

**Linda Powell**

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**From:** /o=REMINGTON/ou=REMARMS1/cn=Recipients/cn=powelllb  
**Sent:** 11/10/2004 12:22:06 PM  
**To:** 'Linas Cernauskas'  
**CC:**  
**BCC:**  
**Subject:** RE: Al Paulson's Article

Per Greg Foster, no changes.

-----Original Message-----

From: Linas Cernauskas [mailto:Linas@harris-pub.com]  
Sent: Thursday, November 04, 2004 9:47 AM  
To: Powell, Linda; Stevenson, Eddie; dlsports@vcn.com  
Subject: Al Paulson's Article

Morning,

Please verify the technical details of Al's article for our upcoming Special Weapons Annual. The article has been enclosed, as well as pasted below my contact info.

As always, thanks!

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Linas Cernauskas, Managing Editor  
Harris Publications  
1115 Broadway  
New York, NY 10010  
Phone 212-462-9597  
Fax 212-807-1479  
E-Mail: Linas@harris-pub.com

Special Weapons 2005

**Title:** Gun Test:  
D&L's CUSTOM MR-700 308

**Blurb:** Upgrading the Remington M700 at a budget price!  
**Bline:** By Al Paulson

Since its introduction more than 40 years ago, Remington's Model 700, especially the Model 700 Police variants, have become the most commonly deployed precision rifle among law enforcement sharpshooters in the United States. US Army snipers employ a specialized variant of the M700 called the M24 Sniper Weapon System. Moreover, American sportsmen have boosted the number of M700 users into the millions. Such enormous popularity across such a diverse array of end-users happens for some very good reasons. The M700 is robust, accurate right out of the box, user-friendly thanks to its good stock and trigger, and a damned good buy for the money. The Remington also has a good reputation for reliability.

With so many rifles in the field, we now have accumulated a knowledge base documenting a number of eccentricities and problems that could affect mission success. Dave Lauck of D&L Sports, and the Small Arms Training Academy, offers an affordable upgrade to the Remington rifle that eliminates virtually all of the potential problems, while making the Remington accurate enough to deliver 1/4-MOA

at a 100 yards. Called the MR-700 system, a department can submit existing guns in their inventory for retrofitting to MR-700 specs, or purchase systems directly from D&L.

The average sportsman is unlikely to encounter any problem with Remington's Model 700 series in a lifetime. The police sharpshooter, however, puts a lot more rounds downrange. One LE sharpshooter I know, for example, spends more money out of his own pocket for practice ammo than his department invests for training all of their SWAT team members combined. As usage goes up, so does the likelihood of encountering a low-probability event that could have disastrous consequences on the success of a deployment.

The Model PSS rifle used in this study came from the factory with a trigger advertised as adjustable from two to eight pounds, but ours was heavier. It also experienced failures to eject. The ejector problem occurs when a strongly sprung ejector rotates across the case head and shaves a sliver of brass from the case. Brass particulates then bind the ejector in its funnel. This problem can be mitigated by routine disassembly and cleaning. Regrettably, this is not a user-friendly exercise, but it is essential when using a plunger-type ejector. I always carry a screwdriver to pry a spent case off the bolt should this malfunction occur. The only sure cure for this problem is to use fixed ejector like the one on D&L's MR-30 PG series (Marksman's Rifle 30 Caliber Professional Grade), which is based upon a D&L receiver specifically designed for the armed professional.

#### Upgrade Details

Dave Lauck solves the above problems by replacing the Remington trigger with Timney's tactical trigger, which I've found to be reliable under the most adverse environmental conditions. The trigger breaks cleanly with absolutely no creep or overtravel. I've used Timney's tactical trigger on a number of platforms to successfully engage targets from stone-throwing distance out to 1.8 kilometers. The Timney tactical is the best M700-compatible trigger certified for LE use in my experience.

The bolt of the Remington M700 can experience problems with the bolt stop sticking down when fouled with dirt or rust. What can happen during brisk bolt manipulation is that the operator can pull the bolt out of the action and into his face at painful velocity. Lauck removes the Remington bolt stop and replaces it with one of his own design.

Lauck's MR-700's bolt stop is a machine screw located at the left rear of the receiver. To withdraw the bolt stop, lightly pull the bolt rearward until it gently engages the bolt stop. Keep very light rearward pressure on the bolt while unscrewing the bolt stop counter-clockwise with your fingers until the bolt can be slid out of the receiver. Do not unscrew the bolt stop completely out of the receiver to avoid loss.

The M700 is also prone to magazine problems. Thankfully, Remington eliminated detachable box magazines due to negative feedback from the law-enforcement community. This discussion is limited to the standard fixed internal magazine. Bolt over base and nose diving are the principal feeding problems. Lauck's MR-700 conversion eliminates these gremlins by eliminating the magazine. Is this throwing the proverbial baby out with the bathwater? Not hardly. Lauck sleeves the action when the magazine is removed, thereby increasing action rigidity and rifle accuracy.

Like Lauck's flagship line of precision rifles, the MR-30 PG series, the upgraded Remington MR-700 is fitted with D&L's proprietary aluminum rail stock. This stock features an adjustable cheekpiece and length of pull, full free-floating of the barrel, a rear monopod, and a much larger and more rigid stock-to-action interface than is provided by factory stocks. The Remington receiver is held by eight quarter-inch machine screws tying a massive top alignment block into the precision bedding surface in the stock. Accessory bars on both sides of the stock accept cartridge carriers.

This stock also fits a prone shooter to perfection. The stock's rear monopod can be deployed on the grip frame or the buttstock frame. End-users like this monopod. Lauck also adds a 20 MOA slant scope base to facilitate shooting at long range. The stock also features 2.5-inch MIL-STD-1913 rails on either side of the forestock that can be used for mounting tactical lights or a laser. The complete system used in this study (i.e., with optics) has an overall length of 39.5 inches and a weight of 20.2 pounds.

The MR-700 does look a bit odd with the optional roll cage and a 12.25-inch carry handle that sits 3.5 inches above the high point of the scope. Yet handsome is as handsome does. Besides the obvious protection it provides for the rifle's optics, the rifle balances really well on the handle. I found it addictively handy. Moreover, the roll cage makes a dandy support frame for a sniper veil. It is worth noting that, regardless of caliber, I tend to shoot my personal best with this stock.

#### Shooting Impressions

Both the MR-700 Remington conversion and the top-of-the line MR-30 PG are designed to be used in a load-one, shoot-one manner. With the bolt back, simply toss a cartridge into the feeding tray and close the bolt. There is never a failure to feed. Additional rounds are stored close at hand in single or twin 6-round cartridge carriers on the forestock. That's fast for lefties. An additional 10-round carrier can be attached to the buttstock which is particularly fast for right-handers.

Reloading by hand from cartridge carriers is surprisingly fast and efficient. With practice, one



can develop a comforting rapid-fire cadence while placing accurate hits on target. That is a skill everyone should cultivate, even in law-enforcement, where such techniques may be used very rarely. You can always shoot more slowly when skilled in rapid fire, but the reverse is not true. Using the MR-700 Remington upgrade, I had no problem placing 5 rounds into a tight group at 100 yards in 21 seconds. Lauck's load-one, shoot-one rifles have developed an enviable track record among armed professionals and serious sport shooters alike. This is a system that works in the "Real World."

A nifty option is that a small pouch may be added to the offside of the rifle for the sharpshooter's dope book, to ensure data are always with the rifle on callouts. The MR-700 Remington upgrade keeps the factory barrel and chamber. Thankfully, Lauck cuts the barrel down to 20 inches and adds an 11-degree crown recessed into the muzzle. A short barrel is typically more accurate than a long barrel because it is stiffer and experiences diminished barrel harmonics. To attach a silencer, have Lauck cut 5/8x24 TPI threads into the muzzle, since these thread specs have become the industry standard for .30 caliber sound suppressors. To optimize accuracy when using a threaded barrel, never shoot unless a thread protector, sound suppressor, or muzzle brake is screwed onto the barrel.

Sharpshooters accustomed to precision rifles with 26-inch barrels may be uncomfortable chopping so much off the barrel. They fear a loss of velocity and accuracy at long range. Mark White of Sound Technology points out that "There is typically very little velocity loss when going from a 26-inch to a 20-inch barrel in a rifle chambered in .308. Results vary with chamber tightness and bore design. Velocity loss by reducing barrel length from 26 to 20 inches typically runs in the neighborhood of 125 to 145 feet per second (fps). Velocity loss is considerably greater when going down to a 16-inch barrel. I base these comments upon my own empirical data," White concludes.

What does shortening do to accuracy in the Real World? A friend who is a US Army sniper instructor successfully engaged ten targets at unknown distances from pistol range out to 1,000 yards using an 18-inch barrel with conventional rifling and Black Hills 168-grain HPBT ammunition. Extensive testing in Finland has shown that an 18-inch barrel is the most accurate from among longer and shorter barrels chambered in .308. Research by Sound Technology has shown that a 20-inch barrel seems to give the best mix of terminal and exterior ballistics, as well as minimal barrel harmonics, especially when using a sound suppressor. Thus based upon a diversity of hands-on testing, shortening a quality barrel to 20 inches can be expected to deliver better accuracy as well as good exterior and terminal ballistics.

Did it in this case? I used Black Hills 168-grain HPBT match ammunition, which has delivered 0.16 MOA in my hands and 0.10 MOA groups in the hands of my friend the Army sniper. Black Hills ammunition is noteworthy for both its consistency as well as accuracy. For those who came in late, individuals and departments can order Black Hills ammunition factory direct if it is not available locally.

While the Remington M700P is normally a 1/2-MOA gun, the one with the trigger that formed the basis of this study delivered 3/4-MOA five-round groups. After D&L's conversion to an MR-700, my three-round groups consistently averaged 0.25 of an inch center-to-center at 100 yards using Black Hills ammunition (see the accompanying table for details). Five-shot groups opened up, with the fifth round always being the flier.

Both the upgraded Remington MR-700 and the top-of-the-line MR-30 Professional Grade rifles come from D&L with the Harris Model LM bipod. Not only is this a very handy, lightweight and robust bipod, I have shot my personal bests in a wide variety of calibers with the Harris Model LM from 50 feet out to 2,000 yards. I recommend it with enthusiasm.

Since Lauck builds the MR-700 system as close as possible to his MR-30 Professional Grade system, the obvious question is "How well does the MR-700 system perform compared to the MR-30 PG rifle of the same caliber?" It is safe to say that the MR-30 PG is a tough act to follow. The MR-700 cured all but two of Remington's potential reliability issues. (1) The MR-700 conversion retains the typical plunger-type ejector, which is subject to fouling. The MR-30 PG uses a fixed ejector, which completely eliminates ejector problems. And (2) the MR-700 still uses Remington's two-piece bolt and handle.

During the winters of Northern Tier states (or farther north), the one-piece bolt and bolt handle of the MR-30 PG's action is substantially stronger. The strongest possible bolt handle is a significant asset when a cartridge or spent case becomes frozen in a weapon's chamber, and a boot or makeshift bludgeon must be used rotate the bolt handle to break the frozen case free and bring the rifle back into action. The Nesika Bay's one-piece bolt and handle is especially tough at very cold temperatures when metal gets surprisingly brittle. My wife, for example, has shattered so many lug wrenches during Fairbanks, Alaska winters that I've lost count. They broke like they were made of glass. Likewise with rifles, I've seen several handles shear off two-piece rifle bolt and handle systems when operating in extreme cold. The MR-700 conversion does not alleviate this problem, but the MR-30 PG does.

The final comparison must be accuracy. In my experience, the MR-30 Professional Grade rifle consistently delivers sub-1/4 MOA five-shot groups in my hands, even when chambered for the .300 Winchester Short Magnum rather than the .308. The MR-700 conversion could deliver similar accuracy for three rounds, but not five. That said, the upgrade's five-round accuracy still improved significantly and three-round groups shrank to less than half the size of the same rifle before the conversion.

Bottom Line

As those in the trade might say, D&L's upgrade to the Remington M700P is a damned good "stick." It solves almost all of the reliability, user-friendliness, and accuracy issues that the M700P can happen in the hands of an armed professional. That said, D&L's formidable MR-30 PG does deliver better accuracy and reliability than Lauck's Remington upgrade. The MR-30 PG would be my choice of the two, if the budget permits. That said, I can recommend the MR-700 system with enthusiasm for the budget minded end-user.

Performance: D&L's MR-700 .308

	3-shots	5-shots
Best Group	0.22	0.51
Worst Group	0.25	0.64
Average	0.25	0.59

Black Hills 168-grain HPBT match ammo was used in this study. Accuracy was measured in inches from 100 yards. Data represent the average of the maximum center-to-center spread of ten groups. All 3-round groups averaged 0.25-inch except best group; this uncanny consistency is a tribute to Lauck's upgrade and to Black Hills Ammunition. With all 5-round groups, the fifth round was always a flier outside the main grouping, adding circa 0.2 MOA to the group's overall size.

For more information contact:

D&L Sports and SATA  
PO Box 651, Dept GW/LE  
Gillette, WY 827170  
307-686-4005  
www.dlsports.com

Remington Arms  
PO Box 700, Dept GW/LE  
Madison, NC 27025  
800-243-9700  
www.remington.com

Black Hills Ammunition, Inc.  
PO Box 3090, Dept GW/LE  
Rapid City, SD 57709  
605-348-5150  
www.black-hills.com

PHOTO CAPTIONS:

GUN-913-4A

D&L's MR-700 conversion of Remington PSS rifle with factory barrel consistently delivered 1/4" groups.

GUN-913-20A

While the MR-700 looks a bit odd with the optional carry handle, this setup is very handy for transporting the 20.2-pound system.

GUN-913-E

D&L's MR-700 upgrade to the Remington Model 700P solves a host of eccentricities and gremlins that may be encountered by the armed professional.

GUN-914-25

Note D&L's improved bolt stop (top left) and Timney tactical trigger, which is certified for LE use.

GUN-914-29

Note the robust construction of D&L's stock below the freefloated barrel, and the accessory bar (on both sides of the stock) that accepts cartridge carriers.

GUN-914-33

A massive alignment block atop the Remington receiver rigidly ties the action to the precision bedding surface in D&L's stock using eight 1/4" machine screws.

GUN-914-E

Details of the adjustable cheek rest, recoil pad, and monopod.