The M1 carbine (formally the United States Carbine, Caliber .30, M1) is a lightweight, easy to use, .30 caliber (7.62 mm) semi-automatic carbine that was a standard firearm for the U.S. military during World War II, the Korean War and well into the Vietnam War. The M1 carbine was produced in several variants and was widely used by not only the U.S. military, but by military, paramilitary and police forces around the world. It has also been a popular civilian firearm.

The M2 carbine is the selective-fire version of the M1 carbine capable of firing in both semi-automatic and full-automatic. The M3 carbine was an M2 carbine with an active infrared scope system.

Despite its name and similar appearance, the M1 carbine is not a shorter version of the M1 Garand rifle. It is a completely different firearm and it fires a different type of ammunition. It was simply called a carbine because it is smaller and lighter than the Garand.

On July 1, 1925, the U.S. Army began using the current naming system where the "M" is the designation for Model and the "number" represents the sequential development of equipment and weapons.[5] Therefore, the "M1 rifle" was the first rifle developed under this system. The "M1 carbine" was the first carbine developed under this system. The "M2 carbine" was the second carbine developed under the system, etc.

Development history

Limitations of weapons in the U.S. arsenal

The M1 Rifle and M1 Carbine share only a buttplate screw and use different sized .30 caliber ammunition

Briefing for staff personnel. Note: Folding stock M1A1 carbine on the table

81 mm mortar crew in action at Camp Carson, Colorado, April 24, 1943. The soldier on the left has a slung M1 Carbine.

A U.S. anti-tank crew in combat in the Netherlands, November 4, 1944. The soldier on the far right is holding an M1 Carbine

Prior to World War II, U.S. Army Ordnance received reports that the full-size M1 rifle was too heavy and cumbersome for most support troops (staff, mortarmen, radiomen, etc.) to carry. During prewar and early war field exercises, it was found that the M1 Garand impeded these soldier's mobility, as a slung rifle would frequently catch on brush, bang the helmet, or tilt over the eyes. Many soldiers found the rifle slid off the shoulder unless slung diagonally across the back, where it prevented the wearing of standard field packs and haversacks.

Additionally, Germany's use of glider-borne and paratroop forces to launch surprise attacks behind the front lines, generated a request for a new compact infantry weapon to equip support troops. This request called for a compact, lightweight defensive weapon with greater range, accuracy and firepower than handguns, while weighing half as much as the Thompson submachine gun or the M1 rifle.[6] The U.S. Army decided that a carbine would adequately fulfill all of these requirements, but specified that the new arm should weigh no more than five pounds and have an effective range of 300 yards. Paratroopers were also added to the list of intended users and a folding-stock version would also be developed.

Designing the M1 carbine

In 1938, the Chief of Infantry requested that the Ordnance Department develop a "light rifle" or carbine, though the formal requirement for the weapon type was not approved until 1940. This led to a competition in 1941 by major U.S. firearm companies and designers.

Winchester at first did not submit a carbine design, as it was occupied in developing the .30-06 Winchester M2 Military Rifle. The rifle originated as a design by Jonathan "Ed" Browning, brother of the famous firearm designer John Browning. A couple of months after Ed Browning's death in May 1939, Winchester hired David Marshall "Carbine" Williams who had begun work on a short-stroke gas piston design while serving a prison sentence at a North Carolina minimum-security work farm. Winchester, after Williams' release, had hired Williams on the strength of recommendations of firearms industry leaders, and hoped Williams would be able to complete various designs left unfinished by Ed Browning, including the Winchester .30-06 M2 rifle. Williams incorporated his short-stroke piston in the existing design. After the Marine Corps semi-automatic rifle trials in 1940, Browning's rear-locking tilting bolt design proved unreliable in sandy conditions. As a result, the rifle was redesigned to incorporate a Garand-style rotating bolt and operating rod, retaining Williams' short-stroke piston. By May 1941, Williams had shaved the M2 rifle prototype from about 9.5 lb (4.3 kg) to a mere 7.5 lb (3.4 kg).

Ordnance found unsatisfactory the first series of prototype carbines submitted by several firearms companies and some independent designers. Winchester had contacted the Ordnance Corps to examine their rifle M2 design. Major René Studler of Ordnance believed the rifle design could be scaled down to a carbine which would weigh 4.5 to 4.75 lb (2.0–2.2 kg) and demanded a prototype as soon as possible. The first model was developed at Winchester in 13 days by William C. Roemer, Fred Humeston and three other Winchester engineers under supervision of Edwin Pugsley, and was essentially Williams' last version of the .30-06 M2 scaled down to the .30 SL cartridge. This patchwork prototype was cobbled together using the trigger housing and lockwork of a Winchester M1905 rifle

and a modified Garand operating rod. The prototype was an immediate hit with army observers.
After the initial army testing in August 1941, the Winchester design team set out to develop a more refined version. Williams participated in the finishing of this prototype. The second prototype competed successfully against all remaining carbine candidates in September 1941, and Winchester was notified of their success the very next month. Standardization as the M1 Carbine was approved on October 22, 1941. This story was the loose basis for the 1952 movie *Carbine Williams* starring James Stewart. Contrary to the movie, Williams had little to do with the carbine's development, with the exception of his short-stroke gas piston design. Williams worked on his own design apart from the other Winchester staff, but it was not ready for testing until December 1941, two months after the Winchester M1 Carbine had been adopted and type-classified. Winchester supervisor Edwin Pugsley conceded that Williams' final design was "an advance on the one that was accepted", but noted that Williams' decision to go it alone was a distinct impediment to the project, and Williams' additional design features were not incorporated into M1 production. In a 1951 memo written in fear of a patent infringement lawsuit by Williams, Winchester noted his patent for the short-stroke piston may have been improperly granted as a previous patent covering the same principle of operation was overlooked by the patent office.
In 1973 the senior technical editor at the NRA contacted Edwin Pugsley for "a technical last testament" on M1 carbine history shortly before his death 19 Nov 1975. According to Pugsley, "The carbine was invented by no single man," but was the result of a team effort including Bill Roemer, Marsh Williams, Fred Humeston, Cliff Warner, at least three other Winchester engineers, and Pugsley himself. Ideas were taken and modified from the Winchester M2 Browning rifle (Williams' gas system), the Winchester 1905 rifle (fire control group), M1 Garand (buttstock dimensions and bolt and operating slide principles), and a percussion shotgun in Pugsley's collection (hook breech and barrel band assembly/disassembly).

Features

.30 Carbine cartridge

WW II M1 Carbine with a magazine pouch mounted on the stock that held two spare 15-round magazines

U.S. Army Rangers resting in the vicinity of Pointe du Hoc, which they assaulted in support of "Omaha" Beach landings on "D-Day", 6 June 1944. Note Ranger in right center, apparently using his middle finger to push cartridges into a M-1 carbine magazine. The carbine and a backpack frame are nearby.

Closeup of M1 carbine receiver. Note: original flip sight and push button safety.

Comparison of M1 Carbine magazines. Original 15-round magazine on left and 30-round on right.

Paratrooper armed with a folding stock M1A1 carbine, fires a bazooka at an enemy pillbox on Greary Point, Corregidor.

A Marine armed with an M1 Carbine and M8 grenade launcher attached to the muzzle, during the Battle of Iwo Jima.

Ammunition

The .30 Carbine cartridge is essentially a rimless version of the then obsolete .32 Winchester Self-Loading cartridge introduced for the Winchester Model 1905 rifle.[14] The propellant was much newer, though, taking advantage of chemistry advances. As a result, the .30 Carbine is approximately 27% more powerful than its parent cartridge. A standard .30 Carbine ball bullet weighs 110 grains (7.1 g), a complete loaded round weighs 195 grains (12.6 g) and has a muzzle velocity of 1,990 ft/s (610 m/s) giving it 967 ft·lbf (1,311 joules) of energy, when fired from the M1 carbine's 18" barrel.

At 100 yards (91 m), the M1 carbine can deliver groups between 3 and 5 inches, sufficient for its intended purpose as a close-range defensive weapon. The M1 carbine has a maximum range of 300 yards (270 m). However, bullet drop is significant past 200 yards (180 m). Therefore, the M1 has practical effective range of about 200 yards.

By comparison, the .30-06 M1 Garand is almost 3 times more powerful than the Carbine. M1 Garand rifles fire a .30 caliber ball bullet weighing 152 grains (9.8 g) at a muzzle velocity of 2,805 ft/s (855 m/s) giving a muzzle energy of 2,655 ft/lb (3,600 joules). However, the M1 carbine's ballistics are markedly superior to the .45ACP caliber submachine guns in common use at the time. As a result, the carbine offers much better range, accuracy and penetration. The M1 is also half the weight of a Thompson submachine gun and fires a lighter cartridge. Therefore, soldiers armed with the Carbine can carry much more ammunition than those armed with a Tommy Gun.

Categorizing the M1 carbine series has been the subject of much debate. Although commonly compared to the later German StG44 and Russian AK-47, the M1 and M2 carbines are under-powered and outclassed by comparison. The Carbine instead falls somewhere between the submachine gun and the assault rifle, and could be called a Personal Defense Weapon since it fulfilled a similar role.

One characteristic of .30 Carbine ammunition is that from the beginning of production, non-corrosive primers were specified. This was the first major use of this type of primer in a military firearm. Because the rifle had a closed gas system, not normally disassembled, corrosive primers would have led to a rapid deterioration of the gas system. The use of

non-corrosive primers was a novelty in service ammunition at this time. Some failures to fire were reported in early lots of .30 Carbine ammunition, attributed to moisture ingress of the non-corrosive primer compound.

Sights

The M1 carbine entered service with a simple flip sight, which had two settings: 150 and 300 yards. However, field reports indicated that this sight was inadequate, and in 1944, it was replaced by a sliding ramp-type adjustable sight with four settings: 100, 200, 250 and 300 yards. This new rear sight was also adjustable for windage.

Magazines

The M1 carbine entered service with a standard straight 15-round box magazine. The introduction of the select-fire M2 carbine in October 1944 also brought into service the curved 30-round magazine or "Banana Clip". After WW2, the 30-round magazine quickly became the standard magazine for both the M1 and M2 carbines, although the 15-round magazine remained in service until the end of the Vietnam war.

Perhaps the most common accessory used on the M1 carbine was a standard magazine belt pouch that was mounted to the right side of the stock and held two extra 15-round magazines. After the introduction of the 30-round magazine, it was common for troops to tape two 30-round magazines together, a practice that became known as "Jungle style". This led the military to introduce the "Holder, Magazine T3-A1" also called the "Jungle Clip", a metal clamp that held two magazines together without the need for tape.

The 30-round magazines introduced for use with the selective-fire M2 Carbine would not be reliably retained by the magazine catch made for the original M1 Carbine which was designed to retain a 15-round magazine, so the much heavier (when loaded) 30-round magazine would not be properly seated in the M1 Carbine magazine well. The loaded 30-round magazine would typically cant (impairing feed reliability) or even fall out, which helps explain why the 30-round magazines have a poor reliability record (they are also more prone to damage due to their added length and weight when loaded as thin steel is used to make them). Thus early production M1 Carbines must be fitted with the type IV magazine catch used on the M2 Carbine (and late production M1 Carbines) if it is to be used with 30-round magazines. The type IV magazine catch will have a leg on the left side to correspond with the additional nub on the 30-round magazines. It is also desirable to load 30-round magazines with only 25 rounds to protect their springs from metal fatigue, which can occur if they are left fully loaded for long periods.

Also, in the heat of combat, the M1 carbine's magazine release button was often mistaken for the safety. This caused soldiers to accidentally release the magazine when they meant to disengage the safety. As a result, the push-button safety was redesigned into a rotating lever-type safety.

Accessories

Due to requests from the field, the carbine was modified to incorporate a bayonet lug starting in 1945. However, very few carbines with bayonet lugs reached the front lines before the end of World War II. By the start of the Korean War, the bayonet lug-equipped M1 was standard issue. It is now rare to find an original M1 carbine without the bayonet lug. The M1 carbine mounts the standard M4 bayonet, which was based on the earlier M3 fighting knife and formed the basis for the later M5, M6 and M7 bayonet-knives.

A folding-stock version of the carbine (the M1A1) was also developed after a request for a compact and light infantry arm for airborne troops. The Inland Division of General

Motors manufactured 140,000 of them in two product runs in late 1942. They were originally issued to the 82nd and 101st Airborne divisions but were later issued to all army airborne units and the US Marine Corps.
As carbines were reconditioned, parts such as the magazine catch, rear sight, barrel band without bayonet lug, and stock were upgraded with current standard-issue parts. Also, both during and after WW2, many semi-automatic M1 carbines were converted to select-fire M2 carbines by using the T17 and T18 conversion kits. The conversion included a modified sear and slide and added a disconnector, disconnector lever, and selector switch that could be set for semi-auto or full-automatic fire.
During World War II, the T23 (M3) flash hider was designed to reduce the muzzle flash from the carbine, but was not introduced into service until the advent of the M3 carbine.[29] With the exception of T23 hiders mounted on M3 carbines, few if any T23 flash-hider attachments saw service during the war, though unit armorers occasionally hand-built improvised compensator/flash-hiders of their own design.
The M1 carbine was used with the M8 grenade launcher, which was developed in early 1944. It was fired with the .30 Carbine M6 Grenade Blank cartridge to launch 22 mm rifle grenades. Stress from firing rifle grenades would eventually crack the carbine's stock. It also could not use the M8 launcher with an M7 auxiliary "booster" charge (to extend its range) without breaking the stock. This made it a type of emergency-issue weapon.

Production

American infantrymen of the 290th Regiment fight in fresh snowfall near Amonines, Belgium. Soldier in foreground is armed with an M1 carbine.
A total of over 6.1 million M1 carbines of various models were manufactured, making it the most produced small arm for the American military during World War II (compared with about 5.4 million M1 rifles and about 1.3 million Thompson submachine guns). Despite being designed by Winchester, the great majority of these were made by other companies (see list of Military contractors below). The largest producer was the Inland division of General Motors, but many others were made by contractors as diverse as IBM, the Underwood typewriter company, and the Rock-Ola jukebox company. Few contractors made all the parts for carbines bearing their names: some makers bought parts from other major contractors or sub-contracted minor parts to companies like Marlin Firearms or Auto-Ordnance. Parts by all makers were required to be interchangeable. Often one company would get ahead or behind in production and parts would be shipped from one company to the other to help them catch up on their quota. When receivers were shipped for this purpose the manufacturers would often mark them for both companies. One of the stranger combinations were the M1's made by the combined efforts of Underwood and Quality Hardware. This receiver was subcontracted from Union Switch and Signal, not Underwood) One has to wonder what the GI thought when he looked at the manufacture's name of the Carbine he had been issued to carry into battle when it was marked UN-QUALITY. Many carbines were refurbished at several arsenals after the war, with many parts interchanged from original maker carbines. True untouched war production carbines, therefore, are the most desirable for collectors.
The M1 carbine was also one of the most cost effective weapons used by the United States Military during World War II. At the beginning of World War II the average production

cost for an M1 carbine was approximately $45, about half the cost of an M1 rifle at approximately $85 and about a fifth of the cost of a Thompson submachine gun at approximately $225. The .30 Carbine ammunition was also far cheaper to produce than the standard .30-06 ammunition; used less resources, was smaller, lighter, faster and easier to make. These were major factors in the United States Military decision to adopt the M1 carbine, especially when considering the vast numbers of weapons and ammunition manufactured and transported by the United States during World War II.

U.S. combat use

World War II

U.S. Marine in combat at Guam.

M1 Carbine at First Iwo Jima Flag Raising

The M1 carbine with its reduced-power .30 cartridge was not originally intended to serve as a primary weapon for combat infantrymen, nor was it comparable to more powerful assault rifles developed late in the war. However, it was markedly superior to the .45-caliber submachineguns in use at the time in both accuracy and penetration, and its lighter .30 cartridge allowed soldiers to carry more ammunition. As a result, the carbine was soon widely issued to infantry officers, American paratroopers, NCOs, ammunition bearers, forward artillery observers, and other frontline troops. The first M1 carbines were delivered in mid-1942, with initial priority given to troops in the European Theater of Operations (ETO).

The M1 carbine gained generally high praise for its small size, light weight and firepower, especially by those troops who were unable to use a full-size rifle as their primary weapon. However, its reputation in front-line combat was mixed and negative reports began to surface with airborne operations in Sicily in 1943, and increased during the fall and winter of 1944.

In the Pacific theater, soldiers and guerrilla forces operating in heavy jungle with only occasional enemy contact praised the carbine for its small size, light weight, and firepower. The Carbine bullets would easily penetrate the front and back of steel helmets, as well as

the body armor used by Japanese forces of the era.[41][42] Soldiers and Marines engaged in frequent daily firefights (particularly those serving in the Philippines) found the weapon to have insufficient penetration and stopping power.[43][44] Reports of the carbine's failure to stop enemy soldiers, sometimes after multiple hits, appeared in individual after-action reports, postwar evaluations, and service histories of both the U.S. Army and the U.S. Marine Corps.

The carbine's exclusive use of non-corrosive-primer ammunition was found to be a godsend by troops and ordnance personnel serving in the Pacific, where barrel corrosion was a significant issue with the corrosive primers used in .30-06 caliber weapons. However, in the ETO some soldiers reported misfires attributed to moisture ingress of the non-corrosive primer compound.

Selective-fire version

U.S. Army troops fighting in the streets of Seoul, Korea. September 20, 1950. The M1 in the foreground has the bayonet mounted.

Initially, the M1 carbine was intended to have a select-fire capability, but in order to speed up development it was decided to omit this feature. On 26 October 1944, in response to the Germans' widespread use of automatic weapons, especially the Sturmgewehr 44 assault rifle, the select-fire M2 carbine was adopted, along with a new 30-round magazine. The M2 had a fully automatic rate-of-fire of about 850–900 rounds-per-minute. Although actual M2 production began late in the war (April 1945), US Ordnance issued conversion-part kits to allow field conversion of semi-auto M1 carbines to the selective-fire M2 configuration. These converted M1/M2 select-fire carbines saw limited combat service in Europe, primarily during the final Allied advance into Germany. In the Pacific, both converted and original M2 carbines saw limited use in the last days of the fighting in the Philippines.

Infrared sight versions

The M3 carbine was an M2 carbine with the M2 infrared night sight or *sniperscope*. The M3 did not have iron sights. It was first used in combat by Army units during the invasion of Okinawa, about 150 M3 were used on Okinawa. For the first time, U.S. soldiers had a weapon that allowed them to visually detect Japanese infiltrating into American lines at night, even during complete darkness. A team of two or three soldiers was used to operate the weapon and provide support. At night, the scope would be used to detect Japanese patrols and assault units moving forward. At that point, the operator would fire a burst of automatic fire at the greenish images of enemy soldiers. The M3 carbine had an effective range of about 70 yards (64 meters), limited by the visual capabilities of the sight. Fog and rain further reduced the weapon's effective range.[46][47] However, it is estimated that fully 30% of Japanese casualties inflicted by rifle and carbine fire during the Okinawan campaign were caused by the M3 carbine.

The system was refined over time, and by the Korean War the improved M3 infrared night sight was in service. The M3 sight has a longer effective range than its predecessor, about 125 yards (114 meters). However, it still required the user to carry a heavy backpack-mounted battery pack to power the scope and infrared light. They were used primarily in static defensive positions in Korea to locate troops attempting to infiltrate in darkness. In total, about 20,000 sets were made before they became obsolete, and were surplussed to the public.

Korean War

M1 carbine in action during Korean War. Note: 30-round magazine, stock pouch for two 15-round Magazine and grenade launcher.

U.S. Marines holding captured Chinese Communists during fighting on the central Korean front. Note: M1 carbine with mounted bayonet

By the Korean War, the select fire M2 carbine had largely replaced the submachine-gun in U.S. service[48] and was the most widely used Carbine variant.[49][50] Although, the semi-auto M1 carbine was also widely used- especially by support troops. However, in Korea, all versions of the carbine soon acquired a widespread reputation for jamming in extreme cold weather, this being eventually traced to weak return springs and poor maintenance under the harsh conditions.

There were also many complaints from individual soldiers that the carbine bullet failed to stop heavily clothed or gear-laden North Korean and Chinese (PVA) troops even at close range and after multiple hits. Marines of the 1st Marine Division also reported instances of carbine bullets failing to stop enemy soldiers, and some units issued standing orders for carbine users to aim for the head. PVA infantry forces who had been issued captured U.S. small arms disliked the carbine for the same reason.

A 1951 official U.S. Army evaluation reported that ..."There are practically no data bearing on the accuracy of the carbine at ranges in excess of 50 yards. The record contains a few examples of carbine-aimed fire felling an enemy soldier at this distance or perhaps a little more. But they are so few in number that no general conclusion can be drawn from

them. Where carbine fire had proved killing effect, approximately 95 percent of the time the target was dropped at less than 50 yards." The evaluation also reported that ..."Commanders noted that it took two to three engagements at least to settle their men to the automatic feature of the carbine so that they would not greatly waste ammunition under the first impulse of engagement. By experience, they would come to handle it semiautomatically, but it took prolonged battle hardening to bring about this adjustment in the human equation."

Despite its mixed reputation, the M2 carbine's firepower often made it the weapon of choice, when it came to night patrols in Korea. And, troops would tape two or three 30 round magazines together to speed up the process of reloading. The M3 carbine with its infrared sniperscope was also used against night infiltrators, especially during the static stages of the conflict. M3 operators would not only use their carbines to dispatch individual targets, but also used tracer ammo to identify troop concentrations for machine gunners to decimate.

Vietnam War

ARVN soldiers with M1 carbines and U.S. Special Forces with M16s

The M1 and M2 carbines were again issued to U.S. forces during the Vietnam War, particularly with United States Air Force Security Police and United States Army Special Forces. These weapons began to be replaced by the M16 and by 1964 they were generally out of service by the mid 1970s, although they were used in limited numbers by U.S. troops and security personnel until the fall of Saigon in 1975.

At least 793,994 M1 and M2 carbines were given to the South Vietnamese and were widely used throughout the Vietnam War.[69] A number were captured during the war by Vietcong. "While the carbine's lighter weight and high rate of fire made it an excellent weapon for small-statured Asians, these guns lacked sufficient hitting power and penetration, and they were eventually outclassed by the AK-47 assault rifle."

The M1/M2/M3 carbines were the most heavily produced family of U.S. military weapons for several decades. They were used by every branch of the U.S. Armed Forces.