

## LWRC M6A3 IAR (Infantry Automatic Rifle)



*“Mack” from Discovery Channel’s “Future Weapons” and “Weaponology” firing the prototype IAR. Note the casings in the air and lack of muzzle rise.*

The IAR was born of a concept founded by the USMC. It harkens back to the Browning Automatic Rifle. This light automatic rifle (not light by today’s standards) was an open bolt, gas operated, magazine fed light machine gun. It was employed by selected members of the USMC squad to provide light machine gun suppressive fire.

The LWRC IAR has dual fire modes. In semi-automatic, it functions closed bolt. If you toggle the selector from semi to open bolt automatic, the rifles bolt remains closed for the first ignition increasing ignition probability to 99.7% allowing the infantry automatic rifleman to take point on patrol, or be the first through any door. After that, the weapon will fire from the open bolt allowing light automatic fire support. When you release the trigger between strings of fire, the bolt remains to the rear. When you pull the trigger again, the bolt closes and fires continuously until the trigger is again released with all the advantages of an open bolt machine gun. To go back to closed bolt semi-automatic fire, you switch the rifles selector back to semi. The bolt closes chambers a round but does not fire. When you pull the trigger, you will get your 1 aimed shot with each pull. This offers all of the advantages of both types of systems with the disadvantages of neither.

The USMC recognized that the Browning BAR of WWII and Korean genealogy filled a role in the squad allowing accurate devastating suppressive fire reliably without the necessity of a quick-change barrel, or belt fed operation. That role was left to the General Purpose Machine gunners. Rarely on section attacks, breaking contact, or advancing to contact are rates of sustained fire required that of a true belt fed machine gun.

Currently the M249 squad automatic weapon undertakes that role. It is a belt fed, gas operated, open bolt light machine gun. The SAW was a purpose built weapon designed

to counter cold war Soviet tactics of massed infantry and dismounted mechanized infantry pouring through the Fulda gap in extended line frontal attacks. The name of the game when countering the Soviets was massed troops and massed firepower and allowed fire and movement. For an infantry section to compete with this, the SAW was born.

Today's soldiers train and fight an entirely different enemy, in different territory and by different means. No longer are there long lines of demarcation between foes. No longer are they facing a massed hoard from a fixed defensive position. The areas of operation are replaced by the geography of an urban landscape complete with schools, places of worship, hospitals and residences. There are nooks and crannies and impromptu defensive or ambush positions built into the landscape. Warfare has become fast and very fluid with far more movement of smaller elements of the battalion to defeat the enemy quickly and decisively through precise tactical fire and maneuver. It is not always clear who the enemy is or who the innocents are. Soldiers fighting small groups are far from the support of their compounds or encampments. They are fighting a low intensity conflict of short lived hit and run ambushes, fighting patrols, and small unit tactics.

Not only is the US modern warfighter adorned with better body armor, better communications systems, and better gear than any soldier in the history of man, but he is carrying more weight. Young Marine SAW gunners are having trouble keeping up with their fire teams due to the weight of the system, the unwieldiness of the belted ammunition, and the reliability issues introduced by using belted ammunition in dusty dirty and sandy environments. Frequent dismounts and remounts from vehicles or aircraft, or fighting from vehicles and aircraft require a handy multipurpose weapon that can provide light machine gun support, while having the inherent capabilities of a carbine.

The environments we fight in decrease the reliability of the SAW. When the weapon is in condition 1 (cocked open ready to fire), the chamber, feed tray is all-open to dirt and debris. When patrolling with an open bolt weapon, the sensitive areas of the weapon are all open for ingress of dirt that could prevent the chambering of a cartridge when the soldier pulls the trigger. His belted ammunition either in his belt box, nut sack, or loose must be kept as clean as the internals of the weapon or it will simply drag the dirt into the action as the gun pulls the belt into the feeding mechanism.

Those who do not understand the role of a magazine fed light automatic rifle are still fighting the last war and not looking to the vast majority of operations undertaken today. The SAW gunner is very closely relegated to his function in the section. He cannot use his SAW to take deliberate surgical aimed shots at enemy combatants because his weapon is open bolt only operation. The entire weapon jerks as the trigger is pulled as the return springs of the action strip, load and fire a round. In a situation where accurate instead of suppressive fire is required, the saw gunner is an ineffectual member of the Squad. As described, in a low intensity conflict, most of the enemy killed are the result of deliberate surgical fire and not volumes of suppressive fire as they would on the open fields of West Germany against an invading hoard. To drive this point home, it should be noted that the SAW has almost no place in small unit SOLIC (special operations low

intensity conflict) operations and many units relegate them to the armory for lack of a more suitable solution.

By USMC doctrine, the SAW gunner cannot be the first member of a “Stack” to enter and clear a building or close alleyways in urban environments. This is not just because the SAW is difficult to manage in close confines. The entry team procedures for clearing a building are very fluid. As members of the team move through a building, members change positions as some secure a room or the rear of the team, while others enter new rooms and doorways. The SAW gunner can never be the first into a room or through a door. This makes the teams movement through a building very complicated as the saw gunners must maneuver to ensure they never enter a door or take lead on the stack. The reason the saw gunner cannot lead the stack is the SAWs open bolt only action. To fire the first round, the trigger is pulled, the bolt must strip a round from the link, load it, lock, then fire. There is a lot of potential for things to go wrong in this chain of events. This brings the likelihood of first round ignition down to an unacceptable level. This effectively takes 2 members of the squad out of the game when you need every man to take and secure a multi room building.

The USMC has developed a set of criteria they would like to see in an infantry automatic rifle. The basic concept being to “keep it simple stupid” by having a lightweight magazine fed weapon capable of decent rates of accurate fire. The weapon should fire from standard STANAG M16 magazines and be provided with a 60-100 round large capacity magazine for use in the sustained fire role. They specified overall sizes, rates of fire, and minimum thresholds to which the weapon must function.

LWRC’s IAR looks very conventional on the outside because we do not ignore 40 years M16/M4 evolution, training, and logistics concerns. Many of the parts in service to maintain the M4 are cross compatible with the IAR. The armorers tools are relevant, the armorer and troop training is relevant. We envisioned a solution that was easily integrated with the least amount of burden to the government and its soldiers. The Troops really do like the M4. It is highly ergonomic, accurate, very modular, very light, and very easy to use. Generations of soldiers are used to its controls, balance and handling. They have developed what is termed “muscle memory” making the weapons operations an almost unconscious affair. LWRC’s gas piston technology has removed everything in the negative column concerning the M4 and made it handle even better. What the troops did not appreciate about the M4 was that it is maintenance intensive, and is environmentally sensitive. Well trained soldiers take care of their weapons. It is not that they will not or don’t need to maintain their LWRC IAR, just that detailed cleanings might take 10 minutes instead of 2 hours.

A heavier weight barrel profile was used to deal with the increased demands of a machine gun. Fins similar to those found on the Thomson sub machine gun were implemented in the barrel profile to allow greater surface area for convection air-cooling of the barrel. The rifling chosen was a 5R polygonal profile. This forms the bullet to the lands and grooves instead of cutting into the bullet jacket. It allows longer barrel life, reduces friction, and creates a better gas seal behind the bullet, which increases velocity.

Development of the dual fire mode module came about as we envisioned a multi role weapon, which is exactly what the USMC is asking for. They want a weapon that is light and handy enough that the automatic rifleman can use it for the every day duties of any rifleman in the squad. Patrolling, counter sniping, and house clearing amongst other mission requirements. This means the weight and the overall dimensions must be in line with usual mission requirements. It also means the soldier must be able to take accurate, deliberate shots in semi-automatic mode, yet be able to deliver support or suppressive automatic fire at sustained rates when required. LWRC envision the best way to do this would be a closed bolt semi-automatic setting that would function exactly as an M4 or M16 would, and open bolt setting in Automatic that functions like a true machine gun.

Open bolt machine guns are common. They fire open bolt only. The advantage is that the barrel has air flowing through the chamber and out of the muzzle end between strings of fire. This has significant impact on how fast the barrel cools, or conversely how much ammunition you can fire before you risk a catastrophic failure. In a closed bolt machine gun, when you release the trigger, the weapon puts a live round in the hot chamber until you pull the trigger again. Putting a live round into a very hot chamber leads to cook offs. A round could cook off during a fire and movement and kill a squad mate or injure the gunner. Closed bolt systems are relegated to assault rifles that do not expect to fire large volumes of automatic sustained fire. The automatic mode on an assault rifle is reserved for emergency situations only and rarely employed by professional troops. In our opinion, closed bolt operation is not an option for a rifle that needs to be capable of sustained fire.

Closed bolt weapons like the M4 are ideal for their intended role. With a round chambered and locked, the trigger mechanism simply has to strike the primer and the round is fired. This gives you 99.7% first round ignition probability, accuracy in a lightweight package. A must have when patrolling or clearing a building. The SAW is perfect for laying down significant firepower when the troops need to fire an maneuver but is bulky, heavy and unwieldy for small unit tactics. The IAR is a RIFLE that has the attributes of the M4 with the addition of a sustained fire mode. These are 2 different tools for 2 different jobs. In no way do the USMC intend to replace the SAW. They just want another tool in the warfighter's tool box suited to fire team tactics in low intensity warfare and operations mounted in urban theaters.



