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PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

06

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

NEW AR-15 PRODUCTS

RUGER PARTS • BRITISH ENFIELD HISTORY, PART ONE • BUILDING AND USING A BETTER PISTOL REST • ADJUSTABLE M...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 174

DIGITAL ARCHIVE EDITION

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MAINTENANCE & REPAIR

Ruger Parts

BY AMERICAN GUNSMITH EDITORS JUNE 2018

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TANDEMKROSS is an aftermarket firearm parts company that manufactures components for popular firearms. While their line covers a wide range of firearms, including the usual suspects of AR-15 and 1911 parts, they are known for their Ruger components. Ruger Parts Their Magazine Disconnect Replacement is for Ruger Mk IV and Mk IV 22/45 pistols.

The primary feature is the “Blast Shield” that allows for the safe removal of the magazine disconnect feature, allowing the gun to fire whether or not a magazine is inserted in the firearm. The design also facilitates proper magazine alignment and shields the sear and hammer from debris. Unlike other fixes for the magazine disconnect feature, the “Blast Shield” design ensures magazines stay in proper alignment, reducing failure-to-feed issues.

The Cornerstone Safety Ledge for Ruger Mk IV 22/45 pistols is an oversized, 1911 style safety. This part enhances the external factory safety without making any modifications to the internal components of the gun with a simple, drop-in upgrade that uses a factory spacer (included) and does not require any special tools to install. This gives the same thumb placement preferred by many 1911 shooters. The hive Grip for Ruger Mk IV 22/45 pistols is modeled after TANDEMKROSS’s SW22 Victory grip.

Designed specifically with competitive shooters in mind, this grip is flexible with an aggressively-textured surface made from a patented impact and vibration-dampening material. The wraparound hive Grip is easy to install and remove for cleaning and firearms maintenance. TANDEMKROSS offers a lifetime guarantee on all of their products. Contact them at tandemkross.com or

HISTORY

British Enfield History, Part One

We'll take a look at the history of British Enfield service rifles, starting with muzzleloaders and single shots.

BY PAUL MAZAN JUNE 2018

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Enfield. The very name conjures up visions of the iconic British service rifles of the 20th century for most of us. Small arms manufacturing at Enfield goes all the way back to the muzzleloading era. The Royal Small Arms Factory in the Enfield suburb of London was opened and assembling Brown Bess muskets in 1804. A new manufacturing facility was built and began making guns for the British military from 1816 to 1988. Power was originally provided by water wheels turned by the River Lea.

The river was also used by barges to bring raw materials from ocean-going ships on the Thames and finished product back for shipment all over the Empire and the world. The Pattern 1800 Infantry Rifle, a muzzleloading flintlock known as the Baker rifle, was the first product manufactured at Enfield and saw service with the British army during the Napoleonic Wars as well as by the Mexican Army under López de Santa Anna during the Texas Revolution.

It was considered very accurate for its day with hits reported out as far as 300 yards. Comparing it to the Brown Bess smooth-bore musket that most troops were still using at the time, it was indeed a marvel of accuracy. It was said any man that was hit with a single, aimed shot at 100 yards with a Brown Bess was a very unlucky man indeed and that was typical British service issue until the 1840s when it was replaced by the Brunswick rifle.

The Brunswick rifle was a muzzleloading percussion rifle in .704 caliber with two groove rifling. It took a belted round ball that was notoriously difficult to load. The 577 Snider, belt on the ball was to be fitted into the rifling in the barrel and required the shooter pay attention to aligning the two. Not terribly difficult on the rifle range but a deuced nuisance on the battlefield when one was being shot at.

Nonetheless, the rifle was in production for nearly 50 years (1836-1885) in four basic models both rifled and smooth bored. They were the patterns 1836, 1840, 1841, and 1848. It was a heavy beast to carry, weighing in at 9-10 pounds without its sword bayonet. After these two somewhat cumbersome weapons the British got it nearly right in 1851. The invention of the Minié ball changed warfare around the world.

It was faster to load than the Baker and Brunswick which were special issue due to their being so slow to load. With Claude-Étienne Minié's projectile, new rifled muskets were as quick to load as the smooth-bores while retaining the accuracy of previous rifles. That made it conceivable to arm an entire army with rifles. Unfortunately, the Board of Ordnance decided to retain the overall length of the older muskets that most troops were still armed with to maintain consistency in bayonet combat.

The 39-inch barrels had hardly gotten into production when someone woke up and realized this was a silly concept. Within two years a new model appeared and finally gave the British Army as good a rifled musket as any army in the world: The Pattern 1853 Enfield used in the Crimean War at The Thin Red Line (Battle of Balaclava) by the British troops as well as by the North and South in the American Civil War.

These were .577 caliber and made in several lengths for the Army, Navy, and artillery troops, with a carbine-length for the cavalry. Most of the guns that saw use in America were made by private companies because Enfield couldn't keep up with the demand from both its own country and the United States who, at this point, weren't very united. You would think with all this success everyone would be happy with the gun but you'd be wrong.

The British Admiralty decided that the barrel of the 1853 was a bit too light and thin to handle the heavy cutlass bayonet they had come up with. They demanded and got a heavier barreled version with five groove rifling. This was designated the 1858 Enfield. The Pattern 1858 Indian Service rifle was developed to arm the Indian Army. The British were always very clever in arming its colonial troops with firearms of lesser effectiveness than those issued to

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Similar in concept to the 1873 “Trapdoor” Springfield but opening to the side rather than toward the muzzle. British units. This was probably in response to British fears of colonial revolt and sealed by the Sepoy Mutiny in 1857. Rather than arm the Indian Army with 1853 rifled muskets, they bored out the barrels to smoothbore, making them less accurate and increasing the bore diameter from .577 to .656, and replaced the adjustable sights to fixed sights.

This made the Indian Army service arm less accurate than the British and also made the barrel A tilting block action with an internal hammer in the original .577/450 Martini-Henry was later converted to .303 British. The Mark IV was given a longer handle to give the shooter more leverage to extract the fired case. thin enough to occasionally burst upon firing. It would also flex and bend if the

bayonet was used with any vigor. This lead to a heavier barreled version that was renamed the Pattern 1859 (modified).

Another version of the 1853 Enfield was the Pattern 1861 Enfield musketoon. It was basically an 1853 Enfield with a short barrel and a faster rifling twist. The British issued it to artillery and the Confederacy imported them to arm both The wholesale slaughter of the War of Northern Aggression (“American Civil War” as the Yankees call it) saw the introduction of small numbers of experimental cartridge rifles, including some repeaters.

But since this is a history of British Enfield firearms, we’ll skip over these and stick with firearms development at Enfield. The American Civil War and the innovative, experimental, and limited-issue cartridge firearms it inspired was the death knell of the muzzleloading era. Governments, being fru-

gal in spending on the military when the guns are silent, was uninterested in developing anew breechloader.

Both the United States and Britain looked for ways to update the vast quantities of muzzle-loading rifles they had on hand rather than spend money developing anew rifle. In the United States, this led to Erskine S. Allin’s conversions of adding a hinged breechblock (“trapdoor”) to the Model 1861 Rifled Musket that had been used as standard Union issue. The British used the Snider conversion of the 1853 Enfield. artillery and cavalry units when they could sneak them through the Union blockade.

The 1866 Snider-Enfield conversion of the 1853 Enfield used most of the original parts with the exception of the breech. Developed by Jacob Snid-

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.577 Snider, .577/450 Martini-Henry, and .45-70 Government used in the trapdoor 1873 Springfield for size comparison. With 85 grains of black powder, it is no wonder the Martini-Henry recoil was considered "substantial." It originally from Montgomery, Georgia and adapted by the British, it fired a .577 caliber cartridge and utilized the original stock, lock, a modified hammer, and all the original furniture. In other words, it gave the British Army a breachloader at a really cheap price.

Despite being a stop gap between the muzzleloading era and anew design, it was both more accurate than the original 1853 as well as much faster to load. The design was so successful and the conversion so easy that there were many imitations, including those of the Nepalese and Dutch, as well as unauthorized knock offs resulting in the French Tabatière and M1867 Russian Krnka rifles. Sniders were made in three lengths.

The Rifled Musket or Long Rifle with a 36.5" barrel and three barrel bands, the Short Rifle with a 30.5" barrel and two barrel bands, and the Cavalry and Artillery Carbine with a 19.5" barrel and one barrel band. The Snider conversions served in the British Army for about a decade until slowly phased out as the first of the really famous British breachloaders were phased in during the mid-1870s. However, the Sniders were given or sold to colonial troops and saw service well into the 20th century with them.

Once again, this kept their colonial troops one generation behind the British Army in firearms. If you have ever seen the movie Zulu you are familiar with the star of the

movie and the next rifle manufactured at Enfield: The .577/450 Martini-Henry adopted in 1871.

Famously used at the Battle of Rorke's Drift by 139 British Army regulars from the 24th Regiment of Foot and a handful of colonial troops against an estimated 3,000-4,000 Zulu warriors fresh off the defeat of a force of 1,800 British, colonial, and native troops along with perhaps 400 civilians at Isandlwana. The cartridge it used was the old .577 Snider base soldered to a brass foil case that was necked down to .450 to improve trajectory and velocity.

Loaded with 85 grains of No. 6 black powder and a 485 grain lead bullet, recoil was substantial. Originally designed as a breachloader rather than a conversion from an older muzzleloading, it was designed by Swiss inventor Friedrich von Martini based on a Peabody design. The rifling was designed by a Scotsman named Alexander Henry, thus Martini-Henry. In the end there were four different variations of this service rifle identified as Mark I-IV.

In 1877 a carbine version was introduced that in itself had five variations. This seems to be the beginning of the confusing English system of coming up with names and markings for every small change no matter how slight. That also led to every person that made any update to the firearm stamping it to show it had been modified to the latest pattern.

You don't have to have seen many British service rifles to know they have more markings on them than a modern Ruger but the marks on the British rifles don't spell any-

thing. Still, they tell a story if you know how to read them. The original cases were brass foil rolled around a mandrel and then soldered to an iron base. These were then loaded with black powder and proved to be rather fragile, subject to being damaged, and tended to stick in the chamber as the barrel heated up.

They were eventually replaced by a drawn solid brass case. The study and collecting of British small arms ammunition is a collecting niche all on its own as there were so many variations. In 1889 the British started converting .577/450 Martini-Henry to .303 British. Of course, they couldn't simply call it a .303 Martini. That would have been too simple. These were renamed Martini-Metford rifles. The conversion used Metfordpattern rifled barrels that were fine for the original black powder .303 cartridges.

In 1895 the Metford barrels were found to quickly wear out when fired with the new smokeless powder version of the .303 cartridge. In that year the Enfield rifled barrel was introduced and the name was changed to Martini-Enfield when the barrel was changed. So, the same gun could have been a Martini-Henry one day, a Martini-Metford the next, and a Martini-Enfield a couple of years later.

The Martini single shot action in its various calibers and conversions was in service from 1871 until 1918 and remained in reserve in Australia, New Zealand, and India well into the World War II years. That concludes our quick tour of the Enfield-made rifles prior to the adoption of a repeating rifle. We will look at those in the next installment. AG

FROM THE ARCHIVE

New AR-15 Products

BY JOE CARLOS JUNE 2018

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It sometimes seems like new goodies for the Stoner platform are appearing on nearly daily basis. So by the time this appears in print I am sure there will be dozens and perhaps hundreds of new products that haven't been covered. With that said, the baker's dozen or so that I am about to talk about cover a variety of disciplines so there should be something of interest to most of you. Skip those items not of interest to you or not legal in competitions you build guns for. Let's get right to it.

Spacegun Buttstock The Spacegun Buttstock is a product built by Gary Eliseo's company, Competition Machine, Inc. (GotXRing.com). The only tools necessary to install (and adjust) this on either an AR-15 or an AR-10 (for you grown ups) is an Allen wrench. This baby is adjustable six ways from Thursday. That means it is probably not a piece of kit you want to slap on the night before a match.

It takes a fair investment of dry and live fire time to get everything just right for each individual shooter.

The cheekpiece rotates up through twelve positions. In the event the shooter needs to operate the charging handle, all that is necessary is to rotate the cheekpiece to its lowest setting (taking only seconds) and the charging handle will operate normally. I like that feature much better than some custom stocks that are not compatible with a charging handle.

Receivers For those custom stocks that interfere with normal charging handle operation, there is the billet Upper Side Charger flat top upper from Lantac USA. (LantacUSA.com). It is a total "slick side" with no brass deflector, forward assist, or dust cover. In addition to the side handle, it is also built to accommodate a regular charging handle. I like the idea of giving the shooter his choice of charging method.

I also like the fact that this receiver is fat right behind the threaded section for the barrel nut, providing superior rigidity and support for the nearly 2/3 of the barrel extension that lives aft of the threaded section. If you are purchasing a sidecharging receiver, you'll need a side charger bolt carrier to go with it. The Young Manufacturing (Young Man-Middle, AR-15 Match Rifle upper.

Top, 32" gain-twist Palma upper shoots 90 grain bullets at a smoking 2,800 fps. ufacturing.net, unit is the ticket and is a true match carrier at a very reasonable price. My studies have shown that true match carriers shoot groups 8.8% tighter than stock low-bid carriers. See my article, "AR-15 Upper Quick Fixes: Match Bolt Carriers" (May 2014.) For those wanting a billet receiver without side charging, I recom-

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mend Sun Devil (SunDevilMfg.com, These are available with any combination of forward assist and dust cover and have heavy walls right behind the barrel nut threads for improved support of the barrel extension. When I was conducting my study of receiver squaring (see next section) I found these Sun Devil units to be nearly run-out free, requiring no machining. Concerning receiver squaring, I will be submitting a full article on this soon.

The front of most receivers, including those for bolt guns, don't come from their manufacturers properly squared for those of us interested in precision shooting. I knew that gunsmiths building custom bolt guns had been squaring their receivers for years, so I decided to set up a study to see if squaring AR receivers would result in any accuracy gains. I determined that properly-squared receivers resulted in a 14% average reduction in group sizes compared to their machine rest performance before squaring.

When I was shooting in competition I would have killed for that kind of accuracy gain! Tool under the receiver fits in a hand drill but added to run out, resulting in receivers becoming less square. Warning, this is probably not something hobbyists want to tackle at home using one of those tools that fit in a hand drill. After measuring a factory AR receiver and following the tool's instructions, I performed the "squaring" procedure. Remeasuring afterward found run out significantly higher!

My advice is to seek out a gunsmith familiar with receiver squaring on a lathe to do the work. Ammunition If you are an AR shooter who only fires ammo seated to fit in a magazine, skip this section. For longer ammunition typically used for long range competition, the Length To Land gauge from Dead Center Sports (DeadCenterSports.com, is helpful. This unit performs the same function as the older Stoney Point, re-introduced by Hornady as the Over All Length Gauge.

Both gauges use caliber-specific dummy casings to determine how far forward of the casing rim a rifle's throat is located in reference to a specific bullet. Getting just the right amount of jump with boat tail bullets (the seating sweet spot) or the optimal jam for Very Low Drag (VLD) bullets is key to tight groups and the LTL Gauge helps establish a starting point. When I took these measurements with the Stoney Point, I often wanted a third hand while the LTL Gauge operates comfortably with two.

Both gauges require the operator to develop a sense of feel when advancing the bullet. The gauge's inventor, Mike Harpster, demonstrates at youtu.be/q-YJkig7Fyk The bullet seating sweet spot is not performed just by taking a LTL reading. This only provides a starting point. Finding the sweet spot requires range testing to compare group sizes from ammo with bullets seated at different depths.

I discuss further in "Bullet Seating Sweet Spot" (June 2016.) Getting this right shrinks group sizes by about 20% and is so important that I perform this load work up on a machine rest for every upper I build or rebarrel. The customer gets a free box of long range ammo set to the sweet spot of his barrel. All he needs to do is set his die to duplicate. Regarding long range ammo, Sierra is marketing two .224 heavyweights.

The 90 grain Match King boat tail (Sierra #9290) has a ballistic coefficient of 0.563 and is a redesign of their 90 grain bullet first introduced in 2005. Unfortunately, those first 90 grainers were seriously flawed and often blew up on the way to the target. Sadly, shooters got confused and thought all brands of 90s did this. The competitive shooting community was poised to drop the older and vastly inferior 80 grain bullets but that froze for nearly a decade until Sierra finally fixed their 90 grain bullet.

I have torture tested this new bullet and have been unable to get one to blow up. It requires a 1:6.5 or faster twist and shoots well in all barrel brands I have tested, Bartlein gain-twist barrels particularly. If you find 90 grain Sierras for sale, make certain you're not purchasing the older design which did not have a factory point and looked like any other open meplat Match King of that era.

The new, factory-pointed 90 grainers have a high ballistic co- Top, new LTL (Length To Land) Gauge by Dead Center Sports.

NEW AR-15 PRODUCTS CONTINUED

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224 heavy weights. Left, 95 grain Match King. Right, 90 grain Match King. efficient and fights wind drift with about 24% greater efficiency than the older 80 grain bullets. Only time will tell if that will influence shooters to make the switch. If I were still actively competing it would be an easy choice. The result of my testing is in "Sierra's New Match King" (October 2017.) Sierra introduced an even heavier .224 Match King in January 2018. This 95 grain bullet (#1396) has an impressive 0.60 B. C.

I haven't tested this one yet but expect to soon. I'll submit an article when I do. My concern is how much pressures will go up with the new bullet, resulting in reduced powder charges and slower speeds, at least in

modest-volume .223 cases. I suspect gain-twist barrels will help with some of that pressure. The Palma match is an international long range (800-1,000 yards) precision competition that been around for along time.

Since it is fired at a slow fire cadence it is no surprise that bolt guns have traditionally been the go to. Historically, this was a .308 Winchester match. There are a number of requirements, including a specified bullet weight of 155 grains. The .223 Remington has since been allowed with similar bullet-limiting rules. Most shooters use an 80.5 grain bullet. A few years ago the folks in charge of the U. S. rules relaxed the bullet limitations to permit the use of heavier and more wind-resistant projectiles.

The only time the older, light bullet requirements are still in place is during the official international Palma championship. If your state association wants to run a Palma match, heavier bullets are now permitted. Needless to say, shooters using both calibers jumped on these rule changes by quickly switching to heavier and more ballistic bullets. 90 grainers are leading the pack with .223.

Many shooters used to AR-15s don't wish to switch to a bolt gun with strange ergonomics for occasional local or regional Palma matches. Since I was already build- Far On top, 10 rounds selected at random. Bottom, the 10 best rounds selected from the 40 remaining rounds.

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ing AR-15s with 20" gain-twist barrels for Service Rifle shooters and 26" gain-twist barrels for match rifles, employing 90 grain bullets was the next logical step to lengthen gain-twist barrels to 30-32" suitable for Palma. Customer satisfaction has been very high. The Competition Machine Spacegun Buttstock has been popular on these AR lowers for Palma and Match Rifle. If you are employing a conventional receiver it will need to be squared.

Also in demand for both disciplines are quality, thick-walled Sun Devil receivers. And some kind of Length To Land gauge is obviously key to load work ups using the Sierra heavy bullets. Notice multiple products covered here intersecting. For more information, "Gain Twist Barrels For Palma" (December 2016) covers more. Although available for years, I still see confused expressions when I mention Hornady's Lock-N-Load Ammunition Concentricity Tool.

The confused are usually doing nothing to gauge or manage cartridge concentricity and may not even know what that term means. One of my admonitions to customers is no gunsmith or barrel maker can create a firearm to accurately shoot "crooked" ammo. Tiny groups demands ammunition straight with the case's center axis. If the bullet is at an angle off center, it will be deformed when entering the back of the barrel and fat groups result.

Sadly, most factory ammo isn't perfectly straight and unless the handloader is taking a few extra simple steps reloads will likely exhibit similar run out, a measurement of how far a bullet is seated off center. Managing cartridge concentricity is easy, fast, and the tool is cheap. It works on facto-

ry and handloaded rounds. Machine rest targets demonstrate better performance. My scores improved noticeably after I started "spinning" my rounds in a gauge.

I discuss this further in "Better Ammo" (April 2016.) Cleaning Another point missed is AR-15s normally shoot better clean. "Clean" includes having the bolt carrier assembly produce more consistent lock ups from daily maintenance and lubrication and proper, careful bore cleaning avoiding damage to the delicate lands. Yes, delicate. While made of steel, lands are only the thickness of paper and rubbing them with a cleaning rod can causes more wear than the passage of bullets.

As a military shooting team armorer for over a decade, I replaced as many barrels due to cleaning rod damage or pitting from total neglect than from being shot out and shooting team members shoot far more than most troops and other gun owners. Stainless barrels are soft and more susceptible to cleaning damage than chrome-moly. Smart guys have helped us by inventing bore guides that fit in the space normally occupied by the bolt carrier. I liken bore guides to seatbelts or studded tires.

They help but none are foolproof. To illustrate, most one-piece AR-15 bore guides have a hole through their center roughly 0.25" while .22 caliber cleaning rods usually measure about 0.20. Guide bore holes are fat because so many .22 bore brushes measure about 0.245" in diameter. The distance from one land across to the other is normally 0.219" while tighter Krieger and Bartlein barrels are 0.218. My machine rest studies show taller 0.218 lands shoot better with all the bullets I've experimented with.

See "Barrels For Custom AR-15s" (July and August 2017) for more details. Grooves normally measure 0.2240" so bore brushes are significantly fatter than the confines they are employed in. The tighter section remains on the cleaning rod. The larger portion replaces the bolt carrier assembly during cleaning. This sizing is on purpose because the brush needs to abrasively remove baked-on fouling. Most run their brushes wet with a moderate solvent.

Brushes are commonly made of bronze, which is copper with some tin alloyed in. Avoid using "hot" copper solvents with them as they'll "eat" brushes. I use Hoppe's No. 9 on my bore brushes and the patches preceding. The reason that the bore in one piece guides is so fat is so that the solvent on the bore brush will actually reach the barrel and not end up just rubbed off inside the bore guide.

The whole bore cleaning process is a matter of protracted discussion in "AR-15 Bore Cleaning" (January 2015.) I am certainly not the first person to discover bore guides are on the fat side. The smart guys at PMA Tool (PMATool.com), have a solution with their two-piece bore guide. The part that fits inside the upper appears like other guides with a fat hole so brushes can travel without losing all their solvent. The second, smaller piece stays on the cleaning rod tight with only a few thousandths clearance.

Start by pushing the rod with brush or patch through the rear of the main bore guide and stop when contact at the throat is felt. The smaller section on the rod is advanced forward into the back of the guide where it locks up tight inside. Cleaning then proceeds as normal with the rod en-

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closed much tighter by the smaller section of the guide. While it is still not perfect, PMA's guide is a big improvement. For you grown ups, it's also available for the AR-10. Alternate Ammunition Experimenting with the Stoner platform and non-standard calibers has been going on for decades. Even I am guilty, starting back during my team armorer days. A fair percentage of our team members were not hunters, had no experience with bolt guns, and didn't desire to experiment with them.

I confess that had I not grown up in Pennsylvania—the last state in the Union to disallow hunting with semi-automatic rifles—I wouldn't have a single bolt gun in my safe either! Go ahead, call me a snob... Back then, before 90s were available, people shooting 1,000 yard Service Rifle matches with AR-15s only used 80 grain bullets and they are on the edge at that distance. Hotter calibers used in Match Rifle are more wind resistant.

A few team members interested in Long Range matches had a plethora of personally-owned (and grossly overpriced) bolt guns running the gambit from hot 6mms to .300 Winchester Magnum. All of them had fancy paint jobs that I dubbed "disco stocks" because they looked better suited for the dance floor with John Travolta than on a rifle range.

Go ahead, call me a snob for the second time... I looked for a Match Rifle solution that would be user friendly for our AR-focused team that wanted a competitive 1,000-yard option by studying wind-resistant calibers that were Stoner compatible. 6.5mm-.284 was the current flavor of the week for long range bolt gunners then.

Blueprints of the cartridge pleasantly surprised me with its rim diameter being nearly a carbon copy of the .308 Winchester, which is what Stoner designed the AR-10 for, eliminating bolt modification. Too, recoil wouldn't pound shooters used to .223 too much like a Magnum would. I provided specs to Pacific Tool and

they made a reamer allowing heavy bullets seating just a little longer than magazine length.

I used a 26" Satern 5R chrome-moly barrel turned to Match Rifle specs, a JP Enterprises handguard, and big Nightforce scope. Upper-to-lower fit was tight using tips described in "The Accu-Wedge" (April 2017.) Tenround machine-rested groups were sub-minute, velocities similar to bolt guns, with not unpleasant recoil. I took the finished product to Quantico for the annual Interservice Match and spent a full day shooting it.

In another life I had set a record there for 1000 yard Service Rifle with an old M14 and hot 180 grain loads that held for nearly a decade until bested by an Army Marksmanship Unit shooter using an AR-15 and 90 grain bullets. The "disco" gunners with their fancy painted stocks guffawed with weakly-disguised snickers at the audacity of trying to compete in Match Rifle class with a gas gun! I asked if someone would care to give the AR-10 a try and one of our High Masters stepped forward.

This was a guy who shot 1,000 yards only once per year at Interservice and had never fired an AR-10 before nor a 6.5mm-.284 rifle. By day's end the snickering stopped when that shooter with his ugly gas gun outshot every one of the "disco" crowd. The story would be better if he had won the entire match but my gas gun shooter was edged out by someone on a competing team. The AMU's reaction was noteworthy.

From the time that AR-10 came out of the case until my High Master had fired his final record round there was a crowd of AMU big wigs standing behind him intent on what was happening. Guess what? The following year the AMU showed up with AR-10s for Long Range. They approached things a bit differently. AR-10 (M110) rifles had limited military service in the Gulf, having 20" barrels chambered in 7.62mm.

You can outfit one with a detachable carry handle and iron sights as a legal Long Range Service Rifle, which is what the AMU did instead of Match Rifle like I did. Both of us were successful. All this happened between one and two decades in the past. The current flavor of the week is the 6.5 Creedmoor which is not as hot as the 6.5 that I had used. It is AR-10 compatible and cartridges are magazine length. It also being chambered in "disco" guns and hunting rifles.

Attitudes have changed from those early 1,000-yard gas gun experiments for sure. Gas guns are prevalent and not just with AR-10s. Strides in the "mouse gun" have been furthered with improved 90 grain bullets, especially in Service Rifle where AR-15s are mandated to use 5.56/.223. While the older, less efficient 80s barely remained supersonic at 1,000 yards, the newer 90s arrive strong and may shoot out to 1,300 yards. Shooters have been searching for a more powerful cartridge to use in AR-15 Match Rifles.

Fatter casings with more powder volume have been tried as have some 6mm rounds. Nothing has seemed to stick, however. In early 2018 the .224 Valkyrie became the flavor of the week. It features a short, fat casing that will work in 6.8mm SPC magazines. It also requires the fatter bolt face. What is truly unique about the cartridge is that shortness allows seating 90 grain .224 bullet to AR-15 magazine length!

Federal is loading rounds as fast as they can for it with claimed velocities around 2,600 fps, the same I get with 90s seated long in .223 Remington though 20" gain-twist Service Rifle barrels. Most of the Valkyrie groups I've seen are around 1 MOA, which is not bad considering. I believe I could get better accuracy with gain-twist barrels and careful assembly procedures but am not motivated to

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do so yet as I build National Match rifles and don't think the Valkyrie has enough advantages to make it suitable for shooting in that discipline. I was about to write the Valkyrie off as just a novelty but believe it has potential for military and police sniping. I don't know if it will ever catch on for sniper work. Even if it doesn't, brisk sales seem guaranteed for the foreseeable future.

The .22 Nosler is another new AR-15 cartridge that came out about a year prior to the Valkyrie but hasn't enjoyed the same hype. I first read about the .22 Nosler in an article by Aaron Carter (July 2017 The American Rifleman.) The .22 Nosler, like the Valkyrie, uses a 6.8 SPC magazine but retains a standard AR-15 bolt which I prefer. Like the Valkyrie, the .22 Nosler uses a fatter case. Unlike the Valkyrie, the .22 Nosler case has not been shortened and is the same length as .223.

Where the Valkyrie case holds about one more grain of water than .223, the .22 Nosler holds about five more. Loading data for the .22 Nosler is available on line and powder charges with 77 grain bullets are running between 3-3.5 grains heavier. I see The author has had good results with JP Enterprises (JPRifles.com, Middle, handguards removed

to show the float tube which surrounds (with clearance) the barrel. Bottom, a quad rail version of an AR-15 handguard is now allowed.

Note, some of these units cause the gas tube to be bent significantly up and out of alignment with the bolt carrier key. This causes fat groups and lots of fliers. published velocities varying between sources. Expect a velocity gain from the .22 Nosler over .223 between 150 and 250 fps.

I don't know of anyone having shot 90s in the .22 Nosler but if the heavier bullet experiences similar velocity gains the .22 Nosler, it could duplicate AR-10 6.5 Creedmoor ballistic performance in the "mouse gun." I am in the process of building a .22 Nosler on an AR-15 Sun Devil upper in Match Rifle configuration and will publish accuracy and velocity results in this magazine. 90s in the .22 Nosler must be seated longer than magazine length, similar to .223.

Handguards Back when I was competing in Service Rifle, M14s had to look unmodified. Internal modifications such as match barrels and triggers lightened to 4.5 pounds were permitted. Similar rules were written for the AR-15. One of the downfalls of the AR-15 for precision shooting was front sling swivel at-

tached to the barrel. Float tubes hidden under A2 handguards with the swivel attached there allowed the barrel to float with no pulling on it. The rifle appeared the same.

A few years ago the CMP and NRA both changed their rules on legal handguards. Unfortunately, this created differing rules. An NRA-legal handguard might not be at a CMP event. There are dozens of handguard designs on the market and trying to pick one that is legal under both sets of rules requires research. Worse, the CMP has a history of changing their rules, such as from 2016 to 2017. Adding insult to injury, none of these handguards provide an accuracy advantage over the older and proven float tubes.

Most of them look cool with rails on four surfaces, called quad rails instead of handguards. I don't know of any Service Rifle competitor attaching anything to these rails and don't know if such accessories would be legal. To top it off, some quad rails cost three times as much and some of these contraptions cause serious accuracy impediments. The problem is some replacement barrel nuts are too thick and block part of the clover leaf the gas tube passes through, forcing a bend in the tube

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Author prefers the newer version on the right which has two large ports per side located at 3 and 9 o'clock. Top-Grade Ammo on the left is newer, to bypass. If during function the carrier moving forward forces the key to capture this misaligned tube, it will cause accuracy problems. My article "Gas Tube Alignment Revisited" (May 2018) discusses this in detail. Shop smart! Recoil Reducers I sometimes have customers supply recoil reducing devices that screw onto pre-ban barrel threads.

Most help with felt recoil., however, I also test machine-rest for accuracy. Until recently, all recoil reducers degraded accuracy. Harrell's Precision (HarrelsPrec.com, offers threaded Tuner Brakes, combining recoil reducers with accuracy tuners. They didn't initially offer 1/2 x 28 thread, so I requested this for pre-ban barrels. Giving these are popular, they thought my suggestion wise and included this thread on their next production run.

The first version of the AR-thread Tuner Brake had holes all around to vent gas. I found the tuner part worked and was able to shrink groups a noticeable degree. After finishing tuning, I removed the Harrell's

unit for a stock A2 flash suppressor and accuracy with it was superior to the best group fired with the Tuner in place. It's worth considering the tuner's bottom holes could promote a dust signature when firing in the prone position in dry conditions.

I put the original version of the Tuner Brake aside and concentrated on other projects. A year or so later a customer approached me about building an upper and he wanted to use one of the Harrell's units. I told him of my less-than-stellar results and he said he had purchased a nextgeneration unit that had two large ports each at 3 and 9 o'clock with no bottom vents. I agreed to try it but wasn't optimistic. However, after the same tuning process the machine rest revealed stellar groups!

When I removed the tuner and substituted a regular A2 flash suppressor, the groups worsened. This new unit is called the Tactical Tuner Brake For AR-15. Reducing recoil and enhancing accuracy is a win! Books In late 2016 Glen Zediker released Top Grade Ammo, his second book on ammunition. I believe the newer book is an easier read that the original Handloading For Competition. Forced to choose, I don't

know which would win out. I strongly recommend that anyone wanting to load better more accurate ammo read both.

We've covered a number of topics of interest to varying disciplines and all but one got "A" grades. In fairness, that single item still gets a "B". The benefits of gain-twist barrels were mentioned several times but were not given a category of their own because this is on "new" AR-15 products and these barrels have been around more than twice as long as Stoner rifles. I've used them for a quarter century and they get an "A+".

I strongly recommend combining again twists with some of the products discussed here to build better rifles. They are marksmanship's best-kept secret. To see again-twist barrel split lengthwise exposing the rifling, stop in my store in Building 910-A on Commercial Row at Camp Perry during the CMP Service Rifle National Matches in late July. I will also have most of the items covered in this article on display. As always, should any of my 16 readers have questions or comments, contact me directly at AG

PEOPLE & COMPANIES

Building and Using a Better Pistol Rest

There is a good chance you can vastly improve your pistol shooting accuracy—and you won't need a machine rest to do it. Building a reliable pistol rest, along with a sound shooting technique, is a good place to begin.

BY NORMAN E. JOHNSON JUNE 2018

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This treatise is a spinoff of my American Gunsmith article in the May 2018 issue covering precision scope mounting the Remington XP-100 pistol. In that article I wrote, "In the load and accuracy of various scoped pistols I had designed and built a special pistol rest. Properly used it pretty much eliminates the human error in testing". This generated a response by the American Gunsmith editor and others to see if I had any interest in writing up an article on how to build this pistol rest.

Here are my efforts toward that end. Basic Design Principles You won't need to be a design engineer or a master machinist to build this pistol rest. Nor is it necessary to follow in precise detail the protocol inherent to my exact plan. In the construction of this pistol rest, now 44 years past, it is evident I used some parts that were readily available to me at the time. As an inventor, I don't throw many things away.

The basic function here involves a rack and pinion-driven post to raise and lower the front rest and a locking mechanism to hold it at desired height. The vertical post moves up and down within its base, which is bolted squarely to the floor of the unit. Both the main post and the gear rack are solidly attached to a heavy angle iron bracket with the gear rack at the front and main post on the back. The heavy angle iron bracket also serves as the base for the upper platform which also is solidly bolted to it.

A special spring bracket is also attached to the angle iron bracket to serve as a counter poise while raising and lowering the assembled sandbag upper platform unit. The gear rack and pinion used to elevate the sandbag platform are also attached directly to the vertical post and angle iron bracket. The pinion gear is attached to a 1/2" horizontal drive shaft forming an integral part of a perpendicular frame assembly bolted to the base of the shooting rest from below.

A lever is attached to the From bottom, the top platform with tapered ends and hinged bag positioner and bag stop; floor of pistol rest with 20 holes drilled for various part attachments; primary post base with hole for gear rack post with side locking lever, gear rack and primary post bolted to angle iron bracket; pinion gear and drive shaft assembly with adjusting lever.

All units on right are later bolted to main floor during assembly. end of the pinion shaft used to conveniently raise and lower the gear rack, thus elevating or lowering the pistol forend on the sandbag. A lever lock positioned within easy reach of the shooter locks the post solidly in position while shooting. The main base, or lower floor, is made up of a flat piece of 6x10x1/4inch cast aluminum. Four 1/2" wing nut bolts are positioned at the four corners used to level the unit on the shooting bench.

THE TOP PLATFORM OF

BUILDING AND USING A BETTER PISTOL REST CONTINUED

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Bolts at bottom are used to attach unit to front of main base. This unit fits into sliding post base (pictured at center). the pistol rest is also made of 1/4" cast aluminum 5x12 with the corners cut off at an angle. This is solidly attached to the heavy angle iron bracket with 3/8" countersunk bolts. Two hinged, laterally opposing, adjustable wings are bolted in place on the top platform 2 1/2" inward from each side.

Located at the top sides of each wing are adjustment arms that engage notches at each side of the floor. This enables the shooter to place the pistol forend into a shaped sandbag for return-to-battery position shot-to-shot. Making The Rear Pistol Rest The rear pistol rest is a very important part of precision shooting. It, too, must be stable and adjustable for height. During normal shooting

from a bench rest to a horizontal target position, the pistol butt is best placed approximately two inches above the bench.

Once this The gear rack is solidly bolted to the angle iron post bracket which enables the post to be raised and lowered by a leverdriven pinion. It can then be solidly locked into a selected position. height is determined, the front rest can be set at desired height. In making the rear rest I used a 7x7x3/16-inch steel plate. As a means of controlling the height of the rear bag rest, I drilled and tapped for half-inch course threads and wing nuts as locks located at each corner.

Having set the rear rest to a comfortable shooting position, it can remain at that setting. As rear bag guides, two 1x5-inch parallel, thin-wall angle irons were attached at the sides. These were spaced 3 1/2" apart for the pre-sized rear bag. Angle iron stops made of

1x3 1/2-inch thin wall angle iron were placed at each end to complete the rear bag setup. Two split pieces of half-inch rubber hose were placed at each side as a protective measure for the bottom of the pistol buttstock.

The rear bag rest forms a very sturdy platform for the pistol butt, allowing for straight back recoil. Sand Bag Considerations Good quality sandbags are an important requirement in precision shooting for pistols or rifles. The bags should be inert and not spongy, but firm. Use fine beach sand or zircon that stays where you put it and doesn't roll like ball bearings. Use a type of leather that won't grab or cling to the pistol forend or butt—a leather with good release or break-away friction.

We want the pistol to feel solidly in position while aiming and firing, yet

BUILDING AND USING A BETTER PISTOL REST CONTINUED

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The white aluminum bracket at center, bolted in position, is used to attach the thrust springs used while raising and lowering the sliding post. The bag adjustment wings are at maximum height as shown here. Base leveling threaded wing nuts are at uppermost position. Gear rack control lever is clearly seen here. Precision Shooting Here I shall pass along some of the accepted techniques that I have observed and used in more than 60 years of shooting, with particular have good contact release upon firing.

I once wrecked one of my pretty good leather jackets for the quality of sandbag leather it produced—and never heard the end of it The

two laterally opposing thrust springs are seen here with spring guide bolted to post bracket. Function of the leveling bolts enable the operator to conveniently set the rear pistol rest to a solid and comfortable shooting level. emphasis on shooting handguns over sandbag rests. Our primary objective here is to markedly reduce or eliminate the human error in our shooting.

While we may not eliminate all of it, we can come mighty close. There exists a direct correlation between pistol hold, trigger control, and recoil. As we strive for best accuracy, the pistol is placed squarely, firmly, and uniformly over the front and rear sandbags. The sight

is then aligned precisely on target by micro adjusting the pistol rest or moving the rear rest or pistol butt, or both, as needed. We must always try to attain optimal stability in the process.

At this stage I hold the pistol grip with one or both hands to assure sight alignment and steadiness. I test for sight stability with varying degrees of hold pressure. I do this a few times as necessary. During this maneuver I prefer to place a quite firm, downward pressure of

BUILDING AND USING A BETTER PISTOL REST CONTINUED

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This setup provides a fully adjustable, solid, precision pistol shooting rest. Author normally uses a two-hand hold for most serious testing. This shows a good view of the left side of the pistol rest. the pistol butt into the rear bags as I use both hands to hold and steady the pistol. The amount is dependent upon the anticipated degree of recoil. I want to be able to maintain reticle stability with absolute zero movement through this process.

Of course, we don't perform these exact maneuvers in rifle benchrest shooting where free recoil is often This pistol chambered in .308 Winchester will produce a level of recoil to raise the forend off the front bag on firing. A good, twohand hold is strongly recommended. This setup is equipped to deliver maximum performance from a .22. used along with usually very light triggers.

While shooting a pistol, we must know and learn the trigger pull weight and feel of each gun in order to get off a steady shot with

good control. Trying a few dry-fire shots to test for sight stability on trigger release can prove helpful. The reticle should remain right on target at the moment of and following dry-fire trigger release or the instant before actually shooting. I'll allude to trigger control in a little more detail a bit later.

Dealing With Pistol Recoil In the process of fine tuning our benchrest pistol shooting skills, we must obviate certain conditions. Here the recoil issue enters the picture. We can't allow those pistols

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22LR semi-automatic handgun with 6-inch standard weight barrel. This was accomplished with special scope-to-barrel mounts designed and made by author. A 2 1/2-10X Sightron scope was used. Lapua Pistol King, CCI Green Tag, and Lapua Std. Plus all grouped under 1/4 MOA at 25 yards. At 50 yards Lapua Pistol King grouped 0.490 MOA and Lapua Midas grouped 0.570 MOA. with significant recoil to just move freely with no human constraints.

The pistol muzzle recoils upward because the line of bore thrust is above the mass center of the gun. If no counter measures are taken, the gun could virtually go airborne. In any case, this can be a very uncomfortable experience, particularly for those unaccustomed to it. Each shooter handles—or more appropriately, tolerates—recoil differently. The tolerance level varies markedly among shooters manifest as a sort of defense mechanism to a neuromuscular response and it can wear one down.

In any case, the shooter must maintain control of the pistol as uniformly as possible, from shot-to-shot during the entire duration of the shooting process or groups will suf-

fer. This is where the process essentially becomes mind over mechanics. Just as an example, application of uneven pressure to the pistol grip will cause bullet impact to go opposite to the direction of applied pressure and your grouping with it.

Trigger control is an unavoidably, often-divided issue, with widely differing schools of thought here. The question often arises whether we should anticipate precisely when the trigger/sear will break or release, or be allowed to come as a surprise to us. In my earlier experience as a U. S. Marine I was taught to anticipate precisely when a firearm would discharge.

Later, in building or testing many, many hundreds of firearms, and installing all manner of triggers, I still prefer to know when each trigger is going to break, along with the realization there will be various degrees of recoil and muzzle blast. I believe I have learned to be a better marksman as a result under all shooting conditions. In any event, I have no quarrel with those who prefer to be taken unaware of the precise instant of firearm discharge.

In either case, we must remain aware of the insidious possibility of flinching as we fire a shot and just because you've been shooting for years doesn't mean it can't happen. I believe being totally unaware of this can exacerbate the problem. Either way, we must follow through and learn to call each shot for better grouping. This will require devoted concentration but you'll find it well worth the effort.

I have introduced these final thoughts to serve as a means of assisting those who have a real desire in becoming more capable pistol shooters. I am hopeful the use of this pistol rest will help you in this endeavor. Good shooting. AG 361" and 0.368" 100-yard groups were shot with a modified XP-100 pistol chambered in .30 BRand wearing a Burris 4-12X scope. An 18" E. R.

Shaw 1:12 twist barrel with 110 grain Hornady V-Max bullets propelled by 33 grains of VV133 powder really seemed to come together here, with just a little help from a good pistol rest.

RIFLES

Adjustable M1 Garand Gas Port

Creating an adjustable gas port for the M1 Garand to increase reliability when firing blanks.

BY CHARLIE BRIGGS JUNE 2018

ORIGINAL PP. 18-19

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Perhaps like any good semi-automatic firearm, and U. S. rifle, caliber .30, M1 is a great one, the M1 Garand does not like firing blanks. However, when firing salutes on Independence Day, Veterans Day, or for military funerals, blanks are an obvious necessity. A variety of attempts have been made to modify the rifle to handle blanks reliably, often with less-than-perfect results. According to Bruce N. Canfield, Contributing Editor of the NRA Publications, this may be the reason the U.

S. military never officially adopted a Blank Firing Adapter (BFA) for the M1. To help solve this, I've developed a simple but effective solution. But first, a brief explanation of what and why.

As most of you know, the M1 is a gas operated, semi-automatic rifle, meaning when the rifle is fired, some of the expanding gas which (normally) drives a bullet is bled off the barrel and operates a piston—the operating rod in this case—which extracts and then ejects the spent case, cocks the rifle for the next shot, and feeds anew cartridge into the chamber; all in a fraction of a second. This is just the way John Garand designed it, for firing bullets or live rounds.

Garand, a Canadian, started working at Springfield Armory on improving American machine guns. There, about 1932, he was moved to designing the M1, the new semi-automatic rifle, which subsequently proved itself extremely well in World War II, and later, Korea. The rifle normally works very well, even in dirty combat conditions. It is The one on the left has been drilled and tapped for the plug described in the article. interesting to note that according to the NRA publication *The M1 Rifle* edited by Maj. G. H.

Drewry and Thomas E. Wessel, "The only instances of trouble in the M1 rifle manufacturing process, or with the finished product, occurred when some other engineer modified Garand's design." In fact, General George Patton referred to the M1 as the greatest fighting weapon ever devised! Firing Blanks Now, when we ask the rifle to fire blanks with no bullet for the gas to push, things quickly become more complicated.

With no bullet to be pushed, little gas pressure develops in the barrel and there's little pressure to bleed off and drive the operating rod. With not enough gas pressure, there's little or no piston movement and little or no functioning, rendering the rifle into a single shot. We can't have that now.

What would happen to a five-shot salute? You don't want five Marines firing and hand-cycling five rifles one at a time!

Because of problems like this many remedies have been envisioned, with most of them consisting of a restriction added to the muzzle. BFAs attempt to save enough gas to allow the rifle to function as a semi-automatic, yet not look funny to the casual observer. Problems can arise, however, when burned powder, not allowed to leave the barrel because of the restriction, accumulates. This leads to clogging gas ports, interfering with piston movement, or both.

Also, variations in blank cartridges and/or operating spring tension from rifle to rifle may cause hiccups in the system. Here in the central part of Florida, my most frequent, regular customer has been the U. S. Marine Corps League, a group of volunteer patriots who honor our servicemen and women at parades and funerals alike. Maintaining their rifles for some time, we noticed all-too-frequent misfires, causing one or more Marines to have to suddenly cycle their rifles by hand.

Accordingly, I conceived a rather simple modification to their BFAs that allowed us to tune each rifle for a given load without excessive cleaning or

ADJUSTABLE M1 GARAND GAS PORT CONTINUED

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frequent swapping out stronger or weaker operating rod springs. I began by making a prototype, drilling and tapping an existing BFA for a 1" long, 3/8-24 slotted plug; itself drilled out 0.005" smaller than the "muzzle" on the original BFA. Then, two slots 0.028" wide were cut in one end by using a slitting blade in the milling machine. A hacksaw could also be used if one is careful enough. The open areas of the slots more than make up for the aforementioned reduction at the muzzle.

Before assembling the now-modified BFA, I first threaded the plug into a 3/8-24 nut to temporarily protect the threads and clamped the nut into a vice. Then, heating up the un-

slotted end to a cherry-red color with an oxy-acetylene torch, I drove a 9/64" Allen head wrench in about 3/16" deep, virtually forging a 9/64 socket for adjusting the plug.

Taking an M1 to the range with its now-modified BFA, I deliberately adjusted the plug out too far, exposing most of the slots to purposely allow too much gas to exit and preventing proper cycling of the rifle. As expected, the first round fired but didn't eject the spent brass or feed the next round. So far, so good. From there, it was a simple matter of using a 9/64 Allen wrench to screw the plug in a little at a time, concealing more of the slots and reducing spent gas until the rifle finally cycled reliably.

I then applied a little Loctite on the threads to keep the plug in place. Obviously, a set screw into the side of the BFA would also hold the plug in place but I didn't want any more visible modifications sticking out, particularly out of the sides! These shortened plugs for modified BFAs are now going into all the League's M1s. For cosmetic reasons, I shortened the plugs a little but left the slots as they were.

Reliability has improved in every case, making for a reliable blank-firing M1 with minimal visible modifications. AG

RIFLES

Cable-Control Trigger Release

A cable-controlled trigger release can be a great aid to accuracy in rifle testing. Here's how to design and build one yourself.

BY NORMAN E. JOHNSON JUNE 2018

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In the process of developing extreme rifle accuracy, trigger control has always been a critical issue. This can be much improved with some form of remote control trigger release, where the shooter's hands don't directly touch the rifle. Crafting some form of trigger release is quite rudimentary and the cost is low. Why A Trigger Release?

Though a cable-controlled trigger release may not be used during actual hunting or Benchrest competition, it becomes a very effective aid during the critical testing of a rifle, particularly the more accurate Benchrest or target rifles using lighter pull triggers. The most common method in effectively testing a rifle for optimal accuracy is to rest the front and rear of the stock on very stable supports.

These usually consists of a precision front bag rest and special sandbags with laterally-positioned ears at the rear of the stock. In this way the rifle is carefully positioned and adjusted so the scope reticle is precisely on target with little or no help in guiding it with the hands or shoulder. Where such human guidance takes place, there is almost certain to be a marked difference from

shot-to-shot on target. This is due to the inability to duplicate the hold and trigger pull from one shot to the next.

To obviate the human element in accurate shooting, triggers are set to a lighter pull weight. Such pull weight may range from as little as two ounces to around two pounds or greater. The most common methods of trigger release involve having the riflescope prealigned on target with the scope reticle fixed on the aim point and pulling the trigger straight back with only the tip of a finger contacting the rifle. No shoulder or hand contact is used as the rifle recoils rearward against the shooter's shoulder.

Of course, all the while the trigger is being pulled, the shooter views the scope reticle precisely on target. If performed correctly, extremely small groups on target are the usual result. This is all well and good for the really light trigger, but when somewhat heavier triggers come into play, some hand and shoulder rifle contact is required and this is where as little as a one pound trigger pull disturbance can cause rifle movement on trigger release, particularly with lighter weight rifles.

So as the rifle is fired with one or two—or more—pound triggers, an equal amount of thumb and/or hand pressure is applied to the rifle stock to compensate for the errors in the trigger pull. Sometimes varying degrees of shoulder pressure are applied in trying to accomplish a more steady trigger pull, usually with little improvement. Major disadvantages of this mechanism are the upside down position requiring a finger tip use to utilize the cam.

This type of trigger does little in delivering a more steady release in precision shooting from a bench rest and rifle testing. This is where the cable control trigger release comes to the rescue. No part of the hand or body comes in direct contact with the rifle until the butt plate moves rearward into the shooter's shoulder or other form of stop. The cable control device is simply a means of attaching a common camera cable shutter release to the trigger guard, enabling it to work the trigger.

This very effective device can be made up by the innovative gunsmith at a very low cost for materials.



Making The Release As I came upon the idea for this cable trigger release, a few different theories were put on paper. I finally went to a simple aluminum block machined with a slot to fit the underside of different style trigger guards. A groove, set at proper angle, was then made at the top of the block to hold and direct the cable release pointer against the trigger. The pictures provided will show the

simplicity of the design. The picture descriptions should further clarify details in machining and usage.

Testing As I made up the trigger release unit, I fitted the attaching slot to a number of different trigger guards for universal application. The slot is formed with a shallow radius to fit the average trigger guard, particularly the Remington Model 700, Winchester Model 70, et al., which turned out to fit near-

ly all rifles. I was really excited to try it on some of my better rifles capable of extreme accuracy in the 1/4-1/2 minute-of-angle range. It functioned without a hitch.

This page: These axiomatic projections show the main body of the cable trigger release. Properly placed slots and grooves allow the block to be clamped to the lower trigger loop and attach the cable release.

CABLE-CONTROL TRIGGER RELEASE CONTINUED

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It's really quite different to shoot with those busy, often-interfering hands totally off the rifle. Anticipation of the muzzle blast and recoil into the shoulder were a different experience as I viewed through the scope. But the release brought out the best in each rifle I tested.

When Left and Remington 700 with a 23" Krieger barrel 13.5" twist rate chambered in 6x45mm shooting a Berger bullet demonstrates grouping capability with a cable-control trigger release. heavy Magnum-type rifles are shot, this device is less useful as shouldering the rifle to receive such recoil will be

necessary. Conclusion Not all of our innovative endeavors or inventions are going to result in success, but when they do, it is most encouraging. I see the cable control trigger release as one of these.

AG The brass clamp screw seen below clamps the unit to the trigger guard.

HISTORY

Reader Forum

BY AMERICAN GUNSMITH EDITORS JUNE 2018

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Readers Thanks I just want to thank you for putting out a most informative and educational publication. I've been a subscriber for over a quarter century and still learn something new with every issue. Even though I'll probably never see 95% of the guns that are written about, I still enjoy learning about them. Thank you for your efforts and those of your contributors. Erratum After the article "Fun With Flintlocks" went to press (May 2018) I discovered that I made an error in terminology regarding the sideplate.

In the article, I referred to it several times as the lockplate. The lockplate is part of the lock while the sideplate is on the opposite side of the stock and acts as a decorative washer for the screws that secure the lock in place. The correct term for the part I was discussing in both the text and picture captions is sideplate. I apologize for any confusion this may have caused.

Detonics Pistol I started reading the Survivalist series by Jerry Ahern back in the early 1980s and have been enamored with the Detonics compact .45 ever since. I recently acquired one. Having disassembled it I'm now red faced as I can't properly reassemble it. I am in need of any maintenance and gunsmithing information you can provide as this gun is a keeper. Despite owning and using many 1911-type handguns, the Detonics has me stumped. Thomas R.

Conner Detonics has changed names over the decades, starting as the Detonics Manufacturing Company in the 1 Slide 2

Rear sight 3 Extractor 4 Firing pin spring 5 Firing pin 6 Firing pin stop 7 Magazine catch lock 8 Magazine catch spring 9 Magazine catch 10 Slide stop plunger 11 Plunger spring 12 Safety lock plunger 13 Grip plate 14 Trigger 15 Mainspring cap 16 Mainspring 17 Mainspring housing pin retainer 18 Mainspring housing 19 Mainspring cap pin Conrad Long Fraser, CO mid 1970s the time frame their compact .45 was made and then reforming as New Detonics and Detonics USA.

Since 2007 the current company iteration is Detonics Defense, most recently forming a partnership with STI (famous for competition raceguns) to co-create an entry in the XM17 Modular Handgun System (MHS) competition. Although their 1911-inspired, striker-fired entry was ultimately beat out by SIG's 320, it did make it into a final round for consideration. Paul Mazan The Detonics Combat Master is considered one of the first compact 1911-pattern pistols to be a production item.

Prior to this, compact 1911s were custom jobs, built by hand and typically by first cutting down a Government model. Sid Woodcock and his friend Chuck Lyford came up with the idea that there might be a market for a pistol like this in production. There were six different models available but they're all similar. Only finish, type of material, and rear sight differentiate the models. Kingman, AZ The original Detonics is really just a smaller version of the 1911.

Although it was billed as the world's smallest single-action autoloader 20 Sear spring 21 Magazine 22 Mainspring housing pin 23 Left hand stock 24 Stock screw 25 Stock screw bushing 26 Safety lock 27 Hammer pin 28 Sear pin guide screw 29 Slide stop 30 Frame 31 Recoil spring guide 32 Inner recoil spring 33 Outer recoil spring 34 Recoil spring cap 35 Barrel 36 Barrel link pin 37 Barrel link 38 Disconnecter 43 Recoil spring 39 Sear 40 Hammer 41 Hammer strut 42 Hammer strut pin chambered for the .45 ACP, the operating principles of the Detonics is no different than Browning's best.

See schematic. Loctite For AR-15 Your articles mention using green Loctite when building AR-15s. I see there is a couple different numbers for this. What kind are you using? Bill Smith Author Joe Carlos responds. If you are using a barrel with a custom BAT Machine extension that does not require adding any shim stock, use the quick drying #638 Loctite. However, #638 sets up too quickly when using shim stock wrapped around a standard barrel extension so the slower drying Loctite #620 is better there.

Note, #620 will also work on barrels with BAT extensions, it just dries slower. 1873 Winchester My shop is repairing a 1873 Winchester .22 made in 1884 and it needs a lot of work. We found a parts gun but the price for it was \$225.00 plus shipping and tax. My customer isn't willing to pay for that just to have parts as there was a lot of other

READER FORUM CONTINUED

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work needed. Do you have any suggestions as to where we can get what we need to make this gun work? If we understand correctly, the owner of this 1873 has decided \$225 is too high a price to pay for restoration to a safe shooting condition. From what you say, this particular owner's gun "needs a lot of work." That translates to plenty of hours of fixing, plus the cost of parts to do the job, plus tax.

Compare the cost of the parts needs with the usual suspects (Jack First, etc.) and estimate your hourly rate required to install them. Add any expense connected with test firing the finished product. Total up the cost. Notify your client of the amount required payable 1/3 up front, 1/3 half complete, and balance due upon delivery. If he still feels \$225 is too high, invite the reluctant owner to secure a competitive bid elsewhere that results in a safe, serviceable Model 1873.

Alternately, offer to clean up his 1873 sufficiently to make it a nonshooting wall hanger. Without having seen the gun, we'd guesstimate that cost—assuming no overall rebluing and wood refinishing is necessary—to be about \$175. If overall refinishing of metal or wood is required, the cost could easily reach above \$500.

Pat Stad AR-15 Bolt Carrier Tilt Regarding anti-tilt pads ("Combating AR-15 Bolt Carrier Tilt", May 2017), when adjusting the screws to uniform the gap at the rear of the bolt carrier group, is it better to try to even the gap around the carrier or adjust it parallel with the bore axis? For example, say your carrier is undersized and adjusting the tilt to get a uniform gap in the back imparts a forward tilt on the carrier.

Would it be more beneficial to monitor the gap up front to keep the carrier parallel with the bore? How would you accurately measure the front gap, especially with the barrel installed? Author Joe Carlos responds. I know of no way to measure the gap around the front of

the carrier with the barrel in place so I use feeler gauges at the back to achieve an equal amount of gap between the top and bottom of the tail end of the carrier.

With the pads located at 4:30 and 7:30 o'clock, most of my carriers level out with about 0.035" of the pin head above the surrounding surface. I set it in place with red Loctite and staking the screw heads. It is important not to get hoggish with your adjustment. A carrier tilted up at the back is as bad as one tilted down. It needs to be level and the best way I've found is to measure with feeler gauges as described in the article.

Hi-Point Model 995 The front sight on my Model 995 carbine completely broke off where the ring that goes around the barrel is on the weapon. I've heard of an epoxy called Black Magic (Sticky- StuffSales.com, that is supposed to be strong enough to drill or machine. Would something like HFT Super Strong Quick Setting Epoxy or J-B Weld work as well, provided it is made to bond to steel? I've tried to contact Hi-Point by phone as required for warranty work/repairs to no avail. Their phones are always busy.

This is an old truck gun that just needs to be accurate enough to get the job done. I'd prefer to just fix it myself. The repair seems simple. Remove two set screws, slide the front sight off, epoxy the broken parts together, let harden, remove any excess adhesive, and reinstall. What's your opinion on this type of repair? Will it work and hold up to the shock from the rounds passing through the barrel?

Jeff Gilkison Noel Adams We believe Black Magic epoxy is sometimes used as the bonding material to affix shotgun ribs to barrels. Unless your 995 9mm carbine can beat a twelve gauge for shock, we have little doubt your front sight will be shot off once it has been properly repaired and re-installed. AG

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