6-inch barrel. These loads were assembled in Starline cases with CCI 500 primers. It is very important to use a standard, nonmagnum primer or pressures will increase substantially.

Using the 240-grain Nosler JHP bullet in the .44 Magnum, start with 11.0 grains and work up to a maximum load of 12.5 grains that produced 1,210 fps from a Ruger New Model Blackhawk Bisley with 5.5-inch barrel. These loads were assembled in Starline cases with CCI 300 Large Pistol primers. Again, do not use

a magnum primer or pressures will increase substantially.

.308 MARLIN EXPRESS DEER LOADS

Q: I am one of the lucky few that have a Marlin 308 MX levergun chambered in the .308 Marlin Express. It has the 22-inch barrel and with Hornady factory loads containing the 160-grain FTX bullet, actual velocity is just under 2,600 fps. I have a 2.8-8x 32mm Leupold VX-3 scope on it and it will regularly stay inside 1-inch at 100-yards. I have taken several Missouri whitetail deer with it, each with a single shot.

I would like to duplicate the factory loads; however, the data that I obtained is falling considerably short, as it is only pushing the Hornady 160-grain FTX bullet to 2,300 fps and is showing signs of nearing maximum pressure. Can you make suggestions as to powder choice and charge weight?

Thanks in advance. I always learn from your articles and find your data to perform exactly as you state.

- V.H., Dallas, TX

A: Using the Hornady 160-grain FTX bullet, start with 41.0 grains

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Hodgdon LEVERevolution can be used to duplicate factory load velocities in the .308 Marlin Express.

of Hodgdon LEVERevolution powder and work to no more than 43.5 grains maximum. The above loads were developed in Hornady cases with Winchester Large Rifle primers. The 41.0-grain charge

will develop around 2,400 fps while the 43.5-grain load will reach 2,600 fps.

Incidentally, I would suggest performing the seating and crimping steps as separate operations.

.338 WINCHESTER MAGNUM

Q: About 20 years ago I purchased a large quantity of Federal's Premium High Energy .338 Winchester Magnum ammunition containing a Nosler 225-grain Partition bullet that was advertised to reach over 2,900 fps. In my Winchester Model 70, that load would cut cloverleaf-size groups. I used it on many hunts, including African plains game, moose, bear and other tough, thin-skinned game. It worked very well, but unfortunately that load is no longer available from Federal. I do won-

der why they discontinued it, as it worked flawlessly in my gun. Do you have any thoughts on this matter?

In those days I did not hand-load, but today I do and very much enjoy it. I would like to achieve the same velocity with the Nosler 225-grain bullet with my hand-loaded ammunition, but no one lists any data that approaches those velocities. Can you offer a formula that will allow me to duplicate it? I have asked this same question to two powder compa-



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nies and they do not have any powder or data that will allow me to duplicate those loads. You are my last hope. Any information that you can provide will be greatly appreciated.

- T.S., Anaconda, MT

A: I have asked Federal Cartridge why they have mostly discontinued their Premium High Energy product line, but answers were vague. I can only speculate that it was probably due to the increased pressures associated with high-performance loads. In short, most ammunition is well below industry maximum average pressure guidelines, usually at least 7 to 10 percent. The High Energy loads reduced this margin enough that some guns proved to be problematic (difficult case extraction, hard bolt lift, etc.).

The good news is that you can duplicate your desired .338 Winchester Magnum load with the Nosler 225-grain bullet. I would suggest starting with Winchester

cases, as they have a larger capacity and give less pressure. Begin with 74.0 grains of Alliant Reloder 19 powder, then work up to 78.0 grains maximum, which will produce 2,930 to 2,940 fps from most 24-inch barrels. These loads were developed using Federal 215 Large Rifle Magnum primers.

.45 COLT CHAMBER DIMENSIONS —

Q: I recently purchased a new Ruger New Model Blackhawk chambered in .45 Colt with an extra cylinder in .45 ACP. I have been using cast bullets from RCBS mould 45-270-SAA in my Smith & Wesson, USFA SAA and Ruger Bisley with 5.5-inch barrel without problems, and always with your load data from *Handloader* magazine. The new gun will not chamber the round. Basically the loaded cartridges will not go deep enough into the chamber. In speaking with Ruger about the problem, they will only test fire with Winchester Super-X 250-grain RNFP bullets.

Any help that you can offer is greatly appreciated. I very much enjoy your writings and always find your information useful.

- L.C., via e-mail

A: In your original letter, you listed the model number, but I was unable to verify the exact version of Ruger New Model Blackhawk that you have. I suspect that it is built on the large frame, or “.44 frame.” Many of these revolvers, but not all, had very tight chamber throats that measure .448 to .450 inch, which was a holdover measurement from the black-powder-era chamber dimensions of the Colt Single Action Army revolvers that were intentionally built with tight throats to help build pressures. Those dimensions were changed after 1900 during the smokeless-powder era. Since Ruger first introduced the Blackhawk .45 Colt in 1970, throat sizes have been all over the map. For example, during the first three or four years of production, most guns had .448- to .450-inch throats, then in the middle 1970s they were changed to around .455 to .456 inch. Around 1997 Ruger went

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Ruger Blackhawk and New Model Blackhawk .45 Colt revolvers vary significantly in throat size. To assure reliable chambering of handloads, cast bullets should be able to be pushed through the throats.

back to the smaller throat of .448 to .450 inch for New Model Blackhawk, Bisley and Vaquero models. In 2005, with the introduction of the New Vaquero, Ruger finally did it exactly right, with most measuring .452 inch, but the larger-frame New Model Blackhawk retained the smaller throats for a period of time, while the New Model Blackhawk .45 (also in Bisley variants) built on the 50th Anniversary .357 frame size received .452-inch throats.

If your revolver has the smaller throats, the full-caliber front driving band of the RCBS 45-270-SAA bullet will not allow your cartridges to chamber, assuming bullets are sized to .452 inch, the most common size used by commercial and do-it-yourself casters.

Before concluding that the above “educated guess” is correct, I suggest trying to find the exact reason that your handloads won’t chamber. In other words, find the tight spot. If the reason is not obvious, I suggest the following procedure: Full-length size a case and make certain that it drops into your gun’s chambers without any resistance. If there is resistance, you may not have your sizer die correctly adjusted to full-length size the case. Once you know that cases are sized correctly and are chambering normally, try loading a dummy round (without powder or primer). Next, remove the cylinder and drop the dummy cartridge into the chamber. If it doesn’t fully chamber, use a brass or plastic mallet and tap it lightly until it begins to chamber more

fully. (Again, do not use a loaded cartridge!) Using a punch, preferably plastic or brass, carefully tap the dummy cartridge back out of the chamber. Examine it carefully. If the tight

spot is the bullet’s front driving band, you will see corresponding marks on the band. If the case is the problem, you will see scratches or a shiny spot when the cartridge is forced into the chamber.

It is possible your Ruger has a tighter chamber than your other guns, and the roll crimp could be excessive (in the form of a slight bulge), preventing proper chambering. If the cases have been fired in a levergun, sometimes there can be a slight bulge just forward of the head, and some dies will not fully remove this bulge to allow reloaded cases to chamber in guns with minimal dimension chambers.

If your revolver has undersized .448- to .450-inch throats, there are a couple of solutions. Try sizing the cast bullets to correspond with throat size. However, this will not result in top accuracy as bullets are then undersized when traveling down the barrel with around a .452-inch groove diameter. This can also cause fusion and barrel leading. The best solution is to open the throats up to .452 inch, which will decrease chamber pressures and nearly always increases accuracy. This can be done at home using a Dave Manson Precision reaming tool (mansonreamers.com) designed specifically for this task, or you can send the cylinder to a competent custom revolver smith, and for a modest fee they can open the throats.

I hope this information proves helpful and thanks for taking the time to read our magazines. ●

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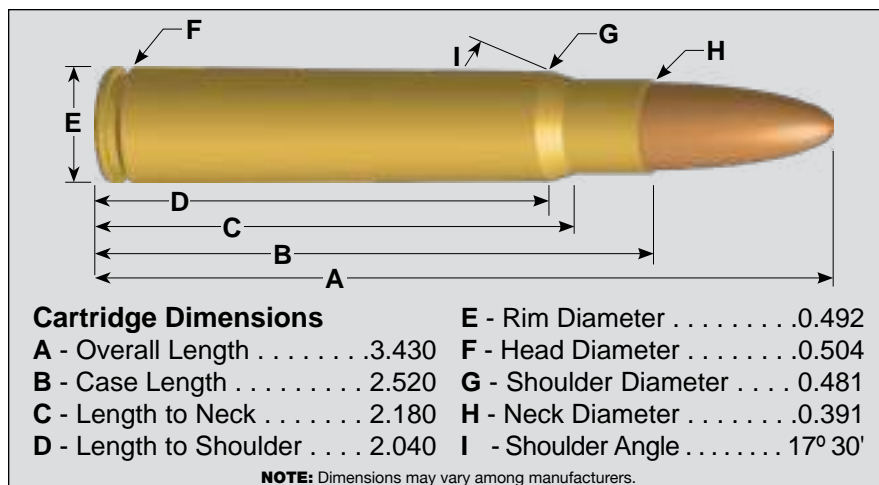


9.3x64MM BRENNEKE

CARTRIDGE BOARD by Gil Sengel

Wilhelm Brenneke was born in 1865 in Prussia, then part of the German Empire. It is recorded that by age 10 he was fascinated by anything that launched a projectile. Soon he acquired a small rimfire, and began making crude rifles on his own. He was formally educated as a machinist, toolmaker and mechanical designer. By 1895 he owned his own company selling his designs in firearms, ammunition and bullets used by other ammunition makers. Brenneke seems to have been a bit of John Browning, Charles Newton and Roy Weatherby all rolled into one.

Our interest here is cartridges, and to that end Brenneke was an avid hunter. Growing up at the end of the black-powder era, he was not satisfied with the performance of lead bullets and old propellant. He believed bullets with metal jackets were needed to produce uniform expansion and humane kills, but only when combined with higher velocities. Brenneke was constantly testing his ideas for such bullets and cartridges. By the Great War he was selling rifles for two new rounds based on the German 7.92x57mm case lengthened to 64mm. One



was an S-bore (.323-inch bullet diameter), the other a 7mm that was virtually identical to the .280 Remington that would come along 40 years later.

Brenneke's two cartridges developed muzzle velocities in the 2,800- to 3,000-fps range. Bullets, however, had a tendency to come apart at close range and failed to expand uniformly as distances increased. He then designed a steel-jacketed, multipurpose bullet known as the *Torpedo Ideal Geschoss* (TIG). Later a *Torpedo Universal Geschoss* (TUG) was created for deeper penetration. An interesting feature of the design is a small shoulder called a *Schar-*

frand (sharp edge) located on the bullet's ogive. Only about .015 inch in width, the shoulder is intended to cut a clean entrance hole in animal hide, allowing free-bleeding from the wound. It remains on the bullets today.

Brenneke was also working on a larger-caliber cartridge. If given modern bullets and high velocity, he believed it would suffice for everything except elephant, rhino and back-up duty for stopping charges of the largest animals; the big British doubles could handle that.

World War I then put an end to sporting cartridge development for several years. By the mid-1920s the .375 Holland & Holland Magnum was proving itself on the large, wild cattle of Asia, tigers in India and most everything in Africa, with any errors in application memorialized on tombstones.

Brenneke was aware of this and set out to duplicate the successful .375's ballistics in his new cartridge. Bullet diameter would be the old German favorite 9.3mm (.366 inch). The long, temperature-sensitive strands of cordite propellant of the .375 H&H would not be used, so the new case could be shorter and much less tapered.



Current popular 9.3mm cartridges include the (1) 9.3x57, (2) 9.3x62 Mauser, (3) 9.3x64 Brenneke, (4) 9.3x66 Sako and the (5) 9.3x74R.

Powder capacity would, however, have to approach that of the H&H cartridge. To do this, the unneeded belt was removed, leaving a base diameter of .505 inch and creating an entirely new case. Length was set at approximately 2.522 inches (it varies a bit) with a neck length of just under one caliber, an 18-degree shoulder and the case body blown out to only a little over .010 inch per side taper from base to shoulder.

The cartridge became known as the 9.3x64mm Brenneke. The year of introduction is often questioned, but 1927 is very close. Most importantly, the cartridge was the largest that would fit in what was becoming known as a “standard-size” action. Friend John



Shown are the (left to right): .30-06, 9.3x64 Brenneke and .375 H&H Magnum. The Brenneke is larger in diameter than the .30-06.

Gannaway has made it possible for us to see an original 9.3x64 made in Wilhelm Brenneke’s shop. The photo shows the unaltered rifle and its Hensoldt scope in claw mounts. It weighs 10 pounds, 3 ounces with a 25.6-inch barrel. Light border engraving and a few oak leaves add a touch of class.

As for the cartridge, the 9.3x64 bullet, case and physical size go together perfectly. It’s big and seems to exude power. Holding one in the hand makes it obvious it’s not a .30-06. Touching off a round containing a 286-grain bullet at over 2,600 fps makes it very obvious it’s not a ’06!

Given ballistics comparable to



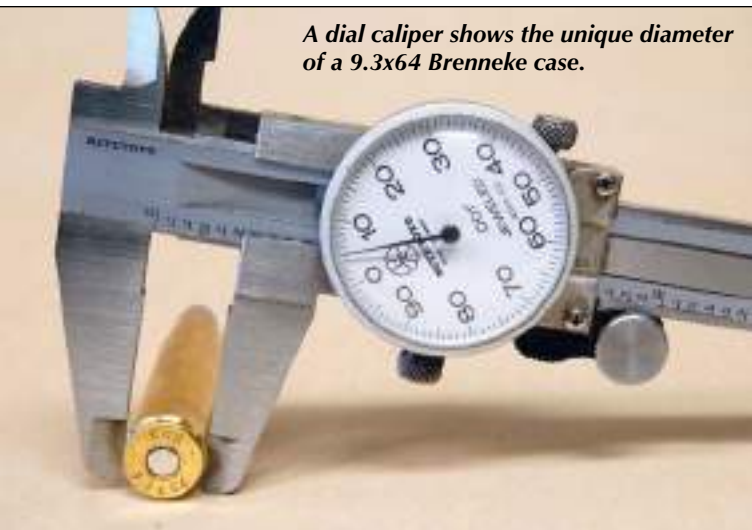
The back of an RWS 9.3x64 Brenneke ammunition box shows a cutaway of the slightly modified Brenneke TUG bullet used today.

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A dial caliper shows the unique diameter of a 9.3x64 Brenneke case.



9.3x64 Brenneke Handloads

bullet (grains)	powder	charge (grains)	velocity (fps)
250 Nosler Ballistic Tip	RL-15*	66.0	2,780
250 Swift A-Frame	RL-15*	67.0	2,800
250 Barnes X-Bullet	IMR-4895**	64.0	2,750
286 Woodleigh	IMR-4350**	71.0	2,532
286 Nosler Partition	RL-15*	66.0	2,589
286 Barnes X-Bullet	RL-15**	64.0	2,500

* Remington 9½ primer

** WLR primer

Notes: A Model 70 Winchester with a 24-inch Pac-Nor barrel and 1:14 twist was used to test all loads. RWS cases used throughout.

All loads from LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

the .375 H&H, reasonably priced rifles and the reliability of the M98 action, it would seem that the 9.3x64 would have been quickly successful. Such was not to be. The reason was due to bullets and competition from an existing cartridge.

The bullet problem was that it didn't hold together and penetrate in many instances. This occurred on both dangerous game and lightly constructed species. Given that the 9.3x64 generated 200 to 250 fps greater velocity than the other 9.3s of the time, it must have been loaded with the same bullets as the slower numbers to forgo the expense of making special bullets for a cartridge that would have limited sales.

No matter how good the 9.3x64 Brenneke was, it had to sell against gunmaker Otto Bock's immensely popular 9.3x62 Mauser cartridge of 1905. Despite being smaller in case diameter and having about 16 percent less capacity, its bul-

lets worked perfectly at the velocities generated. The Brenneke got a bad reputation, especially in Africa, then World War II ended sport hunting.

After cartridges again became available in the 1950s, reports from Africa indicated the bullet problem remained. There has recently been talk of tougher bullets in factory loads. RWS has offered loads featuring a 247-grain soft-point at 2,750 fps muzzle velocity, a 285-grain at 2,650 fps and 293-grain bullet pushed to 2,550 fps. All three yield well over 4,000 foot-pounds of muzzle energy, putting it on par with the .375 H&H Magnum and ahead of the 9.3x66mm Sako. Handloads using today's powders can add a bit to this as well.

Factory ammunition is really a rather moot point as it seems to be hard to find, especially in North America. Nevertheless, with new rifles chambered for the 9.3x64

Brenneke available in Europe and used rifles not too difficult to find, the cartridge is tailor-made for the handloader. At least two sources, Bertram and RWS, sell empty cases. These can also be formed from .300 Winchester Magnum brass by first turning off the belt, but it's a process only advanced handloaders can love! There are many tough 9.3mm custom bullets available that easily withstand the impact velocity of the 9.3x64. Look for firms that sell hard-to-find components like Huntington Die Specialties.

There is also plenty of up-to-date loading data available. Swift Bullet Company's *Reloading Manual Number Two* gives data for both its 250- and 300-grain A-Frame bullets. Woodleigh Bullets lists 62 combinations for the company's 250-, 286- and 320-grain bullets. The book *African Dangerous Game Cartridges* by Pierre van der Walt contains 118 loads using at least 10 powders.

The 9.3x64 Brenneke is an efficient medium bore that can hammer targets close up and, with proper bullets, lengthen the hammer's handle to reach 250 yards or so. It has just had a string of bad luck involving wars, bullets and African countries that limit cartridges that can be used for dangerous game to bullets of .375 inch or larger. Nevertheless, it is an amazing cartridge for the handloader who has a need for its power. ●



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RAMSHOT X-TERMINATOR

PROPELLANT PROFILES by R.H. VanDenburg, Jr.

A while back, when becoming aware that Western Powders, Inc., of Miles City, Montana, was moving the manufacture of its Accurate line of spherical rifle powders from Belgium back home to the General Dynamics facility at St. Marks, Florida, I requested samples of the new products. To date, St. Marks-made Accurate 2230 and 2520 have been reviewed with 2460 to go. In the same shipment I also received Ramshot X-Terminator, also now made at St. Marks, and three new but unreleased powders. These will also be reviewed in time.

The result of all this is that now all Accurate powders are made in North America. Extruded rifle powders have for some time been manufactured at the General Dynamics plant in Ontario, Canada. All handgun powders are manufactured at St. Marks, and now all spherical rifle powders.

Western's Ramshot line is mostly still manufactured in Belgium with

the exception of X-Terminator, the handgun powder Silhouette and the shotshell powder Competition, all of which are made at St. Marks. Western's Blackhorn 209 is made at the Ontario plant. Western also imports and distributes Norma powders.

X-Terminator is a double-base powder with a nitroglycerin content averaging 10 percent. Its bulk density is considered to be .985 g/cc. Diameter of the individual granules is about .016 inch. When comparing the old Belgium-made and new St. Marks-made X-Terminator powders, there is a visual difference. The Belgium powder consists of tiny balls; the St. Marks powder is a blend of tiny balls and some that are flattened. It would seem that the blending method would allow for a tighter control of burning rate, and perhaps less powder migration in automated loading equipment. This latter quality may be minor, if it exists at all, owing to



the very small size of the individual granules.

A burn rate chart in the new Western Powders' *Handloading Guide, Edition 1* lists powders by manufacturer vertically and includes columns for Accurate, Ramshot, Alliant, Hodgdon, IMR, Winchester, Vihtavuori and Norma. In this presentation, X-Terminator is similar in burn rate to Accurate 2230, Reloder 10-X and Norma 201, but no conclusion regarding powder charge weights may be inferred. In the Ramshot line, X-Terminator is the fastest-burning rifle powder. In the Handloading Guide, following X-Terminator data for a number of cartridges is stated "(Ballistically similar to Accurate 2230 in this cartridge.)" with identical data appearing for each powder.

In going over Western's data, I found X-Terminator listed for 46 cartridges from the .17 Remington to the .458 Lott. In some instances Accurate 2230 was listed, but X-Terminator could have been used. Out of that list I've chosen several for further examination.

I first began by comparing the old Belgium-made X-Terminator

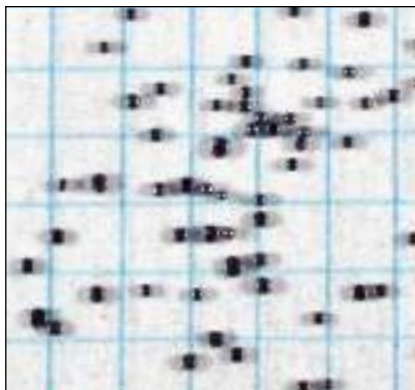
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with the new St. Marks-made powder using 30.0 grains of each under Speer 150-grain bullets in the .30-30 Winchester. Remington-Peters cases and Federal 210GM Large Rifle primers were used in testing. All cases were trimmed to 2.135 inches and fired in a Model 94 Winchester with a 20-inch barrel. Chronograph measurements were taken at 10 feet; temperature was 40 degrees Fahrenheit.

As with my previous tests with A-2230 and A-2520, the powder made at St. Marks appears to be slower burning, but not by much; in fact, no more than might be expected from different lots of the same powder. The new powder did give a smaller extreme velocity spread. Specifically, the old lot registered 2,126 fps; the new, 2,080 fps, a difference of 46 fps. Given the small size of the sample, a handloader must not put too much credence in the difference. Discussing the matter with Western's chief ballistician, he felt the new lots closely mirrored the old.



In the Handloading Guide, the maximum A-2230 powder charge for this combination was 31.0 grains. Winchester cases and primers were used, and data was developed in a 24-inch barrel.

The data for the first cartridge in the accompanying table, the .20 Tactical, was developed for another project but is appropriate for this review. The .222 Remington data – and all the rest – was specifically developed for this column. Both bullet weights in the .222 performed well, but I generally prefer the 50-grain bullet for most var-

Ramshot X-Terminator Select Loads

cartridge	bullet (grains)	charge (grains)	velocity (fps)
.20 Tactical*	32	26.6	4,020
	40	24.7	3,662
.222 Remington*	50	23.5	3,130
	55	22.5	2,915
.223 Remington*	50	24.7	3,369
	55	23.5	3,171
.30-30 Winchester**	150	30.0	2,080
	170	29.0	2,000
.308 Winchester**	150	45.3	2,945
.303 British**	150	43.0	2,618
.45-70 Government (cast)**	300	44.5	1,812
	405	39.5	1,572

* Remington 7½ Benchrest primers

** Federal 210 GM primers

Notes: All barrel lengths are 24 inches except: .30-30, 20 inch; .303, 22 inch; .45-70, 26 inch.

For more data on these cartridges please visit LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

mint hunting. This is still a very accurate cartridge. The .223 Remington used the same bullets as the .222, a Barnes 50-grain Varmin-



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A-Tor and a Nosler 55-grain Varmageddon. Both performed well, but because of the larger case capacity of the .223, I tend to prefer the 55 grain for its higher ballistic coefficient and longer reach.

In the .30-30 Winchester, I stayed with the 30-grain charge for the 150-grain bullet though, as noted, the maximum A-2230 charge is listed as 31.0 grains. The 170-grain bullet's powder charge of 29.0 grains should be considered maximum. Both bullets were the Speer FN. Accuracy was typical for this rifle, iron sights and my eyes. These loads should be ideal in the environment where the .30-30 shines: woods hunting for deer and bear at short to moderate ranges.

With the .308 Winchester, a Hornady 150-grain Spire Point was used, as this is my general purpose, go-to bullet for this cartridge. X-Terminator may be the fastest Ramshot powder suitable for the cartridge and bullet weight. Higher velocity at slightly lower pressure can be obtained with slower powders, but the differences are small.

Another 150-grain bullet was involved in the next test. This time, one of .312 inch in diameter for the .303 British cartridge. Published load data is from a 24-inch barrel. Mine was developed with a Ruger No. 1 with a 22-inch barrel. This turned out to be a good load but, realistically, slower powders are a better choice.

The last test was with the .45-70 in a Marlin Cowboy with a 26-inch barrel. Cast bullets get the most use by me in this cartridge, and I typically keep velocities and pressures near the original black-powder levels. The governing factor here is recoil in a rifle that weighs 7.25 pounds. Modest velocities turn a fire-breathing lion into a pussycat, and it is among my favorite cartridges for simple, fun shooting. Both bullets shown are cast and without a gas check.

Overall, I'm delighted that Western continues to bring so many of its powders back home. It generally means improved lot-to-lot consistency, and availability becomes more of a sure thing. ●

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.38	120 GR.	TC /500 \$32.00	9mm	115 GR.	RN /500 \$31.50	.41	230 GR.	SWC /100 \$32.00
.38	125 GR.	RNFP/500 \$33.00	9mm	125 GR.	RN /500 \$33.00	.44	240 GR.	SWC-HP /100 \$38.00
.38	130 GR.	RNFP/500 \$34.00	.38	148 GR.	DEWC/600 \$41.50	.44	240 GR.	SWC /100 \$38.00
.38-40	180 GR.	RNFP/500 \$42.00	.38	158 GR.	SWC /600 \$44.00	.44	305 GR.	LBT-WFN/100 \$47.00
.44-40	180 GR.	RNFP/500 \$42.00	.40	180 GR.	RNFP /500 \$41.00	.45LC	260 GR.	SWC-HP/100 \$41.00
.45LC	160 GR.	RNFP/900 \$79.00	.45ACP	200 GR.	SWC /500 \$44.50	.45LC	325 GR.	LBT-LWN/100 \$47.00
.45LC	200 GR.	RNFP/500 \$44.50	.45ACP	230 GR.	RN /500 \$47.00	.45-70	430 GR.	LBT-LWN/40 \$24.00
.458	350 GR.	RNFP/100 \$26.00	.45LC	255 GR.	SWC /500 \$55.00	.500	440 GR.	LBT-WFN/100 \$61.00
			.38	148 GR.	WC /500 \$40.00			

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CIMARRON FIREARMS BAD BOY .44 MAGNUM

FROM THE HIP by Brian Pearce

Cimarron Firearms is known for its vast selection of imported, nineteenth-century replica firearms; however, the company recently began offering a new Uberti Bad Boy .44 Magnum six-gun. This single action is equipped with select modern features, offers handsome looks, good workmanship and top-notch accuracy.

While Uberti has produced .44 Magnum revolvers for many decades, Cimarron's Mike Harvey has worked extensively with Uberti to improve quality and appearance, and he set the specifications for this new sixgun, which has resulted in the finest .44 Magnum produced by that company to date.

The Bad Boy features a fully adjustable rear sight that is pinned into the flattertop-style frame. The rear sight notch is .125 inch wide and .065 inch deep, offering enough "light" on each side of the front sight blade to give an excellent sight picture and allowing accurate shooting under most light conditions. Its blade is ramped and dovetailed into the barrel.



The Cimarron Bad Boy .44 Magnum features adjustable sights, a nonfluted six-shot cylinder, 8-inch octagonal barrel and an 1860 army-style grip frame.

The front sight blade is tapered and measures .100 inch wide at the top. The 8-inch octagonal barrel measures .665 inch across the flats at the muzzle. The rifling consists of six lands and grooves with a bore diameter of .417 inch, a groove diameter of .429 inch and a 1:20 right-hand twist. The bore has

a mirror-like, bright finish, which helped prevent leading when using cast bullets, and jacketed bullet fouling was minimal. The smooth forcing cone is cut at 11 degrees.

The cylinder is nonfluted and features countersunk chambers. The outside measurement is 1.680 inches, which is only .010 inch larger than Uberti Colt SAA-pattern clones, or around .030 inch larger than the Colt SAA. The steel used is the European equivalent of 4130 Chrome-moly, which Rockwell tested HRC35 (C-scale). The cylinder is shorter than most .44 Magnum revolvers at 1.675 inches, which includes the counter-bored chambers. While the Bad Boy readily accepts all .44 Magnum ammunition manufactured within SAAMI overall length specifications of 1.610 inches, handloaders will necessarily need to limit maximum overall cartridge length to around 1.660 to 1.665 inches. The latter figure is approximately .010 inch short of being flush with the end of the cylinder. This accommodates some bullet creep that

Cimarron Bad Boy .44 Magnum Handloads

bullet (grains)	powder	charge (grains)	overall loaded length (inches)	velocity (fps)	25-yard group (inches)
240 Oregon Trail Cast RNFP	A-2	6.0	1.568	851	2.00
240 Hornady XTP	A-9	21.0	1.605	1,409	1.05
250 Keith/Lyman 429421	2400	19.0	1.618	1,363	1.40
255 Lyman 429244 w/gc	Power Pistol	9.5	1.660	1,056	1.00
	2400	20.0		1,343	1.25

Factory loads

240 Black Hills JHP (1,260†)	1,299	1.10
240 CCI/Speer Blazer (1,200†)	1,226	1.65
240 Hornady XTP (1,350†)	1,382	1.00
240 Remington JHP (1,180†)	1,311	1.55
240 Winchester JSP (1,180†)	1,363	1.20*

† Stated velocity

* Lowest extreme velocity spread

Notes: A Cimarron Firearms Bad Boy .44 Magnum with an 8-inch barrel was used to test all loads. CCI 300 primers and Starline cases were used throughout. Trim-to case length: 1.275 inches. Maximum length: 1.660. For more data on this cartridge please visit LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

naturally occurs when cartridges are subjected to recoil without tying up cylinder rotation.

The timing is good as the bolt drops correctly in the bolt notch, while lockup is tight and end-shake minimal. Each chamber ranged perfectly with the bore (which was checked using a Brownells Range Rod). The chamber throats measure .430 inch, which is perfect for obtaining top accuracy with both cast and jacketed bullets and is notably tighter than all previous Uberti manufactured .44 Magnums.

While the lock-work is essentially the same as the proven Colt SAA, there are a couple of notable differences. First, the coil hand-spring is constructed of piano wire, making it nearly unbreakable. There is a built-in safety that engages automatically when the trigger is released. The engineering is rather simple and includes a cam that is machined as part of the trigger and actuates a plunger mounted into the hammer. The plunger then causes the firing pin to extend out when the trigger is pulled and the hammer is in motion falling forward. Once the trigger is released, the cam disengages and the firing pin retracts to prevent it from resting on a primer. This allows the revolver to be fully loaded and carried with the hammer down.

The Bad Boy features the Colt Model 1860 Army-style grip frame, which some shooters with larger hands report offers less felt recoil. The stocks are of one-piece Euro-

Cimarron Bad Boy .44 Magnum Specifications

Importer: Cimarron Firearms
Manufacturer: A. Uberti
Action: Single Action
Grip frame: 1860 Colt Pattern
Capacity: Six rounds
Safety: Rebounding firing pin
Cylinder: Nonfluted
Barrel: 8 inches, octagonal
Weight: 41 ounces
Stocks: One-piece European walnut
Sights: Fully adjustable rear, ramp front
MSRP: \$687.50

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The trigger features a cam that actuates a plunger (arrow) inside the hammer, resulting in a retracting firing pin.



Left, the rear sight is fully adjustable for windage and elevation. Right, the front sight is ramped and dovetailed into the barrel.



pean walnut and were sanded to fit the individual revolver during manufacture, resulting in a good fit to the grip frame.

The metal work is hand polished and fully blued, is handsome and receives high marks in overall fit, finish and quality. This finish quality, combined with the attractive, tidy sights and octagonal barrel certainly makes the Bad Boy a nice sixgun.

Right out of the box, the trigger pull broke cleanly at 32 ounces, which helped facilitate accurate shooting offhand or from any field position.

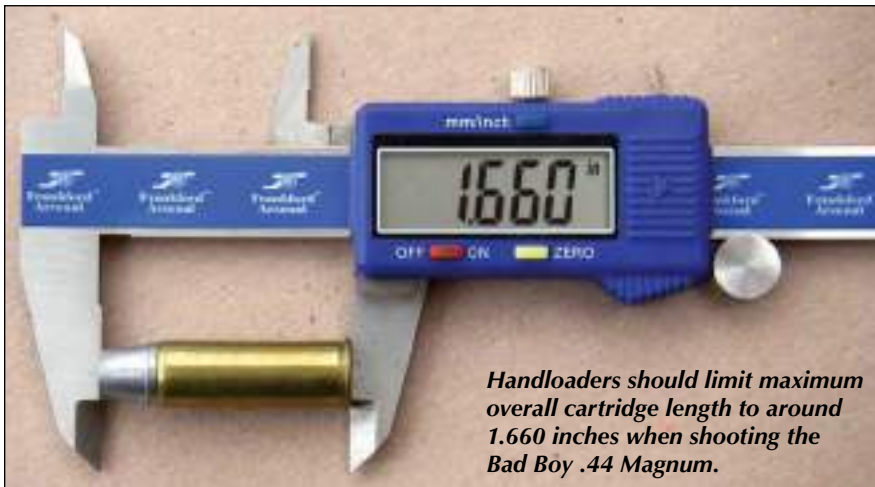
It is noteworthy that Uberti is offering recoil plates on select single-action sixguns, a feature I would like to see added to the Bad Boy, and I hope to see the same revolver with a 5.5-inch barrel and perhaps a smaller (and lighter) SAA grip frame as an option.

With the aid of a sandbag rest, several factory loads containing 240-grain jacketed bullets from Hornady, CCI/Speer Blazer, Black Hills, Remington and Federal were tried at 25 yards. There was plenty of adjustment in the rear sight to allow proper zeroing. As can be seen in the accompanying table, Hornady, Black Hills and Winchester loads each produced groups that hovered around one inch.

Several handloads were tried that ranged from light target loads to full-house versions containing both jacketed and cast bullets. All loads were assembled in Starline cases, capped with CCI 300 Large Pistol primers and given a heavy roll crimp using RCBS dies.

For a light target and economical load, 6.0 grains of Accurate No. 2 powder behind the 240-grain Oregon Trail cast RNFP reached 851 fps and produced groups that hovered around 2 inches.

A bullet that seems perfect for this sixgun is Lyman mould No. 429244, a SWC gas check design. Using No. 2 alloy, my mould usually drops bullets weighing around 255 grains with Hornady crimp-on gas checks and lube applied. The nose length results in an overall cartridge length of 1.660 inches –



Handloaders should limit maximum overall cartridge length to around 1.660 inches when shooting the Bad Boy .44 Magnum.



The new Cimarron .44 Magnum performed well with both cast and jacketed bullets.



The Bad Boy .44 Magnum (top) is built by Uberti and displays significantly better quality than the Iver Johnson Cattleman .44 Magnum (bottom) built by Uberti in the 1970s.

at least when loaded in cases that are 1.275 inches in length. For an accurate midrange load, 9.5 grains of Alliant Power Pistol reached 1,056 fps and cut cloverleaf-type

groups when I could do my part. Moving up to a full-house load, 20.0 grains of Alliant 2400 powder reached over 1,343 fps and produced several groups that hovered

just over one inch, which is an excellent general-purpose hunting load.

No .44 Magnum article would be complete without at least one load utilizing Elmer Keith's classic 250-grain cast bullet from Lyman mould No. 429421. Due to this bullet's nose length, it was necessarily deep seated to correspond with the Bad Boy's cylinder length. The case was crimped over the bullet's front driving band for an overall cartridge length of 1.618 inches. Due to the reduction in case capacity, standard powder charges with Alliant 2400 had to be decreased to 19.0 grains and provided 1,363 fps and groups hovering between one to 1.5 inches.

Hornady's excellent 240-grain XTP bullet was loaded over 21.0 grains of Accurate No. 9 powder, which produced 1,409 fps and essentially identical accuracy as the best factory loads.

Cimarron's Bad Boy is a sixgun that is capable of fine accuracy with a MSRP of \$687.50. ●



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ZEROING FIXED-SIGHT HANDGUNS

MIKE'S SHOOTIN' SHACK by Mike Venturino

When do the fixed sights on a handgun need fixing? My opinion is this: When the shooter cannot aim directly at his chosen target, his fixed-sight handgun needs zeroing. Personally speaking, when shooting for relaxation instead of for an article, I often shoot at moving steel targets. My dueling tree has 4x6-inch paddles, and another more complex target has 6-inch diameter reciprocating paddles (hit one and the other pops up).

Out to 25 yards, if I can aim at a paddle's bottom edge to hit its center, then I'm happy with the handgun's zero. I am not so happy if I have to hold above a paddle's center for elevation or more than a mite off center for windage. In that case, the fixed sights need "fixing." Specifically, I want fixed-sight handguns to put their bullets no more than 2 to 3 inches above point of aim and closely centered laterally.



Mike's recreational purpose for shooting fixed-sight handguns is shooting at small steel plates. He likes guns to hit from dead on to no more than a couple inches high.

A natural question would be: "Why not just get handguns with adjustable sights?" That's logical, and I do own some, but for some reason my psyche favors historical handguns ranging from cap-

and-ball revolvers to many other types, including World War II-era examples. With any luck, such handguns will hit within the above mentioned parameters.

For instance, I have a Smith & Wesson Second Model Hand Ejector .455 Webley that factory letters to the Canadian Government in 1916. After trying a few powders and bullets, I settled on Hornady 255-grain swaged lead RN/FPs over 4.0 grains of Bullseye. The idea here was to try a small variety of handloads with ballistics similar to the military load for which this revolver was intended. Success came quickly.

On the other end of the spectrum was a Smith & Wesson Heavy Duty .38 intended for the high-pressure .38-44 factory loading introduced in 1930, (a .38 Special revolver built on Smith & Wesson's large .44 N-frame.) The first Heavy Duty .38 I tried placed bullets about 9 inches from center in a 7 o'clock direction. A nonshooting collector got a good deal on that Smith & Wesson.

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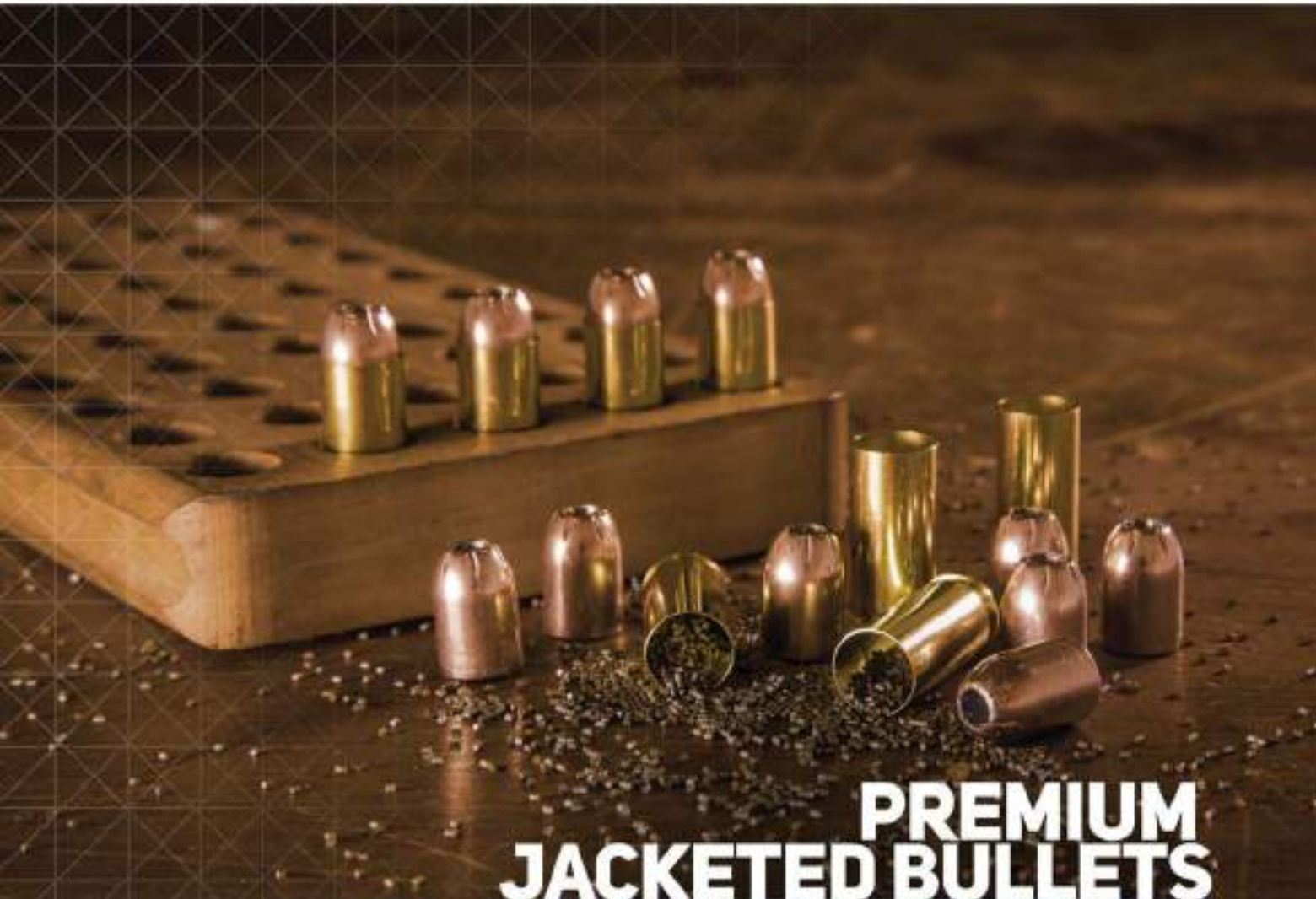
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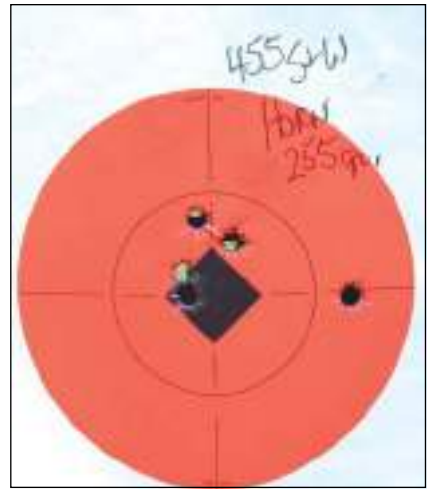


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With a minor amount of handload experimentation, this 1916 vintage Smith & Wesson Second Model Hand Ejector .455 was hitting properly with Hornady 255-grain swaged lead bullets.



Despite the flyer to the right, a Smith & Wesson .455 from the Great War is well zeroed with a handload.

Avid handloaders have an edge when dealing with fixed-sight handguns. We can vary their point of impact for elevation by changing bullet weight. It's a matter of physics: The instant a bullet moves forward, recoil starts making the muzzle move upward. Heavier bullets recoil more, hence they impact higher. They are also

usually in the barrel longer than lighter bullets, which can accentuate the process. Firearms manufacturers take this into account by computing the height of a front sight by the most likely bullet weight with which the revolver will be fired. Have someone aim a relatively long barreled, big-bore revolver at a target straight away

while you stand to the side. It will be obvious that the barrel is actually tilted slightly downward.

Therefore, let's say someone has a fixed-sight .38 Special revolver that is shooting low with 125-grain bullets. That means it was likely made in the time frame when factories intended .38 Specials to use 158-grain factory loads.

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A handloader can probably correct his .38's zero by going to 150- to 160-grain bullets. In extreme cases 170- to 200-grain bullets can be tried. If a revolver with fixed sights is shooting too low, then its sight can be filed, *but this should be done at a range by someone familiar with filing sights*; metal removed is forever gone.

Zeroing for windage is easy if a dovetailed front or rear sight is part of the picture, as it is for many semiautomatics. The sight can just be drifted for windage or its height changed as needed for elevation zeroing. Most modern semiautomatics come with adjustable sights. Historical variants are iffy. I have a John Inglis Hi-Power 9mm (Canadian) that has a dovetailed front sight. A Belgian FN Hi-Power made in the same year does not.

The windage problem can be more complicated with revolvers. Traditionally styled single actions such as Colt SAAs, their many replicas and Ruger's Vaqueros are easily adjusted. A gunsmith with a set of hardwood blocks and a vice can tweak a barrel in the revolver's frame so the front sight tilts ever so slightly. A revolver that hits a few inches left can have the barrel tightened a pinch, so the sight leans left, resulting in groups moving to the right – and vice versa. Is loosening the barrel a problem? Not with the minor adjustment it would require to move the group center left.

Complications arise with double-action Smith & Wesson revolvers, because their cylinder pins latch fore and aft. The pins and latches must not misalign. I have not been above taking a pair of pliers and bending front sights on revolvers, but I don't recommend it to others. I have watched gunsmiths put a hardened steel block to the side of a Smith & Wesson's sight, then tilt it very slightly away while tapping the sight blade until it hits the block. A little trial-and-error shooting will result in a zero for that revolver.

There is an old saying: "Once

sighted in, a fixed-sight handgun is forever sighted in." Not quite. It must be used with ammunition for which it was mated, or the zeroing process will have to

be repeated; not to mention how it might be fired during the sighting-in process; handheld or with a benchrest. Point of impact may vary between the two methods. ●



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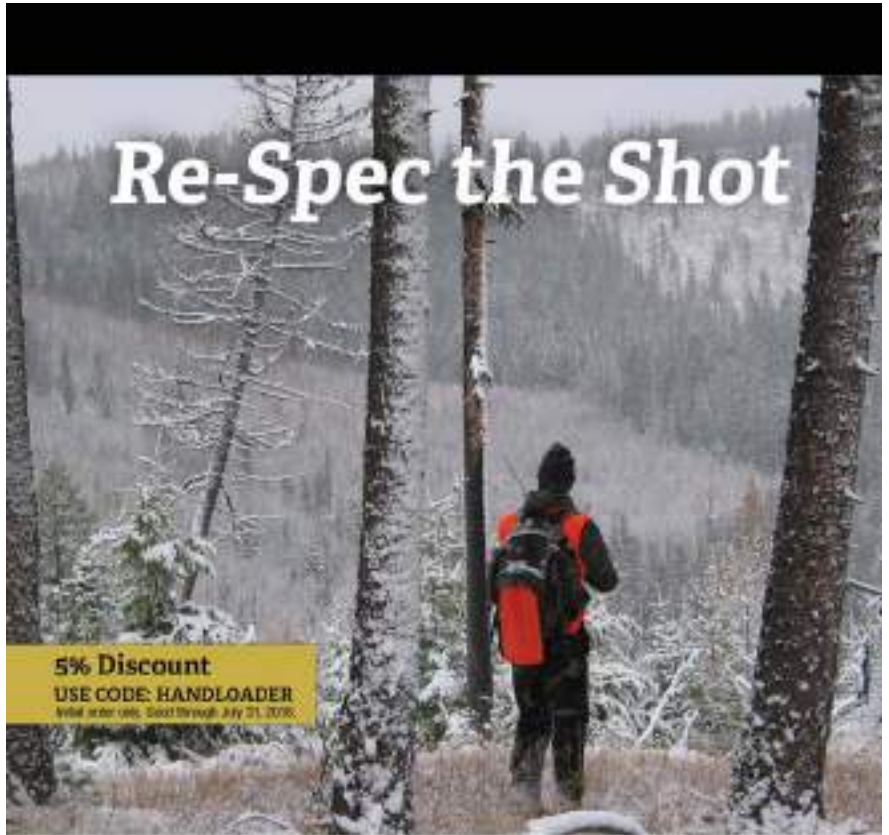
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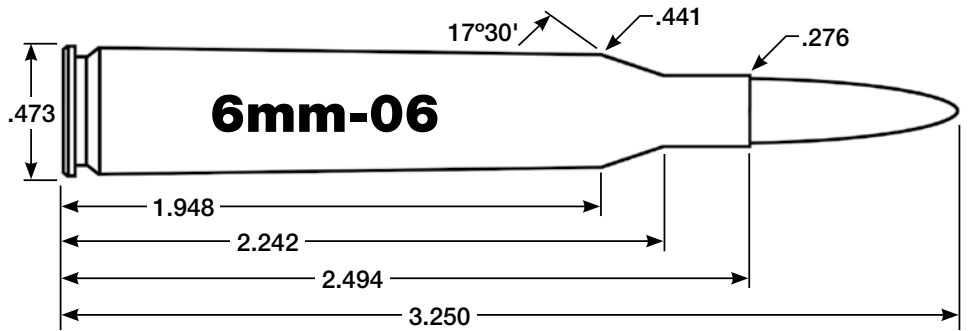


6MM-06

WILDCAT CARTRIDGES by Layne Simpson

Beginning with the introduction of the .45-70 Government in 1873, most rifle cartridges adopted by the U.S. military went on to enjoy popularity among civilian hunters and shooters. The 6mm Lee Navy for the Model 1895 Lee Straight-Pull rifle was an exception. The last of about 22,000 military and sporting rifles departed the factory in 1916, but since the ammunition remained available until the 1930s, one might think wildcatters of that era would have been lured to its bullet diameter like starving yellowjackets at a watermelon festival. They were not.

Unlike American hunters, Europeans had no need for wildcats when they could choose among factory-loaded numbers such as the 6x57mm Mauser, 6x58mm Forster and .244 Halgar Magnum. All were introduced prior to 1925. The British-designed .240 Nitro Express (.240 Apex) was the first



belted cartridge of its caliber, and the later .240 Weatherby Magnum is a virtual spitting image of it. The much larger .244 Holland & Holland Magnum on the .300 H&H case may have been spooked from the bushes by the introductions of the .244 Remington and .243 Winchester.

Wildcatters in America virtually ignored the 6mm caliber until the 1940s, probably due to a lack of jacketed bullets. Once they became available from Earnest

Gardiner, Ralph Sisk and a few others, new cartridges began to pop up. From around 1945 until the .243 Winchester and .244 Remington were introduced in 1955, a rather large litter of known wildcats emerged. One of the earliest was the .240 Super Varminter from Jerry Gebby, who is also credited with the introduction of the .22-250, or .22 Varminter, as he called it. His .240 Super Varminter was formed by necking down the .270 Winchester case with no other change.

6mm-06 Handloads

bullet (grains)	powder	charge (grains)	overall loaded length (inches)	velocity (fps)	100-yard 5-shot group (inches)
55 Nosler Ballistic Tip	H-414	52.0	2.920	3,817	1.22
75 Sierra Varminter HP	VV-N160	54.0	3.065	3,644	.87
80 Hornady GMX	Hybrid 100V	51.0	3.105	3,481	1.18
85 Barnes XBT	IMR-4350	49.0	2.995	3,479	1.34
85 Nosler Partition	H-4831	55.0**	3.000	3,510	1.10
90 Nosler AccuBond	RL-22	56.0	3.180	3,462	.71
90 Swift Scirocco II	H-4831	53.0**	3.185	3,428	.82/1.96*
	IMR-7977	58.0		3,376	.88
95 Sierra Tipped MatchKing	H-4831	53.0**	3.250	3,444	.53
100 Nosler Partition	IMR-7828	53.0	3.150	3,313	1.14
103 Hornady ELD-X	Retumbo	60.0	3.260	3,309	.65/2.18*
115 Berger VLD Hunting	Magpro	51.0**	3.330	3,126	.79/2.34*

* group shot at 300 yards

** Federal 215M primers

Notes: All powder charges were maximum in the test rifle and should be reduced by 5 grains for starting loads. A Thompson/Center Custom Shop Encore Rifle with a 26-inch Hart barrel and 1:8 twist was used to test all loads. Federal 210M primers were used except where noted. Cases were formed by necking down Nosler .25-06 brass. Velocities were recorded with an Oehler Model 33 chronograph 12 feet from the muzzle. Accuracy is an average of three or more five-shot groups fired at 100 yards except where noted.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.



Water capacity of the the 6mm-06 case (center) is about 3 grains more than the .240 Weatherby Magnum (left) and a grain more than the 6mm-284 (right).

In Ackley's handbook it is given top velocities of 3,619 and 3,412 fps with 75- and 90-grain bullets.

One of the more capacious cartridges on the .30-06 case is the .240 Gibbs. It is a member of a family of eight wildcats created during the 1950s by gunsmith Rocky Gibbs of Viola, Idaho. Powder capacity is increased as much as possible by fireforming the case to absolute minimum body taper; and in addition to increasing shoulder angle to 35 degrees, it was moved forward, leaving an extremely short neck.

The plain-vanilla 6mm-06 featured in this article might best be described as a "country boy's .240 Weatherby Magnum." Cases for forming it are abundant and less expensive to boot. Powder capacities of the two cartridges are not too far apart. Filled to the brim with water, Weatherby cases on hand held an average of 62.9 grains while Nosler, Hornady and Remington .25-06 cases necked down to 6mm held 66.7, 66.4 and 66.9 grains, respectively. The 6mm-284 formed from Lapua 6.5-284 brass holds 64.1 grains.

Through the decades my wife, Phyllis, and I have used several 6mm cartridges to take quite a few deer and pronghorn. All shots were at ethical distances, and all animals died quickly. One of my first modern bolt-action rifles was a Winchester Model 70 Featherweight .243 Winchester, and it was followed by a Remington 725 .244 Remington. Phyllis took possession of the Model 70 and in addition to other game, she used it to take a pronghorn buck so good it took me a very long time to catch up. The Model 725 is still one of my favorite deer rifles. A Model 700 6mm Remington (same as the .244) was also added to our collection. (It is one of very few rifles to escape the factory in 1962 with "6mm Remington Magnum" stamped on its 20-inch barrel.) Then came a couple of custom rifles in 6mm-284 Winchester; one quite heavy for windy day rock-chucks, the other light for deer in the high country.



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Cases are easily formed by running virgin .30-06 or .25-06 brass through a 6mm-06 full-length resizing die, but some chambers may require reducing neck diameter of the .30-06 by reaming or outside-turning. Cases include the (1) .30-06, (2) .25-06, (3) 6mm-06 case and a (4) 6mm-06 loaded round.

I first used a 6mm-06 to take a very good pronghorn in New Mexico. Having previously bagged them with several other cartridges, something different seemed like it would be fun, and it was. My handload pushed the original Swift 90-grain Scirocco along at just over 3,400 fps from the 26-inch Shilen barrel of a T/C Encore rifle. Zeroed 3 inches high at 100 yards, it struck dead on to point of aim at 300 yards and dropped about half the body depth of a mature buck at 400.

Maximum case length is 2.494 inches, same as for the .25-06 and .30-06 cases. My preference is to neck down the .25-06, but virgin .30-06 brass is as easily run through a 6mm-06 full-length re-

sizing die with zero case loss. Neck wall thickness will vary among the various brands of cases, but neck diameter with a bullet seated in a necked-down .25-06 case usually runs around .270 inch. Maximum for the .243 Winchester and 6mm Remington is .276 inches. A necked-down .30-06 case will be in the neighborhood of .275 inch, so most chambers will likely require reaming or, preferably, outside neck turning of the brass.

When squeezing down case necks to 6mm, the die should be adjusted in the press to leave a small secondary shoulder just forward of the original shoulder for positive headspacing. Keep turning in the die until the case fully enters the chamber, but with a bit



The 1:10 twist of older rifles will stabilize most bullets up to 100 grains, but in order to handle longer bullets, a new barrel should have a faster twist. Bullets tested include the (1) Nosler 55 Ballistic Tip, (2) Sierra 75 HP, (3) Hornady 80 GMX, (4) Barnes 85 XBT, (5) Nosler 90 AccuBond, (6) Swift 90 Scirocco II, (7) Nosler 100 Partition, (8) Hornady 103 ELD-X and a (9) Berger 115 VLD Hunting.

of resistance to bolt closure. The case is then ready to load.

The 6mm-06 gradually gains chamber pressure as a powder charge is increased, and unlike some of the other low-expansion-ratio cartridges, there are no sudden pressure spikes just prior to reaching maximum. This may not hold true for all powders, but it has been my experience with those included in the data table. Hybrid 100V, IMR-4350, H-4831 and Reloder 21 have proven to be excellent choices for bullets weighing 80 to 95 grains while IMR-7828, Retumbo and Magpro are equally good with heavier bullet weights. Prior to trying the last two, I had assumed that slower-burning Retumbo would be a better choice



Above, a custom Thompson/Center Encore 6mm-06 with a 26-inch Hart barrel with a 1:8 twist was used to test the accompanying handloads. Right, Magpro, H-4831 and VV-N160 are excellent powders for the 6mm-06.

than Magpro with the Berger VLD Hunting bullet, and while velocity was a bit higher, accuracy was not as good. Standard primers work fine with most of the powders, but velocity spread at low ambient temperatures is lower when using Federal 215 primers with H-4831 and Magpro.

The original Swift 90-grain Scirocco and the later Scirocco II have accounted for most of the game I have taken with the 6mm-06, and there have been no flies on performance. But out of curiosity more than anything else, other bullets will be used on hunts with the cartridge in the future. I am especially interested in checking out the long-distance performance of the Hornady 103-grain ELD-X and the Berger 115-grain VLD Hunter on deer-size game. The Hornady 80-grain GMX, Barnes 85-grain XBT and Nosler 85-grain Partition in the neighborhood of 3,500 fps should also be quite effective.

Most rifles built in the past will have a 1:10 or 1:12 rifling twist rate. Due to today's availability of extremely long-for-caliber bullets, a quicker twist is not a bad idea for a new rifle build. Hornady recommends a twist no slower than 1:8 for its 103-grain ELD-X. In his book *Ballistic Performance of Rifle Bullets*, Bryan Litz says 1:8 will stabilize the Berger 115-grain VLD Hunting but goes on to recommend 1:7.2 as optimum. Having previously found this long projectile to shoot groups smaller than .60 inch from a Ruger Precision Rifle 6mm Creedmoor with a 1:7.7 twist, I figured the 1:8 twist of my 6mm-06 would also stabilize it in flight. It has proven accurate enough.


I have not seen any pressure-tested data for the 6mm-06, but several manuals have data for the .240 Weatherby Magnum and the 6mm-284. I have yet to experience a problem when using published starting loads for those two cartridges in the 6mm-06, but there is no law against backing off an additional grain or two. This cartridge simply begs to be used with a barrel no shorter than 26 inches. ●


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10MM AUTO

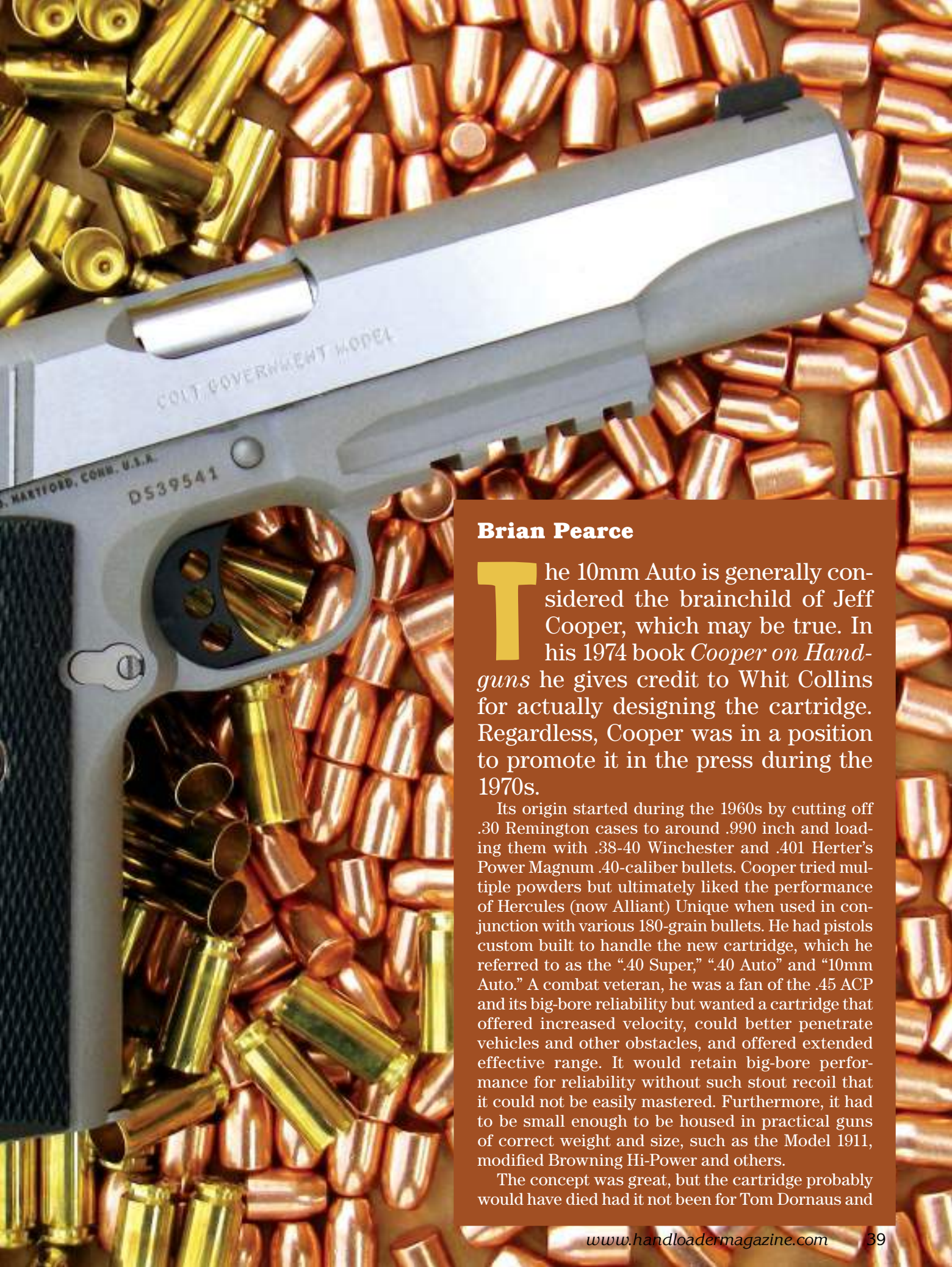


The 10mm Auto (center) was designed to give greater velocity and shock than the .45 ACP (left). The .40 S&W (right) is basically a shortened 10mm Auto with a small primer pocket.

Load Testing with a
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Brian Pearce

The 10mm Auto is generally considered the brainchild of Jeff Cooper, which may be true. In his 1974 book *Cooper on Handguns* he gives credit to Whit Collins for actually designing the cartridge. Regardless, Cooper was in a position to promote it in the press during the 1970s.

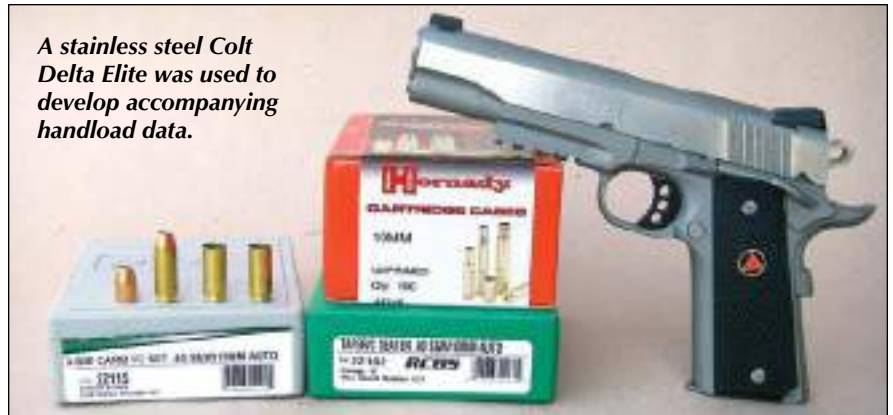
Its origin started during the 1960s by cutting off .30 Remington cases to around .990 inch and loading them with .38-40 Winchester and .401 Herter's Power Magnum .40-caliber bullets. Cooper tried multiple powders but ultimately liked the performance of Hercules (now Alliant) Unique when used in conjunction with various 180-grain bullets. He had pistols custom built to handle the new cartridge, which he referred to as the ".40 Super," ".40 Auto" and "10mm Auto." A combat veteran, he was a fan of the .45 ACP and its big-bore reliability but wanted a cartridge that offered increased velocity, could better penetrate vehicles and other obstacles, and offered extended effective range. It would retain big-bore performance for reliability without such stout recoil that it could not be easily mastered. Furthermore, it had to be small enough to be housed in practical guns of correct weight and size, such as the Model 1911, modified Browning Hi-Power and others.

The concept was great, but the cartridge probably would have died had it not been for Tom Dornaus and

10MM AUTO



The Colt Delta Elite 10mm Auto features snag-free sights with white dots.



A stainless steel Colt Delta Elite was used to develop accompanying handload data.

Mike Dixon, who finalized cartridge dimensions and introduced the Bren 10 autoloading pistol in 1983. Norma began producing ammunition with a 200-grain bullet at an advertised 1,200 fps. Unfor-

tunately, a combination of issues forced Dornaus & Dixon Enterprises to file for bankruptcy; production halted in 1986.


The cartridge received widespread publicity when Smith & Wesson and Colt began producing autoloading pistols, and the FBI officially adopted the cartridge in 1989, which resulted in soaring commercial demand. It was the 10mm's outstanding performance, however, that caused its rise and fall. In short, the FBI found full-power loads a bit stout for some agents and soon requested a load that would launch a 180-grain bullet at 980 fps; some sources list velocity at 1,030 fps. While there was no official name for these "reduced" loads, they are often referred to as "FBI lite," "FBI load" or simply "subsonic."

It didn't take Smith & Wesson long to figure out that the 10mm FBI load could be contained in a shorter case, allowing it to be housed in most 9mm pistol designs that were notably lighter and more compact. By cutting the case to .850 inch and changing the primer from large pistol to small pistol, the .40 S&W was introduced in 1990, and it easily met the above ballistic requirements and gave a notable performance edge over the 9mm Luger. Its pop-


ularity was immediate; it was adopted by many law enforcement agencies, shooters and was commonly used for home protection and concealed-carry applications. The popularity of the .40 S&W almost killed the 10mm, but it has proven too useful.

In spite of the .40 S&W being a great cartridge, many handloaders enjoy the significant performance advantages of the 10mm Auto. It is suitable for hunting big game up to the size of deer, and it has gained popularity using non-expanding, heavyweight bullets for protection against bears. It is highly accurate and ranks as one of the most versatile autoloading pistol cartridges. As a result, it has staged a comeback, and demand has grown steadily over the past decade or so. Kimber, Colt, Ruger, Remington, Dan Wesson, Glock, SIG Sauer, Rock Island and others are offering pistols, and Ruger is offering its Redhawk revolver. Smith & Wesson is considering reintroducing the Model 610 revolver.

In studying current factory loads, their performances (and pressures) are all over the map. For example, Federal still offers the FBI load with a 180-grain Hydra-Shok JHP at 1,030 fps and an American Eagle 180-grain FMJ at the same velocity. Federal's sister company, Blazer, offers a non-reloadable aluminum case load containing a 180-grain TMJ bullet at 1,050 fps. Remington lists a 180 Metal Case bullet at 1,150 fps, and Winchester offers the 175 Silver-tip HP at 1,290 fps. Hornady lists a 155 XTP at 1,265 fps, a 175 Flex-Lock at 1,160 fps and a 180 XTP



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The 10mm Auto utilizes bullets that measure .400 inch in diameter.



Maximum case length is .992 inch.

at 1,180 fps. Buffalo Bore loads a 200 FMJ-FN at 1,200 fps that effectively duplicates early Norma factory loads, but the company also offers a 180 JHP at 1,350 fps.

These variances in factory-load performance should be discussed before handloaders select load data and assemble ammunition. Maximum average pressure guidelines established by the Sporting Arms and Ammunition Manufacturers' Institute (SAAMI) are listed at 37,500 psi; however, most ammunition manufacturers keep their loads around 5 to 10 percent below maximum, but not all. Even at a slightly below maximum pressure level, the 10mm Auto will push a 180-grain bullet to 1,300 fps and even close to 1,350 fps, or a 200-grain bullet at 1,150 to 1,200 fps, but only with the correct selection of components. Of the previously mentioned ammunition companies, only Winchester and Buffalo Bore offer loads that approach those ballistics. Federal is happy with its subsonic FBI loads that are suitable for all guns. Remington bumps the velocity and pressures of its load above that figure, but it is still loaded well below industry maximum pressure levels. Hornady ammunition performs notably better than the FBI load but is still on the conservative side, which is unusual for this company.

While this discussion could be very lengthy, it is best summarized by stating that 10mm Auto pistols are not all equal in regard to strength. Some guns will easily handle maximum-pressure loads without issue, while others cannot. The problem is that many pistols

have largely unsupported chambers to facilitate reliable feeding. When used with full-power loads, a case may occasionally rupture just forward of the solid head (at the bottom of the chamber) when pressures are still high, which sends gas down into the magazine. In some instances these occurrences will shatter the grips, send debris flying and potentially cause injury to the shooter.

On the other hand, pistols that feature correctly engineered feed ramps that result in a "supported"

chamber, along with correct recoil spring(s), lockup etc., will handle full-power 10mm loads with ease, as do all revolvers. Most gun companies have made engineering corrections to improve current models; however, guns with unsupported chambers are still in circulation, and in some cases are still being manufactured. This explains why most ammunition companies are taking a rather conservative approach in regard to the pressure of their 10mm Auto loads.

With these thoughts in mind, I

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10MM AUTO

These 10mm Auto barrels illustrate that not all pistols offer the same amount of case support. At left is the Colt Delta Elite followed by a Kimber Stainless Target II and a Glock 40 Gen 4.



am also choosing to limit the accompanying pressures to 30,000 psi or less, which can be used in any pistol so chambered. Loaded to this pressure level, 150- and 155-grain bullets can usually reach 1,300 to 1,350 fps, 180-grain bullets to around 1,200 fps and 200-grain bullets at 1,100 fps, which is still respectable performance.

For developing the accompanying handload data, a Colt Delta Elite Stainless (Government Model) was selected. The pistol displays good machine work, is tight and proved accurate. It features a beavertail grip safety with memory pad, a flat mainspring housing, lowered and angled ejection port,

snag-free white dot sights each mounted to the slide via dovetails, extended trigger and an optional rail. The trigger broke at a respectable 5 pounds.

Both Starline and Hornady cases were used to develop the accompanying data. They are both strong, of high quality and readily available. Hornady cases were used to develop loads containing bullets from 135 through 165 grains, while Starline brass was used for all loads containing 180- through 200-grain bullet weights. In spite of being fired and reloaded multiple times, no cases split, cracked or showed signs of fatigue.

The industry lists a maximum case length of .992 inch and a minimum suggested trim-to-length of .982 inch. Often, but not always, top accuracy will be achieved from cases that are at maximum length. In measuring cases from Federal, Hornady, Remington, Winchester and Starline, none measured a full .992 inch when new. They all measured .982 to not over .988 inch.

Like most other rimless auto-loading pistol cartridges, the 10mm Auto headspaces on the case mouth, which should be taper crimped to maintain positive headspace. The taper crimp also serves to hold the bullet in place during feeding, assists with smooth feeding and aids with powder ignition. Industry specifications list the case mouth with a measurement of .423 inch, but some thinner cases with this amount of crimp will not offer enough bullet pull. Apparently I am not the only one that has experienced this. For example, in measuring the crimp on 10 different factory loads with blade calipers, only two had a crimp



This is typical 25-yard accuracy obtained with the Colt Delta Elite 10mm Auto.

that measured .423 inch. The remainder measured between .420 to .422 inch. All cases in the accompanying data were crimped to .421 inch and worked flawlessly in the Colt Delta Elite. As a reminder, bullets should always be seated to their correct overall cartridge length without any crimp, then the crimp is applied as a separate step.

Using blade calipers to measure an exact crimp dimension might give some handloaders difficulty. Another option is to place a factory-loaded cartridge into the shellholder and raise the

Along with RCBS dies, Hornady and Starline (not shown) cases were used for the accompanying loads; CCI 300 and Federal 150 primers can be used interchangeably.



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(Continued)

Table I **10mm Auto Handloads**

bullet (grains)	powder	charge (grains)	overall loaded length (inches)	velocity (fps)
135 Nosler Hollowpoint	A-5	9.5	1.255	1,211
		10.0		1,267
		10.5		1,318
	Unique	7.8		1,266
		8.1		1,300*
		8.3		1,321
	Blue Dot	12.0		1,255
		12.5		1,310
135 Sierra JHP	WV-N340	7.8	1.255	1,105
		8.2		1,188*
		8.4		1,233
	A-7	11.0		1,068
		11.5		1,140
		12.0		1,228
	12.5	1,309		
	140 Barnes XPB	A-7		10.5
11.0			1,298	
WV-N350		7.0	1,188	
		7.5	1,235*	
		8.0	1,302	
150 Nosler JHP	W-231	7.0	1.260	1,199
		7.5		1,237
		8.0		1,293
	Power Pistol	8.0		1,199
		8.5		1,254
		9.0		1,309
		9.5		1,362
	WV-3N37	8.0		1,111
		8.5		1,165*
		9.0		1,238
	9.5	1,278		
150 Sierra JHP	A-7	11.0	1.255	1,104
		11.5		1,166
		12.0		1,244
		12.5		1,318
	A-5	9.0		1,047
		9.5		1,140
		10.0		1,201
	Bullseye	10.5		1,278
		5.5		998*
		6.0		1,066
155 Hornady XTP	Universal	6.5	1.255	1,154
		7.0		1,233
		7.3		1,290
	A-7	11.5		1,204
		12.0		1,262
		12.5		1,315
	Unique	7.0		1,154
		7.5		1,222*
		8.0		1,255
		8.5		1,287
155 Speer Gold Dot HP	800-X	8.0	1.260	1,081
		8.5		1,136
		9.0		1,174
		9.5		1,254
		10.0		1,305
	A-5	10.5		1,349
		9.5		1,169
		10.0		1,231

(Continued)

Table I **10mm Auto Handloads**

bullet (grains)	powder	charge (grains)	overall loaded length (inches)	velocity (fps)	
155 Speer Gold Dot HP	A-5	10.5	1.260	1,285	
		11.0		1,356	
	A-2	5.6		1,002	
		6.0		1,074*	
		6.2		1,105	
165 Sierra JHP	A-7	10.0	1.255	998	
		10.5		1,054	
		11.0		1,124	
		11.5		1,185	
	Universal	12.0		1,244	
		6.0		1,002	
		6.5		1,080	
		7.0		1,155	
	Power Pistol	7.4		1,232	
		8.0		1,189*	
		8.5		1,265	
165 Speer Gold Dot HP	A-9	14.0	1.260	1,255	
		2400		13.0	1,101
		13.5		1,148	
		14.0		1,216	
	A-5	8.5		1,048	
		9.0		1,136	
		9.5		1,188	
	CFE Pistol	9.8		1,222	
		6.5		959	
		7.0		1,031	
7.5	1,121*				
180 Nosler JHP †	2400	11.0	1.255	970	
		11.5		1,021	
		12.0		1,088	
		12.5		1,145	
		13.0		1,197	
	A-5	8.0		1,021	
		8.5		1,070	
		9.0		1,135*	
	Power Pistol	9.3		1,168	
		6.0		1,007	
		6.5		1,065	
7.0	1,108				
7.5	1,134				
7.8	1,159				
180 Hornady XTP †	Longshot	7.0	1.255	994	
		7.5		1,084	
		8.0		1,157	
	A-9	12.0		1,091	
		12.5		1,141	
		13.0		1,179	
	CFE Pistol	13.3		1,208	
		6.5		952	
		7.0		1,022	
		7.2		1,049	
		7.2		1,079	
Autocomp	6.5	990			
	7.0	1,056			
	7.2	1,079			
	7.2	1,079			
Titegroup	5.0	945			
	5.3	978*			
	5.6	1,030			
180 Speer Gold Dot HP †	WV-3N37	7.0	1.250	998	
		7.5		1,048	

(Continued on page 45)

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10MM AUTO

ram on the press all the way up. Then screw down the taper crimp die (without a seating plug installed) with finger pressure only until it is in firm contact with the factory round. Lower the ram and remove the factory cartridge, then turn the crimp die down another quarter-turn to compensate for “spring” that will likely occur. Now taper crimp a loaded cartridge that has the bullet seated to the correct overall length. If that crimp is identical in measurement to the factory load, set the lock ring. If done correctly, you should be ready to crimp handloaded cartridges that closely duplicate factory-load crimp specifications.

Some handloaders claim that the 10mm Auto does not headspace on the case mouth, but rather is held in place by the pistol’s extractor. It is true that a case that is shorter than industry-specified minimum lengths can be held firmly enough by the extractor to fire.

An extreme example is that most 1911 10mms with an internal extractor can be loaded with a magazine full of .40 S&W cartridges and fired. The cartridges will generally feed, fire and function, but there will be an occasional misfire due to the lack of positive headspace control. Furthermore, accuracy will be extremely poor, and for reasons that will not be discussed at this time, *this practice can potentially prove dangerous and is not recommended.*

In addition to all of the evidence of dimensional cartridge drawings and chamber specifications, doubters should consider that a 10mm cartridge can be inserted into a revolver chamber backward as the rim, measuring .425 inch, is the same as the case head and cannot possibly facilitate headspace control. However, when cartridges are chambered correctly, the case mouth firmly contacts the end of the chamber to achieve correct headspace

(with the only exception of revolvers loaded with moon clips). Again, when inserted into a chamber correctly, the case mouth plays an important role in positive headspace.

CCI 300 Large Pistol primers were used to develop the accompanying data; however, Federal 150 primers can also be used interchangeably. Primers should be seated .003 to .005 inch below flush to help assure reliable ignition and proper feeding.

There are many outstanding powders suitable for assembling first-rate 10mm handloads. For light target loads, Hodgdon Titegroup, Winchester 231, Alliant Bullseye and Accurate No. 2 are good examples that produced low extreme velocity spreads. The velocity performance-minded shooter will gravitate toward slower-burning propellants such as Accurate No. 5, No. 7, No. 9, Alliant Power Pistol, Unique, Hodgdon Longshot, Vihtavuori 3N37 and powders with a similar burn rate. High-volume shooters will appreciate the copper fouling-eraser qualities of Hodgdon CFE Pistol powder, which also delivered top-notch accuracy in the Colt pistol.

Thanks to the extreme popularity of the .40 S&W, there is a large selection of excellent 10mm/.400-inch bullets available from all major U.S. bullet manufacturers. Lightweight cup-and-core examples include Nosler and Sierra 135-grain JHP bullets while Hornady, Nosler, Sierra and Speer offer various 150- and 155-grain hollowpoint bullets that provide rapid expansion. Although these bullets are designed primarily for the .40 S&W, they worked very well in the 10mm.

It is the various 180-grain bullets that really shine in the 10mm, as they offer distinct performance advantages and were generally the most accurate. Although it is a true match bullet, the Sierra 190-grain FPJ is a good choice where deep penetration is desired on game such as bear or hogs. While I have not tested the

Table I 10mm Auto Handloads						
bullet (grains)	powder	charge (grains)	overall loaded length (inches)	velocity (fps)		
180 Speer Gold Dot HP†	W-3N37	8.0	1.250	1,129*		
		8.2		1,155		
	800-X	7.5		1,006		
		8.0		1,038		
		8.5		1,097		
	A-9	9.0		1,146		
		9.5		1,190		
		12.0		1,118		
		12.5		1,143		
		13.0		1,185		
		13.3		1,210		
	180 Sierra JHP†	Blue Dot		8.5	1.255	991
				9.0		1,043
		A-7		9.5		1,126
10.0			1,201			
10.5			989			
Unique		10.0	1,051			
		10.5	1,130			
		11.0	1,168			
		6.5	1,082			
		7.0	1,125			
		7.5	1,157			
800-X		8.0	1,122			
		8.5	1,174*			
		8.8	1,202			
190 Sierra Match FPJ†	A-7	9.0	1.250	935		
		9.5		970		
	Power Pistol	10.0		1,041		
		10.5		1,133		
		6.0		983		
	A-2	6.5		1,009		
		7.0		1,082		
		7.3		1,112		
		5.0		888		
	Unique	5.5		948		
		5.7		982*		
		5.0		801		
		5.5		905		
	200 Hornady HAP†	Longshot		6.0	1.260	913
6.5			971			
A-7		7.0	1,033*			
		7.5	1,104			
		8.5	955			
800-X		9.0	984			
		9.5	1,048			
		6.5	889			
		7.0	941			
A-9		7.5	1,024			
		7.8	1,073			
		11.0	1,038			
		11.5	1,092			
Power Pistol		11.8	1,105			
	6.5	963				
	7.0	1,054				
	7.3	1,090				
Unique	5.5	933				
	6.0	985				
	6.5	1,022				

(Continued)

Table I 10mm Auto Handloads				
bullet (grains)	powder	charge (grains)	overall loaded length (inches)	velocity (fps)
200 Hornady HAP†	W-3N37	6.5	1.260	956
		7.0		998
		7.5		1,044
		7.7		1,065
		6.0		964
180 Oregon Trail Cast TC†	Power Pistol	6.5	1.250	1,040
		7.5		997
	A-5	8.0		1,033
		8.5		1,074
		4.5		844*
	W-231	5.0		908
		5.5		987
		6.0		1,071

* potentially most accurate with this bullet

† Starline cases

Notes: A Colt Government Model Delta Elite Stainless with a 5-inch barrel was used to test all loads. Hornady cases were used except where noted. CCI 300 primers were used throughout. Bullet diameters: .400 inch jacketed and .401 inch cast; maximum overall loaded length: 1.260 inches; SAAMI maximum case length: .992 inch; industry suggested trim-to length: .982 inch.

For more data on this cartridge please visit LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

Table II 10mm Auto Factory Loads		
load (grains)	stated velocity (fps)	actual velocity (fps)
155 Hornady XTP	1,265	1,288
175 Hornady FlexLock	1,160	1,174
175 Winchester Silvertip HP	1,290	1,285
180 Buffalo Bore JHP	1,350	n/a
180 Federal AE FMJ	1,030	999
180 Federal Hydra-Shok JHP	1,030	981
180 Hornady XTP	1,180	1,195
180 Remington Metal Case	1,150	1,129
200 Blazer TMJ	1,050	1,028
200 Buffalo Bore FMJ-FN	1,200	n/a

Notes: A Colt Government Model Delta Elite Stainless with a 5-inch barrel was used to test all cartridges.

Hornady 200-grain HAP bullet for penetration, company representatives tell me that it will not expand, which might make it a good choice for the above application.

A number of subsonic starting loads were developed (mostly with 180-grain bullets), which will more or less duplicate the FBI load and can be suppressed if desired.

All loads were assembled with an overall cartridge length between 1.250 and 1.260 inch, with the latter being the industry maximum length, and all loads chambered properly in the Colt Delta Elite. However, some early 10mm pistols may require slightly deeper seating for the bullet's ogive to clear the chamber's leade. Seating bullets deeper, even in small increments, will change the pressure of a given load.



NORMA BRASS

FOUNDED FOR HANDLOADERS





Terry Wieland

One of the sweetest things to a handloader's ear, as he ponders an alluring rifle for a rare cartridge, is to hear the guy behind the counter say, "Norma makes brass for that." When you hear those words, you know that most (if not all) of your troubles are over.

American shooters have had access to brass, bullets and loaded ammunition from the Swedish company off and on for 60 years now. Sometimes we didn't even know it. Back in the 1960s, when some hotshot was singing the praises of his .300 Weatherby Magnum, he was actually touting Norma ammunition. The company has been making Weatherby brass and providing Weatherby's loaded ammunition since the 1950s – and great stuff it is.

Today, Norma USA has a firm foothold on American shores, but it has been a long time coming. Since 1950, there have been a few false starts, a few unrewarding partnerships and the unpredictable vagaries of currency fluctuations. What has never changed, however, is the consistently high quality of Norma products. In my opinion – based on more than 50 years of experience – Norma brass, especially, has maintained its quality year after year, and that is no small feat.

As a company, Norma Precision is 124 years old. This makes it, to my knowledge, by far the oldest company originally founded for the sole purpose of serving handloaders. It was founded in 1894 by the Enger brothers to provide jacketed bullets to Norway's target shooters, who were then adopting the new Mauser 1894 military rifle with its 6.5x55 cartridge and learning to cope with the demands of smokeless powder.

Norway has always been a nation of shooters. For years, Norwegian marksmen made their passion affordable by casting bullets and loading their own ammunition. With smokeless powder, this was no longer possible, since only jacketed bullets could withstand the increased heat and pressure, so the Enger brothers set up a small shop to make jacketed bullets for them. As business grew, contracts came their way, including one from the government of Sweden. This required a new facility in the small Swedish town of Åmotfors, which Norma has called home ever since.

The entire history is told in the Norma handload-

Fashioning 9x57 brass from Norma's 9.3x57 is as easy as pulling the handle on the press. The brass does not even need lubrication, and re-formed cases are indistinguishable from factory 9x57.

NORMA BRASS

ing manual (which belongs on the shelf of anyone who uses Norma brass or bullets), but one of its earliest innovations deserves particular attention. The company developed a method of pressing the jacket to give the bullet what we now call a boat-tail. It was well known by target shooters at the time that a bullet's accuracy depends on the consistent precision of its base. Norma's ballistics engineer, Karl Wang, developed a method of rolling the jackets and imparting a boat-tail. This was a ballistic breakthrough. Norma bullets acquired a reputation for long-range accuracy, and the company's process provided a decided commercial advantage that lasted for years.

Over the next century, Norma Precision branched out into the production of brass cartridge cases, primers and loaded ammunition for target shooters, hunters

and the military. At one point, the company designed and manufactured its own handloading equipment, including a press. Today, many American shooters also know the brand for its line of smokeless powders.

Throughout this time, Norma Precision aimed for the highest quality. Unfortunately, high quality often brings high prices with it. As an import, Norma has always been at a disadvantage in that regard anyway, competing with domestic products, and currency fluctuations don't help the situation. As a handloader, however, price matters less to me than quality and availability, especially when dealing with cartridges that are not readily available elsewhere.

Since 1975, I have never been without a Weatherby rifle of some description, which meant Norma-made brass. In 1987 I became quite fond of the 6.5x55 Swedish cartridge; at the time only loaded Norma ammunition was available, so I bought and used that. In fact, I still have some brass that I've been loading off and on for 30 years. Later I acquired both a 7x61 Sharpe & Hart and a .358 Norma Magnum. Brass-wise, both

are Norma exclusives. Most recently, I have been shooting a 9x57 and several 6.5x54 Mannlicher-Schönauers. Norma makes 6.5x54 M-S brass, although it no longer offers loaded ammunition. And while it does not currently make 9x57 brass, it does have 9.3x57, which can be necked down as easily as resizing a fired case.

The only complaint I have ever heard about Norma brass was one soul who claimed that he found it to be "too soft." That has never been my experience, and I don't really understand the complaint anyway. As many would-be manufacturers have discovered to their cost, stamping out cartridge cases is no simple matter. Aside from requiring the proper alloy of brass to start with, the finished case needs to have a base that is relatively hard but with a body – and especially a neck – that is malleable enough to accept the bullet, resilient enough to grip it firmly and soft enough to expand readily and provide a complete gas seal.

A base that is too soft can cause all kinds of difficulties when subjected to pressures exceeding 50,000 pounds per square inch (psi). These include rupturing and

Select Norma Brass Handloads

cartridge	powder	charge (grains)	primer	velocity (fps)	comments
.222 Remington, Anschutz, 20-inch barrel					
50 Nosler Ballistic Tip	H-4198	20.5	F205M	3,020	Lower-volume brass
.22 High Power, Savage Model 1899, 20-inch barrel					
70 HDS Custom	IMR-4064	26.6	F210M	2,497	Norma designation 5.6x52R, Powley Computer load
6.5x54 M-S, Mannlicher-Schönauer, Model 1903 African, 26-inch barrel					
130 Sierra HPBT	H-4895	35.0	F210M	2,447	
6.5x55, Parker-Hale Model 1100 Lightweight, 22-inch barrel					
140 Nosler Partition	IMR-4350	48.0	F210	2,850	Maximum load, approach with caution
8x57 JS, Mannlicher-Schönauer, Model 1950, 24-inch barrel					
150 Sierra spitzer	RL-15	49.0	F210M	2,720*	
200 Nosler Partition	H-4350	52.0	F210M	2,484*	
9x57, Haenel-Mannlicher, New Model, 22-inch barrel					
225 Sierra spitzer	IMR-3031	45.5	F210M	2,231	Norma 9.3x57 necked down, Powley Computer load
.358 Norma Magnum, Schultz & Larsen, Model 65 DL, 23.5-inch barrel					
125 Sierra HP	Trail Boss	19.0	F215M	1,839	Accurate short-range load
180 Speer FP	H-4895	75.0	F215M	3,294	

* Very accurate loads that shoot to the same point of impact at 100 yards.

For more data on these cartridges please visit LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

flowing into crevasses in the action, impeding operation or even jamming the rifle. It can also cause the primer pocket to expand, rendering the case useless for reloading. A case body that is too hard, on the other hand, becomes brittle and may split – sometimes on first firing. And a neck that is too hard may split even *without* firing, just from seating the bullet, or from leaving it in storage. Many boxes of old ammunition have split necks simply due to age.

Brass work-hardens, which means that as you resize it, it gradually becomes harder and more brittle. This can be avoided by periodically annealing the neck and shoulder; this process, however, needs to be approached carefully to avoid softening the case in areas where it needs to be hard and tough.

Starting with brass that is a little soft around the neck and shoulder is a minor problem that solves itself – hence, my difficulty in appreciating the complaint about Norma brass being soft. Anyway, I have never found that to be the case, and over the years have reloaded literally thousands of Norma cases, and some individual cases 20 or 30 times.

Part of Norma's major push into the American market after 2000 included the introduction of its African PH ammunition line. This proved to be a huge success. First, the ammunition itself is excellent, loaded to hunting velocities with Woodleigh bullets in obscure calibers such as the .500 Jeffery and .505 Gibbs. The simple availability of brass gave both of those cartridges a real shot in the arm. Originally intended as a "prestige" item, African PH ammunition became, and remains, a Norma best-seller.

.22 HIGH POWER

The .22 Savage High Power (also called the "Hi-Power" or "The Imp") was the first real small-caliber, high-velocity cartridge in America, designed by Charles Newton and introduced by Savage in 1911 in the Model 1899.

Although it was quickly super-



Old and new: A 6.5 Creedmoor Ruger Model 77 Hawkeye FTW Hunter (top) and a Savage Model 1899 .22 High Power. Norma makes brass for both of them.

sed by newer, better cartridges like the .250-3000, and only Savage chambered it commercially, the .22 High Power became a favorite in Europe for single-shot and double rifles. Over there it's known as the 5.6x52R, and it achieved such popularity that most European cartridge manufacturers continue to make it right up to the present day. Of these, the only company I know of that offer high-quality virgin brass in the U. S. is Norma. For .22 High Power owners, it's a lifesaver.

6.5x54

MANNLICHER-SCHÖNAUER

This is one of the most popular and successful hunting cartridges of all time, and it was loaded commercially in the U.S. until long after the Second World War. One by one, however, American companies dropped it and by the 1960s, only Canada's Dominion brand was available here. Norma still offers its superb brass in the U.S. but not loaded ammunition.

The 6.5x54 M-S offers some challenges for handloaders not encountered with other cartridges. Its chamber dimensions tend to vary, with some displaying signs of excessive headspace while others are so tight they present extraction difficulties even with mild handloads. Since handloading is

the only way to keep these lovely rifles shooting, having top-quality brass is an absolute must. It will fireform to the chamber and can then be neck-sized only. This will obviate the headspace problem.

One of my Mannlichers had an overly snug chamber, and absolutely nothing worked until I had it reamed slightly and acquired some Norma brass. Older, odd-brand brass still doesn't work, but with Norma brass it fires and cy-

Although it's more than a century old, the 6.5x54 M-S is still a great cartridge. Having new Norma brass is a treat for owners of Mannlicher-Schönauer rifles and carbines.



NORMA BRASS

cles like a dream. I keep a separate batch of brass fired only in that rifle and then neck-sized.

9x57 MAUSER

The 9x57 Mauser was developed in the 1890s and is nothing more

nor less than the venerable 8x57 necked up. In power it compares to the much later .358 Winchester, although most European loadings fit in between the .358 and the smaller .35 Remington. It can be loaded to launch a 225-grain bullet at 2,200 fps or a little faster, making it a great woods cartridge for anything up to elk or moose.

The 9x57 was one of the original chamberings of the Haenel-Mannlicher rifles imported to the U.S. from 1902 to 1914. They were

based on Commission 88 actions and sport such mouth-watering goodies as full-length integral ribs, half-octagonal barrels and double-set triggers. Pick one up, and the urge to shoot it becomes almost overwhelming.

Since Norma offers 9.3x57 brass, necking it down a mere .012 inch (.3mm) is easier than resizing fired cases. It's so effortless a hand-loader doesn't even need to lube the cases. By modern standards, the 9x57 is a low-pressure cartridge; in a light rifle, it also has a pretty hefty kick. Keeping loads reasonable benefits both your shoulder and the brass, and it can be reloaded almost indefinitely.

.500 JEFFERY

AND .505 GIBBS


These are two old English nitro-express cartridges intended for magazine rifles. The .500 Jeffery was actually a development of August Schuler in Germany, but it was given a second home in London by W.J. Jeffery around 1925. The .505 Gibbs was introduced in 1911.

Historically, few rifles were made for either cartridge. According to reliable estimates, probably only 100 or so of each were made between their introduction and 2000, which means that more

Norma makes ammunition and brass in such American standards as the .270 Winchester and .30-06, as well as rare or obsolescent cartridges.

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Inclusion of the .505 Gibbs in Norma's African PH ammunition breathed new life into the great old nitro-express cartridge.

have been made for both since 2000 than in the 80 years previous. Much of this renewed popularity can be laid at Norma's door, since the company included both in its African PH series.

Neither cartridge case is readily fashioned from any existing brass. The .500 is a fat cartridge with a rebated rim, while the .505 is so oversized it makes the .416 Rigby look like a .30-06. Finding ammunition or brass for either was a headache as far back as the 1960s, once Kynoch discontinued them. Prices of double rifles skyrocketed through the 1990s, putting them out of reach of most hunters. At the same time, magnum Mauser actions became available from Granite Mountain, as did finished rifles from CZ. This made it possible for Americans to own .500 Jefferys and .505 Gibbs rifles. Enthusiastic owners of these behemoths can now batter themselves to their hearts' content.

In the 1950s Norma was involved in the introduction of the 7x61 Sharpe & Hart, and later two cartridges of its own – the .308 and .358 Norma Magnums. In 2000, it adopted the wildcat 6.5-284 (6.5-284 Norma), and provides both ammunition and brass. Most recently it has introduced two new target and hunting cartridges, the .300 Norma and .338 Norma Magnums.

All of the above cartridges have merits – and some deserved a better reception than they received – but in every case, the availability of Norma components guaranteed that owners of a 7x61 S&H, .358 Norma Magnum and 6.5-284 had access to some of the finest components in the world, and for many years after their introduction. As owners of such orphans as the .256 Winchester Magnum will attest, this is no small thing. •



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Mike Venturino

Photos by Yvonne Venturino

When opening two very heavy boxes of cast bullets recently sent to me, little did I know I was about to delve into something I had never before experienced. Although I have been casting my own bullets for more than 50 years and have shot tens of thousands of commercially cast types along with my own, I wasn't prepared for what was in those two boxes from Missouri Bullet Company (MBC).

The bullets were red! A couple packages had black bullets, but most were red. Also, some of the bullets had normal grooves for carrying lubricant, but there was none. Others were straight-sided with no grooves at all. I must admit that the term "coated cast bullets" was not unfamiliar, but if I had ever seen one previously, the recollection was gone. I was looking at a couple thousand assorted, coated bullets in 100-round packages ranging from .25 to .50 caliber.

This is where the search engine Google comes in handy. Typing in "Missouri Bullet Company" got me to missouribullet.com. The first thing searched out was this red Hi-Tek coating. Here's what I found: "The coating itself consists of a catalyst which binds a polymeric colorant agent with acetone which is then applied in bulk to raw bullets and baked onto the bullets' surface at nearly 400 degrees. The coating is a polymer (bonded with metal) and forms an extremely tough new surface for the bullet. The application of the coating is repeated for an additional coat. The

bullets are then sized normally but not lubricated as the coating itself acts as a bullet lube. Nominal bullet diameter is not affected."

Additionally stated was that this material is made in Australia, and its purpose is to coat bullets so no raw lead alloy is exposed as required by some indoor ranges. It also keeps alloy from touching barrels, which should reduce or eliminate lead fouling and improve precision grouping. My thoughts then were as might be expected from an old dinosaur like myself who has lubed every single personally-cast bullet since 1966. My thought was, *We shall see*.

The red coating was now understood, as was the reason some bullets had no grease grooves. I also had to admit that the bullets did have a slick feel when handled. Also, the coating was said not to affect bullet diameter. When samples were measured they were as advertised in diameter. Interestingly, on every 100-bullet package there was a Brinell Hardness Number (BHN), and they were not all the same.

Packaged with the bullets was a pamphlet describing MBC's thoughts on bullet hardness. Contrary to the old mantra bandied about by many cast bullet shooters that "harder is better," MBC's take on the matter is that hardness is better *sometimes* and that bullet hardness is best dictated by cartridge pressures. As many other handloaders have learned through experience, overly hard bullets can cause worse lead fouling than softer bullets. The key is obturation, which is simply the bullet's ability to expand to the diameter of the barrel in which it is fired. Gas leaking around a bullet's base is the primary culprit causing lead fouling. And of course, that obturation/sealing will be determined by the cartridge's pressure, or how hard the bullets' bases are pushed upon powder ignition.

MBC's informational pamphlet says it works with two basic foundry-certified alloys. One is 2 percent tin, 6 percent antimony, with the other 92 percent

MISSOURI BULLET COMPANY TESTING COATED CAST HANDGUN BULLETS

lead, which gives a BHN of 18. The other is 1.3 percent tin, 4 percent antimony, and the remainder is lead. That one must have a BHN of 12, but the pamphlet does not state that precisely. However, all the company's "Cowboy" bullets and others meant for mild revolver cartridges have packages indicating "Brinell 12." Those for semiautomatic handguns or magnum revolver loads state "Brinell 18." (Some packages for high-velocity rifles, such as 7.62x54mm Russian or 8x57mm Mauser, are labeled Brinell 20, but that alloy's composition is not mentioned in the literature.)

Before ever opening one of the 100-bullet packages, there was something about them I admired. The bullets had names indicating a shooting purpose. For instance, many were "Cowboy." Others were "IDP," "Pinbusters" or "Whitetail." One that made me smile was "Buffalo" for 400-grain .45-70 FNs. Those names helped me pick some of the guns and loads with which to use specific bullets. Also needing a mention while speaking about the packaging is that MBC will sell samples of its bullets. That way a particular bullet can be experimented with before being purchased in quantity. Any of the bullets can likewise be purchased with normal hard lubricant (not the grooveless ones) or no lubricant at all. The Hi-Tek coating can be bought separately if shooters wish to try coating a favorite home-cast bullet. MBC does not offer any gas check-style bullets.

The next step was determining how to proceed with the informal test. I decided this article should consider handguns only (MBC cast rifle bullets will be covered in the near future). In regard to handgun bullets, MBC offers them ranging from a .313-inch, 78-grain bullet for various .32 revolvers to a .501 inch,



All groups were shot with handguns mounted in a Ransom Machine Rest, including this Ruger Blackhawk .44 Magnum.

500-grain FN for the .500 S&W. Not owning handguns for either of those or for such cartridges as .480 Ruger, it was necessary to pick and choose from several dozen packages. Another limiting factor was a desire to shoot groups with handguns using a Ransom Pistol Machine Rest. Some cartridges were eliminated due to my not having grip adaptors for some handguns such as a Colt Model 1908 .380.

Eleven handguns chosen were for the same number

Double-action revolvers were used to test four cartridges with five Missouri Bullet Company coated bullets, including a (1) .38 Special 158-grain RNFP, (2) .357 Magnum 158 SWC, (3) .44 Special 200 RNFP, (4) .44 Special 240 SWC and a (5) .45 Auto-Rim 200 RNFP.





Four double-action Smith & Wesson revolvers used during testing include the (1) Second Model Hand Ejector .44 Special, (2) Model 20 .38 Special (3) Pre-Model 27 .357 Magnum and a (4) Model 22 .45 Auto-Rim.



The four autoloading pistols used to test bullets include the (1) Colt Model 1911 El Centurion, (2) Les Baer Model 1911, Thunder Ranch Special .45 Auto, (3) Kimber Pro-Carry .40 S&W and a (4) German (Mauser) P38 9mm.

MISSOURI BULLET COMPANY

of cartridges. Four were semiautomatics, four were double-action revolvers and three were single-action revolvers. These handguns ranged in age from a 1929 vintage Smith & Wesson Second Model Hand Ejector .44 Special to a 2007 manufactured Colt SAA .44-40. At the small end was a Smith & Wesson Model 20 .38 Special, and on the large side was a Colt New Frontier .45. None of these handguns have had custom work in regard to accuracy. A few I have had for 20 to 30 years and have been machine-rest tested previously, and a few have been on hand for

only a few months and this was their first time in the Ransom Rest.

Also ordinary was the manner by which 16 MBC bullets were loaded into those 11 cartridges. Cases were full-length sized, case mouths were belled and then bullets seated and crimped with standard off-the-shelf reloading dies by RCBS, Lyman and Redding. In other words, these bullets were loaded no differently than I load my own home-poured bullets. Revolver cartridges were roll crimped, and loads for semiautomatics were taper crimped. Wolf Small Pistol and Federal 150 Large Pistol primers were used as appropriate. Headstamps of brass used will be in the accompanying table, and all cases had been fired previously, except for those used in two cartridges, the .38 Super and

.45 Colt. Brass for these two cartridges was unfired and supplied by Jagemann (JagemannSporting-Group.com). It was of fine quality.

In a few instances, a current favorite powder was used such as 6.0 grains of Trail Boss in .45 Colt with 250-grain bullets or in .44-40 with 200-grain bullets. Old favorites were used in both magnums: 14.0 grains of 2400 with 158-grain SWCs in the S&W .357 Magnum and 21.0 grains of the same powder with the Ruger .44 Magnum. The rest of the assortment used charges picked from one or another reloading manual for powders on hand.

All experienced cast bullet shooters know that when switching from one bullet lubricant to another, the first few shots likely will be flyers. Then the gun will settle down and group to the load's potential. Therefore, before shooting from the machine rest, each gun was fired with MBC Hi-Tek bullets

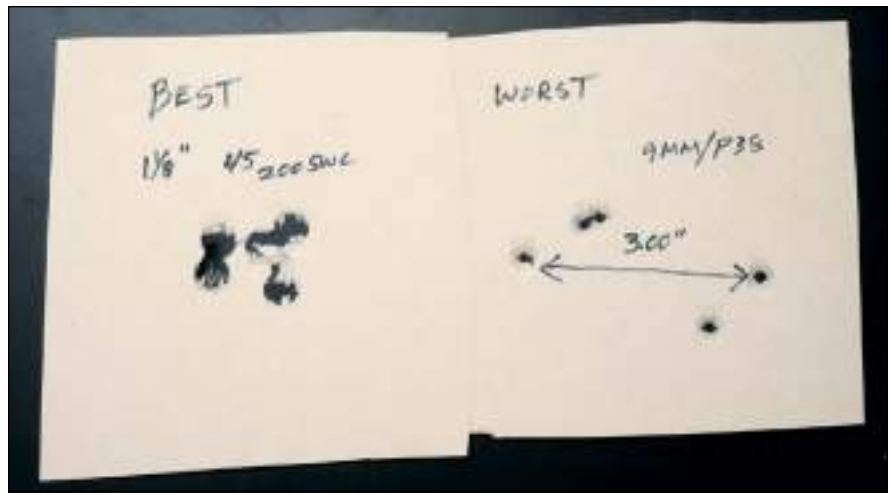
Mike used four semiautomatic pistol cartridges with a total of seven Missouri Bullet Company coated bullets including, the (1) 9mm 115-grain RN, (2) 9mm 124 RN, (3) .38 Super 124 RN, (4) .38 Super 147 Tapered FP, (5) .40 S&W 180 Tapered FP, (6) .45 Auto 200 RN and a (7) .45 Auto 200 SWC.



for chronographing velocity and to determine if loads functioned reliably in the semiautomatics, which they did. When mounting each handgun into the Ransom Rest grip adaptors, another 10 rounds were fired, and the fixture tightened after each round. Then a five-shot group was fired at 25 yards with each bullet chosen.

To be honest, I had little confidence in lubeless bullets. So the first revolver fired was also one in which I had little confidence – a Colt New Frontier .45 that has .456-inch chamber mouths, and the MBC bullets were .452 inch in diameter. Therefore, I was sur-

(Continued on page 68)



These targets show the smallest and largest groups fired with the handguns. The group at left was shot with a Les Baer .45 Auto using 200-grain, smooth-sided SWC bullets. The group at right was shot with a World War II vintage P38 9mm Parabellum with 115-grain RN bullets.

Select Missouri Bullet Handloads

bullet (grains)	powder	charge (grains)	primer	case	velocity (fps)	extreme spread (fps)	5-shot 25-yard group (inches)
9mm Parabellum, German P38, 5-inch barrel							
115 Parabellum RN (.356 inch)	W-231	4.1	Wolf SP	Winchester	999	43	1.875
124 RN (.356 inch)	W-231	3.8			927	28	3.0
.38 Super Colt 1911 El Centurion, 5-inch barrel							
124 Parabellum RN (.356 inch)	Unique	5.5	Wolf SP	Jagemann	1,312	16	3.0
147 Subsonic FN (.356 inch)*	Unique	4.8			1,131	21	2.625
.38 Special, S&W Model 20, 6.5-inch barrel							
158 Cowboy No. 15 RNFP (.358 inch)	HP-38	3.7	Wolf SP	Starline	731	29	2.375
.357 Magnum, S&W Pre-Model 27, 6.5-inch barrel							
158 .357 Action SWC (.358 inch)	2400	14.0	Wolf SP	Browning	1,390	65	2.50
.40 S&W, Kimber Pro-Carry, 4.25-inch barrel							
180 TCFP/IDA No. 5 RN (.401 inch)	HP-38	4.3	Wolf SP	Winchester	806	28	1.75
.44 Special, S&W Second Model Hand Ejector, 6.5-inch barrel							
200 Cowboy No. 5 RNFP (.430 inch)	Unique	7.4	Federal 150 LP	Winchester	988	74	2.875
240 Elmer Keith RNFP (.430 inch)	Unique	6.6			919	49	2.25
.44-40 Colt Single Action Army, 4.75-inch barrel							
200 .44-40 RNFP (.428 inch)	Trail Boss	6.0	Federal 150 LP	Starline	735	48	2.125
200 Cowboy No. 5 RNFP (.430 inch)	Trail Boss	6.0			734	36	2.375
.44 Magnum, Ruger Old Model Blackhawk, 6.5-inch barrel							
240 Elmer Keith SWC (.430 inch)	2400	21.0	Federal 150 LP	Norma	1,413	84	2.375
.45 ACP, Les Baer Model 1911 Thunder Ranch Special, 5-inch barrel							
200 .45 Oddball RN (.452 inch)	W-231	5.7	Federal 150 LP	Federal	791	21	2.25
200 IDP No. 1 SWC (.452 inch)*	W-231	5.7			781	25	2.375
.45 Auto-Rim, Smith & Wesson Model 22, 4-inch barrel							
200 .45 Oddball RN (.452 inch)	Unique	5.3	Federal 150 LP	Starline	788	51	2.75
.45 Colt, New Frontier, 7.5-inch barrel							
200 Cowboy No. 4 RNFP (.452 inch)	Trail Boss	6.4	Federal 150 LP	Jagemann	770	34	2.50
250 Cowboy No. 1 RNFP (.452 inch)	Trail Boss	6.0			680	20	1.75

* Bullet has no lubrication grooves and smooth sides.

Notes: All loads were chronographed at approximately 6 feet. All groups fired from Ransom Pistol Machine Rest.

For more data on these cartridges please visit LoadData.com.

Be Alert – Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.



The MP moulds come with hex keys, a top punch, a bottle of oil and pins for appropriate moulds.

MP BULLET MOULDS

A First Look at New Brass Moulds



John Haviland

They say necessity is the mother of invention. In Miha Prevec's case, a lack of bullets drove him to make a mould for himself, and that eventually turned into a job making bullet moulds for shooters around the world.

Prevec started reloading 25 years ago. He mostly shot International Practical Shooting Confederation matches with a .45 Auto. However, finding bullets for reloading was difficult in his home country of Slovenia. He was working in a tool shop at the time and had access to an EDM machine, so he made a two-cavity aluminum mould based on the Hensley & Gibbs No. 68 mould. A few years later he started working in the information technology industry and lost his access to a milling machine. He bought a six-cavity mould but was disappointed in its quality.

"I called a friend of mine who has a big tool shop and asked him if I could make some molds," Prevec said. "He agreed and I ordered a cherry cutter." In the meantime, Prevec posted on the Cast Boolits website that he would be machining moulds, and if anyone was interested in buying one, they should contact him. In two days, 40 people had signed up to buy

one of his moulds. "The rest is history they say." MP Kalupi d.o.o. is the official company name. MP Kalupi in Slovenian means "MP Molds" (mp-molds.com).

Prevec and his father, a retired machinist, are the only employees at the moment. The company recently moved to a larger shop, and Prevec is looking to hire more people. He also contracts out some work, such as laser cutting and machining various pins.

Most of Prevec's more popular moulds are always in stock. Others are made on an as-needed basis. Mostly he conducts group buys on the Cast Boolits forum. When 25 people have signed up to buy the same mould, he machines a batch, bills the customers and mails them out. The shipping price is included in the cost of a mould. He always makes a few additional moulds of a batch he has sold and posts them on his website.

MP mould options include designs for a hollow-point or roundnose, flat, beveled or hollowbase, and bullets without lube grooves intended for coating. Calibers include .22, .24, .308 and up to .45 for rifle cartridges, and 9mm through .45 for handgun cartridges. An RCBS/Lyman-type top punch is included with each mould, and they fit on Lee six-cavity handles. Moulds are cut to drop their stated bullet weights cast of wheelweights, as most of MP Molds' customers prefer to cast bullets with that lead alloy. "Most bullet designs are made by Bobby Kell Jr. from Centralia, Illinois," Prevec said.

Prevec prefers to make brass moulds. "Brass is easier to machine [than steel], better retains heat, does not rust and there is no need for bushings for hollow-point pins," he said. The few moulds he makes of steel are intended for Magma or Ballisti-Cast casting machines. His aluminum moulds usually have six or eight cavities and come with a steel sprue plate.

Many of the company's moulds are designed to incorporate interchangeable pins to cast roundnose or hollowpoint bullets. For example, the four-cavity MP 452-185 mould comes with pins to cast roundnose bullets, and pins with a long-tapered tip to cast hollowpoint bullets. The MP 452-374 mould includes a set of pins that are flat on one end to cast bullets with a flat tip, but the pins can be turned around so their dimpled tips cast bullets with a more rounded tip. Two sets of pins with pointed tips that cast hollowpoint bullets are also included. One set of pins forms a deep and wide hollowpoint. The other set of pins forms a shallower hollowpoint with a pentagonal shape. The opposite ends of the hollowpoint pins are flat and can be turned around to cast bullets with flat tips.

Two screws go through holes on the side of one half of a mould and thread onto each pin. Clips attach to the base of the screws to keep them in place. "I always include a few extra clips," Prevec said. A small bottle of lubricant is included with each mould, and

MP BULLET MOULDS

a drop of it on each screw helps it freely slide in and out. Most other brands of moulds that incorporate point or base pins are made with a slotted strap screwed to the bottom of the mould that allows the pins to slide back and forth when the mould is opened or closed.

Before casting with the MP 452-374 mould, I installed one pin with a dimpled tip, one with a flat tip, one with a long hollowpoint pin and one pentagonal hollowpoint pin. I scrubbed the brass mould with a toothbrush and dish detergent and rinsed it with hot water to remove any oil from the cavities. The four-cavity mould is big, measuring 3.15x1.3x1.50 inches,



Redding delivers more selection in its die sets for 2018 highlighted by the new Handgun additions to their popular Premium Die sets. New offerings are also available in 20 Nosler, 24 Nosler, 6.5 GAP 4-S and 450 Bushmaster. A new Competition Seat Die has also been added to the 6mm Dasher allowing additional Type-S Match Sets for the cartridge. More popular cartridges have been added to the Premium Die Sets, Master Hunter Series and National Match die sets as well.

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and it fits on Lee six-cavity mould handles. Placing the mould on the stovetop burner set on low for 20 minutes helped bring it up near to casting temperature.

The lead alloy in my RCBS furnace was of wheelweights. Bullets dropped from the mould wrinkled and stuck to the hollowpoint pins the first few casting cycles. Some alloy overrun spilled onto the pin screws on the left side of the mould, and removing the lead took some time. Tilting the mould slightly to the right prevented that problem.

The mould then started dropping fully formed bullets. The nose pins slid out most of the time when the mould opened and pulled the bullets out of the cavity. When they remained in, a light tap on the pin screws with a sprue mallet pushed out the pins. Bullets stuck somewhat on the hollowpoint pins. Rapping the mould handle with the mallet knocked them off the pins but distorted the bullets. MP Molds' website suggests turning an open mould upside down to free the bullets. That worked, and the hollowpoints remained intact.

Bullets dropped from the mould were .454 inch in diameter. The roundnose bullets weighed 227 grains, the pentagonal hollowpoint bullets weighed 217 grains

Right, the MP 452-374 mould provides the option of casting bullets with four different nose designs. Below, the MP 359-125 eight-cavity mould was used to cast bullets for .38 Special loads shot from a Smith & Wesson Model 19 .357 Magnum.



Most MP moulds are made of brass. A few are of aluminum or steel.

and the deep hollowpoint bullets weighed 210 grains. The weights of 15 bullets varied up to .5 grain.

Alternating between casting with the MP 452-374 and MP 452-185 moulds, the moulds maintained an even temperature to produce fully formed, shiny bullets.

The MP 452-185 four-cavity mould with flat-tip pins in place cast semiwadcutter bullets with narrow, flat noses. Bullets dropped from the mould weighing 188 grains and were .454 inch in diameter. I completely cleaned a .451-inch die to make sure no lube got





MP four-cavity brass moulds are big and require preheating and casting a few times to bring them up to the correct temperature to produce fully formed bullets.



Many moulds come with pins to cast different types of bullets. The pins attach to screws that slide in and out of the cavities.

on the bullets and pushed some of the bullets in and out of the die. Bullets were then powder-coated and baked, which increased diameter to .453 inch.

One plus of cast bullets is they have a very uniform shape from one bullet to the next. Using a Hornady Lock-N-Load Bullet Comparator, I measured the base to near the front of the ogive of 10 bullets cast from the MP 452-185 mould. All of them measured the same. However, 10 jacketed, 185-grain semiwadcuter bullets varied up to .004 inch, so cast bullets did result in more uniform cartridge fit in a chamber. That is probably quibbling, as the overall length of an autoloading handgun cartridge is usually kept a bit short to leave some room to accommodate powder fouling. But I like to nitpick.

I dropped .45 Auto cartridges, with bullets seated obviously long, into the chamber of my Colt Gold Cup and increased seating depth until cartridges freely chambered, arriving at cartridge lengths for bullets cast from the MP 452-185 mould, plus two hollowpoints and one roundnose bullet cast from the MP 452-374 mould. With bullets seated to those cartridge lengths, two full magazines of cartridges loaded with each bullet reliably cycled through the pistol. While shooting targets, the loads never bobbled while feeding from the magazine into the chamber – all chambered fully.

To remove human error, the Colt was clamped in a Caldwell HAMMR mechanical handgun rest. At 25 yards the MP cast bullets shot just as well from the Colt as various expensive jacketed bullets had in times past.

More .38 Special and .357 Magnum cartridges are fired than any other centerfire cartridges around my house. Casting .35-caliber bul-

lets with two- and four-cavity moulds is a laborious chore to keep everyone shooting. So with much appreciation, I started casting bullets with MP Molds' brass, six-cavity MP 359-135 mould and aluminum, eight-cavity MP 359-125 mould.

Cast from wheelweight alloy, bullets weighed 131 grains from the MP 359-135 mould. Most of

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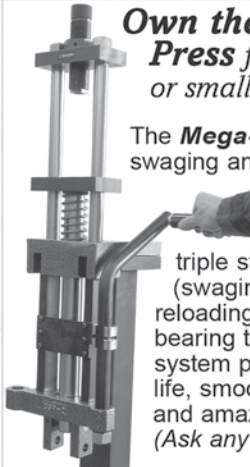
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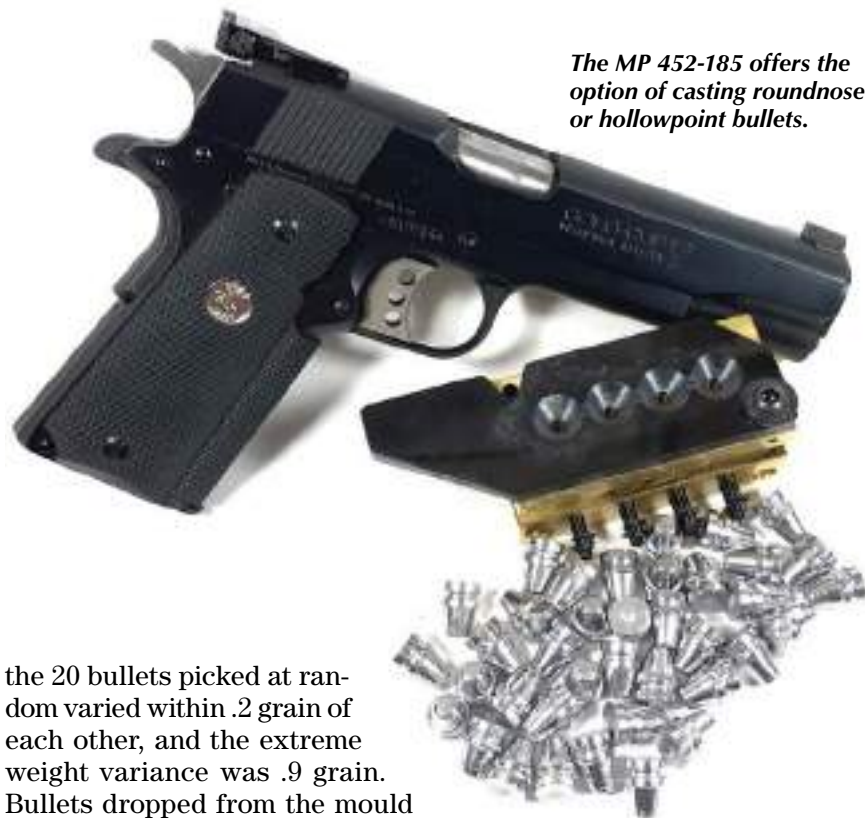
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MP BULLET MOULDS



The MP 452-185 offers the option of casting roundnose or hollowpoint bullets.

the 20 bullets picked at random varied within .2 grain of each other, and the extreme weight variance was .9 grain. Bullets were pushed in and out of a .359-inch sizing die only to add lubricant to the single lube groove.

The bullets do not have crimping grooves and look like bullets for the 9mm Luger. In fact, the company's website indicates the bullets can be sized to .356 inch for the 9mm Luger. I adjusted the seat die to seat the bullets in .38 Special cases with the case mouths just above the top of the lube groove, and barely crimped the mouths against the bullets. The length of one unfired cartridge left in the revolver remained unchanged after firing 10 other cartridges.

The MP 359-125 is a long, eight-cavity, aluminum mould with a steel sprue plate. It came with Lee handles attached to the mould and a leverage bar on a third handle that bears against the side of the mould to open the sprue plate. If bullets were left in the mould long enough for the sprue to sufficiently harden on the last bullet cast, the sprue plate raised slightly and left a bump of lead in the middle of the base of the first bullet cast. After

some trial and error, I found the timing required before opening the sprue plate so the base of all eight bullets were cut cleanly. No smears of lead formed on the bottom of the sprue plate. Alternating pouring from one end, then the other, also helped.

Most of 20 bullets cast from the

A Colt Gold Cup .45 Auto produced this group at 25 yards with 227-grain bullets cast from an MP 452-374 mould and IMR Target powder.



Select MP Molds Handloads

bullet (grains)	powder	charge (grains)	primer	case	overall loaded length (inches)	velocity (fps)	5-shot 25-yard group (inches)
.45 Auto, Colt Gold Cup, 5-inch barrel							
188 MP 452-185	HS-6	9.3	WLP	Fed	1.250	973	1.62
	IMR Red	5.5				941	3.24
	IMR Target	6.0				997	3.35
210 MP 452-374 HP	W-572	7.0	Win	1.270	918	1.00	
	IMR Target	5.5			912	3.07	
217 MP 452-374 HP	W-572	6.5	Fed	1.265	865	3.15	
	IMR Target	5.3			876	1.94	
227 MP 452-374	W-572	6.2	Rem	1.265	853	2.51	
	IMR Target	5.0			841	2.00	
.38 Special, Smith & Wesson Model 19, 4-inch barrel							
125.8 MP 359-125	W-572	5.6	WSP	Rem	1.490	771	1.02
	IMR Red	4.0				804	1.70
	IMR Target	4.3				868	1.70
131 MP 359-135	Clays	3.3		1.530	672	2.20	
	Titegroup	3.5			778	2.25	
	Universal	4.5			n/a	1.65	

Notes: Velocities were recorded at 10 feet. Temperatures ranged from 26 to 30 degrees Fahrenheit. For more data on these cartridges please visit LoadData.com.
Be Alert - Publisher cannot accept responsibility for errors in published load data. Listed loads are only valid in the test firearms used. Reduce initial powder charge by 10 percent and work up while watching for pressure signs.

MP 359-125 mould varied within .3 grain of each other, with two bullets differing by .9 grain. Bullets dropped from the mould with a diameter of .359 inch. The bullets also do not have a crimping groove, and I seated them in .38 Special cases.

The bullets shot rather accu-

rately from my old Smith & Wesson Model 19 that has had upward of 25,000 rounds fired through it over the years. The majority of those bullets were cast two at a time, too. However, in the future, casting with the two MP Molds moulds will free up all manner of time so that I can shoot more. ●

Eight-cavity MP 359-125 moulds require the correct timing of casting and opening the mould to produce bullets with evenly cut bases while not leaving smears of lead on the bottom of the sprue plate.



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John Barsness

Some handloaders believe smokeless rifle powders were perfected by 1950. By then, they had definitely been improved enormously since 1884, the year France introduced the 8mm Lebel cartridge loaded with *Poudre B*. In the early 1930s Dr. Fred Olsen developed Ball powders for Western Cartridge Company, and in the mid-30s DuPont started introducing its final generation of IMR extruded powders. IMR-4350 appeared in 1940, the slowest-burning powder then available to handloaders, and during World War II even slower IMR powders appeared, including one sold after the war by Bruce Hodgdon as H-4831.

However, all successful new technologies evolve quickly. "Flying machines" also rapidly improved from the 1880s to 1950, from balloons to the Wright brothers to supersonic jets – but that doesn't mean airplanes or rifle powders haven't improved since.

In any new technology, most advancements typically occur in the midrange of potential uses, the reason there are so many rifle powders with a burn rate somewhere around IMR-4895. Originally developed to produce moderate pressures in .30-06 ammunition for the M1 Garand, another technological advancement of the 1930s, IMR-4895 is still popular today. So are dozens of other midrange powders, including newer standbys – Alliant Reloder 15, Hodgdon Varget and Ramshot TAC – because they work great in a variety of popular mid-capacity cartridges like the .308 Winchester.

But rifle cartridges at either end of the capacity spectrum suffered for decades under a far more limited range of powders. That started to change for "magnums" in the 1940s with IMR-4350 and H-4831, and over the next several decades new slow-burning powders emerged each year like April flowers. Unfortunately, during the same period not much changed for really small centerfire rifle cartridges, and the poster child for these unlucky rounds is the .22 Hornet.

In 1920 a major ballistic gap existed between .22 rimfires and the .25-20 WCF. The Hornet was designed to plug this gap by beating the velocities of "high speed" .25-20 ammunition. Final development took place in the late 1920s at the U.S. military's Springfield Armory, where Col. Townsend Whelen was director of research and development, using rechambered 1903 Springfield rimfire training rifles. Thanks to publicity from gun writers (including Whelen), Winchester introduced Hornet ammunition in 1930 before any rifle factory cham-

Hodgdon's CFE BLK powder worked great with all bullet weights shot from a CZ 527 .17 Hornet. While the short bullets don't leave much fouling, the "copper fouling eraser" in the powder eliminates any visible trace.



A TRIO OF

Updated Loads for the



bered the round. The first loads featured blunt-nosed, 45-grain hollowpoints or 46-grain full-jacketed bullets, primarily due to the 1:16 rifling twists of rimfire barrels used in both custom and factory rifles. However, back then many shooters also considered blunt bullets more accurate than spitzers, especially in smaller-caliber rifles.

The first factory ammunition was listed at 2,350 fps, but in 1934 Hercules introduced a spherical powder it called 2400, named for the muzzle velocity possible in the .22 Hornet. In 1935 DuPont introduced IMR-4227, a small-granule, extruded powder also primarily designed for the Hornet but with a slightly slower burn rate than 2400. By World War II the listed velocity of factory ammunition had increased to 2,650 fps.

During World War II, .30 Carbine ammunition was loaded with a new spherical powder that had a slightly slower burn rate than IMR-4227. After the war it was sold to handloaders as Winchester 296 Ball Powder. Soon Hodgdon offered a similar powder called H-110. (Today Hodgdon distributes Winchester-brand powders and lists identical charges for W-296 and H-110 because they are the same powder, made in the same factory.) In 1946 the factory velocity for .22 Hornet ammunition reached 2,690 fps then stayed there for decades, frozen in time like the woolly mammoths still occasionally found in Siberian ice.

I bought my first two handloading manuals in 1966, the *Lyman Ideal Handbook No. 42* and *Speer Manual for Reloading Ammunition Number 6*.

Lyman only listed four powders for loading the .22 Hornet – Hercules 2400, IMR-4227, H-110 and a Hodgdon powder similar to 2400, H-240 that was discontinued in the 1960s. Speer listed the same powders, along with Hodgdon H-4227.

The .22 Hornet's popularity started dropping in 1950 after the appearance of the .222 Remington in that company's Model 722 rifle, a postwar "short" bolt action. The .222 held about twice as much powder as the Hornet, and the 722 had the same 1:14 rifling twist as .220 Swift rifles. The original factory load featured a 50-grain spitzer at 3,200 fps, resulting in considerably more utility than the .22 Hornet, with finer accuracy and only slightly more recoil.

The .222's immediate and spectacular success resulted in yet another .22 Hornet handloading problem: Original rimfire Hornet barrels had rimfire bore dimensions, so bullet companies made slightly smaller diameter, blunt Hornet bullets, along with .224-inch spitzers for "modern" cartridges like the .222 Remington and .220 Swift.

After the .222 became popular, many rifle manufacturers started using .224-inch barrel grooves for all .22 centerfires. Some even standardized on a 1:14 rifling twist, but others retained the original rimfire rifling twist in .22 Hornets. My BRNO .22 K-Hornet is a fine example of this bipolar disorder, with .224-inch grooves and a 1:16 twist.

The powder situation remained the same until about 1980 when Winchester 680 appeared, which eventually became Accurate Arms 1680. Several years ago,

HORNETS

.17, .22 and .22 K-Hornet

A TRIO OF HORNETS

Western Powders bought Accurate Arms and today sells a more consistent powder called Accurate 1680. With a burn rate too slow to increase velocities in the .22 Hornet very much, A-1680 works very well in the .17 Hornet.

In the late 1980s, Nosler initiated another technological advance with its Ballistic Tip bullets. One long-time problem for all .224 varmint cartridges was the relatively low ballistic coefficient (BC) of softpoint and hollowpoint spitzers. While hollowpoints with tiny openings had decent BCs, they expanded less consistently than softpoints – and if the opening was enlarged enough to enhance expansion, BC dropped. Plastic-tipped bullets both expanded violently *and* increased BC.

At the turn of the twenty-first century, the .22 Hornet received its first substantial powder improvement since W-296/H-110. Primarily designed for reloading .410 shotgun shells, Hodgdon Lil'Gun also turned out to be practically perfect for 40-grain bullets in



A BRNO magazine (right) allows bullets to be seated about .06 inch longer than the SAAMI-length magazine of the CZ 527, allowing plastic-tip bullets to work, despite the short neck of the K-Hornet case. Hornady shortened its version of the .17 Hornet to avoid any problems with plastic tips.

the .22 Hornet. Combining a Hornady V-MAX, Nosler Ballistic Tip or Sierra BlitzKing bullet with Lil'Gun resulted in ammunition that shot a little flatter than the original 50-grain softpoint spitzer load for the .222 Remington, yet used far less powder – and at lower pressures than previous Hornet powders.

The previous velocity king with 40-grain bullets was H-110, but Hodgdon's present loading data shows a top H-110 velocity of 2,795 fps at 41,800 Copper Units of Pressure (CUP). The top Lil'Gun load gets 2,826 fps at only 28,400 CUP. Lower pressure may seem irrelevant, but .22 Hornet cases don't have much brass surrounding the primer pockets, and the pockets stay tight far longer when using Lil'Gun instead of H-110, especially during warm weather commonly encountered when ground squirrel and prairie dog hunting.

The Hornet's popularity started rising again but ran into



The 1:14 rifling twist in the Ruger No. 1B's barrel (left) stabilizes 55-grain bullets, but the traditional 1:16 twist in the BRNO K-Hornet's barrel can be a little marginal with some 40-grain bullets.

another technical roadblock. Because original .22 Hornet ammunition was loaded with blunt-nosed bullets, rifle magazines were very short. Seating plastic-tipped 40s to fit inside standard factory magazines usually resulted in the curve of the bullet's ogive way down inside the neck, and the partially exposed case mouth often hung up when sliding from the magazine into the chamber.

Luckily, the .22 Hornet's neck length is .323-inch, even longer than the .308 Winchester's. Some handloaders found they could trim Hornet cases shorter, and still retain enough neck length to hold longer bullets firmly, so cartridges fed slickly. Other handloaders (including me) found single-shot Hornets allowed 40-grain plastic tips to be seated much further out, increasing powder room.

Meanwhile, many bullet companies still produced relatively short, 40-grain softpoint and hollowpoint bullets, and the wide variation in bullet lengths resulted in a wide range of 40-grain Lil'Gun data. Hodgdon's listed maximum charge for the Speer 40-grain softpoint of 13.0 grains just about fills the case to the mouth, but the Speer bullet is only about two-thirds the length of the longest 40-grain plastic-tip bullet. As a result, there isn't room to seat 40-grain plastic tips to the

Both 2400 and IMR-4227 were originally developed primarily for the .22 Hornet during the peak of its early popularity in the 1930s.





Accurate 1680, Hodgdon Lil'Gun and Alliant Power Pro 300-MP all work in all three Hornet cartridges, but none were designed specifically for that purpose.



standard SAAMI 1.732-inches overall cartridge length without considerable powder compression.

Several bullet companies list one maximum load for all their bullets of a certain weight, even if some bullets provide more powder room and/or less pressure. This is one reason maximum Lil'Gun loads for 40-grain bullets vary from 11.0 grains in Nosler's latest manual to 13.2 grains in Hornady's.

The low Nosler maximum probably isn't due to high pressure, but a lack of powder room. When its fifth manual appeared in 2002, Nosler still made a blunt-nosed, 45-grain Hornet bullet. The maximum Lil'Gun charge was 12.5 grains, almost 14 percent larger than today's 11.0 grains for the 40-grain Ballistic Tip.

The 45-grain bullet's muzzle velocity was 2,749 fps in a 22-inch barrel, a little slower than the 2,762 listed for 11.0 grains of W-296. Hornady's manual also shows the highest 40-grain velocity with W-296/H-110, again probably due to powder space, since the company's V-MAX is the longest 40-grain plastic-tip bullet. Hornady also lists 2400 as matching the Lil'Gun's 2,800 fps – about 250 fps more than the top velocity Alliant lists for 2400 with 40-grain bullets.

Aside from bullet length, primers can be another reason for load-data variation in the .22 Hornet. For decades one "secret" Hornet handloading technique was to use small pistol primers, but handloading manuals advised against it

because of the thinner cup of pistol primers. Speer eventually ran some tests, and in its 14th manual announced pistol primers were safe and also reduced velocity variations, the reason handloaders who used them often obtained better accuracy. As a result, all .22 Hornet loads for the 14th manual were shot with CCI 500 primers.

However, in my own .22 Hornet experiments with Lil'Gun, CCI 450

Small Rifle Magnum primers produced the finest accuracy, slightly better than CCI BR-4 benchrest primers. In the same test, CCI 500s resulted in the worst accuracy of several primers tested. Many other handloaders report similar results, probably because Lil'Gun's somewhat harder to ignite than some other Hornet powders.

The "improved" version of the .22 Hornet, called the K-Hornet,

.17 Hornet, .22 Hornet and .22 K-Hornet Handloads

bullet (grains)	powder	charge (grains)	primer	case	overall loaded length (inches)	velocity (fps)	5-shot 100-yard group (inches)
.17 Hornady Hornet, CZ 527, 22-inch barrel, 1:9 rifling twist							
20 Hornady V-MAX	A-1680	12.0	Rem 7½	Hor	1.729	3,588	.56
20 Nosler Varmint Tip	A-1680	12.0			1.708	3,666	.48
20 Hornady V-MAX	CFE BLK	12.8			1.729	3,775	.54
25 Hornady V-MAX	CFE BLK	11.6			1.729	3,394	.76
Berger 30 HP	CFE BLK	10.7			1.642	2,908	.56
.22 Hornet, Ruger No. 1B, 26-inch barrel, 1:14 rifling twist							
30 Barnes VG	H-110	13.0	CCI 500	Win	1.693	3,249	.61
40 Nosler Ballistic Tip	Lil'Gun	13.0	CCI 450		1.938	3,014	.78*
	Power Pro 300-MP	13.3			1.938	3,050	.98*
55 Nosler Varmint Tip	CFE BLK	13.0			1.929	2,454	1.01
.22 K-Hornet, CZ 527, 22-inch barrel, 1:14 rifling twist							
35 Hornady V-MAX	Lil'Gun	14.0	WSR	Win	1.709	3,323	.41
40 Sierra HP	Lil'Gun	13.5			1.759	3,078	.44
45 Sierra RN	Lil'Gun	12.5			1.727	2,945	.62
.22 K-Hornet, BRNO ZKW 465, 22.875-inch barrel, 1:16 rifling twist							
40 Nosler Varmint Tip	Power Pro 300-MP	13.5	CCI 450	Win	1.824	3,143	.88
40 Nosler Ballistic Tip	CFE BLK	15.5			1.875	2,954	1.30
45 Sierra RN	Lil'Gun	11.5	S&B		1.809	2,831	.88*
	CFE BLK	16.0	CCI 450		1.809	3,008	2.03
50 Sierra BlitzKing	CFE BLK	15.3	CCI 450		1.828	2,925	4.87**
55 Nosler Varmint Tip	CFE BLK	15.0			1.835	2,742	5.31**

* 10-shot group

** Did not stabilize in 1:16 twist, most bullet holes showed tipping.

For more data on these cartridges please visit LoadData.com.

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A TRIO OF HORNETS

along with Hornady's version of the wildcat .17 Hornet, also exhibit more sensitivity to powders and primers than larger cartridges. This makes sense, because in such tiny cases any slight variation in brass, bore diameter and chamber dimensions makes more difference than in larger cartridges. This is exactly why today's wider variety of suitable powders and primers helps Hornet handloaders.

Two other useful powders appeared after Lil'Gun, Alliant Power Pro 300-MP and Hodgdon CFE BLK. Like all other "Hornet powders" introduced after 2400 and IMR-4227, both were primarily designed for other purposes; 300-MP for magnum handgun cartridges and CFE BLK for the .300 AAC Blackout. Alliant 300-MP is slightly slower burning than Lil'Gun, and CFE BLK is slightly slower than A-1680.

Which powder works best depends on the particular Hornet cartridge, and often bullet weight. The .22 Hornet I've shot for 15 years is a Ruger No. 1B, which allows 40-grain plastic-tip bullets to be seated out to an overall length .2 inch longer than standard Hornet magazines. As a result, there's plenty of room for 13.0 grains of Lil'Gun, or 13.3 grains of 300-MP. The Power Pro 300-MP charge exceeds Alliant's listed 11.7 grain maximum considerably but results in essentially the same 2,944 fps muzzle velocity listed by Alliant, allowing for the 26-inch barrel on the Ruger, and measuring case expansion indicates pressure is similar to the Lil'Gun load.

With bullets lighter than 40 grains in both the standard and K-Hornet, H-110/W-296 usually results in higher velocity than Lil'Gun. I've thoroughly field-tested such lighter bullets, particularly the 30-grain Speer TNT Green because some localities now ban lead-core bullets. While

the low BCs of 30- to 35-grain bullets prevent them from working as well at longer ranges as 40-grain plastic-tips, light bullets at over 3,200 fps are vastly superior to slow, 45-grain blunt-nose bullets.

The .17 Hornet wildcat was based on the .22 K-Hornet necked down, but when Hornady introduced a commercial version in 2012, the case had been shortened enough to easily use plastic-tipped bullets in standard-length magazines. While Lil'Gun will work in Hornady's .17, some handloaders have experienced loose primer pockets with Hodgdon's listed maximum charge of 10.0 grains, probably due to the primer. Hodgdon's tests used a Federal 205M, one of the milder small-rifle primers, and hotter primers increase pressures. However, that's largely irrelevant, since slower powders work better in the .17 Hornet anyway. My CZ 527 prefers Remington 7½ Benchrest primers to any others tested with both A-1680 and CFE BLK.

In my present BRNO .22 K-Hornet, 300-MP did slightly better with the same CCI 450 primer preferred by the Ruger No. 1. Luckily, the BRNO has a magazine .06 inch longer than standard SAAMI length, allowing the use of plastic-tip, 40-grain bullets without any problems, though the 1:16 rifling twist won't fully stabilize bullets over 40 grains. I still included CFE BLK data for heavier bullets in the chart, in case somebody has a 1:14 twist K-Hornet, because it produces higher velocities than any other powder tried.

Also included is data for my first K-Hornet, a CZ 527, but that rifle was sold a decade ago because the magazine was too short for long, plastic-tipped bullets. Despite the high velocities possible with all the bullets tried, they didn't shoot as flat as 40-grain plastic-tip bullets from the Ruger No. 1, so the CZ went down the road.

While experimentation with bullets, powders and primers to determine what works best in *your* rifle is standard handloading technique, it's even more critical when loading the little Hornet cartridges. ●

Reloader's Press

(Continued from page 9)

what few jacketed .44 bullets were available at the time. So, the best option was to start casting bullets, or find someone who did, just to maintain a supply of ammunition. A problem showed up when the only cast bullet moulds available at the local outlet was the Lyman No. 429348 wadcutter that averaged 183 grains from my alloy(s). It was supposed to be a target bullet, but when launched at roughly 1,100 fps from the Hawes, it nearly cut big desert jackrabbits in half. Unfortunately, it punched big holes in prime coyote and badger hides. It also shot a bit low when shot from the Hawes with fixed sights, so the upper rear corner of the front sight was cut at approximately a 45-degree angle, the lower edge of which was used as a reference with the bottom of the rear notch to bring the relatively lightweight wadcutters to point of aim.

In time, while I maintained an interest in the .44 Special sixguns acquired over the years and adopted a .45 Colt for most outdoor work, .44 Magnum sixguns didn't generate much interest, although there has been at least one in the safe for well over 40 years.

Interestingly enough, to date, my pet .44 Magnum is a pre-Smith & Wesson Mountain Gun with the typically tapered 4-inch barrel that lacks the later logo. With no improvements or alternations to the action, it is by far the most useful when compared to the big double- and single-action revolvers. Once it was decked out with Herrett Roper-type, round stocks, it handled perfectly with full-house factory loads or midrange handloads. If anyone had suggested I would someday prefer a relatively lightweight 4-inch Smith & Wesson .44 Magnum double action after shooting that first factory load in the Hawes nearly 50 years ago, I probably would have suggested they might want to exchange those chopped nuts they're storing up between their ears for something a bit more useful. ●

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MISSOURI BULLET COMPANY

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prised when the first four shots clustered in only 1.125 inches. The fifth was a flyer, making the group size 2.5 inches. Five, 250-grain bullets then made a 1.75-inch group. Becoming enthused, all seven revolvers were fired that same afternoon. The smallest group came with the Ruger (Old Model) Blackhawk .44 Magnum at 1 3/8 inches. The largest was with the nearly 90-year-old Smith & Wesson Second Model Hand Ejector .44 Special, at just under 3.00 inches.

The next afternoon there were more pleasant surprises. My 9mm experiences with cast bullets, beginning in 1977, have been just barely on the good side of dismal. Often I've seen nothing but tumbling bullets from a variety of 9mm Parabellum pistols. Conversely, a 1943 vintage German P38 shot fine with MBC 115-grain bullets. Its 2.25-inch group was pleasing. The best group of the entire series came with a Les Baer Thunder Ranch Special .45 Auto. MBC's 200-grain slick-sided SWC put five shots into 1.125 inches.

As things stand, I admit to being impressed with coated bullets. Although I still enjoy casting BPCR competition bullets, at times work constraints keep me from casting as many recreational handgun bullets as needed. MBC can help fill that void.

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In Range

(Continued from page 70)

that today's exceptional factory ammunition is available largely because of the efforts of these guys. Shooters who pursue pure accuracy or seek to achieve maximum ballistic efficiency with a particular cartridge or load hot, accurate ammunition for hunting, have forced ammunition makers to measure up in their own products.

Manufacturers like Winchester and Remington have a love/hate relationship with handloaders, and their components have come and gone on the market as new managers take over marketing departments and conclude that, by selling bullets and/or powder to handloaders, they are cutting their own throats. Older managers who actually spent some time around shooters knew that, in fact, the reverse was true. By competing on components with small companies like CCI (primers) or Sierra (bullets), they are proving that their own factory products can equal the specialty companies.

One thing of which I am absolutely certain is that, should handloading die out, ammunition manufacturers would breathe a sigh of relief, and their products would go into a gradual decline. It could be argued that with more manufacturers of factory ammunition than ever before, sheer competition would keep quality standards high. Perhaps, but I would rather not take the chance.

Another worry is that ammunition manufacturers are merely waiting for the opportunity to drop calibers or particular loads from their lineups. A new swarm of MBAs descends on the production line, picks out which ones are not profitable enough and discontinues them. If you are a fan of the .303 Savage, .250-3000 or various other cartridges, you know what I mean.

It's common for a particular manufacturer to produce excellent products in one caliber but be only ho-hum in another. The good stuff might be made on a brand-new production line, while the older caliber is turned out on machines

that date from the Reagan Administration. As machines wear out, uniformity becomes ragged, tolerances spread, accuracy drops off. The day finally comes when the machinery has to be replaced. If it is being used to produce a caliber with modest sales, replacing it is not worth the investment. If you shoot that particular caliber, you either handload or stop shooting.

Hornady, fortunately, has taken this practice and turned it on its head – not once but several times. The company has produced short runs of rare brass and bullets for some seriously arcane cartridges. One that springs to mind is the 8x56R Hungarian. That cartridge was used in only one rifle, to the best of my knowledge – the Mannlicher M95 straight-pull. After the dissolution of the Austro-Hungarian Empire in 1918, Hungary inherited thousands of M95s. These were rechambered and bored out from the 8x50R Austrian. The 8x56R has a larger case, but it also uses a bullet that is .328 inch rather than .318 or .323 inch.

With both cases and bullets presenting a problem, few of those perfectly good rifles could be put to use. By providing brass, bullets and loaded ammunition, Hornady

solved that problem. You can still find remnants of those components for sale here and there, and they are a godsend.

A dozen years ago, the company did the same with the .450/400 Nitro Express (3), and Ruger cooperated by chambering that interesting old cartridge in the No. 1 single shot. It is now a stock item. Hornady has also loaded 6.5 and 7.7 Arisaka. These have sometimes been custom runs for retailers, but it's the end result that counts – they became available to everyone.

More companies should follow Hornady's lead in this department. Shooting fads come and go (long-distance, black-powder target shooting, Cowboy Action, steel silhouettes), but handloading is one constant that binds many shooting disciplines together. The more shooters there are, the healthier the overall market. ●



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THE BACKBONE OF HANDLOADING

IN RANGE by Terry Wieland

Over the past couple of weeks on various trips to my rifle range, I've run into two shooters who, in the course of conversation, let slip that they "used to handload, but gave it up."

"Why?" I asked. One just shrugged and said it took up too much time. The other, a really serious – and I mean *really* serious – target shooter, said how he could get all the accuracy he could use from good factory ammunition. In fact, he added, he had trouble matching it with handloads.

Now this guy, who rejoices in the nickname "Crazy Larry," has told me more than once that his goal in life with one of his over-the-top, spare-no-expense, semi-automatic rifles is to put five bullets into one hole. That is one exact, perfectly round, .224-inch diameter hole, with no elongation or ragged edges to show that more than one shot has been fired.

This has been the goal of benchmark shooters since the late 1940s, when that arcane activity took hold of men's imaginations – and since 1900 before that, when it went by the name of "table shooting." I don't know that anyone has ever actually done it, either in practice or competition, because

that would be a .0000-inch group. At any rate, until very recently, no one in his right mind would pursue such a goal and *not* be a handloader. If it could be done at all (a questionable proposition in itself) it would require the ultimate in handloads.

It should be added that my acquaintance is really a one-dimensional shooter, by which I mean that, as far as I know, he doesn't hunt deer, engage in Cowboy Action, shoot pistols or do anything except snuggle up to his beloved black guns. It seems to me, the more different activities you engage in, the more likely you are to become a handloader and stay a handloader. So many things we do are only possible if you "load your own."

Within the last 10 years, factory ammunition has overtaken most handloads in two important areas. First, it has become more accurate overall, and match ammunition now is astonishing. Second is power. Some of today's factory firecrackers would make old-time hotshots like P.O. Ackley turn pale. I'm glad that factory ammunition can now fill most of those two needs, because it leaves me free



Hornady has made several small runs of specialty cartridges over the years. The availability of brass, bullets and loaded ammunition helps keep a lot of old rifles shooting.

to pursue some of the more interesting aspects of handloading.

At one time I knew a shooter who took up handloading and became so engrossed by it that he found himself spending most of his time at his bench, and very little at the range. It got to the point where he shot solely in order to have a reason to load more ammunition. Another acquaintance read an article about developing loads for individual rifles to arrive at the ultimate in power combined with accuracy, using the optimal bullet for a particular rifle. Having done this for four or five rifles of his own, he ran out of projects and started doing it for friends. Last I heard, he was hardly shooting at all except to develop loads for other people.

Finally, there is a class of handloader who becomes a professional ballisticians in everything but name. They own every instrument known to man, from dial calipers to chronographs, and hover over their loading bench like Dr. Frankenstein with a fresh corpse, working far into the night and occasionally shouting "Eureka!"

Those who are new to the game forget – or probably never knew –

(Continued on page 69)

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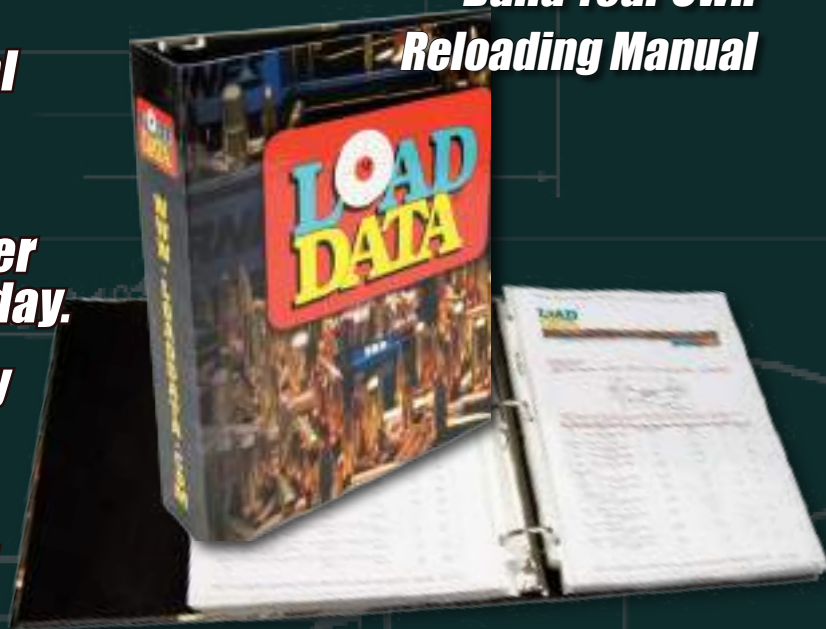
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