Silver Barrels And Black Bullets: The 223 Remington

By Richard Cundiff

These components were used in testing the author's Winchester Model 70 Varmint in 223 Remington.

The author used a Remington XP-100 pistol action and a Remington barrel in 223 to build this rifle in 1982. Scope is a Tasco 2.5-10x with mil dot reticle.

Since time immemorial man has educated himself to cope with many adversities in his continual struggle to survive. He has learned to feed himself by eating all sorts of nondescript flora and an occasional beast, if he was fortunate enough not to get eaten first. He also has learned to protect himself from the ravages of life, including his fellow man.

Arms technology progressed from the thrown rock, sling-shot, jaw bones of asses and large femurs, on to spears, arrows, and finally, in the 13th century, the introduction of black powder and some very crude and primitive hand-held forged iron tubes loaded with stones.

Throughout history there has always been some dude who seems to think that the world would not properly revolve around the sun unless he was in charge. This egotism also led to a lot of dissent and different opinions from those who opposed these ambitious undertakings. Solving these differences eventually led to mortal combat — war — something for which the human race is well-known.

One aspect that comes out of war is a lot of technological advancement in weaponry. Some of this technology in the area of small arms development has led to the design of some excellent firearms and ammunition. Although most warring nations have, over the years, developed their own small arms and ammunition, we will be discussing only those efforts from the "Land of the Free and the Home of the Brave."

I can think of only half a dozen significant designs that were instrumental in defending our nation against aggression from other countries. We will not include the 38-40 or the 44-40 W.C.F. as these were used only on domestic soil. The 45-70 U.S. Government used in the 1873 trapdoor Springfield rifle was probably the first rifle-ammo combo to be used against a foreign aggressor, during the Spanish-American War.

There are only two military cartridges that were not a total success in the eyes of our government, the 30-40 Krag and the 6mm Lee Navy, or 236 U.S.N. Both of these designs were adopted in the late 1800s but were discontinued after a very brief time. It would be only a few short years before one of the finest centerfire cartridges of all time would be designed, the 1903-1906 30 U.S. Government, or 30-06 Springfield as it is more widely known. In 2006, we of the firearms faithful celebrated a century of service with one of the all-time greats.

The 30-06 would reign supreme through two world wars and part of another "police" action. In between these wars the old '06 was gaining a prestigious reputation as a fine hunting round. It would be more than fifty years before the 30-06 was retired from duty in the service of our country.

In 1954 the U.S. Army ordnance adopted the 7.62 NATO round, known as the 308 Winchester in civilian garb. It wasn't until 1957 that a rifle was designed to fire this popular replacement

Left to right: 30-1903 Springfield, 30-06 GI, 7.62 NATO 1952 match, 5.56mm NATO, and 30 U.S. carbine.

These cases all are based on a diameter of 0.375": 221 Fireball, 222 Remington, 223 Remington, and 222 Remington Magnum.

for the old war horse 30-06. The 308 has developed quite a following among the accuracy crowd. It possessed near 30-06 ballistics but in a smaller package. The 7.62 NATO in the M-14 rifle is an excellent military cartridge, but the recoil did sometimes intimidate recruits, which makes for poor marksmanship. That leaves us with the hero of this story, the 5.56mm Ball M-193, or 223 Remington, another darned good cartridge which became 50 years old in 2007.

Many excellent hunting cartridges originally were designed for military use, with only a change to the bullet construction and a different designation. While researching for this article I ran into many discrepancies concerning the history behind the 223 Remington; therefore, we will compensate with what I have learned from my many years with this cartridge and some information furnished by more astute historians.

In 1957 the U.S. military assigned both of our major arms companies, big green and the big red W, to design a cartridge that would be smaller, lighter, and yet able to quell the likes of foreign aggression with the same authority as the 7.62 NATO. With less recoil, more recruits could become master shooters and would be able to carry twice as many rounds in combat.

During the developmental stages of the 5.56mm NATO, a rifle was needed for testing. Gene Stoner of Armalite had designed the AR-10 for the 7.62 NATO and, using a smaller version, came up with the AR-15. The 222 cartridge case was used initially, but could not achieve the required ballistics at 500 yards with the 55-grain boat-tail bullet. Somehow Bob Hutton of *Guns and Ammo* became involved in this program and supposedly came up with a case 0.060" longer than the 222 Remington. For some unknown reason the military would not accept the 222 Remington Magnum or the 224 Winchester, which was very similar. Ballistics "experts" believed the 222 Remington Magnum represented a much better design than the 223 Remington. If this is true, why is the 222 Remington Magnum now obsolete? I also believe the 222 Remington Magnum to be a good round, as accurate as the 222 with some added velocity. The 5.56 NATO cartridge was adopted by the military in 1964.

I am not one of those shooters who has become enamored by the frugality of using cheap, once-fired military brass, although I have owned at least one or more rifles in the more popular GI calibers. During the late 1970s and early '80s I made up some hunter class rifles in 308 Winchester that were superbly accurate, using the Sierra 168-grain IBT bullet and 39.5 to 41.0 grains of H4895. And my old Remington 700 30-06 still is in my gun rack!

During my fifteen years competing in the Southwest Regional Benchrest wars, I was always greeted with an aloof attitude whenever I mentioned the 223 Remington. It simply was not considered to be as competitive as other popular cartridges of the day, the 6x47, 222 1/2 Shilen, 222 Improved cartridges of all descriptions, and the relatively new kid on the block, the 6mm PPC. As they say, the rest is history.

Dr. Dennis Bowman's custom 223 Remington.

The only competitive version that I can recall was a 223 Improved with a 35-degree shoulder angle and straight body taper. I remember reading about this cartridge in the NBRSA news when it was in *Rifle* magazine thirty or more years ago. I believe a gentleman from the St. Louis area by the name of Art Freund designed and championed the cartridge for many years.

Being a hard-headed individualistic beast that benchrest shooters tend to be, it took me several years before I was convinced that I should be using a 223 for a backup rifle to my beloved 17 calibers. I made up some wonderfully accurate varmint rifles chambered in 223 Remington.

Most factory rifles rely on military specs when cutting chambers. Many of these chambers are cut on the large side for use in semiautomatic and fully automatic military weapons, with a lot of freebore, a very short 3 degree leade angle in the throat, and a 1:12" rate of barrel twist. Later models of the M-16 have a 1:7" twist for use with the 69-grain M2 Ball ammo. Most of the bolt guns I built up in the '70s and '80s were barreled with 1:14" twist Hart or Shilen tubes. My reamer, ground to my specs by Dan Green, has a body diameter 0.002" smaller, very little freebore, and 1.5 degree leade in the throat.

Many live varmint shooters are concerned with killer velocities using very short and light bullets relative to caliber, to quell prairie beasties and other denizens of the fields. According to some antiquated methods of determining the proper twist or pitch rate, one of which is the renowned Greenhill formula from the 18th century, a 1:13.786" pitch will stabilize most 224 diameter bullets from 40 grains to 60 grains. A 1:14" twist rate is as close as you are gonna get, for all practical purposes.

The trend a few years back was the so-called VLD, high B.C. projectiles for long-range (whatever that may be) shooting over hill and dale, which of course requires very fast twist rates of 1:7", 1:8", and 1:9" to stabilize these very long bullets. I have noticed a resurgence of this practice in the last several years. A staunch proponent is my friend Darrell Holland, of Powers, Oregon. His case of choice is the 223 Ackley Improved 40 degree.

In my opinion, Jim Carmichel

Table of Loading Information for 223 Remington Used by Author

With my extensive background in benchrest competition, I am not one to sit at the bench for hours and test a dozen bullets and various propellants. Most of my benchrest loads were usually the same components that were used by the winners of the smallest group and the 100-yard, 200-yard, and grand aggregates. I think that makes sense. I don't believe the kill area of a varmint can be measured in thousandths of an inch. The following is a very good consistent load I have used in my 223s for more than thirty years. These loads were clocked out of my "walking varminter," as described in the article.

Remington XP-100 action, Remington Custom Shop take-off barrel, Canjar trigger, Garrett field grade stock. At the time the scope was a Leupold 12x with fine cross hairs.

Load:

26.5 grains H335	Remington 7 1/2 primer
Remington cases	50-grain Remington bulk bullets

Pro Tach chronograph at fifteen feet.
Velocities:

1. 3,561 fps
2. 3,566 fps
3. 3,546 fps
4. 3,548 fps
5. 3,549 fps

Five-shot average velocity: 3,553 fps
Extreme spread: 15 fps
Standard Deviation: 7.5 fps

This load would consistently group 0.5" at 100 yards with my 7.5 pound varminter. So why try another powder?

In my opinion, H322 powder, marketed by Hodgdon, is one of the most versatile propellants available to today's handloaders. Like good old H4895, H322 will work well in a number of cartridges, and if you use a powder measure it flows as well as ball powder with no need for a tall drop tube to get that last kernel into the case. If you have this problem you might consider using a faster propellant.

Remington Model VSSF 223 Remington

Powder: Walt Berger's T-32, slightly faster by one or two grains than H322.
Cases: Remington R-P.
Bullets: Berger 55-grain moly coated, 23 grains T-32, 5-shot average velocity: 3,125 fps
Berger 52-grain, 23.7 grains T-32, 5-shot average velocity: 3,185 fps
Nosler 40-grain, 24.5 grains T-32, 5-shot average velocity: 3,430 fps
Nosler 50-grain, 24 grains T-32, 5-shot average velocity: 3,275 fps

The above loads were safe only in my guns and neither the author nor **The VARMINT HUNTER Magazine®** are responsible for their use in other firearms in 223 Remington caliber.

is one of the most prolific writers of our time and is well-schooled in the art of "gunniness" (my word.) He once made a very eloquent statement: "No shooting subject is more likely to make one sound like an expert, and at the same time prove him a fool, than a discussion of rifling twist." There, Jim, you have been quoted and maybe they will put this in your epitaph. In my collection of parts and pieces is a 224 caliber barrel with a 1:6" twist which was made by Bliss Titus, the well-known Arizona maker. This barrel is at least fifty years old and I haven't a clue as to what it was to be used for. There were not, at least to my knowledge, any VLD bullets during that era except for the 224 Clark.

Excuse me for tooting my horn here, but I was very proud of one of my projects from the early 1980s. My dentist, who also is a shooter, contacted me (no bartering) to build him a varmint rifle in 223 Remington. After discussing the list of components he requested, I started ordering from my suppliers. A Remington barreled action was the basis for the project, which was accurized with a minimal amount of work. One adamant requirement was the weight had to be kept under 7.5 pounds, including scope and mount. One of the Hart family's finest was ordered in a No. 3 medium contour with a 1:14" twist. The finished length was 23 inches. The stock was a laid-up fiberglass unit from High Precision, which at the time was located in Janesville, California, close to Lassen Junior College. Lassen has one of the best gunsmithing schools anywhere. I believe High Precision is now located in Pennsylvania.

After many hours of machining, glass bedding, and stock finishing, the rifle was assembled and ready for a scope. A Leupold 2.5-8x was chosen and mounted in Leupold rings and bases.

At the time I was active in the NBRSA and used numerous pounds of H322. Many gun writers of that era proclaimed that H322 was used only as a benchrest powder and was not acceptable as a good propellant for any other purpose. Boy, I wonder about some of these guys. Whatever became of them?

As most custom gunsmiths should do, the rifle was taken to our local range for a shakedown. Forty R-P (Remington) cases were loaded using H322 and H4895, twenty cases with Sierra 52-grain BTs, and twenty with Sierra 53-grain flat base. After the barrel break-in ritual of twenty single shots, cleaning in between rounds, I was ready to fire for effect. With 23.5 grains of H322 and the 52-grain BT bullet, each ensuing shot did not increase the group size, although it was difficult sighting through the eight power setting of the scope. After the fifth shot I hurried over to the 100-yard course to check out my shooting results.

One tiny ragged hole was all that was found. Cool, I said to myself. The only problem was there were no moving target backers or witnesses to verify this wondrous achievement. My caliper recorded a 0.049" group. Very cool! I wished the NBRSA measuring committee could have been there. It had to be some kind of record for a 7.5 pound rifle with a semiround fore-end and eight power scope. Just think, "I could've been a contender, I could've been somebody." The last time I heard from Dr. Bowman, the rifle was still shooting those nice tiny groups that make old gunsmiths just feel good.

Another example of the 223's credibility was a rifle I rebarreled for Chub Eastman when he was with Leupold scopes some years ago. This was a Remington Custom Shop 700 BDL in an H-S Precision stock. The nicely done barreled action was fitted with a standard contour and would shoot in the 0.2s with little effort, but Chub wanted a heavier varmint weight barrel. He also had sent me a Shilen chrome moly 1:12", No. 6 taper barrel blank.

After fitting and chambering this barrel, the unit was caustic blued by a friend in Carson City, Nevada. Subsequently, the rifle was sent to Chub after mounting a Leupold 12x scope with a 1/4 minute dot reticle.

Before Chub went to Nosler Bullets he was a sales rep for Leupold in Beaverton, Oregon. One of Leupold's testing facilities is a 100-yard underground shooting range. They have a hallway leading to the tunnel where employees can hang their best groups from a rifle they have shot in the tunnel. Using Black Hills reloads and 55-grain full jacketed bullets, Chub shot a less than 0.250" group. (I have a copy of the target.) I talked with Chub over the phone some time ago and I asked if he still had that rifle. Yes, he answered, but the old chrome moly barrel had well over 10,000 rounds through it. The Remington 700 has since had a stainless Pac-Nor barrel installed in, what else, the 223 Remington.

During all of this time I had used only one 223 rifle for my own shooting. This neat little gun is based on an XP-100 action with a Canjar trigger and a Model 700 bolt handle and recoil lug. Using a very old Garrett F.G. stock, the original chambering was for an experimental cartridge I designed in 1980. My wildcat used the 222 Remington case with a 40 degree shoulder angle which is blown forward 50 thousandths of an inch, creating a neck length the same as a 222 Remington Magnum. This case was designed to compete with the PPCs using a 0.244" neck outside diameter and 24 grains of H322 with the 52-grain Berger. As most wildcats go, this one did not produce the results I was looking for. I thought it would make a great varmint round except for the fire-forming ritual, neck turning, and all the pain-in-the-neck procedures required with most wildcats. After shooting it for two varmint seasons I replaced my 222 CLC, Cundiff's Little Cartridge, with the Remington Custom Shop barrel from Chub's original 223.

After all of those years of skepticism and bad-mouthing by some of my benchrest shooting buddies, I finally was convinced that I had found the one cartridge which came close to my Holy Grail of gundom I had been searching for. Shooting my "parts" rifle for several years contributed to this conclusion.

By this time I also had discovered the ideal powder for the 223 Remington, H335. Twenty-six grains of this excellent ball powder works well with a variety of bullets. My shooting partner, Herb Jeffries, using the same combination in his

rifle, eliminated many a crop-destroying varmint in the wild alfalfa fields of northern Nevada.

At the time this was written, the 223 Remington had become the most popular centerfire cartridge in history, even overtaking the 30-06, according to reloading die sales at RCBS in Oroville, California. I would imagine that this popularity also includes the sales of rifles by our arms companies.

My personal preference for American-made rifles has always been in favor of "Big Green." The Model 700 is a simple, well-designed action with an excellent trigger system and a viable reputation for accuracy that bows to none, especially with their new hammer forged barrels.

I never have been a fan of "the rifleman's rifle," the Winchester Model 70. Although it had a handsome profile it was only a copy of the finest bolt-action ever produced, the Mauser Model of 1898, albeit with a few minor alterations of design. One of these changes was the cone breech, in my opinion a very weak area, especially with high intensity loadings. Even so I don't recall any records of blowups involving the Model 70 action and several custom benchrest actions employ this concept.

Although the post-1964 Model 70 wasn't considered the epitome of rifle actions as the pre-1964 was to some die-hard fans, the post-'64 was a much stronger action than its predecessor. Unlike the Remington Model 721, 722, 700 series of actions, Winchester did not offer a short version of the Model 70 until 1997. As most shooters realize, the short actions accommodate the short and medium length cartridges much better and also will make up into a more compact package with the increasing use of those 26" to 30" "Paris gun" varmint barrels for those ultimate velocity figures.

In the first part of 1998 I came upon a deal I couldn't turn down: a new Winchester Model 70 with a short action and a "heavy varmint" silver barrel in 223 Remington chambering. The price was right. At first I was somewhat skeptical concerning the 1:9" twist, but on to the "rest of the story."

The Model 70 came with an H-S Precision synthetic stock with the now-popular action bedding block. This stock is similar in outward appearance to the old Winchester National match pattern. It was perfect for a live varmint rifle. After tweaking the very simple but proven trigger mechanism to a nice, crisp 1.75-pound release and some minor refitting of the trigger guard, I mounted the scope. Another deal I had run across several years ago was a Bausch and Lomb Elite 4000 6-24x in matte finish. In my opinion this is an excellent alternative to some of those higher end optics. Besides, once again the price was right. The scope was mounted on the rifle using Leupold two-piece bases and Redfield medium rings.

Usually I am not one of those dudes who wears out a barrel "working up" a load. So I loaded up fifty rounds of 223 IMI brass that had been "match prepped." By the way, this is as close to military match brass as you can get. Great stuff. Using my knowledge from earlier 223 projects, the loads were 28 grains of H335 with the 40-grain Nosler, 26.5 grains with the 50-grain Nosler, and 25.5 grains with Mr. Berger's famous 52-grain moly coated wonders.

After using the Nosler 40- and 50-grain bullets to sight-in the scope and break-in the barrel, using twenty rounds, a final barrel maintenance was performed to remove any and all accumulated fouling.

My next series of five-shot groups were with the 52-grain Berger molys. The first four shots went in the same hole and I blew the last shot. My eyes are not what they once were and tire very easily if I push things too far. I ran a patch with Kroil through the barrel as per Walt's instructions and took a walk around the range. After thirty minutes or so I returned to the shooting bench, wiping the Kroil-soaked barrel dry, and prepared for more testing. Next I shot another group using the 55-grain molys with similar results. By this time I was rather impressed with this big ol' silver and black rifle.

The last two groups of my day of shooting were with the 40- and 50-grain Nosler Ballistic Tips. The little 40-grainers at close to 3,600 fps went into a nice tidy 0.260" ragged five-shot hole. None of those weenie three-shot groups were allowed. For some reason the 50-grain Ballistic Tips did not do as well, but I didn't have time to give them a real test. Maybe a slight variance in the powder charge is needed.

To say the least, I was impressed with this out-of-the-box factory rifle and it dispelled all of my apprehensions of the Greenhill formula. Although the 40-grain Nosler is rated with a little higher ballistic coefficient than those old 40-grain semipointed Hornet bullets, they did perform admirably in the fast 1:9" twist and short throated Model 70, at least in this test.

Many years ago when I first met Harvey Miller he was working with a 225 Winchester case reformed to 219 Donaldson Wasp dimensions in both 224 and 6mm calibers. Coincidentally, I had just finished a Winchester High Wall in 219 Donaldson Wasp using a Shilen barrel. Harvey asked if I had used a black or silver barrel. At the time I had no clue what he was referring to. But I learned real fast. By the way, Harvey set a NBRSA world's record with his 6mm MCR on the 225 Winchester case in the early 1970s. I think we shooters also have a winner with the silver barrels and black bullets in use today.

Since this was written, the use of molybdenum disulfide has waned in popularity because the barrel cleaning regimen and ballistic results were not worth the effort, in the view of some shooters, except for certain applications, primarily benchrest competition.

If you do a lot of shooting, a case of Black Hills or other nonfactory loads can be a big savings unless, of course, you like to reload. I do, and most of my bolt guns were converted to single-shot with Alvin Davidson's conversion ramps. One shot at a time works for me.

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