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North Vietnamese K50 SMG

LaserMatch Tracer Ammo

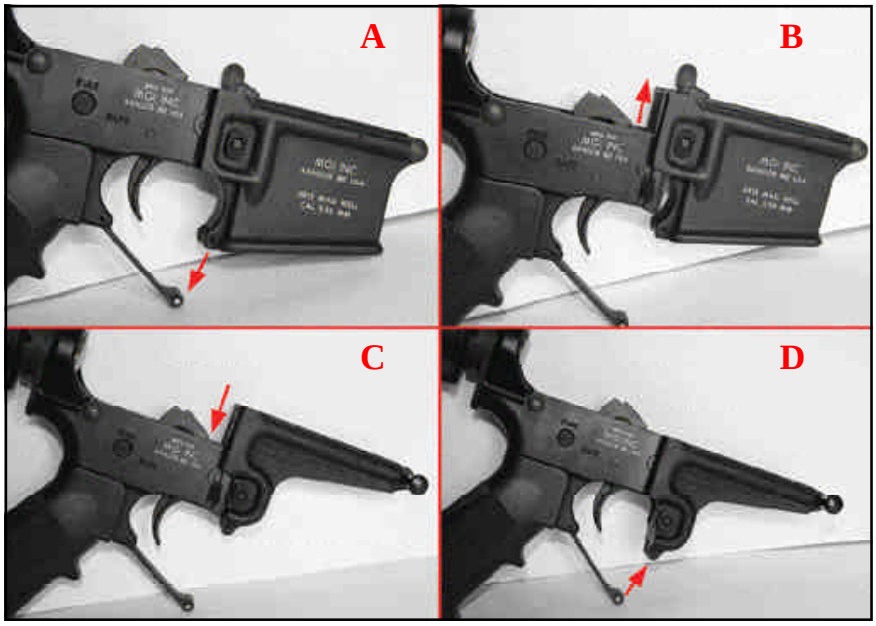
MGI Modular Weapon System

Spring 2007 Class 3 Directory

Very few firearms can claim to be as versatile as the AR-15/M16. Thanks to MGI the spectrum just widened even more - much more.

There is an abundance of caliber conversions, barrel lengths and configuration options available for the firearm that has been the primary service weapon of the United States military for over 40 years. In order to make such radical changes to a single rifle, it has been necessary to procure a new, barreled upper receiver, a matching rail system, and specialty magazines with proprietary adapters. At least that used to be the case - until now. Enter the Hydra Modular Weapons System from MGI.

Imagine having one firearm, in this case a registered M16, and having the ability to fire numerous calibers. That is not such a big stretch since several conversions in the form of barreled upper receivers have been available for a number of years. What if you could make the caliber change in less than 2 minutes without using any tools? Again, nothing very spectacular because changing the barreled upper receiver and bolt is a fast and easy process. What if you could do this and continue using your upper receiver and rail system without even having to disassemble the firearm? Now that is something radically different.



Right: In order to change the magazine-well all the operator needs to do is (A) depress the trigger guard detent and swing the guard down. (B) Depress the magazine release button and lift the magazine-well up and off the receiver. (C) Place the new magazine-well down on the receiver, aligning the dovetail slots until it snaps and locks onto the magazine release. (D) Replace the trigger guard.

In the Beginning

The Hydra Modular Weapons System is a combination of AR-15/M16/M4 upgrades going back for decades. Mack

Gwinn Jr., President of MGI holds over 25 firearms related patents. The original founder of several firearms related companies including Bushmaster Firearms and MWG, Gwinn has been involved in the firearms industry for almost 4 decades. While many of his designs are unrelated to the AR-15/M16/M4, such as the M2HB-QCB, his latest venture, MGI certainly focuses on this weapons system and boasts impressive upgrades and radical design changes.

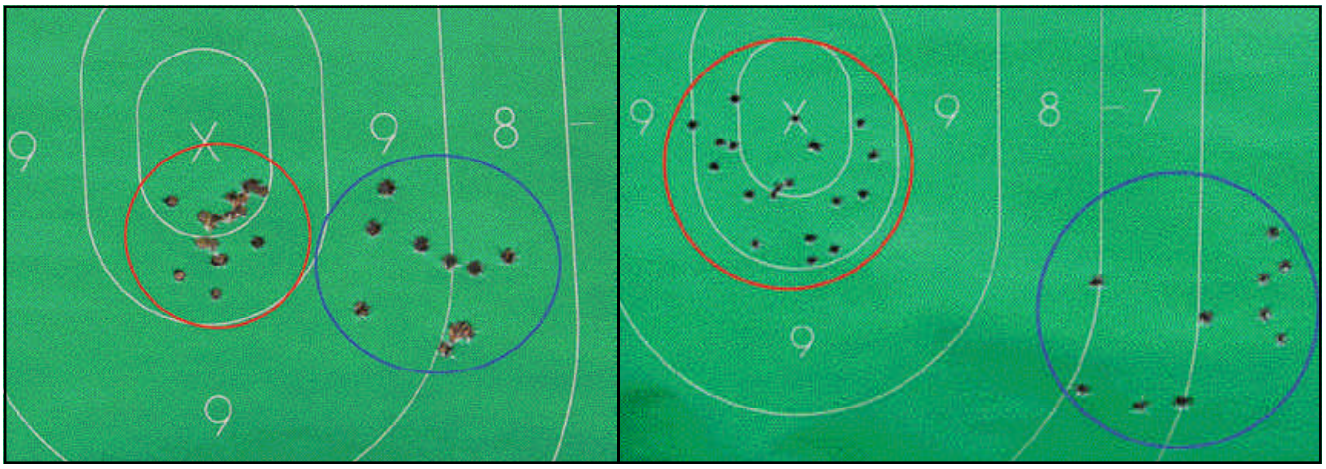
The Upper Receiver

As reviewed in *Small Arms Review* (Vol. 8, No. 3, December 2004) the MGI Quick Change Barrel (QCB) Upper Receiver allows the shooter the ability to quickly change barrels with no tools in less than a minute. The QCB Upper Receiver has undergone several upgrades and modifications in the last two and a half years, including a complete rail system as the standard handguard. The MGI QCB-C handguard utilizes four 5.75-inch M1913 Picatinny rails, each at 3 o'clock, 6 o'clock, 9 o'clock and 12 o'clock. The 12 o'clock (top) rail is completely regulated with the flattop rail on the upper receiver giving the operator several sight and accessory options. They are manufactured so precise that the upper and handguard can even be "bridged" creating a top rail over 13 inches in length when used with a carbine length barrel and gas system. For those who wish to use a full-length barrel and gas system, MGI also offers a 5.5-inch handguard/rail extension. When utilizing this extension the top rail is almost 19 inches in length.

Another major upgrade to the new MGI QCB-C Upper Receiver is the addition of the barrel locking arm retaining block. This retaining block slides on the 6 o'clock Picatinny rail and slides over the barrel locking arms, holding them firmly and eliminating anything sticking out that could be caught on clothing or foliage.

Like the original QCB Upper Receiver the new QCB-C variation still uses factory AR-15/M16/M4 barrels. There is nothing proprietary that needs to be purchased to use this system. If you have a factory barrel you wish to use with the QCB Upper Receiver, all you need to do is remove the delta ring, the barrel nut, the sling swivel and the front handguard keeper and it is ready to use. No special parts or accesso-

<u>Below</u>: In the red circles are two different 10-round groups of 5.56x45mm ammo, fired individually after completely swapping calibers and firing two 5-round groups of 7.62x39mm ammo as shown in the blue circle. This target on the left was placed at 50 yards from the shooter and both groups were fired using the same point of aim. A second test was conducted simultaneously at 100 yards and the results are visible on the target to the right.



Above: Due to the design of the Modular Weapon System, it breaks down and fits in an extremely small package. All the parts in this briefcase are laid out in the photo below it.

ries are necessary and all existing barrels work fine. In the case of changing calibers as well as barrel lengths the correct bolt and bolt carrier are installed and the upper receiver conversion is complete.

The Lower Receiver

Most people would agree that the weakest link in AR-15/M16/M4 caliber conversions is the feeding system. The shape, function and interior dimensions of the original magazine-well don't easily allow the use of many other magazines. When others are utilized, special and sometimes expensive adapters are typically necessary, and at times, mandate the use of heavily customized proprietary magazines. These can also be quite expensive since they are not surplus or even "off the shelf" items. The performance with some of them has also been less than acceptable at times due to the constraints of the original magazine-well dimensions. When there are problems, magazine related feeding and function issues always seem to lead to the majority of the troubles. Anyone who has tried to push several 7.62x39mm rounds into a standard 30-round AR-15 magazine and expect it to feed reliably when used with a 7.62x39 upper receiver has undoubtedly faced the same problems. In this particular situation, the larger diameter of the rounds necessitates more curvature in the feeding device in order to freely advance and feed correctly. The straight shape of a factory AR-15/M16/M4 magazine-well does not allow for this magazine shape.

This major feeding problem has been resolved with the MGI Hydra Modular Weapon System by simply allowing the user to utilize the correct magazine for the correct caliber. This gives the proper presentation of the cartridge in both height and feed angle, as it was originally designed for, using factory magazines. When shooting 5.56x45 (.223 Rem), standard AR-15 magazines are used. When converting to 7.62x39mm, standard AK47 magazines are used. When shooting .45ACP, Grease Gun magazines are used and when using a 9x19mm system, Sten magazines (and soon Glock, Uzi and Colt magazines) can be utilized. All these magazines work in their original, unmodified condition, and all without the use of expensive and troublesome magazine-well adapters.

This advancement in the MGI Hydra feed system has been accomplished by designing the lower receiver to accept several magazine-wells, so the correct magazine can always be used with the correct caliber, bolt and barrel. The magazine-well

can be removed and replaced with no tools and easily accomplished in under 1 minute. At the present time, magazine-wells are available in 5.56x45mm (.223 Rem) and 7.62x39 with others in the final stages of production including 9x19mm and 45ACP. Provisions for several other calibers are also being developed including .22LR, .22 Magnum, .40 S&W, 7.62x25mm and many more.

The Complete Modular System

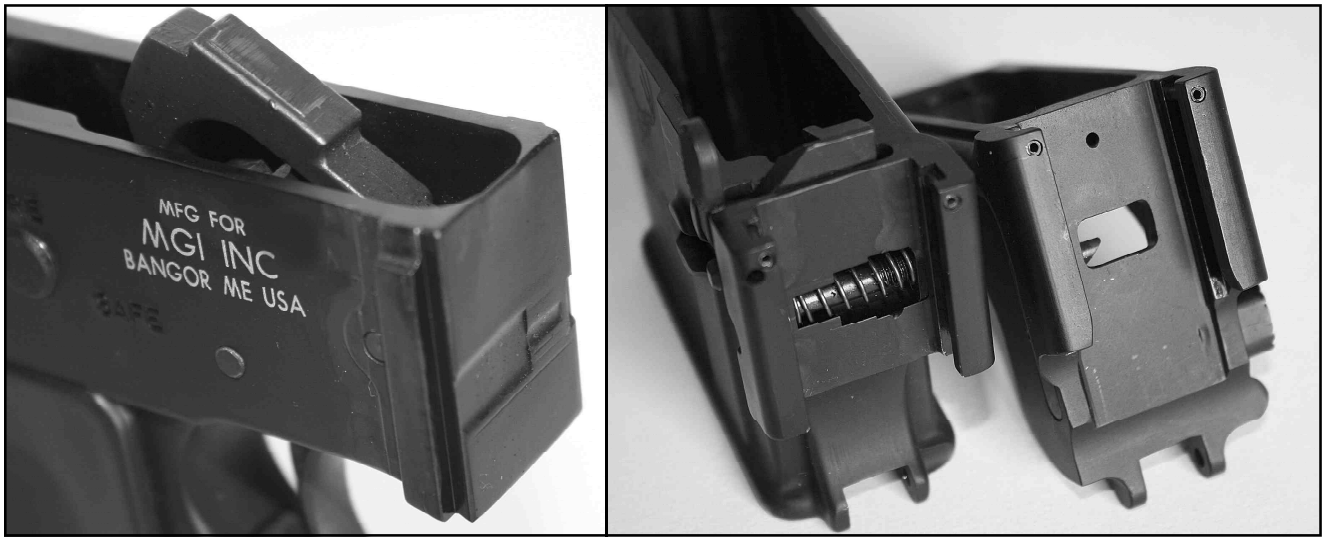
Even though the MGI QCB Upper Receiver is completely compatible with all Mil-Spec AR-15/M16/M4 lower receivers, and the MGI Modular Lower Receiver is compatible with all Mil Spec upper receivers, the real potential of their flexibility happens when they are used in conjunction with each other. Several other components have also been developed and designed to be used in this system and when combined, create entirely new possibilities and options that never existed in the past.

The Defender D-Ring

The addition of the MGI "Defender" D-Ring is standard in all complete weapons systems. The D-Ring increases the reliability of the AR-15/M16/M4 by virtually eliminating extraction problems and increases typical extractor spring force by 4 times over the factory spring. The D-Ring is used by several police departments across the nation and is used extensively by members of the armed forces in the War On Terror. Many factors including gas port erosion can contribute to creating a higher rate of fire causing an extreme centrifugal force on the extractor as the bolt rotates and unlocks. This centrifugal force can cause the extractor to lift and can lead to a dangerous failure to extract. The additional force on the extractor keeps it closed in the position it was designed to be in, insuring a positive extraction. Sandy or dirty conditions can also lead to more drag on the casing after firing and this extra spring tension creates a more positive extraction in these cases as well. Over the years, some end users have used common O-rings from the local hardware store to reach the same goal as the D-Ring. While they are inexpensive and plentiful they can lead to a malfunction due to inferior materials compared to the D-Ring. Standard o-rings are not designed to take the harsh and rapid repetitive compression that the D-Ring was engineered for. Also, while the shape of the D-Ring holds it in position, a standard o-ring can slip and cause the extractor to stick open.

The MGI Regulated Gas Tube

The MGI Regulated Gas Tube is another important system upgrade and greatly assists in solving gas port erosion problems. It is completely adjustable allowing the shooter to control the amount of gas used to operate the system. The rifle can be tweaked for particular ammunition or specifically adjusted just for the current conditions it is operating in. It is installed just like a standard gas tube and is adjusted with a standard Allen wrench.



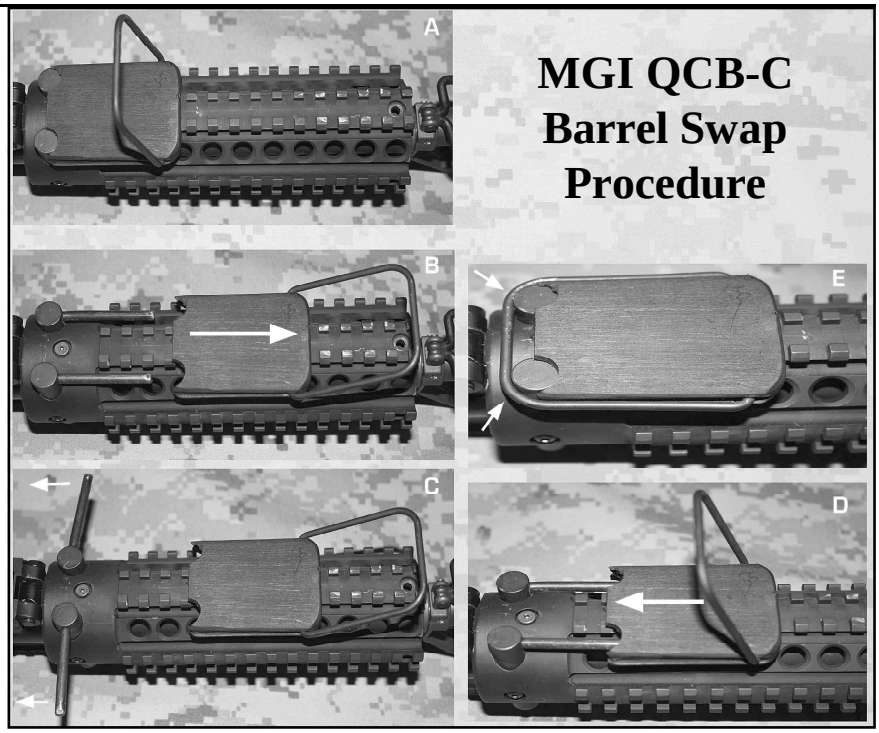
Left: Close-up view of the dovetail locking mechanism on the MGI lower receiver. Right: Close-up view of the dovetail locking mechanism on the AR15 mag-well (left) and on the AK47 mag-well (right).

MGI Rate Reducing Buffer

The MGI Rate and Recoil Reducing Buffer assists in increasing hit probability by reducing felt recoil and reducing muzzle rise. These buffers were tested extensively in *Small Arms Review* (Vol. 7, No. 8, May 2004) and performed extremely well. The buffer utilizes a mechanical operating system and is not sensitive to extreme temperatures like similar hydraulic systems. During all phases of testing, the MGI Rate Reducing Buffer dramatically reduced muzzle rise and consistently lowered the rate of fire when used with fully automatic firearms. The reduction in rate of fire is directly related to the original cyclic rate: the faster the cyclic rate, the greater the reduction in rate of fire. Never did the rate of fire become slow enough where they did not still fire with 100% reliability.

The 7.62x39mm upgrade

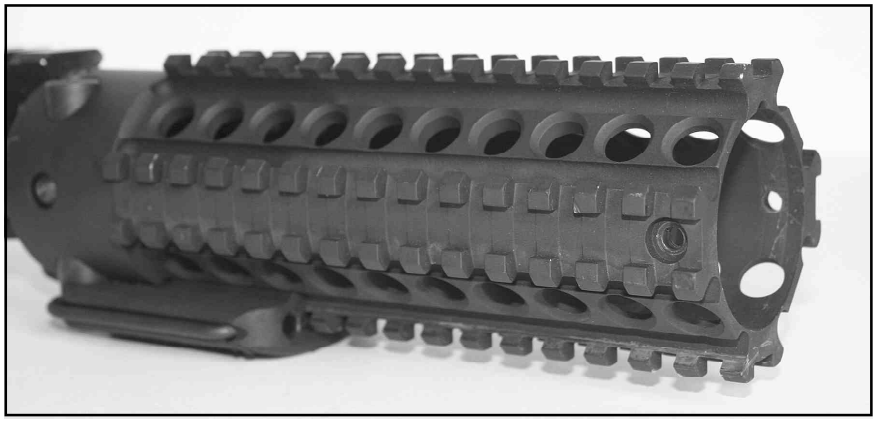
While 7.62x39mm conversions to the AR-15/M16/M4 are nothing new, MGI has engineered several improvements to their system. As mentioned previously, the Modular Lower Receiver will accept a magazine-well that allows the use of standard AK47 magazines. In order to function properly with standard AK47 magazines, the bolt carrier has also been slightly modified from the original design. Once modified, the carrier will still work fine when used in conjunction with the 5.56x45mm system so it is actually a multi-

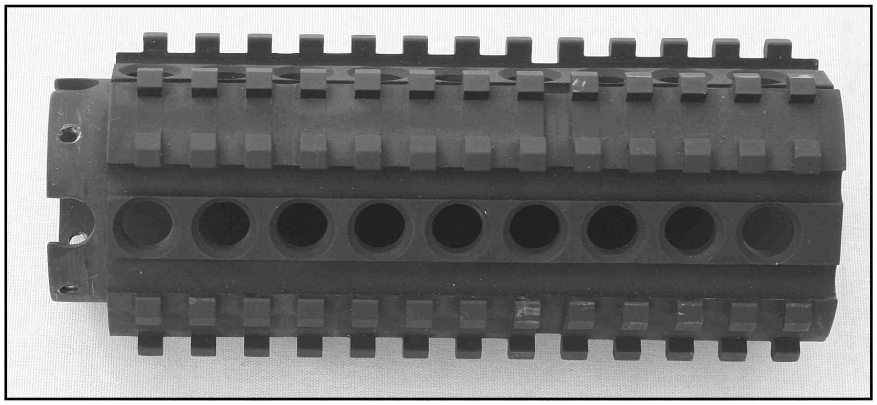


Above: With a barrel in place, lock or hold the bolt to its rearward position and snap the retaining lock (A) up as illustrated. Slide the retaining block (B) to the front to expose the locking arms. Swing the locking arms (C) open and the barrel will slide out to the front. To install the new barrel reverse the procedure. When sliding the retaining block over the closed locking arms (D) you will notice a small amount of pressure as the locking arms close tightly during each change. This provides uniformity, necessary for accuracy and dependability that the MGI QCB is able to provide. Snapping the retaining lock back down (E) completes the barrel change procedure.

use carrier. The MGI QCB-C upper receiver has also been designed to accept these AK47 magazines as well as a multitude of others and has slightly different internal dimensions than standard upper receivers in order to facilitate this conversion.

One of the newest MGI innovations in this caliber conversion is in the fire control group. It is well known that the properties of rifle primers are very different depending on the country of origin and type of ammunition. Some Com-Bloc 7.62x39mm primers can react quite differently than NATO 5.56x45 primers and this difference has led to an unreliability factor when utilized in some firearms. The Com-Bloc firearms designed specifically for this caliber have addressed this in their design and do not have the same reliability issues. After years of research and development MGI believes they have now addressed these differences and will soon be offering a bolt and firing pin upgrade specifically designed for use with this caliber. The author has had the opportunity to test the bolt upgrade in its prototype form, and the results thus far have been excellent. Early tests have shown that when this upgrade is utilized with otherwise unusable ammunition, the failure to fire rate is almost completely diminished. Although this upgrade is designed to be used in conjunction with the MGI Modular Weapons System, it will work with any 7.62x39mm AR-15/M16/M4 conversion to increase reliability.





Top: The handguard on the new MGI QCB-C Upper Receiver has 4 M1913 Picatinny rails for use with numerous optic and accessory options.

Above, center: The MGI QCB-C handguard extension attaches to the standard QCB-C upper receiver allowing use of barrels with full-length gas systems.

Range Time

Numerous hours were spent at the range with all aspects of the MGI Hydra Modular Weapons System. While several thousands of rounds have been fired in all configurations, there are a few interesting points that need to be discussed.

One pressing question in particular (and rightly so) always follows a system designed with a quick-change barrel mechanism: "How well does it re-zero after removing and replacing the barrel?" A legitimate question and a series of tests were performed to find that answer when preproduction testing first started.

The tests we designed were far more intense than simply shooting a group, remove barrel, reinstall barrel and re-shoot group exercise. We were looking for and measuring point of impact shift, not sniper grade accuracy. Both barrels were already "well seasoned" from lots of rate of fire testing and we were running Wolf Polyformance ammunition this day. This was to be conducted as a real-world exercise, not a bench-rest rifle, solenoid-fired electronic trigger test. Rounds would be

Below: The MGI receiver with an AR-15 mag-well installed on the left, and with an AK47 mag-well installed on the right.

Right: An MGI Modular Lower Receiver with AR-15 mag-well below a QCB-C upper receiver with the extension installed for the 20-inch barrel above.

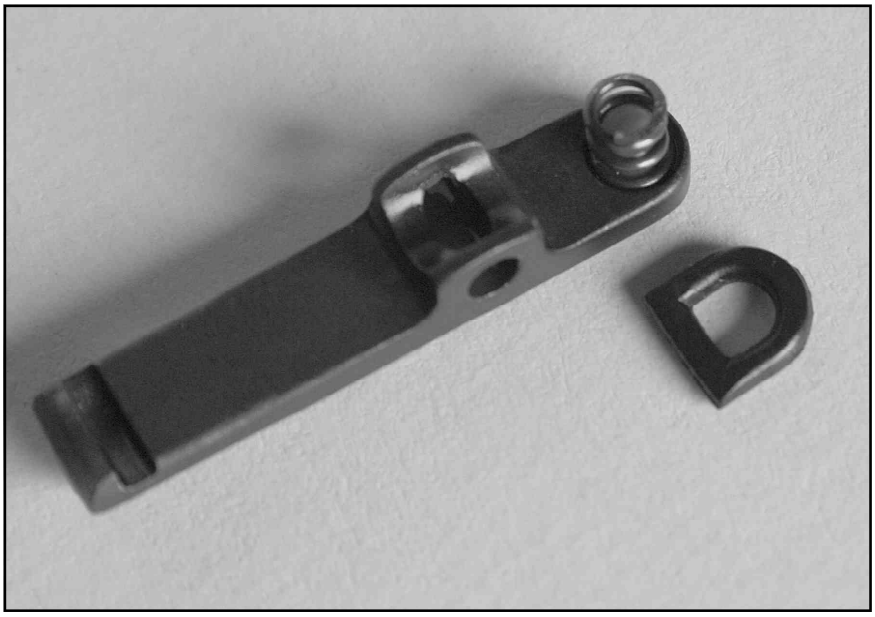
fired in a rapid-fire fashion, allowing a second or two between each shot but without the luxury of any slow-fire deep breathing exercises like we are all taught to do in NRA Shooting School.

Targets were set at 50 yards and at 100 yards. The rifle was setup in 5.56x45 with a 4x12x40mm scope and was bore-sighted. It was "zeroed" in 5.56x45mm on the 50-yard target. That would be the last of the scope adjustments for this exercise. At 50 yards, ten rounds of 5.56x45mm were fired using the "X" as the point of aim. After letting the barrel cool for just a few seconds the barrel, bolt and magazine-well were swapped out for the 7.62x39mm system. At that point 5 rounds of 7.62x39mm were fired at the 50-yard target using the same point of aim as before. Immediately after firing the 7.62x39mm rounds the rifle was swapped back to 5.56x45mm and another 10 rounds of 5.56x45 were fired again, with the original point of aim. Finishing the 5.56x45, the rifle was converted back to 7.62x39 where we immediately fired 5 more rounds.

We completed the exercise and repeated it exactly the same at 100 yards. We were very pleased with the outcome and surprised at how close the groups were, even though they were completely different barrels and very different calibers. We didn't know what to expect in accuracy as far as the original barrel and ammo combos would be concerned, and were extremely impressed when the original point of impact was re-established after multiple changes. Some photos are included in this article showing the results of these tests. It must be stressed again that these were not accuracy tests, just redundant point of impact tests and the system scored very well. If we used match grade (or even "not-shot-out") barrels with proper trigger time and discipline combined with match ammo we have no doubt the results would be even more dramatic. But that was not the point of this exercise.

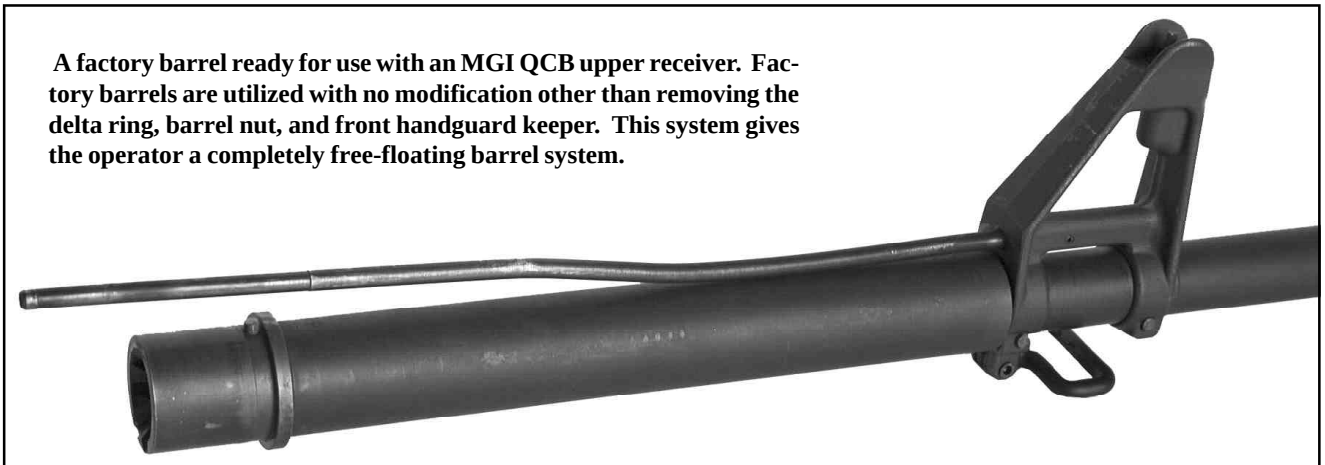
Right: - An MGI Rate Reducing Buffer to the left of a factory M16 buffer. The MGI Buffer consistently reduces felt recoil, and increases hit probability by lowering the cyclic rate and taming muzzle rise.

Below: A Defender D-Ring pictured below an M16 extractor. The D-Ring slides over the original extractor spring giving it approximately 4 times the extraction power.



The Future

Even though the MGI Hydra Modular Weapon System holds some extremely



A factory barrel ready for use with an MGI QCB upper receiver. Factory barrels are utilized with no modification other than removing the delta ring, barrel nut, and front handguard keeper. This system gives the operator a completely free-floating barrel system.

impressive design characteristics, the project is still in its very early stages and is evolving faster than this writer can keep up. Some of the designs on the drawing board must remain behind closed doors at this time but other upgrades that have been cleared to mention include a belt-feed mechanism, an open bolt option for registered full-auto users and even an open-bolt/closed-bolt system, something many thought could never be developed. The new open-bolt/closed-bolt system is in the final phases of testing and will be entering the pre-production phase very soon. This unique design allows the open-bolt function when utilized in fully automatic and fires in a closed-bolt mode when switched to semiautomatic. This design allows for maximum cooling and increased safety when shooting in fully automatic without compromising accuracy when shooting in semiautomatic. This writer has had the opportunity to handle this upgrade in its various stages and it is very exciting indeed.

Several more calibers and magazine-well options are slowly making their way towards the market. Some additions are as radical as 7.62x51NATO and .458 SOCOM (all based on the same lower receiver and upper receiver design) and some are simply additions to fit more common magazines allowing "duty" magazines to be utilized helping to launch the MGI Hydra Modular Weapon System even higher as a convenient companion rifle for almost any standard "duty" sidearm. To provide an even more unique addition to the system, all pistol calibers are now being tested utilizing the standard gas system instead of the traditional blowback style function that has become so common. In MGI prototype firearms, the early results show far less recoil and better controllability.

Conclusions

The MGI Hydra Modular Weapon System is the most radical and versatile upgrade to the AR-15/M16/M4 that this writer has had the opportunity to handle to date. With numerous caliber changes available and several barrel lengths, all while using standard unmodified barrels with absolutely no tools necessary for changing, it is in a class of its own. Combined with the lower receiver that uses interchangeable magazine-wells allowing common, correct, unmodified magazines with these caliber conversions, this system is well ahead of its time in the standard Black Rifle Market. We are looking forward to additional releases from MGI and will be sure to keep the readers of *Small Arms Review* informed as they come to the market.

Editors Note: Due to his involvement in the firearms community, as well as with Small Arms Review magazine, the author is involved with several related businesses in the area of consulting, research & development and testing & evaluation. MGI is no exception to this, and due to these unique relationships he is able to provide our readers with first look and premiere article content on occasion.

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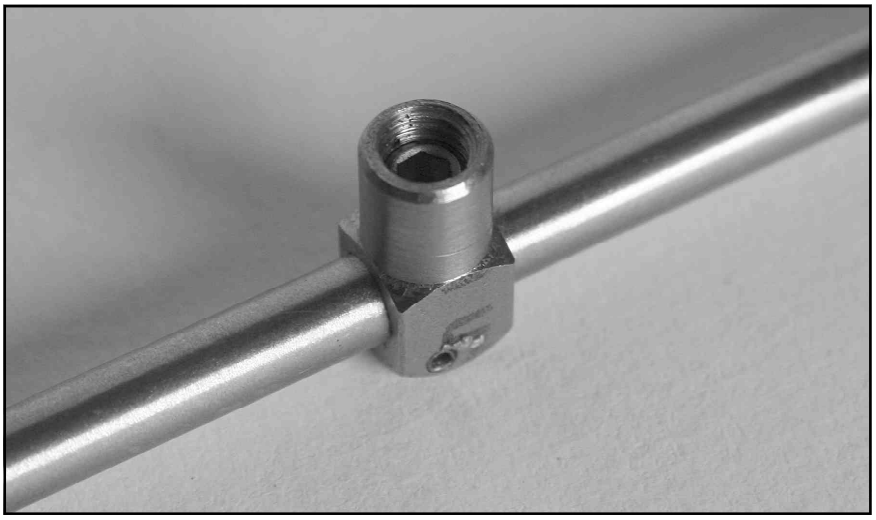

Right: The MGI Regulated Gas Tube allows the shooter to determine the optimum amount of gas to operate the firearm with varying ammunition and shooting conditions.