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WAVE OF THE FUTURE: The XM-8 Battle Rifle

Question: Can you build an all-purpose battle rifle that can change colors, barrels, and weapons packages on the fly, comes equipped with a grenade launcher and shotgun that can take out Sigourney Weaver's aliens, and jams far less frequently than the M-16? Answer: The new XM-8 rifle by Heckler and Koch.



Photo by Heckler & Koch, USA

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For almost 40 years, the [M-16 5.56mm combat rifle](#), in all its incarnations, has served as the United States military's primary battle rifle. To give you an idea of how long a time that is, the only other long gun with a similar tenure is the .58 caliber Brown Bess musket - which entered service with the Continental Army in 1776.

The German weapons manufacturer Heckler & Koch believes it's high time for a change; specifically, it would like to see the United States retire the M-16 and replace it with a slick, new, high-speed battle rifle dubbed the XM-8. And boy, what a rifle it is ...

Army of One

The XM-8 weapon system -- for that's what it really is, a family of related weapons -- packs quite an arsenal in its portable shape (6.4 pounds, lighter than the current M-4 at 8.85 pounds). It takes its cue from the M-29 [Objective Individual Combat Weapon](#) (OICW), a \$10,000 prototypical technology test bed from the late 1990s. The OICW was a

XM-8 Rifle: The Skinny

Name:

XM-8 Rifle (Heckler & Koch)

Type of Equipment:

Battle rifle

Killer Features:

- Flexible, heavy-duty weapons platform accommodates rifle and grenade launcher
Polymer "shell" can be replaced with shells of different colors, to blend in with environment
- All weapon attachments, barrels, butts, and optics can be switched out by operator, without special tools or maintenance
- Improved "pusher" gas piston cuts down on weapon

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combination of "kinetic energy" projector (a battle rifle that fired the Remington .223) and a semi-autonomous, air-bursting 20mm grenade launcher. The XM-8 is the "kinetic energy" portion of the OICW, plus a receiver to which all other components can be attached or removed.

Complementing the XM-8 are two attachable weapon systems, the XM320 40mm single shot grenade launcher and the LSS 12-gauge shotgun. The XM320 incorporates a swing out barrel design with integrated sight, and is capable of firing all currently manufactured 40mm grenades, while the LSS is capable of firing both lethal and non-lethal shotgun shells, as well as specially-designed breaching shells. Both weapons are mounted forward of the magazine, underneath the barrel, and can be installed by the operator in minutes without tools.

The XM-8 is a model of efficiency in use: its operation controls are ambidextrous, it has three firing modes (single round, three-round burst, and fully automatic), and can handle a variety of magazines, including a 30 round semi-opaque (to allow the shooter to see how many rounds are left in the magazine) hard plastic magazine, which can be rapidly reloaded in close combat situations, and a 100-round drum (for sustained fire), as well as 10-round weapon qualification magazines and M-16 style metal magazines.

Flexible on the Fly

Whether the user is a sniper or part of an attack team, the XM-8 can accommodate all uses. It uses four different interchangeable barrels (a 9" compact, a 12.5" assault, a 20" match grade sharpshooter, or a 20" heavy barrel for sustained high ROF applications), each of which can be swapped out at the unit level in less than 2 minutes. The weapon can also be equipped with a 5-position collapsible stock, a flat butt plate (for an extremely small weapon profile), an adjustable sniper stock, or a folding stock.

Attention has also been paid to look and feel with the XM-8. Forward handguards incorporate non-slip materials to improve weapon handling and retention. The XM-8's non-metallic components are manufactured from fiber reinforced plastic polymers which can be molded in numerous colors, and can be removed or replaced by the operator without specialized tools. In other words, whether you're in the jungle or on the sand, the weapon's "skin" can be changed to blend with its surroundings.

The XM-8 doesn't skimp on optics, either. Its optics/sight package is an "all-in-one" combination: an infrared laser target designator, IR target illuminator and 1x close combat red-dot sight. In addition to incorporating the three sights into one system, the sight is zeroed at the factory and can be removed and reinstalled by the operator without specialized tools, or the loss of zero. Contrast this with the M-16/M-4 series: While advances have been made in their combat optics to improve rifle accuracy, these advances have brought additional issues (increased weight, cost, the need to continuously re-zero the devices when removed).

jamming

Armament:

- Base configuration fires Remington .223 (a.k.a. the 5.56mm NATO) bullets; 20 mm grenades
- Attachments include XM320 40mm single shot grenade launcher, and LSS (lightweight stand-off shotgun) 12-gauge shotgun that fires 2.75" and 3" 12 gauge shells

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How useful are the XM-8's interchangeable parts? Here's a quick look at some of the M-16's problems in this regard:

- A half dozen incarnations of the M-16/M-4 are currently in service, and none of them have parts that are 100% interchangeable with a different series weapon.
- For the M-16, mounting optics requires the use of weapon specific (read: non-interchangeable) adapters.
- The M-16A1 (still in widespread service with the National Guard and Reserves) was designed to fire the M198 5.56mm Ball cartridge, while the M16A2 and later rifles (used by Active Duty formations) was designed to fire the heavier M855 cartridge. While both rifles can chamber and fire both types of bullet, the M885 bullet weighs more, and is less accurate when fired from the M16A1.

On the other hand, the XM-8 has:

- One common component receiver, with the remaining parts (barrel, optics, stock, hand guards, auxiliary weapons) attached as needed.
- Combining three optic units into one not only reduces weapon weight, but also simplifies equipment issue, maintenance and accountability.
- One common bullet type (5.56mm cartridge) for all models.

This is not to say that soldiers are going to enter battle toting a golf bag of rifle barrels and accessories, but rather, replacement parts can be replaced or exchanged at the unit level without worrying about system compatibility. At the end of the day, does any of this make the XM-8 more lethal than the M-16? No, as both fire the same 5.56mm cartridge ... but the XM-8 completely outclasses the M-16 in reliability, ease of maintenance, and reduced logistical requirements.

XM-8 Variations

The XM8 is designed as a modular weapon; different barrels and other modules can be swapped quickly depending on operational requirements. The XM8 will also be lighter and more reliable than the existing M4 carbine and M16 rifles. If this rifle is approved, the Army could field 900,000.

XM-8 Baseline Carbine



- 12.5" barrel
- Common modular assemblies

XM8 Carbine with Add-On XM320 Grenade Launcher



- Side loading 40mm grenade launcher

Compact Carbine



- Short 9" barrel
- Butt cap receiver cover
- Personal defense applications

Sharpshooter Variant



- 20" barrel
- Advanced optical sight (all variants)

Automatic Rifle

Pushing Lead

Of course, all the fancy weapons and attachments on a rifle don't mean much if it jams on the operator. One of the M-16's major flaws is jamming, due to its gas operating system, where propellant gasses are used to cycle the rifle's bolt and fire bullets. In the M-16, these gasses are vented directly back to the rifle chamber itself. This means that every time the weapon is fired, propellant gasses, gunpowder residue, and other particles are deposited directly on the bolt face (this process is called "fouling"). Eventually, the bolt becomes too dirty to fully lock into place, rendering the weapon unreliable.



While no gas-operating weapon (including the XM-8) is immune to the effects of fouling, the XM-8's system presents a clear advantage over the M-16: The receiver utilizes a six-lug rotating bolt that fully supports the cartridge case and is driven by a "pusher" type gas piston. This piston is unaffected by barrel changes, and is even capable of operating if the weapon's barrel is full of water. Most importantly, it eliminates fouling of the bolt face, which dramatically improves the weapon's overall reliability in a sustained firing situation. In short, soldiers using the XM-8 in combat should have one less thing to worry about, and that one thing can mean the difference between life and death.

Goodbye to the Past

If you add up all the M-16's flaws -- its poorly designed gas operating system, its need for constant maintenance and cleaning, its lack of interchangeable parts - it becomes clear that the XM-8 is superior to the M-16/M-4 family in all respects. It is lighter, cheaper, more reliable, and easier to maintain than the current rifle. In short, it surpasses all of the M-16's strengths while eliminating all of its weaknesses, thus earning a spot on our Military Gear Hot List.

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XM-8 Prototype Specifications

Caliber: 5.56 x 45mm NATO	Barrel Life: 20,000 rounds minimum
Builder: Heckler & Koch	Muzzle Velocity: 3005 feet/second (M855 Ball) with 20" barrel 2675 feet/second with 12.5" barrel 2365 feet/second with 9.0" barrel
Weight: 6.4 lbs (prototype), 5.7 lbs objective	Magazine Capacity: 10 or 30 rounds (magazines can be nested together); 100 round drum available
Overall Length: 33.3 inches (carbine stock extended)	Stock: 5 position adjustable for length
Barrel Length: Assault: 12.5" Sharpshooter: 20.0" Compact: 9.0" Automatic Rifle: 20.0"	Bayonet Lug: Yes (12.5 & 20" barrels)
Rate of Fire: Cyclic - 750 rpm Sustained - 85 rpm up to 210 rounds	Bipod Interface: Yes (20" only)

Rate of Twist:
1 in 7 inches

Sighting System:
Fully integrated red dot with laser illuminator and pointer

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