

ARCHIVED REPORT

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Military Small Arms (United States)

Outlook

- U.S. Department of Defense continues short-term rearming cycle to replace battle-worn weapons
- Budget limitations drive U.S. DoD emphasis on near-term procurement and upgrades of existing designs
- Selection, development and procurement of entirely new small arms systems have taken a back seat to near-term budget realities
- January 2017: U.S. Army awards SIG Sauer a contract worth \$580 million to provide the SIG P320 as the M17/M18 Modular Handgun System, replacing the Beretta M9 as the standard-issue sidearm

Orientation

Description. Personal and crew-served weapons, ranging from 9mm sidearms through 12.7mm (.50-cal) rifles and machine guns.

Sponsor. The U.S. Army and U.S. Navy fund the research, development, and procurement of small arms in the United States.

Licensees. Several international contractors continue to produce U.S. small arms designs, with or without license.

Status. Development through serial production.

Total Produced. Through 2023, we estimate the various contractors produced over 2.5 million small arms since 1970 inclusive.

Application. Sidearms (pistols) provide a level of protection to personnel for whom a shoulder arm (rifle, battle carbine, shotgun, etc.) would be inappropriate.

The military rifle and battle carbine provide the individual infantryman an effective small arm for both attack and defense.

The carbine and shotgun provide close-quarter firepower in circumstances where a more conventional weapon might not be appropriate.

Machine guns provide sustained supporting fire and light air defense for maneuver forces.

Price Range. According to U.S. Department of Defense budget request documentation and open-source reporting, U.S. military small arms carry the following unit prices:

<u>Designation</u>	<u>Description</u>	<u>Unit Price</u>
M9	Pistol, semi-automatic	\$675 (MSRP)
M11	Pistol, semi-automatic, compact	\$992 (MSRP)
M1911A1	Pistol, semi-automatic	\$899 (MSRP)
M17/M18 MHS (P320)	Pistol, semi-automatic	\$176
M16A3	Battle Carbine	\$723
M4A1	Carbine	\$641
M26	Modular Accessory Shotgun System (MASS)	\$3,133
M203A2	Grenade Launcher Module, 40mm	\$1,031
M320	Grenade Launcher Module, 40mm	\$3,169

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<u>Designation</u>	<u>Description</u>	<u>Unit Price</u>
M24	Sniper Rifle	\$6,560
M110	Semi-Automatic Sniper System (SASS)	\$6,319
M107	Sniper Rifle, heavy	\$11,400
M1A	Commercial (semi-only) M14 Rifle	\$1,786 (MSRP)
Mossberg 500 Series	Shotgun, pump-action, 12-gauge	\$500 (MSRP)
M104/Benelli M4	Shotgun, pump-action, 12-gauge	\$1,999 (MSRP)
M249 SAW	Squad Automatic Weapon	\$3,514
M240B	Machine Gun (infantry version)	\$7,090
M240L	Machine Gun (lightweight version)	\$9,502
M2HB	Machine Gun, .50-caliber	\$11,200

Contractors

Prime

Barrett Firearms Manufacturing Inc	http://www.barrett.net , PO Box 1077, Murfreesboro, TN 37133 United States, Tel: + 1 (615) 896-2938, Fax: + 1 (615) 896-7313, Email: mail@barrettrifles.com , Prime
Beretta USA Corp	http://www.berettausa.com , 17601 Beretta Dr, Accokeek, MD 20607 United States, Tel: + 1 (800) 237-3882, Prime
Colt Defense LLC	http://www.colt.com , 547 New Park Ave, West Hartford, CT 06110 United States, Tel: + 1 (860) 236-6311, Fax: + 1 (860) 244-1442, Prime
FN America LLC	http://fnamerica.com , 797 Old Clemson Rd, Columbia, SC 29229 United States, Tel: + 1 (803) 736-0522, Fax: + 1 (803) 736-4169, Email: info@fnamerica.com , Prime
Knight's Armament Co	http://www.knightarmco.com , 701 Columbia Blvd, Titusville, FL 32780 United States, Tel: + 1 (321) 607-9900, Fax: + 1 (321) 268-1498, Email: trupert@knightarmco.com , Prime
O.F. Mossberg & Sons Inc	http://www.mossberg.com , 7 Grasso Ave, North Haven, CT 06473 United States, Tel: + 1 (203) 230-5300, Fax: + 1 (203) 230-5420, Email: service@mossberg.com , Prime
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Springfield Armory	http://www.springfield-armory.com , 420 W Main St, Geneseo, IL 61254 United States, Tel: + 1 (309) 944-5631, Fax: + 1 (309) 944-3676, Email: sales@springfield-armory.com , Prime
U.S. Ordnance Inc	http://www.usord.com , 300 Sydney Dr, McCarran, NV 89434 United States, Tel: + 1 (775) 343-1320, Fax: + 1 (775) 343-1331, Email: marketing@usord.com , Prime

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

M9 Personal Defense Weapon

Following several evaluation cycles, the U.S. Department of Defense selected the Beretta Model 92F in 1989 as the M9 Personal Defense Weapon, replacing all existing sidearms in several calibers.

Caliber	9x19mm Parabellum
Overall length	21.7 cm (8.54 in)
Barrel length	12.5 cm (4.92 in)
Weight (with empty magazine)	950 g (2.09 lb)
Magazine capacity	15 rounds
Method of operation	Short recoil, semi-automatic
Method of fire	Double action
Muzzle velocity	390 m/sec (1,279 ft/sec)
Manufacturer	Beretta USA Corp

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M11 Compact Pistol

In 1992, the U.S. Department of Defense began procuring the SIG Sauer P228 to fill its M11 Compact Pistol requirement, providing specialized military personnel with a concealable handgun.

Caliber	9x19mm Parabellum
Overall length	18 cm (7.09 in)
Barrel length	9.8 cm (3.86 in)
Weight (with empty magazine)	830 g (1.93 lb)
Magazine capacity	13 rounds
Method of operation	Short recoil, semi-automatic
Method of fire	Single or double action
Muzzle velocity	350 m/sec (1,148 ft/sec)
Manufacturer	SIG Sauer Inc

M17/M18 Modular Handgun System

In August 2015, the U.S. Army released the XM17 MHS Request for Proposals, beginning the competition for the next-generation standard-issue sidearm to replace the Beretta M9. On January 19, 2017, the Army awarded SIG Sauer a procurement contract worth \$580 million to provide the SIG P320 as the MHS. The Army may procure over 280,000 full-size P320s, as well as 7,000 compact versions. The rest of the U.S. Department of Defense may procure an additional 221,000 pistols under the MHS program.

Caliber	9x19mm Parabellum
Overall length	20.3 cm (8 in)
Barrel length	11.9 cm (4.7 in)
Weight (with empty magazine)	836 g (1.84 lb)
Magazine capacity	10-17 rounds, depending on caliber
Method of operation	Short recoil, semi-automatic
Method of fire	Striker-fired, double action only
Manufacturer	SIG Sauer Inc

M16A2 Series

The M16A2, an improved M16A1 originally developed by the U.S. Marine Corps, remains a standard shoulder arm with all U.S. forces and a number of organizations worldwide.

Caliber	5.56x45mm NATO (.223 Remington)
Overall length	100 cm (39.37 in)
Barrel length	51 cm (20.10 in)
Weight (empty 30-round magazine)	3.57 kg (7.86 lb)
Magazine capacity	20 or 30 rounds
Method of operation	Direct gas, semi-automatic, or three-round burst
Cyclic rate	700 to 900 rounds/min
Muzzle velocity (M193)	991 m/sec (3,251.27 ft/sec)
Muzzle velocity (SS109)	948 m/sec (3,110.20 ft/sec)
Manufacturers	Colt Defense LLC, FN Manufacturing LLC

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M4 Carbine

This lighter and shorter version of the M16A2, featuring a shorter barrel and a telescoping buttstock assembly, contains internal components that are interchangeable with the M16 series. It is now the primary shoulder arm for US. forces, supplanting the full-length M16-series battle carbine.

Caliber	5.56x45mm NATO (.223 Remington)
Overall length (stock extended)	84 cm (33.07 in)
Overall length (stock retracted)	76 cm (29.92 in)
Barrel length	36.8 cm (14.49 in)
Weight (empty 30-round magazine)	2.57 kg (5.65 lb)
Magazine capacity	20 or 30 rounds
Method of operation	Direct gas, semi-automatic, or three-round burst
Cyclic rate	700 to 900 rounds/min
Muzzle velocity (M193)	921 m/sec (3,021.62 ft/sec)
Muzzle velocity (SS109)	906 m/sec (2,972.40 ft/sec)
Manufacturers	Colt Defense LLC, FN Manufacturing LLC

M14/M1A Rifle

The M14 rifle remains the last true full-caliber battle rifle in U.S. service. Adopted in 1957 as the successor to the legendary M1 Garand rifle, the M14 was the first U.S. military weapon to fire NATO-standard ammunition. Serial production of the M14 ended in 1964, with a total production run of about 1.38 million rifles. Springfield Armory began manufacturing the M1A in 1974; production of the commercial M14 variant is ongoing. The standard-grade M1A currently carries a manufacturer's suggested retail price (MSRP) of \$1,739.

Caliber	7.62x51mm NATO (.308 Winchester)
Overall length	112 cm (44.1 in)
Barrel length	55.9 cm (22 in)
Weight (loaded)	5.1 kg (11.2 lb)
Magazine capacity	20 rounds
Method of operation	Gas, semi-automatic, or full-automatic (M14); semi-automatic only (M1A)
Cyclic rate	700 to 750 rounds/min
Muzzle velocity	853 m/sec (2,798.5 ft/sec)
Manufacturer	Springfield Armory

M24 Sniper Weapon System (SWS)

The M24 Sniper Weapon System (a military variant of the venerable Remington Model 700 bolt-action rifle) replaced the M21 Sniper Rifle (a modified M14) in U.S. Army service. Procurement began in FY88 for 500 units at \$1.9 million.

Caliber	7.62x51mm NATO (.308 Winchester)
Overall length	109 cm (43 in)
Barrel length	66 cm (24 in)
Weight (with sling and scope)	6.3 kg (13.85 lb)
Magazine capacity	5 rounds
Method of operation	Bolt action
Cyclic rate	Bolt action
Muzzle velocity	798.9 m/sec (2,621 ft/sec)
Manufacturer	Remington Military Products Division

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M40A3 Sniper Rifle

In 1966, the U.S. Marine Corps adopted the Remington Model 700 bolt-action rifle as the M40A1 sniper rifle. The U.S. Marine Corps Marksmanship Training Unit (MTU) began development of the improved M40A3 in 1996; fielding with USMC scout snipers began in 2001.

Caliber	7.62x51mm NATO (.308 Winchester)
Overall length	112.4 cm (44.25 in)
Barrel length	63 cm (24.8 in)
Weight (with sling and scope)	7.5 kg (16.5 lb)
Magazine capacity	5 rounds
Method of operation	Bolt action
Cyclic rate	Bolt action
Muzzle velocity	777 m/sec (2,550 ft/sec)
Manufacturer	Remington Military Products Division

M110 Semi-Automatic Sniper System (SASS)

The weapon is essentially a U.S. Army variant of the Mk 11 Mod 0 in service with U.S. Navy SEAL teams. The M110 SASS completed operational testing in 2006. According to U.S. Army budget request documentation, the Army held a revised initial procurement objective of 3,065 weapons through FY11; any additional procurement after FY11 has been on an as-needed basis.

In FY15, the U.S. Army intended to commence funding the Compact Semi-Automatic Sniper System. The CSASS is a compact and lighter-weight SASS rifle with a shorter barrel, a collapsible buttstock, a new suppressor, a new optic, and a slightly modified receiver. However, the Army's annual budget request documentation indicated only minimal funding in FY15-FY16, and none after that.

Caliber	7.62x51mm NATO (.308 Winchester)
Overall length (with suppressor)	118.1 cm (46.5 in)
Barrel length	61 cm (24 in)
Combat weight (with scope, suppressor, and bipod)	7.85 kg (17.3 lb)
Magazine capacity	10 or 20 rounds
Method of operation	Direct gas, semi-automatic
Cyclic rate	Bolt action
Muzzle velocity	777 m/sec (2,550 ft/sec)
Manufacturer	Knight's Armament Co

M107 Heavy Rifle

A heavy rifle for special use by U.S. forces, the semi-automatic M107 (Barrett Model 82A1M) fires from its integral bipod. In a recent policy change, the U.S. Department of Defense accepted the Model 82A1M as the standard heavy sniping rifle for U.S. Special Operations Forces.

Caliber	12.7x99mm (.50 cal)
Overall length	114.3 cm (45.0 in)
Barrel length	73.7 cm (29.0 in)
Weight	9.98 kg (21.96 lb)
Magazine capacity	10 rounds
Method of operation	Short recoil, semi-automatic
Cyclic rate	Semi-automatic
Muzzle velocity	853 m/sec (2,798.5 ft/sec)
Manufacturer	Barrett Firearms Manufacturing Inc

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M249 Squad Automatic Weapon (SAW)

In September 1980, the U.S. Department of Defense selected the M249 SAW – the FN Herstal Minimi light machine gun – to bridge the gap between the M16 and the M60 machine gun at the infantry squad level.

Caliber	5.56x45mm NATO (.223 Remington)
Overall length	104 cm (40.94 in)
Barrel length	46.5 cm (18.31 in)
Weight (with cleaning kit and bipod)	6.85 kg (15.10 lb)
Type of feed	300-round belt, FN or M16 30-round magazine
Method of operation	Gas piston, automatic
Cyclic rate	Variable, from 700 to 1,000 rounds/min
Muzzle velocity (M193)	965 m/sec (3,165.97 ft/sec)
Muzzle velocity (SS109)	915 m/sec (3,001.93 ft/sec)
Manufacturer	FN Manufacturing LLC

M240B Machine Gun

The M240, a license-produced copy of the FN MAG general-purpose machine gun, has become the primary vehicle- and ground-mounted general-purpose machine gun in U.S. Army and U.S. Marine Corps service.

Caliber	7.62x51mm NATO (.308 Winchester)
Overall length	123 cm (48.4 in)
Barrel length	62.7 cm (24.7 in)
Weight (empty)	12.25 kg (26.9 lb)
Type of feed	Disintegrating-link belt
Method of operation	Gas piston, automatic
Cyclic rate	750 rounds/min
Muzzle velocity	853 m/sec (2,798.5 ft/sec)
Manufacturer	FN Manufacturing LLC

M2HB Heavy Machine Gun

The legendary Browning M2 still reigns as the standard for heavy machine guns in the United States, as well as throughout much of the world. Adopted by the U.S. Army in 1923, the M2 continues to soldier on, firing from a tripod or various vehicle and tank mounts.

Caliber	12.7x99mm (.50 cal)
Overall length	165 cm (65.0 in)
Barrel length	114 cm (44.8 in)
Weight (empty)	39.1 kg (86.12 lb)
Type of feed	Disintegrating-link belt
Method of operation	Short recoil, automatic
Cyclic rate	Variable, from 450 to 600 rounds/min
Muzzle velocity	810 m/sec (2,657.4 ft/sec)
Manufacturer	Saco Defense (General Dynamics Armament and Technical Products)

Variants/Upgrades

Variants. Not generally applicable. U.S. forces assign new model designation suffixes or entirely new model designations to small arms variants.

Modernization and Retrofit Overview. Not generally applicable. Contractors usually integrate enhancements and upgrades as production cut-ins or offer enhancement kits for existing weapons.

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M17 Modular Handgun System

Source: U.S. Army

Program Review

Background. The U.S. Army's total active inventory of small arms exceeds 2.4 million weapons, with an estimated value of over \$2.5 billion.

The Big Five

U.S. Department of Defense procurement over the past decade has concentrated on the following weapons types:

- The 9x19mm Parabellum M9 as the standard sidearm
- The 5.56x45mm NATO (.223 Remington) M16 series battle carbine as the standard rifle
- The 5.56x45mm NATO (.223 Remington) M249 SAW as the standard squad-level support weapon
- The 7.62x51mm NATO (.308 Winchester) M240 series as the standard general-purpose machine gun
- The 12.7x99mm (.50 cal) M2HB as the standard heavy machine gun

Description. The following small arms are currently in service with U.S. forces:

M9 Pistol. In June 1981, the U.S. Army formally announced its intention to procure a new sidearm, designated M9, to replace the existing variety of .32-, .38-, and .45-caliber sidearms then in inventory. The Army anticipated a requirement among the three

U.S. services for 220,000 M9 pistols, chambered for the NATO-standard 9x19mm Parabellum cartridge. Congressional opposition forced the U.S. Army to cancel the program in spring 1982. The original bidders for the M9 contract were Smith & Wesson, Beretta, Fabrique Nationale, and Heckler & Koch.

Beretta's Major Coup

In FY84, both the U.S. Army and the U.S. Marine Corps attempted to procure the M9, also known as the Personal Defense Weapon (PDW); Congress again rebuffed them. Despite a series of protracted congressional hearings, court cases, and demands for renewed competitive testing (all instigated by Beretta's competitors in the PDW program), the U.S. Department of Defense selected the Beretta Model 92F series for the PDW requirement in January 1985.

The Italian-made Beretta Model 92F pistol later secured the remaining M9 options, worth \$9.9 million, according to a 1992 statement by Col. Richard Williams, (then) U.S. Army M9 program manager.

Beretta USA delivered over 387,600 M9 pistols to the DoD. Beretta USA has also sold tens of thousands of additional Model 92 pistols to various law enforcement agencies and private gun owners in the United States.

M11 Compact Pistol. In addition to the M9, the U.S. Department of Defense desired a compact pistol suitable for the concealed-carry requirements of

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criminal investigation personnel, as well as for certain military intelligence applications. Following a competitive evaluation, the DoD selected the 9x19mm Parabellum SIG Sauer P228, type-classified as the M11, in 1992.

M17/M18 Modular Handgun System. In 2011, the U.S. Army launched its long-awaited XM17 MHS program to select a replacement for the M9 pistol. The parameters of the MHS program specified a modular handgun design requiring minimal additional development. While not specifying a required caliber, the MHS was to have better terminal ballistics, at 50 meters, than the standard-issue 9mm M882 full-metal jacket round fired from an M9.

In August 2015, the U.S. Army released the official MHS Request for Proposals. Initially, 12 contractors submitted pistols for the competition. After extensive test and evaluation, the Army narrowed the competition to pistols submitted by Beretta USA (9mm M9A3), Glock Inc (9mm Glock 17 Gen 4 and .40 S&W Glock 22 Gen 4) and SIG Sauer (9mm and .357 SIG P320).

Army Selects SIG P320

On January 19, 2017, the U.S. Army awarded SIG Sauer a contract worth \$580 million to provide the SIG P320 as the M17 MHS. Deliveries commenced in 2017 and will extend through 2027. SIG Sauer is producing the pistols at its Exeter, New Hampshire, facility.

Current plans call for the Army to purchase more than 280,000 handguns, according to Program Executive Office Soldier officials. The Army also plans to buy approximately 7,000 subcompact versions of the handgun. The other military services participating in the program may order 212,000 systems above the Army quantity.

Combat Shotgun. Since before World War I, U.S. forces have relied on a variety of shotguns. For the most part, these weapons have been military versions of standard pump-action hunting weapons, such as the Winchester Model 1897, the Remington 870 Wingmaster, and the Mossberg 500 series.

CAWS/CSS M104

In 1994, under the Joint Services Small Arms program, the U.S. Marine Corps began evaluating various weapons for the Joint Services Combat Shotgun program. The requirements for this 12-gauge weapon include:

- Semi-automatic operation
- A tubular magazine holding at least six rounds

- The ability to chamber both 2 3/4 -inch standard and 3-inch Magnum ammunition
- A weight not to exceed 3.86 kilograms (8.5 lb) and an overall length not to exceed 106.05 centimeters (41.75 in)
- The ability to mount enhanced sighting devices, such as the PVS-4 passive night sight

Under the evaluation program, which ran through 1998, the U.S. Department of Defense selected the Benelli M4 Super 90 as the Close Assault Weapon System/Combat Shotgun System in May 1999. Heckler & Koch USA, as the U.S. agent for Benelli, produces the Benelli M4 Super 90 as the M104 shotgun.

Mossberg 500: Cheaper & Better

However, we have found little evidence that U.S. forces have actually used the M104 in combat. Since 2003, U.S. troops have been purchasing off-the-shelf commercial 12-gauge shotguns, primarily the Mossberg 500 series, as a stopgap measure.

Lacking significant U.S. DoD procurement, U.S. troops have been purchasing Mossberg shotguns with their own funds. Beyond its affordable commercial price range, the Mossberg 500 design offers a number of desirable features for a combat shotgun:

- The dual-action bar mechanism provides a smooth and reliable pump action, regardless of ammunition type.
- The elevator design precludes shell-override malfunctions. Unlike other pump-action shotgun designs, a round that slips past the cartridge stop simply falls out the bottom of the receiver instead of jamming the mechanism.
- The feed mechanism allows the shooter to quickly unload the tubular magazine without cycling each round through the chamber.
- The placement of the ambidextrous safety at the top rear of the receiver enhances the shooter's ability to control the weapon properly.
- The shooter can disassemble and assemble the weapon quickly for cleaning without special tools.

Though the Benelli M104 has barely made its presence felt, photographic and anecdotal evidence indicates the Mossberg 500 series remains a ubiquitous combat asset for U.S. infantry units in Afghanistan and Iraq.

M26 MASS. In 2005, the U.S. Army's 10th Mountain Division conducted initial field-testing in Afghanistan of a low-cost, virtually homegrown product of the U.S.

Army Dismounted Battlespace Battle Lab (DBBL) in Fort Benning, Georgia.

The M26 Modular Accessory Shotgun System (MASS) is a lightweight 12-gauge shotgun system that mounts under the barrel of the M4 carbine in a manner similar to the 40mm M203 grenade launcher. The M26 MASS weighs 1.2 kilograms (2.7 lb) and measures 41.9 centimeters (16.5 in) in length. With the attachment of a pistol-gripped collapsible buttstock, the XM26 becomes a stand-alone shotgun.

Homegrown Design

As an indirect outgrowth of Picatinny Arsenal's non-lethal munitions program, the M26 can fire lethal (commercial 12-gauge 2¾-in and 3-in Magnum shells), non-lethal, and breaching rounds. In designing a shotgun to fire all three types of munitions, the DBBL faced certain challenges. Low-powered non-lethal rounds do not reliably cycle the actions of existing semi-automatic shotguns; conventional pump-action designs are simply too large to mount under the barrel of the M4 carbine. The DBBL's M26 thus features a unique manually operated straight push-pull bolt with a reversible charging handle for right- or left-handed operation. The shotgun also features a five-round box magazine.

The DBBL's primary objective for the M26 is to provide the infantryman the enhanced capability of a shotgun without separating the infantryman from his primary weapon. This weapon will undoubtedly become an extremely popular and sought-after M4 accessory.

The U.S. Army DBBL developed the M26 in cooperation with C-MORE Systems (Manassas, Virginia). Vertu Corp (Manassas) acts as the prime contractor for production of the M26 MASS.

M16 Series. The M16 series and its 5.56x45mm NATO (.223 Remington) cartridge have long been the subject of widespread criticism.

Hardly a Battle Rifle

While the M16 series is unquestionably an excellent battle carbine, its employment as a full-fledged battle rifle clearly demonstrates its inferiority to true battle rifles (such as the M14) in terms of mechanical reliability, range, accuracy, and power. Indeed, a 7.62x51mm NATO (.308 Winchester) round fired from an M14 rifle retains more energy at 460 meters (500 yd) – the U.S. Army's stated maximum effective

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range for M16 series weapons – than a 5.56x45mm round fired from an M16 has at the muzzle.

Enter the M16A2

To address the deficiencies of the original M16A1, Colt developed an improved version, initially designated M16A1E1, featuring:

- Redesigned and hardened furniture
- Improved sights
- A three-round burst capability in lieu of an automatic fire option
- A bore with a tighter rifling twist (one turn in 177.8mm, or 1 in 7) than the M16A1 (1 in 12)

The tighter rifling twist is optimal for both the original M193 round and the M855A1 round, allowing the weapon to fire both types of NATO-standard cartridges.

Although the U.S. Army accepted the new weapon, type-classified M16A2, for gradual fielding, Canada actually produced the first M16A2 weapons. Diemaco Inc manufactured a slightly modified M16A2 (designated C7 in Canada) under license for the Canadian Defence Forces, with first deliveries in May 1986. The original contract was reportedly worth CAD107 million; production ran into the 1990s.

Along with its carbine version, designated C8, the Diemaco C7 largely replaced the 7.62x51mm C1 rifles in the Canadian Defence Forces. Diemaco has also sold the C7 to the Netherlands, with the first delivery of over 50,000 weapons in May 1995. Denmark placed an order for the C7 as well.

On May 20, 2005, Colt Defense LLC (West Hartford, Connecticut) announced the completion of its acquisition of Diemaco Inc, Colt's primary foreign licensee. Diemaco now operates as Colt Canada Corp, a wholly owned subsidiary of Colt Defense.

By September 1987, Colt had produced more than 300,000 M16A2s, most of which went to the U.S. Marine Corps. Colt delivered the first of an anticipated 125,000 M16A2s to the U.S. Army in February 1987. However, the Army awarded FN Manufacturing a follow-on five-year contract for up to 335,800 additional M16A2s in 1988. In 1999, FN Manufacturing won a \$4 million contract for 20,635 kits to convert M16A1 weapons to the A2 model. Later, the U.S. DoD awarded FN Manufacturing a sole-source contract for production of the M16A2.

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Further M16 Variants

Experience with the M16A2 during Operation Desert Storm (1991) led to a new series of product improvements to the basic M16 design. The M16A3 is the A2 with a removable carrying handle/rear sight assembly and a low-profile rail mount. The M16A4 is the A3 fitted with the Knight's Armament Co rail adapter system, replacing the standard hand guards. The U.S. Army ordered at least 40,000 M16A4 variants.

Modular Weapon System Kit

In March 1996, the U.S. Army ordered 80,000 Reflex Collimator Sights (with an option for 20,000 more) from Aimpoint Corp for the M16 series. The Modular Weapon System kit by Knight's Armament provides one receiver-mounted rail mount (the Picatinny rail) and a new aluminum hand guard assembly with a forward pistol grip and four integral rail mountings (also the Picatinny rail). This rail system enables attachment of a variety of sights and accessories (some already fielded), including:

- A white light source
- An infrared light source
- A laser-aiming device
- An enhanced-performance day sight
- An image intensification night sight

The U.S. Special Operations Command procured the Modular Weapon System in quantity, retrofitting this kit to over 10,000 M16 series weapons and M4 carbines.

Soldiering On

The ever-controversial M16 series is in its sixth decade of service with U.S. forces. The question for the U.S. Department of Defense becomes one of balancing the cost benefits of continued upgrades to the existing weapon versus the viability of any potential successor to the M16.

M4 Carbine. The U.S. Army originally procured the Colt M4 Carbine (previously the XM4 Personal Defense Weapon) to replace the 1940s-vintage M3 Grease Gun, which remained in limited service in the mid-1990s.

The U.S. Marine Corps also purchased the M4 to supplement the M9 pistols issued to platoon commanders and sergeants. In 2015, the Marine Corps announced it would begin procuring M4s for general issue, replacing its full-size M16s.

M16A2's Carbine

The M4 is essentially a carbine version of the M16A2, just as the Vietnam War-era XM177E1 was a carbine

version of the M16A1. The M4 program began engineering development in FY85, with an initial procurement of 1,500 M4 carbines for \$1 million in FY89. Prior to 2002, the most recent major procurement was in May 1998 for 15,925 M4 and M4A1 weapons. The M4A1 is a slightly modified version featuring a quick-change sight based on Picatinny rail technology, optional firing modes, and a hand guard-mounted vertical grip. Like the M16 series, the M4 carbine can mount the Aimpoint Reflex Collimator Sight and the Modular Weapon System kit.

M4 Carbine SOPMAK

Based on input from U.S. Army Special Forces and Ranger units, Colt produced an enhancement kit, the M4 Carbine Special Operations Peculiar Modification Accessory Kit (SOPMAK), for its M4 carbines used by the U.S. Special Operations Command. The kit includes the following:

- 4x day telescope
- Reflex sight
- Laser-aiming device
- Infrared pointer/illuminator
- High-intensity rail-mounted flashlight
- Forward vertical hand grip
- Suppressor

The Rail Interface System replaces hand guards, allowing the mounting of various accessories. This SOPMAK-enhanced M4 was designated M4A1 Close Quarters Battle Weapon by the DoD.

New Weapon of Choice

A 1998 agreement between Colt and the U.S. Army made Colt the sole source for the M4 and all its parts through 2010. However, demand for the M4 carbine after 2001 exceeded Colt's manufacturing capacity, forcing the Army to employ FN Manufacturing LLC as a secondary source for both the M16A4 and the M4 carbine. The M4 has become the weapon of choice for U.S. combat troops.

M14/Designated Marksman Rifle. First issued in 1957, the M14 remains the only standard full-caliber battle rifle in the U.S. military inventory.

True Battle Rifle

The M14 is, in fact, the last true "battle rifle" (as opposed to an intermediate-caliber battle carbine) available to U.S. forces. The weapon, with its 7.62x51mm NATO (.308 Winchester) cartridge, provides the infantryman with exceptional accuracy and

power beyond 460 meters (500 yd) – the "riflemans quarter-mile." The effectiveness of the M14's 7.62x51mm NATO round at this range far exceeds that of the M16's 5.56x45mm NATO round at the muzzle.

Combat Realities

Combat operations, especially in Afghanistan, clearly demonstrate the need for a 7.62mm rifle capable of range, accuracy, and power well beyond the capability of a 5.56x45mm weapon. Reports persist that paratroopers of the 82nd Airborne Division, in particular, continue acquiring every M14 and M1A (the commercial model of the M14) that they can get their hands on for use in open terrain.

Although the U.S. Marine Corps first mentioned a requirement for a precision semi-automatic weapon chambered for the 7.62x51mm NATO cartridge in 1993, Operation Enduring Freedom in Afghanistan clearly demonstrated the urgent need for an infantry shoulder weapon with range and accuracy beyond the capabilities of the M16. The Marine Corps Combat Development Command accelerated its Designated Marksman Rifle program to field just such a weapon.

DMR: Marines' M25

The Designated Marksman Rifle is essentially the Marine Corps equivalent of the Army M25, originally developed by the U.S. Army's 10th Special Forces Group (Airborne). The M25 is basically a National Match-grade M14 modified with a new barrel, furniture, muzzle brake/sound suppressor, rail mount, and telescopic sight.

M24 Sniper Weapon System. In FY83, the U.S. Army initiated the Sniper Rifle System program to develop a replacement for the 7.62x51mm NATO (.308 Winchester) M21 sniper rifle, a modified M14 rifle by Springfield Armory. By the mid-1980s, the competition had narrowed to two candidate systems:

- A modified Model 700 bolt-action rifle by Remington Arms Co
- A sniper rifle based on the Steyr Sturmgewehr 77 design

In 1988, the U.S. Army selected the classic Remington Model 700 design as the M24, with an initial procurement objective of 2,510 weapons. The Army has procured the M24 in 7.62x51mm NATO and, more recently, 7.82x66.55mm (.300 Winchester Magnum) chamberings. The upgraded M24 – the .300 Winchester Magnum XM2010 – will serve as the medium member of the Family of Sniper Weapons.

M40A3 Sniper Rifle. Since the early 1960s, this variant of the venerable Remington Model 700 bolt-

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action rifle has been the standard sniper rifle for the U.S. Marine Corps. Chambered for the standard 7.62x51mm NATO (.308 Winchester) cartridge, the M40A3 features a permanently mounted 10-power sight. The Marine Corps has also procured the M40A3 in the 7.82x66.55mm (.300 Winchester Magnum) chambering.

Each a Unique Weapon

Although the M24 and M40A3 share the Remington Model 700 action, they are not identical. Both the U.S. Army and U.S. Marine Corps have extensively modified the Model 700 with custom barrels, custom stocks, and various optical systems to meet each service's unique requirements. Further, service armorers adjust each M24 and M40A3 to fit the individual sniper. Thus, each sniper's M24 or M40A3 is, to a certain extent, a unique weapon.

M110 Semi-Automatic Sniper System. During 2006, the U.S. Army conducted an operational evaluation of the 7.62x51mm NATO (.308 Winchester) XM110 SASS. This rifle is essentially a variant of the Knight's Armament Co Mk 11 Mod 0 weapon currently in service with U.S. Navy SEAL team snipers. The Mk 11 Mod 0, in turn, traces its roots back to the Stoner SR-25 design.

M16's Big Cousin

The program represented a direct response to field requirements from U.S. Army snipers for a 7.62mm rifle offering a higher rate of fire and a less distinct profile than the bolt-action M24 while being lighter than the M107. Following a competitive evaluation of five candidate weapons, the U.S. Army awarded Knight's Armament the SASS contract in September 2005. Exhibiting its Stoner heritage, the M110 features the AR15/M16 direct gas impingement operating mechanism. It also mirrors the general AR15/M16 layout and profile.

Major features of this weapon include:

- An integral removable suppressor that does not require re-zeroing the rifle after installation or removal
- A detachable bipod
- An ambidextrous selector lever
- Picatinny rails to accommodate various optics
- A high-capacity (20-round) magazine

The M110 SASS entered service in 2007. According to U.S. Army budget request documentation, the U.S. Army held a revised initial procurement objective of

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3,065 weapons through FY11; procurement after FY11 has been on an as-needed basis.

The next step for the U.S. Army is to develop and field the Compact Semi-Automatic Sniper System. The CSASS is a compact and lighter-weight SASS with a shorter barrel, a collapsible buttstock, a new suppressor, a new optic, and a slightly modified receiver.

M107 Heavy Rifle. Following its fielding in Operation Desert Storm (1991), the Barrett Firearms semi-automatic Model 82A1 directly influenced U.S. Army doctrine regarding 12.7x99mm (.50-cal) heavy rifles. Shortly before hostilities broke out in 1991, the U.S. Department of Defense procured a number of off-the-shelf Model 82A1 heavy rifles for a variety of specialized missions, including anti-sniper, explosive ordnance disposal, and high-value target destruction. Since the war, Barrett has sold the Model 82 to at least 19 export customers; several others are evaluating the weapon. Deployed U.S. forces continue to employ the rifle, with a good deal of success.

Model 82A1 Leads to Changes in Doctrine

Prior to 2001, U.S. Army doctrine for the employment of .50-caliber heavy rifles specified the use of only bolt-action rifles, and not the M2HB heavy machine gun with its tricky single-shot manipulation. However, combat experience with the increased firepower of the semi-automatic Model 82A1 precipitated a change in Army doctrine. U.S. Special Operations Forces employ a slightly modified Model 82, designated Model 82A1M by Barrett.

Army Picks a Winner

In April 2005, the U.S. Army announced its approval of the M107 rifle for full materiel release to soldiers in the field. The U.S. Army funded the M107 program as a Soldier Enhancement Program in order to type-classify a semi-automatic .50-caliber rifle for the Army and other military services. The Barrett Model 82A1 underwent standard type-classification as the M107 in August 2003.

In a ceremony held on June 8, 2005, the U.S. Army vice chief of staff and the commanding general of U.S. Army Materiel Command officially recognized the Barrett M107 as one of the "Top Ten Greatest Inventions of 2004." The M107 was the only weapon system among the 10 programs the U.S. Army recognized during the ceremony.

M249 Squad Automatic Weapon. In 1982, the U.S. Army accepted the 5.56x45mm NATO (.223 Remington) Minimi light machine gun by FN Herstal as the M249 Squad Automatic Weapon. The Army set initial procurement (prior to SAW production

in the United States) at 13,294 Belgian-made weapons. Of these, the Army acquired 8,179 and the Marine Corps laid claim to 5,115.

Early Problems

In 1985, the Army suspended procurement of the M249 until the contractor could incorporate a number of modifications into the design. The primary design problems involved the carrying handle, the difficulty in changing a hot barrel, and ammunition feed problems with standard M16 30-round magazines. FN Manufacturing incorporated the requested changes into a product-improved M249 SAW; FNMI won a new solicitation in 1988.

Due to technical problems associated with the manufacturing process, deliveries of the product-improved SAW fell three years behind schedule. Consequently, the U.S. Army did not issue the initial multiyear procurement contract until 1988; production commenced in 1990. As the U.S. Marine Corps continued to field the original version of the M249 SAW, these delays did not affect Marine acquisition and fielding. FN Manufacturing also developed a retrofit kit to correct the deficiencies of the early-production M249 SAW.

Lightweight M249 SPW

In October 1997, FN Manufacturing unveiled a lighter version of the M249 SAW at the Association of the U.S. Army (AUSA) annual convention. The lighter version of the M249, the Special Purpose Weapon, fulfills specific requirements of the Special Operations Command. The M249 SPW weighs 5.7 kilograms (12.54 lb), versus the 7.5 kilograms (16.5 lb) of the standard M249 SAW. The M249 SPW features a lighter barrel; it has no provision for a magazine feed or a tripod mount. The SPW also features a Picatinny rail fitted to the receiver and a lighter stock.

Ongoing Upgrades

The U.S. Army and FN Manufacturing continue to cooperate on further upgrades, currently in various stages of development and integration. Upgrades include a shorter 38.1-centimeter (15-in) barrel, the M5 collapsible buttstock, and the Optical Rail Top Cover for the Picatinny rail sight mount. The Mk 46 Mod 0 represents the current production-standard lightweight version of the M249 SAW, specifically for special operations applications.

M240 Series Medium Machine Gun. In 1976, the U.S. Army selected the FN Herstal 7.62x51mm NATO (.308 Winchester) MAG 58 for use as a coaxial tank machine gun; it was designated M240. On an exterior

pintle mount, the M240 also replaces the M60 machine gun on many tactical vehicles.

U.S. Production

Following adoption of the M240 in 1976, FN Herstal delivered 10,000 M240 machine guns to the U.S. Army in 1977. Subsequently, FN Manufacturing set up a facility in Columbia, South Carolina, for manufacture of the M240, M249, and M16. Procurement is ongoing.

Standard Medium MG

In 1995, the U.S. Army initiated the 7.62mm Machine Gun Program. Under the program, retrofit kits were required for the upgrade of existing M60 and M240 machine guns, as the selected weapon was to be standardized as the primary 7.62x51mm machine gun in service. Whichever weapon won the evaluation program had to be compatible with the new M122/M122E1 lightweight tripod and the XM993 armor-piercing ammunition then under development. The Army also required a 15,000-round barrel life, with an 1,800-round Class I stoppage rate.

For the M240, FN developed a kit containing a new top rail mount (the Picatinny rail) that accommodates a variety of optical and electro-optical sighting devices, new iron sights, a blank firing device, improved internal components to enhance mechanical reliability, and a new longer-life barrel.

In late 1995, the Army selected the M240 as the standard 7.62x51mm medium machine gun.

M2HB Heavy Machine Gun. Like its M1911A1 .45 ACP caliber pistol, John Browning's 12.7x99mm (.50-cal) M2 heavy machine gun – known by U.S. troops as the "50-cal" or "Ma Deuce" – stands as proof that age does not necessarily equate with obsolescence.

Undisputed Standard

Utterly reliable under all conditions and delivering decisive firepower, the M2 remains the undisputed standard for all heavy machine guns worldwide. Since the U.S. Army first adopted the M2 in 1923, generations of soldiers and Marines have learned to love the reassuring jackhammer-thump of the M2 in combat. Indeed, in June 2003, a U.S. Army ordnance survey team in Iraq found that the one weapon U.S. troops consistently requested in greater quantities was the M2HB heavy machine gun.

U.S. Department of Defense procurement of completely new M2HB heavy machine guns is now on an as-needed basis only. The latest procurement began in late 1999. Of the at least 62,400 M2 machine guns currently in service, many still bear World War II-vintage manufacture dates.

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Keeping Current

General Dynamics provides upgrade components to bring the M2 up to the M2A1 standard. Some of the components are common to the new Fifty/.50 lightweight machine gun developed by the firm. The components, available as a kit or individually, consist of:

- A new flash suppressor
- A new safety mechanism
- A quick-change barrel component, with a quick-change satellite-lined barrel featuring fixed headspace and timing
- A new barrel support
- A receiver mount for a variety of sights

Despite the sustained dominance of the M2HB over the past 90 years of service, the U.S. Army began procuring a lightweight replacement for the M2 in FY11. Nevertheless, the M2HB will no doubt soldier on for years to come.

Analysis. History has long demonstrated that the development and fielding of new small arms in the United States is a slow, time-consuming, and politically charged process. Even selection of such a mundane weapon as a new pistol for the U.S. armed forces proved to be a difficult and time-consuming process, inevitably interlinked with politics. This was due to several factors, not the least of which was bureaucratic inertia and user preference.

Indeed, the switch from the M1911A1 pistol to the M9 with its much less potent cartridge still stirs heated controversy decades later. As for reactions to the selection of the SIG P320 to replace the M9, stay tuned.

Small arms development programs often become political footballs, at the mercy of various congressional whims and international trade agreements. Witness the U.S. Army acquisition of M240 and M249 machine guns from Belgium, a move clearly tied to reciprocal sales of F-16 fighter aircraft to Belgium.

Incremental Improvement

Since the end of World War II, there have been relatively few successful technological advances in the field of small arms development. The Objective Individual Combat Weapon program serves as a graphic example of an unsuccessful major technical advance. The U.S. Army historically tends to prefer product improvement to new system development. The Army's ongoing programs to enhance the M249 SAW and M240 machine gun, as well as the ongoing

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enhancement of the M16 battle carbine series, are good examples of this institutional tendency.

Not a Linear Process

In the end, one cannot regard U.S. DoD small arms development and procurement as any sort of linear process. Immediate contingencies often clash with long-term development concepts, and congressional interests and individual service requirements further complicate an already cumbersome development and acquisition architecture.

In the universe of the U.S. infantryman's basic small arms, we clearly see this clash unfold. Despite the Army's desire for a new generation of small arms, more immediate constraints force the Army to engage in product-improvement programs for existing weapons instead. At the same time, U.S. troops persist in clamoring for the 1950s-era M14 rifle as an alternative to intermediate-caliber battle carbines and the venerable M1911A1 pistol instead of the M9. Yet, small arms programs move along somehow.



101st Airborne Division (Air Assault) Soldier with His M4 Carbine

Source: U.S. Army

Funding

In annual U.S. Department of Defense budget request documentation, each service specifies small arms procurement requirements to varying degrees of detail. The lack of consistency provides, at best, incomplete data regarding small arms procurement within the DoD as a whole. At worst, the data provided precludes meaningful analysis of DoD small arms procurement. For this reason, the Forecast International Weapons group no longer includes such funding data in this report.

Timetable

The failures of the XM8 have effectively killed the carbine portion of the Objective Individual Combat Weapon (OICW) program. Nevertheless, the U.S. Army still hopes to begin fielding a new generation of small arms at some point during the next 10 years.

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11th Armored Cavalry Regiment Soldier with His M14 Rifle

Source: U.S. Army

Worldwide Distribution/Inventories

Export Potential. U.S. military small arms are ubiquitous throughout the world because of the country's liberal export policy pertaining to these weapons. Adding to their worldwide prevalence are the licensed and unlicensed production programs of a number of firms in various nations.

Countries. According to U.S. government weapons export summaries, the following countries have been recipients of U.S. small arms exports and transfers since 1991: **Afghanistan (Taliban), Argentina, Bahrain, Belize, Bosnia-Herzegovina, Chile, the Republic of China (Taiwan), Costa Rica, Egypt, Greece, Guyana, Iraq, Israel, Jordan, Latvia, Lebanon, Lithuania, Mexico, Morocco, Oman, the Philippines, Saudi Arabia, Thailand, Turkey, and Uruguay.** In actuality, however, these countries represent a relatively small percentage of the totality of U.S. small arms in service worldwide.

Forecast Rationale

The Forecast International Weapons Group expects U.S. Department of Defense procurement of existing small arms designs to continue, albeit at a significantly reduced level averaging about 34,250 weapons per year. We believe the M4/M4A1 carbine will account for 80 percent of U.S. small arms procured during the forecast period.

Hard Times for New Designs

The incessant budget crises in Washington continue to wreak havoc with U.S. DoD plans for small arms development and procurement. The status of next-generation weapons programs remains, at best, in limbo.

SIG P320 Selected as the M17 MHS

On January 19, 2017, the U.S. Army awarded SIG Sauer a contract worth \$580 million to provide the SIG P320 as the M17/M18 Modular Handgun System, replacing the Beretta M9 as the standard service sidearm. Deliveries commenced in 2017 and will extend through 2027. SIG Sauer is producing the pistols at its Exeter, New Hampshire, facility.

Current plans call for the Army to purchase more than 280,000 handguns, according to Program Executive Office Soldier officials. The Army also plans to buy approximately 7,000 subcompact versions of the handgun. The other military services participating in

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the program may order 212,000 systems above the Army quantity.

Focus on Short-Term Needs

Current U.S. DoD small arms procurement reflects a distinct short-term emphasis in response to an evolving threat environment abroad and the reality of dwindling funding at home. These simultaneous conditions effectively trump significant expenditures for the next generation of small arms.

In sharp contrast to the U.S. Army's erstwhile emphasis on fielding next-generation weapons systems under the Objective Individual Combat Weapon (OICW) and Objective Crew Served Weapon (OCSW) programs, the U.S. DoD is now forced to deal with a distinct waning of interest by the White House and Congress in the near term – with an inevitable negative impact on appropriations.

For now, the best the DoD can hope for is to maintain existing small arms already in the inventory and attempt modest improvements when it can secure funding.

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