The Los Angeles Silhouette Club

The .444 Marlin

By: Glen E. Fryxell

Large caliber, rimmed, straight-tapered cases have long had an appeal to the American shooter. So have lever-action rifles. It's kind of like pot roast and mashed potatoes and gravy, they just sort of belong together. This is the story of how one such combination came to be, and how the handloader can make it even better.

Starting in 1872, the Ordnance Department started conducting a series of tests in which they were evaluating a variety of centerfire black powder cartridges for possible adoption as the new military rifle round. Basically they were comparing straight-tapered cases to bottle-necked cases, in calibers from .40 through .45, with lead bullets weighing from 290 to 484 grains. A tremendous amount of shooting was performed, mapping the various trajectories, group sizes, penetration and wind drift out past 1000 yards. This work was summarized in the "Report of a Board of Ordnance Officers Convened Under Special Orders No. 107, Dated Adjutant General's Office, May 7, 1872, For the Purpose of Determining the Proper Caliber for Small Arms" (how's that for a title?), published in 1873. Ultimately, this research led to the adoption of the .45-70 as the standard cartridge for the 1873 Trapdoor Springfield rifle. However, it's interesting to note that as a part of this evaluation, the Ordnance Officers developed a cartridge (test fired in "Gun Number 15") with a straight-tapered 2.3" rimmed case, with a .430" diameter 365 grain bullet, that bore a remarkable resemblance to what would later be called the ".444 Marlin", differing only a few thousandths in certain key dimensions. While some have described the .444 Marlin as "a modern .45-70", the historical record shows that the basic concept behind the case design actually predates the adoption of the .45-70 as the official military cartridge!

This concept was revisited in 1882 with the Maynard single-shot rifle and the .40-70 Maynard cartridge, loaded with a 430 grain lead bullet at just over 1300 fps. This was a rimmed, straight .451" diameter case, 2.45" long that shot a .422" diameter bullet. This is slightly longer and narrower than the .444 Marlin's 2.225" tapered case, but would have had very similar capacity. The .40-70 Maynard was viewed as both a target and a hunting cartridge.

While smokeless powders, high pressure loads, muzzle velocities over 2000 fps and modern heat treated steels were still well in the future, the precedent for a rimmed, straight 2 1/4" .43 caliber cartridge case was established in the 1870s and 1880s.

During the 1950s, high pressures, high velocities and the art of wildcatting were all the rage. Seating tinier bullets on top of bigger, belted cases consumed lots of printer's ink, surplus powder and barrel steel. But wildcatters by their very nature are an independent thinking lot, and not all were focused on bolt-guns and blistering

velocities. The concept of a rimmed, straight 2" case with a .430" bullet surfaced once again in Phoenix, Arizona around 1960 with the 44 Van Houten Super, a wildcat cartridge made by necking up the .30-40 Krag case up to .44 caliber and cutting the case to 2". This cartridge was designed specifically for lever-action rifles, heavy timber and big critters.

In 1964 Marlin distilled all this history and all these features down into a new cartridge for their New Model 336 lever-action rifle. The .44 Magnum was enjoying lots of press and good sales at this time, and Marlin chose to conceptually stretch the Magnum case into a full-length rifle cartridge for a heavy-hitting black timber rifle. The .444 Marlin was the result.

The Marlin Model 444S, fitted with a Lyman 66 peep sight.

Factory ammo was loaded with the same 240 grain SP bullet that had proven so popular in the .44 Magnum, it's just that now it was stoked to an impressive 2300+ fps. This makes a fast-expanding, hard-hitting deer load. The .444 Marlin has a great deal of big-game potential, but a 240 grain soft-point bullet is not necessarily the best bullet to fully realize that potential. For an idea of what can be done, harken back to the .40-70 Maynard with its 430 grain lead bullet at 1330 fps for an idea of what can be done with a case this size, and then "modernize" those ballistics with smokeless powder and stronger, modern steels. 430 grain .430" diameter bullets are difficult to find these days, but 300 grainers are no problem. For an expanding bullet, a 265-300 grain JSP offers better sectional density and penetration than the standard 240 grain bullet, and for a deeply penetrating solid a 300 grain (or more) hard-cast bullet would be just the ticket. While the factory 240 grain load is a fine deer/black bear load (and quite accurate to boot), to realize the full potential of the .444 Marlin cartridge handloading is called for.

Remington-Peters has made .444 Marlin ammo and brass since its inception in 1964. Originally, this ammo was loaded with 240 grain bullet, then a 265 grain load was added (and later dropped). More recently, Hornady has added a 265 grain load to their light magnum line of ammo. Brass is quite uniform, with no wide variations in case capacity, brass hardness, or case length, as is sometimes encountered with other cartridges. It's a strong, modern, well-made case that lasts through many loadings, it's readily available and affordable. Of the many thousands of rounds of .444 ammo that I've shot over the years, I have yet to have a single case split or fail in any way (well, aside from that one that I accidentally stepped on and crushed...).

A few observations have come sharply into focus in my 10+ years of loading for the .444 Marlin in the Contender (re-chambered from a .44 Magnum Super 14 barrel, with a 1 in 20" twist). For bullets weighing 240-270 grains, 4198 and Re 7 are the powders to beat, even H322 is too slow for these lighter bullets in the shorter barrel. H322 really shines with 300 grain bullets, and does fine with heavier bullets as well. Once one gets above 300 grains, then slower powders like 2520 and BL-C(2) excel, and 4198 and Re 7 are too fast (375 grain spitzers are nicely stabilized by the Contender's 1 in 20" twist). When working with the Contender, consistent ignition of

a large dose of powder in a short barrel is aided by using a magnum primer, even when using an easy to light powder like 4198. I was curious to see if these trends would still hold true in the longer barrel of the .444 rifle. Ken Waters reported in Pet Loads that magnum primers were of value with the slower burning powders in the Marlin .444, but that they were not necessary with 4198 and Re 7.

Jacketed Bullets:

The Hornady 265 grain FP was specifically designed for the .444 Marlin in 1967, and it's a dandy. It's very accurate, cycles perfectly, and by all accounts expands beautifully. The 300 XTP is another excellent bullet for the .444 Marlin, and offers a real elk-sized wallop. For the non-caster, these two bullets offer superb performance in the .444 Marlin cartridge.

For the jacketed bullets, I started off with a couple of favorite loads for my Contender: the 265 grain Hornady over 44.0 grains of Re 7, and the Hornady 300 grain XTP over 40.0 grains of Re 7, both with the Fed 215 primer. These loads were found to deliver 1971 and 1834 fps, respectively, from the Marlin. Interestingly, these velocities are virtually identical to those obtained with these loads from the much shorter barreled Contender (a re-chambered 14" Hunter barrel, so about 12 3/4" barrel). Both of these loads are particularly accurate in the Marlin, although slower than desired. Working up, it was found that 47.0 grains Re 7 with the 265 grain Hornady upped the velocity slightly to 2008 fps, and put 5 shots into one ragged hole at 50 yards. For the Hornady 265, 46.0 grains of H4198 also gave good accuracy at 1973 fps. In my rifle, these loads are considerably slower than the velocities reported in the Hornady and Hodgdon loading manuals for these charges with the Hornady 265 grain bullet.

45.0 grains of Re 7 with the 300 XTP generated a very useful 2013 fps, but with only so-so accuracy in my rifle. 43.0 grains of H4198 gave good accuracy with the 300 XTP, but at less than top velocity. For whatever reason, I have had trouble matching published velocities with jacketed bullets and the faster powders, but both of these bullets deliver excellent accuracy and function flawlessly in the levergun. These faster powders provide optimum performance in the shorter barreled Contender, but seem to be a little lacking in the longer Marlin.

Perhaps a slower powder is needed for the longer barrel? Perusing the Hodgdon loading manual shows the highest velocity load for the 300 grain bullets being 57.0 grains of H335 (about 2150 fps). Attempts to load the 300 grain Hornady XTP over 55.5 grains of H335 resulted in heavily compressed charges and damaged cases. I tried a number of different loading techniques, but I just couldn't make it work, so this combination was dropped from consideration. I went back to good ol' H322. 52.0 grains of H322 with the Hornady 265 grain FP (sparked with the WLR primer) was found to give 2210 fps and excellent accuracy. 49.0 grains of H322 was the most accurate load tested with the 300 XTP (once again with the WLR primer), giving right at 2100 fps, and arguably forming the best overall jacketed load tested in the .444 Marlin levergun. H322 seems to vary somewhat lot to lot, and in contrast to the faster powders discussed above, it seems that I have a somewhat faster lot of

H322 than the powder used to develop the loads in the Hodgdon manual (but very similar to that used in the Hornady manual). The bottom line is that H322 works very nicely in the .444 Marlin, and gives an excellent combination of velocity and accuracy, within acceptable pressures.

Cast Bullets:

The Hornady 265 grain FP was made specifically for the .444 Marlin. The 300 grain XTP is also very good in the .444.

Originally, the .444 Marlin rifle was fitted with a Micro-Groove barrel, with a 1 in 38" twist (Micro-Groove rifling was introduced in the mid-1950s). Ken Waters reported in 1970 that this twist would not handle anything heavier than 310 grains, and made the excellent suggestion that the factory should load a toughly constructed bullet weighing between 275 and 290 grains for deep penetration to compliment the rapid expansion of the 240 grain SP load. The classic Greenhill Formula (i.e. using 150 as the constant): **twist = 150 x (diameter)^2/length)** suggests that the maximum length bullet that can be stabilized in .444's 1 in 38" twist is a mere 0.730" long. This is a rather dubious prediction since the Hornady 265 grain FP, which was designed explicitly for this gun, and shoots very well indeed, is .806" long. This form of the Greenhill Formula is generally accepted as being appropriate for more moderate velocities below 1500 fps (it was derived from 19th century black powder artillery after all). For more typical rifle velocities (e.g. 2000 fps), a value of 180 has been suggested for this constant, leading to a prediction of .876" as the maximum bullet length that this barrel will accurately deliver. This prediction still seems somewhat conservative since the SSK 320 is about .930" long and shoots just fine in the .44 Magnum 1984 Carbine with the same 1 in 38" twist. It will prove enlightening to find out exactly what is appropriate for both the gun and the formula.

The question has also been raised about how well Micro-Groove rifling can handle cast bullets. The gun used in these tests was made in 1980, with Micro-Groove rifling, and was fitted with a Lyman 66LA peep sight. Marlin now makes this gun with cut Ballard rifling, 6 grooves, 1 in 20" twist (switching over sometime around 1997), so while the earlier guns may have some limitations based on the slow twist and shallow rifling, the newer guns should be very well suited to everything the older guns can handle, and possibly more.

Since Ken Waters reviewed the cartridge back in 1970, a whole herd of cast bullet designs have come available for the .44 Magnum that can also potentially be used in the .444 Marlin. A number of these are heavyweights that can take advantage of the added case capacity of the larger case, but only if the lazy 1 in 38" twist of the Marlin rifle will stabilize them. Previously, I worked with this twist rate in the Marlin 1894 .44 Magnum and found that the SSK 320 grain bullet was the heaviest that it would stabilize (but that was "Ballard-cut" rifling, not Micro-Groove). It's important to recognize that the .444 Marlin lever-gun is going to run even the heaviest .44 cast bullets pretty fast, so I started off casting these bullets with either straight linotype alloy (BHN = 21), or water quenched wheel-weight alloy (BHN =

16-18) (as I found out later, this wasn't necessary, as alloys with BHN of about 13 work just fine). The bullets I started off with were the plain-based LBT 430-300-LFN, and the gas-checked 280 grain Lyman 429640, Saeco 300 grain RNFP, RCBS 300 grain SWC, LBT 430-350-WLN, and NEI 429-330-GC (see Figure 3).

It quickly became apparent that the Saeco 300 grain GC-RNFP (#433) bullet was a very accurate projectile in the .444 Marlin. Indeed, it's been responsible for some of the smallest groups ever produced by this rifle, with any bullet, cast or jacketed.

So much for Micro-Groove rifling not shooting cast bullets well! Loaded to an OAL of 2.54" and lightly roll-crimped over the ogive, it cycled, fed and chambered very smoothly. Using the Winchester Large Rifle primer, 43.0 grains H4198 with the Saeco 300 gave very good accuracy at 2003 fps.

Some of the bullets tested in the 444 Marlin. (l-r: LBT 430-300-LFN, 280 grain Lyman 429640, Saeco 300 grain RNFP, LBT 430-350-WLN, and NEI 429-330-GC).

Working with H322, I started at 46.0 grains, and was treated with very good accuracy and 1907 fps. Working up to 49.0 grains of H322 gave right at 2100 fps, and 50 yard 5-shot groups hovered right at 1" all the way. This is a compressed load with the Saeco bullet and since the crimp groove is in the wrong place a light roll-crimp was placed over the ogive of the bullet to hold the bullet in place. This is a very accurate combination -- H322, the Saeco 300 grain RNFP-GC and the .444 Marlin.

Just for the record, the various lengths of the bullets used in these tests are:

Hornady 265	.806"
Hornady 300 XTP	.865"
Saeco 300	.835"
RCBS 300 GC-SWC	.892"
SSK PB 320	.930"
NEI 330 GC (SSK)	.990"
LBT 350 WLN	.983"

All of these cast bullets were designed for the .44 Magnum, and have their crimp grooves located appropriately for use in revolvers, not for the Marlin lever-gun. For these tests, I ignored the crimp groove and seated these bullets to an OAL of 2.540" and crimped over the ogive. I used a .426" expander ball and sized all of these cast bullets .431" and lubed everything with my homemade Moly lube (equal parts by weight beeswax and Moly grease). With bullets as long as these, this combination provides sufficient throat tension to prevent bullets being more deeply seated under recoil while in the magazine.

It was felt that the 300 grain RCBS GC-SWC (not pictured) might also be a good bullet for this cartridge/gun combo, with its radiused ogive, GC, weight and length. In this case, it would be necessary to seat the bullet deeply, and crimp over the forward driving band. Seated thusly, it cycles a little roughly, but not to the point of being a problem. It chambers just fine, there's just an extra rattle or two along the way. These tests were started off with 46.0 grains of H322 with the WLR primer. This load provided very good accuracy (5 shots into an inch at 50 yards), and very uniform velocities 1979 +/-7 fps. Working up to 48.0 grains of H322 gave very good accuracy and 2044 fps, and while 49.0 grains once again gave velocities right around 2100 fps, accuracy suffered markedly with this bullet. For whatever reason,

in my rifle, it's best to stop at 48.0 grains of H322 with the RCBS 300 grains GC-SWC, but this is a fine load.

Even the plain-based LBT 300 grain LFN made a good showing for itself in the .444 Marlin levergun. When loaded on top of 42.0 grains of H322 and sparked with a Fed 215 primer, it delivered 1915 fps and decent accuracy. Similarly loaded, the Lyman 429640 GC-FP (the predecessor to the Devastator HP) delivered 1953 fps and fine accuracy. While these last two loads are not maximum loads (based on pressure), they would nonetheless do a fine job in the hunting fields.

Heavyweights:

How heavy a bullet will the .444 Marlin Microgroove barrel stabilize? For these tests, I started off with one of my favorite heavyweight cast bullet loads for my Contender -- 42.0 grains of H322, sparked with a Federal 215 primer, underneath the SSK 340 grain GC-FP (330 grains the listed linotype weight, this bullet weighs 340 grains when cast of water-quenched WW alloy). This mould was made by NEI and is listed as the NEI 429-330-GC (#266). This load delivers about 1650 fps from a 14” Contender, and groups quite nicely with its 1 in 20” twist. Peak pressures of this load are estimated to be less than or equal to that of factory ammunition, based on case expansion. For the Marlin levergun, I seated the bullet slightly deeper (OAL = 2.54”) and roll-crimped over the forward driving band. Loaded thusly, the ammo fed and chambered very smoothly indeed, just as one would expect with the truncated cone ogive. Chronographing this load revealed a velocity of 1851 fps from the 22” Marlin. Accuracy was very good. Repeating these tests with the SSK bullet with 42.0/H322, this time using Winchester Large Rifle primers, gave 1855 fps and 1” 5-shot groups at 50 yards. While the Federal 215 primer is needed for top accuracy in the short barreled Contender, both standard and magnum primers seem to give good velocity uniformity and accuracy in the longer Marlin levergun. Magnum primers don't seem to provide any advantage in the rifle with H322.

Similar tests were carried out with the LBT 350 grain WLN-GC (356 grains when cast of water quenched WW alloy). This ammo was once again assembled with 42.0 grains of H322, the Federal 215 primer and seated to an OAL = 2.540". Ammo loaded in this manner cycled just fine, but the Marlin rifle wasn't designed with meplat this large loaded to this OAL, and this ammo just barely fed in through the loading port into the magazine, and probably should be just a touch shorter. I ignored the crimp groove, seated the bullet deep and placed a light roll-crimp over the ogive. Test firing this ammo revealed two things -- signs of excessive pressure, and velocities of 1886 fps. Repeating these tests using the Winchester Large Rifle primer gave acceptable pressures (based on case expansion), 1833 fps and 2" 5-shot groups at 50 yards. Magnum primers appear to push this load "over the edge" in terms of acceptable pressures.

I took both of these heavyweight cast bullets and the .444 out to a remote, basalt lined BLM canyon to do some plinking, and the SSK bullet had very a consistent point of impact out to 150-200 yards (as far as I could shoot in this canyon), indicating good, stable flight. The heavier LBT bullet was not as consistent

in terms of its point of impact, although it still delivered reasonable long range accuracy. This is in stark contrast to these two heavyweights in the .44 Magnum Marlin with the same lethargic twist, where they didn't group well at all, and commonly key-holed at 50 yards. The additional velocity of the .444 Marlin seems to be providing enough additional spin to these bullets for them to stabilize -- more than enough for the SSK, and just marginally enough for the heavier LBT. These data would suggest that the constant in the Greenhill formula for this velocity range might need to be adjusted upwards to 190-200.

Mountain Molds Custom Mould designed specifically for the .444 Marlin:

So much for Micro-Groove barrels not shooting cast bullets well! BUT the bottom line is that none of the cast bullets currently available is properly designed for the .444 Marlin, so I had one made up. Mountain Molds offers the service of custom made bullet moulds to the customer's specs. I designed a bullet specifically for the .444 Marlin levergun, with the following attributes:

1> Properly located crimp groove.

2> Proper nose length/configuration (.315"), ogival round nose flat point for smooth cycling.

3> 0.425" X 0.060" front band for optimum fit to the factory throat (to be engraved/supported by the rifling).

4> Large 73% meplat for optimum hunting performance.

5> 300 grain bullet weight (WW alloy).

6> Acceptable length for twist rate (.805", the blunt profile of this bullet actually leaves this 300 grain bullet the same length as the 265 grain Hornady).

7> GC design.

8> Large Keith-inspired grease groove.

9> Wide driving bands (provides more metal for the shallow Micro-Groove rifling to "bite").

I filled in Dan's worksheet, printed it out and mailed it in with a check. 8 weeks to the day, the mould showed up at my door. Bullets dropped from the mould oversized (as I had intended) at 0.433+" and (just like all of the moulds I've gotten from Dan) the bullets were actually ROUND. They weighed 290 grains when cast with 2 parts range scrap and 1 part linotype (this 2:1 alloy has a BHN of about 13), 295 grains when checked and lubed. This is pretty much spot on to what I ordered since I had designed the finished bullet to be 300 grains with WW alloy, which is slightly more dense than the alloy I was using. I designed the original version of this bullet with a full diameter forward driving band, which turned out to be a bad idea as it took too much force to engrave upon chambering in the Marlin's short throat (it shot very well, but would not be practical as a hunting bullet as chambering took too much effort). So, I had Dan make a modified version of this mould in which the forward driving band was somewhat reduced in diameter (.425") to facilitate chambering, but still allow it to center itself by being engraved lightly upon chambering. The second mould Dan made for me showed up a month later and was perfect. Sized .431", this bullet printed 5-shot groups at 50 yards (iron sights) of 1" to 1 1/4" when loaded on top of 48.0 grains of H322 (WLR primers) with velocities averaging a little over 2070 fps. Upping the charge to 49.0 grains of H322 increases the velocities to 2095 fps and group sizes stayed right at 1" to 1 1/4". The modified design cast, fed, cycled, chambered and shot beautifully. This is the best cast bullet I've shot in the .444 Marlin. Mountain Molds (www.mountainmolds.com) can make the same mould for you, if you want.

Conclusions:

OK, let's put this into perspective. A Marlin 1894 .44 Magnum carbine can drive the 300 grain cast bullets quite nicely at 1700 fps, but can't handle anything much heavier due to the limitations of the 1 in 38" twist and the OAL needed to feed from the magazine through the short action. The .444 Marlin can provide an additional 400 fps with the 300 grain bullets, which makes this gun suitable for pretty much anything in North America.

When assembling loads for the .444 Marlin, H322 seems to be the powder to beat, and standard primers work just fine in the rifle (although magnum primers provide better accuracy in the shorter barreled Contender).

.444 Marlin round loaded with the Mountain Molds 300 grain GC-FP, and the lubed and checked bullet.

Turning to jacketed bullet selection, both the Hornady 265 FP and 300 XTP are very accurate bullets, and by all accounts expand well when fired from the .444 Marlin. In selecting a cast bullet for the .444 Marlin, the SAECO 300 grain RNFP-GC bullet is an accurate choice, as is the RCBS 300 grain SWC-GC. The best overall cast bullet for the .444 Marlin is the Mountain Molds 300 grain RNFP-GC, the only cast bullet designed specifically for this cartridge and gun. It was found to be a very accurate bullet, that fed and cycled from the magazine very smoothly, and it has a large meplat for hunting. In terms of heavyweights, the .444 Marlin levergun is capable of driving the NEI (SSK) 340 grain bullet at 1850 fps with very good accuracy for those that want the additional thump of a heavier bullet (penetration of the SSK bullet should be exceptional). These cast bullet loads very nicely compliment the expansion behavior of factory ammo and jacketed handloads. The 350 grain LBT LFN-GC is right on the edge of being stabilized at 1800 fps with the 1 in 38" twist. Short range accuracy is good with this bullet, but groups open up as the range increases (and marginal stabilization can lead to erratic wound channels upon impact). Based on years of experience with the .444 Marlin in re-chambered Contenders, I am confident that the newer guns that Marlin is making, with their 1 in 20" twist, will handle heavyweight cast bullets just fine.

So where does the .444 Marlin fit in, in terms of big-game lever-gun cartridges? Well, let's start with the .30-30 family of cartridges that are easy to find, easy to shoot and have been reliably killing deer and black bear for many, many decades. This power level is typified by 170 grain bullets at about 2150 fps. While the .30-30 certainly *can* kill elk and moose, most hunters opt for something a little more powerful for these beasts to drop them as quickly as possible and avoid losing the animal. The next step up in power is found in the .33, .348, .35 and .356 Winchester group of cartridges. With these rounds we are generally talking about 200-250 grains bullets at 2200-2400 fps. They have established themselves over the years as reliable black timber elk rounds. The next step up the power ladder, we find the .444 Marlin loaded

with 300 grain bullets at 2100 fps (cast or jacketed), providing the hunter with a great deal of power and versatility. This level of performance is riding hard on the heels of the revered .405 Winchester (300 grains at 2200 fps), with a better (i.e. less abusive) stock design, easy to find strong brass, and out of a levergun that won't crush the family budget. This power level will handle anything in North America, and would not be out of place in Africa. Yup, the .444 Marlin is a keeper. You might even call it modern-day *big medicine*...

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