

## One-hole groups from a production rifle?

Last December, that was the topic of a gun club porch discussion in which I was involved. In fact, I started the conversation in that direction when several others opined that such 100-yard accuracy can only be obtained by parting with the big bucks required to have a custom rifle manufactured. I said I thought I could do it with a standard production rifle with only modifications that were reversible and could be carried out by anyone with minimal mechanical ability. When the badgering continued the following week, I set out to either prove my point or ingest some of my own shoe leather.

I am a hopeless Remington Model 700 (<http://www.remington.com/>; 1-800-243-9700) enthusiast and have something on the order of two dozen of them in my safe so the make and model of this new rifle was a given. Aside from superb accuracy, one of my main criteria for this rifle was light recoil so prolonged sessions at the shooting bench will be comfortable and enjoyable. To serve both goals, I decided upon the enormously popular .223 Remington cartridge. My safe contains two Model 700s in .223REM, a 33 year-old BDL I bought for our son when he was born in 1981 and a VTR, the varmint/tactical version with a triangular barrel, as well as a Model XP-100R "handrifle." But neither of those rifles have a heavy barrel, so I wanted to add one to my collection that does.

The model I really wanted, the Model 700 VL SS Thumbhole, was recently discontinued and none remain in Remington's inventory. The same is true for the Model 700 VSSF so since I wanted the rifle to be made from stainless steel, I chose the VSF (Varmint Synthetic Fluted). While I don't consider a plastic stock that cannot be bedded something I want on a benchrest gun, I have to admit that my VTR, which is bone-stock except for its trigger, is surprisingly accurate in its unaltered Desert Camo stock. In fact, it has been known to punch out a one-hole group every now and then! But I wanted a more benchrest-friendly stock for this new rifle and selected a Revolution benchrest/tactical stock in brown laminated woods from Keystone Sporting Arms, LLC (<http://www.keystonesportingarmsllc.com/>).

That stock has a butt area that is deeper and wider than a typical rifle stock, high comb, near vertical pistol grip that places your finger for a more straight-back trigger pull, ambidextrous palm swells, a wide flat forend with twin swivel studs, full floating barrel channel and an aluminum bedding block that extends from one action screw to the other and from the top to the bottom of those screw holes, thus also offering pillar bedding for the receiver. Between the light recoil of the .223REM cartridge, the gun's finished weight of 11-1/4 pounds, the stock's shape and its Pachmayr Decelerator recoil pad, the recoil barely feels like a centerfire! Should more gun weight be desired, I'm sure the thick butt area and wide, deep forend could be drilled for the insertion of lead shot or other dense material. The two action screws were torqued to 40 inch-pounds when the barreled action was set into it.

While the stock was off, I wanted to replace the trigger group. Remington's newer X-Pro trigger is nice in that it is externally adjustable for pull weight but as I learned with my VTR, when you

have the adjusting screw in the trigger blade set to the lightest possible pull weight, it protrudes downward so far that it interferes with your finger position on the trigger. I understand that Remington has gone to a shorter screw in response to customer feedback, but I contacted my friends at Timney Triggers (<http://www.timneytriggers.com/>; 623-223-1111), who were kind enough to supply a Model 512 trigger group for this project. It came with the pull weight set at 3-3/4 pounds but I was able to reset it to a safe one pound, 11 ounces. By comparison, the lightest I've been able to set an X-Pro trigger is about 3-1/2 pounds.

Aside from a lighter pull weight than most factory triggers can deliver, Timneys are super-crisp, consistent in operation and have a wider blade than the stock Remington triggers. That last quality adds comfort to the feel of a trigger and can even make a trigger's pull weight seem lighter. I have Timney Triggers in several rifles and shotguns and they have become my "go-to trigger" for accurate shooting. Installation is simple – following the directions included with the trigger group, just push out two pins, exchange the trigger groups and reinsert the pins. If you follow the instructions, no springs will go flying about your gun room and there will be no complications.

My loyalty to Remington rifles is equaled by my optics loyalty and just about every scope I own is a Leupold (<http://www.leupold.com/>; 800-LEUPOLD), so it was more or less automatic that this rifle would wear one as well. I went with a 6-18x 40mm VX-2 Target scope with a parallax-adjustable objective lens, target turrets and a Leupold Dot reticle in two-piece Leupold bases and STD rings, which were lapped prior to being torqued to 28 inch-pounds around the scope. The scope was then bore-sighted and adjusted during barrel seasoning to shoot slightly off-center on the target so as not to tear up my aiming spot.

I have scopes of higher magnification – as high as 36x – but as I've aged, I have found that my heartbeat can be seen in reticle movement on the target at magnification settings over 18x and I find that distracting when trying to concentrate on holding that little dot squarely in the center of the target's bull. Yes, I know that movement is present at any magnification but I can't see it below about 18x. Mind over matter, you know...

I think it is important to mention that ring height with this stock can be critical. I normally use low rings on rifles with sporter-weight barrels and medium rings for a little more objective bell clearance with varmint-profile barrels like this one but the high comb on this stock mandated that I use high rings. I could get my eye aligned with the eyepiece with medium rings but I was crushing my cheek downward to accomplish that.

My final addition to the rifle was a low benchrest-style Harris Model HBRM bipod (<http://www.harrisbipods.com/>). Several of my regular shooting buds criticize my use of one for bench shooting but I find the rifle more stable with a bipod than any front bag-type rest I've tried – and I've tried a bunch of them. Again, higher magnification scopes tend to make even minute gun movement painfully obvious.

I bought a box of inexpensive Remington UMC ammo to use for barrel seasoning chores and cleaned the bore with Sweet's 7.62 bore solvent after each of the first five rounds then after the following five groups of three rounds until the 20 rounds in the box were expended. Based upon the very light, almost invisible blue-green coloring on the patches, I felt the bore was a good one. Smoother bores that tend to collect less copper fouling from bullets are usually more accurate than rougher ones or ones with tool marks.

Next came time at the loading bench assembling test loads. I did not bother segregating cases by weight or turning the case necks but they were all trimmed to the published trim-to length and the primer pockets were uniformed. When reloaded, they were neck-sized only and the primer pockets were cleaned. In all, I tried 13 different bullets and five different powders for a total of 51 recipes.

The bullets used in my first group of recipes were the 50-grain Berger FB Varmint, 50-grain Nosler Varmint Ballistic Tip, 50-grain Hornady V-Max, 52-grain Hornady Match, 52-grain Nosler Custom Competition, 52-grain Sierra MatchKing and 53-grain V-Max, as those bullets have yielded good accuracy for me in other rifles with .224" bores. The powders included Hodgdon Varget, Benchmark and H322; Winchester W748 and IMR 8208XBR. I had numerous other potential powder choices on hand but decided upon those five for starters. All loads were charged with the published minimum powder charges, as hunting velocity was not a priority while light recoil and extended barrel life were. All the loads were sparked by CCI BR-4 Benchrest primers.

This rifle's barrel has a rifling twist rate of one turn in 12 inches, a fairly standard twist for this caliber that is intended to deliver good accuracy with bullets in the popular 50- to 55-grain weight range. And the rifle did in fact deliver very good accuracy with two of the bullets in that range, the 53-grain V-Max with 24.0 grains of Benchmark (load #12), which shot into one 0.180" hole, and the 52-grain Hornady Match bullet over the same amount of W748 powder (load #25), which came close with a 0.254" ragged hole. But as exciting as those groups were, neither result could be duplicated. Load #12 shot into 0.541" the second time I tried it and 0.913" the third time with two bullets in one hole. My hold was good each time (I always discard any results where any error on my part is noticed) so in my opinion, the third group suggested poor bullet stabilization. Load #25 shot into 0.806" with the same two-in-one-hole grouping the second time, so I decided to expand the bullet weight range.

The bullets for the next group of test loads included the 55-grain Hornady V-Max, 55-grain Berger FB Varmint, 55-grain Nosler Varmint Ballistic Tip, 60-grain Berger FB Varmint and 64-grain Berger FB Varmint with the three powders that exhibited the best accuracy with the first group of bullets, Hodgdon Varget and Benchmark and Winchester 748.

Apparently, my rifle's 26-inch barrel failed to get the memo about liking lighter bullets as it demonstrated a definite preference for the heavier slugs. With one exception, all the groups with the 60- and 64-grain Bergers ranged from 0.255" to 0.367". That exception was the 60-grain bullet over 22.5 grains of W748, which shot into 0.704". I was so encouraged by the

consistently good grouping by the rest of those loads that I decided to give Berger's 70-grain VLD a try with those three powders. But that bullet obviously exceeded the rifling twist rate's ability to stabilize it as all three groups were over two inches with ragged, torn holes in the paper that indicated that bullet yawing was taking place.

The 64-grain Berger over 24.5 grains of Varget (load #44) is the one that shot into one 0.255" hole so I retested it. That time, it was even better at 0.234" and it officially became my load of choice. I was glad but not surprised to see a Berger bullet come out on top because they shoot well in many of my rifles. Plus, the folks at Berger are great to speak with and really seem to care about their customers and how they feel about the company's products. (And before you even *think* I get them for free, I pay the same amount for my Bergers as everyone else.) That load's average muzzle velocity was a barrel-friendly 2,934 feet per second (fps) with an average Extreme Deviation of 29fps, if you worry about such things. I always record my deviation readings but have found some loads with higher numbers that shot good groups while some loads with low ones – even single-digit numbers – have yielded pretty ugly groups.

I had a lot of fun testing all those recipes and look forward to zeroing the scope and burning lots of powder in this rifle. Fortunately, as I use Varget in several other small-to-medium case cartridges, I keep plenty of it in stock. The rifle might even be used to dispatch the odd hayfield critter, coyote or fox on occasion. Best of all, it appears that I will not have to open mouth and insert foot as it obviously IS possible to punch one-hole groups with a standard production rifle.