Precision Weapons: Handmade by Marines, for Marines
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Precision Weapons

Handmade by Marines, for Marines

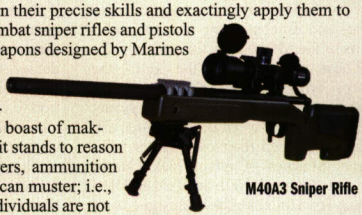
Precision weapons are all about "tight groups." PWS says its rifles must put a group of five rounds in an area less than 3 inches by 3 inches at 300 meters before the weapon goes to the operating forces.

Story and photos by R. R. Keene

During World War I, U.S. Army General John J. "Black Jack" Pershing, who saw Marine riflemen calmly shoot and kill German soldiers at great distances, begrudgingly conceded: "The deadliest weapon in the world is a Marine and his rifle." Nothing in the nearly 90 years since has changed that belief or the Corps' catechism of inculcating the dogma that "every Marine is a rifleman."

While Marines have mastered the nomenclatures of many rifles, for leatherneck shooters, the holy grail of individual, aimed firepower is the sniper rifle. Of all the American forces, only the U.S. Marines remain devoted to building and issuing sniper rifles to shooters trained and designated with the military occupational specialty (MOS) 0317, Scout/Sniper.

The Precision Weapons Section, Weapons Training Battalion, Training and Education Command, Quantico, Va., is where the small-arms craftsmen (MOS 2112, Precision Weapons Technician) learn their precise skills and exactingly apply them to what they believe are the best combat sniper rifles and pistols in the world, because they are weapons designed by Marines for specific needs of Marines.



M40A3 Sniper Rifle

In the highly competitive world of shooting, for the Precision Weapons Section (PWS) to boast of making the world's-best small arms, it stands to reason they must have the best armorers, ammunition technicians and machinists they can muster; i.e., gunsmiths of the Corps. Such individuals are not

necessarily found in the ranks of snipers, team shooters and expert marksmen. However, everyone agrees there has to be a basic "love of guns" that runs from the trigger fingers to the hearts of the Marines who work on the weapons.

The work speaks for itself. Having grown from a single milling machine and a lathe back in 1968, PWS today supports the renowned Marine Corps Rifle and Pistol teams of the Marine Corps Competition-in-Arms Program, as well as the sniper teams and designated marksmen of the operating forces, with a variety of precision rifles, pistols and ammunition.

Here's how they do it.

Theirs is a world almost unto itself. Located in the wooded areas west of main-side Quantico next to the Calvin A. Lloyd ranges, Weapons Training Bn is a site most Marines find to be a good assignment. They have their own barracks, mess hall, club and exchange that lend an air of self-sufficiency. It is, with its multiple shooting-related schools and functions, the ultimate gun club for those who carry the whiff of gunpowder as practitioners and devotees to the Corps' belief that good shooters are still the key to combat success.

The Precision Weapons Section, housed at Harllee Hall—named in recognition of Brigadier General William C. Harllee, the "Father of Rifle Practice in the Marine Corps"—is colocated with the Staff Sergeant Abraham G. Twitchell Weapons and Ammunition Test Facility at Weapons Training Bn. It was designed by precision weapons technicians to not only build and test small arms, but also to school the Marines who will make them.

The officer in charge, Chief Warrant Officer 5 Scott A. Justus, along with Master Gunnery Sergeant David H. Clark, the staff noncommissioned officer in charge, heads up PWS with approximately 50 Marines and civilians. With this group, there is practically nothing in the world of gunsmithing they do not know nor cannot do—at least when it comes to sniper rifles and especially the various evolutions of the M40 bolt-action sniper rifle.

These evolutions of the M40—the Corps' hybrid versions of the Remington 700 Short Action—came about during the Vietnam War when it was decided that Marines needed their own sniper rifle. Three Marines—Captain Jack Cuddy, Marine "Gunner" Neil Goddard and Sergeant Ted Hollabaugh—redesigned and transformed the Remington 700 into the M40. Since then, Marine snipers have sighted down the barrels of several variations of the M40 all the way up to the current 16.5-pound, 44.3-inch, M40A3 first fitted to snipers in 2001.

"Everything we build is strictly Marine Corps only," said MGySgt Clark. "That's what makes these rifles unique.

"The M40 has been the peak of the pyramid for years in sniping, and industry has taken what we've done and created similar rifles, but they've always looked at ours as top of the pinnacle."

"However, the process we use to build it and the procedures we utilize don't go out to industry," explained CWO-5 Justus. "They can do all the parts, but the know-how is something that's maintained here."

The precision weapons technicians begin their creation with the barrel. According to MGySgt Clark: "We purchase a 1-12 twist barrel blank, [match grade] with a number 7 taper, a .30-caliber hole, and lands and grooves put in it. We will take that barrel [and] completely finish it. We will cut the crown, the crown recess, cut the threads for it to be accepted into the receiver, and cut the chamber so it will accept a .308 case. We use a fiberglass stock."

What happened to walnut and birch wooden stocks?

"Wood has a tendency to expand in hot environments and contract in cold environments," said MGySgt Clark. "Fiber is denser. It retains a lot more. We modify the stock and actually glass-bed the action to eliminate possible stress to barrel and bolt. This ensures that movement relative to the weapon's anchor points on the stock is minimized during ignition. If the action does not return to the same position on the bedding, it cannot be relied upon to shoot with consistent precision or accuracy. So, it's got a two-part epoxy that handles like putty, hardens like steel, and sands like wood. It is nonmagnetic, nonrusting and noncorrosive."

Clark continued: "The receivers are all trued to the center of the bore. We machine the top ends of the receivers out to mount the rails, and the rails are all kept within the same specs, so every gun is pretty much identical.

"We use a Marine Corps Scout Sniper Day Scope [SSDS], heavy-duty scope rings, M1913 Picatinny optical platform, and an accessory rail is attached to the stock, which allows the use of the Scout Sniper Medium Range Night Sight at the discretion of the sniper, as the situation dictates.

"The shooter has an adjustable cheek and length of pull on the stock. We also equip the stock with a tactical bipod.

"This generation of M40A3 also has a detachable magazine box. The shooter carries a small, five-round box magazine, preloaded. Each shooter has eight magazines.

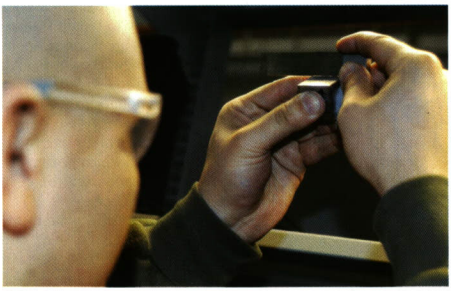
Sniper instructor and veteran scout/sniper Sgt Joseph Roy sights down the Marine Corps Scout Sniper Day Scope, mounted on the M40A3, getting ready to send a round downrange. He says the SSDS is "probably the best damn scope in the world."

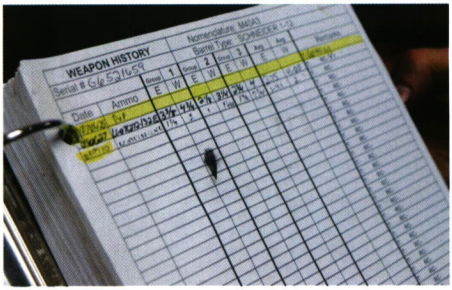
"It is a lot more convenient and saves time," said Clark.

To put together a weapon such as this is exacting work. The Precision Weapons Facility is where they do the precision work on parts where rifles and pistols require tooling to within a 10,000th of an inch. Staff Sergeant Joseph Baughman, the Marine Corps Pistol Team armorer, noted: "We frequently cut things down by hand to within 1,000th of an inch. If I'm trying to work a particular part to a particular gun, I may need to file from 695 thousandth of an inch to 693, and I'll do it by hand with a file."

Kevin Kistler, who retired as a gunnery sergeant in 1999 as one of the Corps' top-notch team shooters and a two-time national champion, now does the testing on the sniper rifles. "We will fire not less than 81 rounds through the M40: one proof round [for safety], which is a high-pressure round, and 60 rounds of function ammo through it. We do a series of rounds and cleaning, and more rounds and clean-

Kevin Kistler (above) fires a 7.62 mm M39 Enhanced Marksman Rifle from a test rack. The rifle will be fired at least 81 times and won't be sent to Marine marksmen until it passes PWS Marine specifications. Sgt Hamlet Tavarez (below left) is learning to become a precision weapons technician. It takes about a year of schooling. PWS leathernecks keep a record of every handmade weapon until the end of its service life when it comes back to PWS to be cut up and sold for scrap.





ing. Once we get done with that, if there aren't any malfunctions, the rifle gets looked at again by the armorers, and it will come out here one last time for testing.

"We'll put it in the same test rack, shoot five rounds to settle the gun into the rack. Then we begin with three, five-shot groups that must average less than 3 inches tall by 3 inches wide at 300 meters. Then it is considered a passing gun. It is all documented. We store the data, and the gun goes out to the operating forces."

Only then is the rifle proof stamped. "That means we stuck a high-pressure round in it; dropped the hammer on it," MGySgt Clark said. "The gun didn't blow up. The receivers are serialized; all the components are stamped with that gun's receiver serial number.

"The guns are all born here, and they eventually will come back to die here, at the end of their service life, to be cut up and sold for scrap."

The round for the sniper rifle will reach out to 1,000 yards. It is a .308 Winchester, AA11, 175 grain, designed specifically for the sniper program at PWS in the late 1990s and manufactured for the Marine Corps by the Lake City Army Ammunition Plant, Independence, Mo. It is basically a mass-produced match load. Lake City keeps the ammunition within the minimum requirement standards. With velocity and powder weight, they are all within certain specs.

The PWS leathernecks top off the sniper rifle with the SSDS, which, according to sniper instructor and veteran combat sniper Sergeant Joseph Roy, is "probably the best damn scope in the world. It is also easy to maintain."

While the work is designed to produce the most accurate, finely tuned rifle possible, the weapons also are Marine-proof.

"We are not nice to these guns when

Manufacturer: Precision Weapons Section, MCB Quantico, Va.

The M40A3 Sniper Rifle
System Characteristics:
Caliber: 7.62 mm
Weight: 16.5 lbs
Length: 44.3 inches
Maximum Effective Range: 1,000 yards
Employment: Individual
System Description: The M40A3 is a Marine Corps-designed, bolt-action, 7.62 mm sniper rifle. The M40A3 is capable of one minute of angle accuracy, and the mounting rail allows for the attachment of day or night optics. It provides the precision sniper capability for use by Marine Corps snipers in the execution of missions in support of offensive and defensive operations.
Program Status: Procurement to support an increased Approved Acquisition Objective and modifications to upgrade weapon capability, to include a MilStd 1913 forward accessory rail, detachable box magazine and flash hider and/or suppressor.

M40A5 Sniper Rifle (shown with optional sound suppressor)
System Characteristics:
Caliber: 7.62 mm
Weight: 16.5 lbs
Length: 44.3 inches
Max Effective Range: 1,000 yards
Employment: Individual
System Description: The M40A5 is a Marine Corps-designed, bolt-action, 7.62 mm sniper rifle. The M40A5 is capable of one minute of angle accuracy, and the mounting rail allows for the attachment of day or night optics. It provides a precision sniper capability for use by Marine Corps snipers in the execution of missions in support of offensive and defensive operations.

M39 Enhanced Marksman Rifle
System Characteristics:
Caliber: 7.62 mm (AA11 long-range round)
Weight: 11 lbs
Length: 44 inches
Maximum Effective Range: 770 meters
Employment: Individual
System Description: The M39 EMR is a highly modified M14 rifle that is designed by the Marine Corps. It is employed by designated marksmen in Marine Corps Security Forces' Fleet Antiterrorism Security Team companies, in military police special reaction teams aboard Marine Corps installations and in explosive ordnance demolition teams. It provides a precision weapon for use in other than sniper teams, as well as arms the observer of the scout/sniper team with a semiautomatic weapon, which provides close-in fire to protect the team.
Program Status: Improvements include a metal stock and bipod that can be extended, adjustable cheek piece, high-capacity magazines, and the Scout Sniper Day Scope (SSDS) that flips into night-vision capability.

.45-Caliber MEU(SOC) Pistol
System Characteristics:
Caliber: .45
Weight: 2.4 lbs
Length: 8.6 inches
Maximum Effective Range: 50 meters
Employment: Individual
System Description: The Marine Expeditionary Unit (Special Operations Capable) pistol is a modified M1911, semiautomatic pistol. It provides a "backup weapon" for those Marines who perform close quarters battle.
Program Status: Sustainment of current systems and procurement of additional quantities required for U.S. Marine Corps Forces Special Operations Command.

we're testing them," said Kistler. "I don't handle them with kid gloves. I'm not real easy on the bolt during accuracy testing, 'cause I figure as hard as I am here, it is not near the conditions they are going to have out there in the world. So, when the rifles pass out of here, we are confident they can hit something 6 inches wide by 6 inches long at 600 yards with one shot.

"They [snipers] regularly shoot 800 to 1,000 yards. That's qualification for a sniper. There's shots [that have] been taken upwards of 1,200 yards. They regularly work in that realm—from 500 to 1,000 yards. They also do unknown distances and multiple positions, sitting and kneeling. The snipers are taught range estimation in case the batteries go bad or the range finder is broken."

There are some things shooters need to be aware of, cautioned Kistler. "The worst thing you can do with this gun, to affect its accuracy, is mess up the crown by running it into something like a rock. The crown being that little 45-degree angle cut [just inside the lip of the barrel], right at the end of the lands and grooves that allows the gasses to escape evenly as the projectile leaves the muzzle. If the gasses come out one side more than the other, it causes the projectile to be off axis just as it leaves the bore. If there is a weak link, that's it. That's why that barrel has a recess cut into it—so the crown is less prone to getting hit."

Even if the crown is damaged, it does not take major surgery to repair. It takes about 90 seconds for a precision weapons technician to cut a new crown. Rough abuse with a cleaning rod will also cause small scratches and gouges to the crown that will affect the accuracy.

On the whole, the Marine sniper is toting a rugged weapon on which he can rely. In the future, that weapon will be even more versatile and deadly.

"The M40A5 is the next version [to] which we are slowly transitioning," said CWO-5 Justus, who pointed out several of the planned modifications. "The M40A5 has the tip of the barrel threaded for a muzzle brake that gives the shooter the capability of adding a [sound] suppressor at his or her discretion, based on the mission as it dictates."

Justus said there have been situations in Iraq that have called for this—"where a car would pull up and three or four guys would start to set up an IED [improvised explosive device]. The sniper may be back only 300 yards. He takes one shot, and the sound of the rifle gives his cover away. He can only get one person. The M40A5 will have the capability to suppress its sound."

Clark added: "In the past, most sniping

Left: SSgt Joseph Baughman, Marine Corps Pistol Team armorer, performs precision work on .45-caliber pistols.

Above: Sgt Joseph Roy test fires one of the MEU(SOC) pistols. Each pistol will be fired literally hundreds of times to ensure it is ready to provide a Marine with close quarters battle protection.

was done from 600 to 900 yards. A sniper would take his one shot. The target would drop, and the sniper would be gone before anyone had any idea of where that shot came from. In today's urban environments, a lot of shooting is within 300 yards. The sniper takes that shot, and the bad guys turn around and turn their fire right on him. With the suppressor capability, you can still shoot and you'll hear the round crack, but it muffles the sound and hides the flash so, if you shoot it at night, there's no big signature. A sniper can engage multiple targets without giving his position away. He can sit there and pick them off."

"These are all things—evolutions—that came about as urgent needs from operating forces in Afghanistan and Iraq: lessons learned in war," said Justus. "They said, 'What can you do?' We did research and development with Marine Corps Systems Command and developed something that would meet the accuracy requirements and give them the capability they want. This is the design, and future sniper rifles will be the M40A5 variation."

When a sniper in the field recognizes a new need or new capability for his rifle, usually the information is gathered and an Urgent Universal Needs Statement is submitted to Headquarters, U.S. Marine Corps, Plans, Policies and Operations. It is reviewed. If there's agreement to a need, the concept goes into testing and research and development (R&D).

"In Afghanistan," MGySgt Clark said, "they're saying they need rifles that reach out past 1,000 yards. The Warfighting Lab [Marine Corps Warfighting Laboratory, Marine Corps Combat Development Command, Quantico], which looks out for future technologies, asked us if we could build something for them. They told us what they wanted to have. We did our homework, came up with all the parts and components we needed. They purchased. We put it together. One of the keys to shooting such great distances is the .338 Lapua Magnum rimless round."

It is a larger bullet that will take down anything from a Cape buffalo to an armored-up Osama Bin Laden. "It gives snipers more power to push the round a greater distance and still have the same level of stability out to about 1,500 to 1,600 meters of accuracy. This is strictly an R&D thing that could become, at some point in time, what they would go to for long-range sniper capability."

MGySgt Clark noted that they are building more rifles because the number of snipers in the Corps keeps increasing. The idea is to make those rifles more user-friendly; not only for the operator, but also at the unit-user level so there's less need for a rifle to go to higher levels of maintenance. The idea is a quicker turnaround time for maintenance—to put the rifle back into the hands of the operator and keep the weapon in service longer.

The mechanics who do it are the MOS 2112 precision weapons technicians.

"There has to be a passion for this. Not every 2111 [armorer] can become a 2112, precision armorer," said Clark. "You have to have a little salt on your boots. Applicants should be at least a corporal. They have to meet a specific ASVAB score of 105 on the Mechanical Maintenance [MM] section, be on at least their second enlistment, have a desire to come here, and get recommendations from qualified armorers and their OICs. The course is almost a year."

Most potential 2112 precision technicians see theirs as a desirable skill set.

"Fortunately for us, the majority of them stay in until they are retirement-eligible," said Clark, "but they get snatched up quickly because of the reputation they carry. You go to any gun show; these guys are world-renowned for their capabilities. They learn two skills—machining and gunsmithing. Some pick up welding.

"You need knowledge and maturity. Getting a recommendation by a 2112 in the fleet certainly goes a long way. It is something an armorer has to pursue. Nobody is going to come knocking and say, 'Hey, there's an opening at Quantico, do you want to go?' "

The satisfaction is in knowing that building the Corps' sniper rifles is, in reality, an act of creation, and the reward is in knowing that the men who use the rifles are supremely confident in your creations.

Sgt Roy, the sniper instructor, said, "There are probably rifles more accurate, but they can't withstand the beatings that Marines put them through." For example, back in the late 1990s—during the initial R&D phase for the M40A3—the snipers would drop the rifles off of the back of a 5-ton truck just to see what parts would break.

What's the best sniper rifle in the world? MGySgt Clark doesn't hesitate: "In the hands of a Marine, the M40A3 is the most lethal weapon on the battlefield today."

... And tomorrow, it will be the M40A5.