# Machine Guns M2 Browning

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*This article is about the .50 caliber M2 machine gun. For the Browning .30-06 machine gun, see* [*M1919 Browning machine gun*](https://en.wikipedia.org/wiki/M1919_Browning_machine_gun)*.*

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| **Browning Machine Gun, Cal. .50, M2, HB** |
| M2HB heavy machine gun |
| **Type** | [Heavy machine gun](https://en.wikipedia.org/wiki/Heavy_machine_gun) |
| **Place of origin** | [United States](https://en.wikipedia.org/wiki/United_States) |
| **Service history** |
| **In service** | M2HB from 1933–present |
| **Used by** | See [*Users*](https://en.wikipedia.org/wiki/M2_Browning#Users#Users) |
| **Wars** | [World War II](https://en.wikipedia.org/wiki/World_War_II)[Korean War](https://en.wikipedia.org/wiki/Korean_War)[First Indochina War](https://en.wikipedia.org/wiki/First_Indochina_War)[Suez Crisis](https://en.wikipedia.org/wiki/Suez_Crisis)[Vietnam War](https://en.wikipedia.org/wiki/Vietnam_War)[Six-Day War](https://en.wikipedia.org/wiki/Six-Day_War)[Yom Kippur War](https://en.wikipedia.org/wiki/Yom_Kippur_War)[Cambodian Civil War](https://en.wikipedia.org/wiki/Cambodian_Civil_War)[Cambodian-Vietnamese War](https://en.wikipedia.org/wiki/Cambodian-Vietnamese_War)[Falklands War](https://en.wikipedia.org/wiki/Falklands_War)[South African Border War](https://en.wikipedia.org/wiki/South_African_Border_War)[Namibian War of Independence](https://en.wikipedia.org/wiki/Namibian_War_of_Independence)[Invasion of Grenada](https://en.wikipedia.org/wiki/Invasion_of_Grenada)[United States invasion of Panama](https://en.wikipedia.org/wiki/United_States_invasion_of_Panama)[Gulf War](https://en.wikipedia.org/wiki/Gulf_War)[Somali Civil War](https://en.wikipedia.org/wiki/Somali_Civil_War)[Yugoslav Wars](https://en.wikipedia.org/wiki/Yugoslav_Wars)[Afghanistan](https://en.wikipedia.org/wiki/War_in_Afghanistan_%282001%E2%80%93present%29)[Iraq](https://en.wikipedia.org/wiki/Iraq_War) |
| **Production history** |
| **Designed** | 1918 |
| **Manufacturer** | Current: General Dynamics, Fabrique Nationale, U.S. Ordnance, and Manroy Engineering (UK)Former: Sabre Defense Industries, Colt's Patent Fire Arms Company, High Standard Company, Savage Arms Corporation, Buffalo Arms Corporation, General Motors Corporation (Frigidaire, AC Spark Plug, Saginaw Steering, and Brown-Lipe-Chappin Divisions), Kelsey Hayes Wheel Company, Springfield Armory, Wayne Pump Company, ERMCO, and Ramo Manufacturing |
| **Produced** | 1921–present (M2HB) |
| **Number built** | 3 million |
| **Specifications** |
| **Weight** | 38 kg (83.78 lb.)58 kg (127.87 lb.) with [tripod](https://en.wikipedia.org/wiki/Tripod_%28weapon%29) and T&E |
| **Length** | 1,656 mm (65.2 in) |
| [**Barrel**](https://en.wikipedia.org/wiki/Gun_barrel) **length** | 1,143 mm (45.0 in) |
|  |
| [**Cartridge**](https://en.wikipedia.org/wiki/Cartridge_%28firearms%29) | [.50 BMG (12.7×99mm NATO)](https://en.wikipedia.org/wiki/.50_BMG) |
| [**Action**](https://en.wikipedia.org/wiki/Firearm_action) | [Short recoil-operated](https://en.wikipedia.org/wiki/Recoil_operation) |
| [**Rate of fire**](https://en.wikipedia.org/wiki/Rate_of_fire) | 450–635 rounds/min (M2HB) 750–850 rounds/min (AN/M2)1,200 rounds/min (AN/M3) |
| [**Muzzle velocity**](https://en.wikipedia.org/wiki/Muzzle_velocity) | 2,910 ft/s (890 m/s) for M33 ball |
| **Effective range** | 1,800 m (2,000 yd)  |
| **Maximum range** | 2,000 m (2,200 yd) |
| **Feed system** | [Belt-fed](https://en.wikipedia.org/wiki/Belt_%28firearm%29) (M2 or M9 links) |

The **M2 Machine Gun**, **Browning .50 Caliber Machine Gun**, is a [heavy machine gun](https://en.wikipedia.org/wiki/Heavy_machine_gun) designed towards the end of [World War I](https://en.wikipedia.org/wiki/World_War_I) by [John Browning](https://en.wikipedia.org/wiki/John_Browning). It is very similar in design to Browning's earlier [M1919 Browning machine gun](https://en.wikipedia.org/wiki/M1919_Browning_machine_gun), which was chambered for the [.30-06](https://en.wikipedia.org/wiki/.30-06_Springfield) cartridge. The M2 uses the much larger and much more powerful [.50 BMG](https://en.wikipedia.org/wiki/.50_BMG) cartridge, which was developed alongside and takes its name from the gun itself (BMG standing for *Browning Machine Gun*). The M2 has been referred to as "Ma Deuce", or "the fifty" in reference to its caliber. The design has had many specific designations; the official designation for the current infantry type is **Browning Machine Gun, Cal. .50, M2, HB, Flexible**. It is effective against infantry, unarmored or lightly armored vehicles and boats, light fortifications and low-flying aircraft.

The Browning .50 caliber machine gun has been used extensively as a vehicle weapon and for aircraft armament by the [United States](https://en.wikipedia.org/wiki/United_States) from the 1920s to the present. It was heavily used during [World War II](https://en.wikipedia.org/wiki/World_War_II), the [Korean War](https://en.wikipedia.org/wiki/Korean_War), the [Vietnam War](https://en.wikipedia.org/wiki/Vietnam_War), and during operations in [Iraq](https://en.wikipedia.org/wiki/Iraq) and [Afghanistan](https://en.wikipedia.org/wiki/Afghanistan) in the 2000s (decade). It is the primary heavy machine gun of [NATO](https://en.wikipedia.org/wiki/NATO) countries, and has been used by many other countries. The M2 has been in use longer than any other [small arm](https://en.wikipedia.org/wiki/Small_arms) in U.S. inventory except the [.45 ACP](https://en.wikipedia.org/wiki/.45_ACP) [M1911 pistol](https://en.wikipedia.org/wiki/M1911_pistol), also designed by John Browning.

The M2HB is manufactured in the United States by [General Dynamics](https://en.wikipedia.org/wiki/General_Dynamics) and [U.S. Ordnance](https://en.wikipedia.org/wiki/U.S._Ordnance) for use by the United States government, and for US Foreign Allies via FMS sales. [FN Herstal](https://en.wikipedia.org/wiki/FN_Herstal) has manufactured the M2 machine gun since the 1930s. U.S. Ordnance developed their M2 Quick Change Barrel system after years of manufacturing machine guns for the U.S. Department of Defense and U.S. allies.

**History**

During World War I, the Germans introduced a heavily armored airplane, the [Junkers J.I](https://en.wikipedia.org/wiki/Junkers_J.I). The armor made aircraft machine guns using conventional rifle ammunition (such as the .30-06) ineffective. The United States became keenly aware of this problem when [Quentin Roosevelt](https://en.wikipedia.org/wiki/Quentin_Roosevelt)'s aircraft was shot down. Consequently, [American Expeditionary Force](https://en.wikipedia.org/wiki/American_Expeditionary_Force)'s commander General [John J. Pershing](https://en.wikipedia.org/wiki/John_J._Pershing) asked the Army Ordnance Department to develop a machine gun with a caliber of at least 0.50 inches (12.7 mm) and a muzzle velocity of at least 2,700 feet per second (820 m/s). This idea was inspired by an earlier large caliber machine gun developed by Germany; the [MG 18 TuF](https://en.wikipedia.org/wiki/MG_18_TuF) heavy machine gun, firing the [13.2mm TuF](https://en.wikipedia.org/wiki/13.2mm_TuF) round.

Efforts by John M. Browning and Fred T. Moore resulted in the water-cooled Browning machine gun, caliber .50, [M1921](https://en.wikipedia.org/wiki/M1921_Browning_machine_gun). An aircraft version was termed the Browning aircraft machine gun, caliber .50, M1921. These guns were used experimentally from 1921 until 1937. They had light-weight barrels and the ammunition only fed from the left side. Service trials raised doubts whether the guns would be suitable for aircraft or for anti-aircraft use. A heavy barrel M1921 was considered for ground vehicles.

John M. Browning died in 1926. Between 1927 and 1932, Dr. S. H. Green studied the design issues and service needs. The result was a single receiver design that could be turned into seven types of .50 caliber machine guns by using different jackets, barrels, and other components. The new receiver allowed right or left hand feed. In 1933, Colt manufactured several prototype Browning machine guns (including what would be known as the M1921A1 and M1921E2). With support from the Navy, Colt started manufacturing the M2 in 1933.

A variant without a water jacket, but with a thicker-walled, air-cooled [barrel](https://en.wikipedia.org/wiki/Gun_barrel) was designated the M2 HB (*HB* for *Heavy Barrel*). The added mass and surface area of the heavy barrel compensated somewhat for the loss of water-cooling, while reducing bulk and weight: the M2 weighs 121 lb. (55 kg) with a water jacket, but the M2 HB weighs 84 lb. (38 kg). Due to the long procedure for changing the barrel, an improved system was developed called QCB (quick change barrel). A lightweight version weighing 60 lb. (27 kg) was also developed.

**Design details**

The Browning M2 is an [air-cooled](https://en.wikipedia.org/wiki/Air-cooled), [belt-fed](https://en.wikipedia.org/wiki/Belt_%28firearm%29) [machine gun](https://en.wikipedia.org/wiki/Machine_gun). The M2 fires from a [closed bolt](https://en.wikipedia.org/wiki/Closed_bolt), operated on the [short recoil](https://en.wikipedia.org/wiki/Short_recoil) principle. The M2 fires the .50 BMG cartridge, which offers long range, accuracy and immense [stopping power](https://en.wikipedia.org/wiki/Stopping_power). The closed bolt firing cycle made the M2 usable as a synchronized machine gun on aircraft before and during World War II, as on the early versions of the [Curtiss P-40](https://en.wikipedia.org/wiki/Curtiss_P-40) fighter.

The M2 is a scaled-up version of John Browning's [M1917 .30 caliber machine gun](https://en.wikipedia.org/wiki/M1917_Browning_machine_gun) (even using the same timing gauges).

**Features**

The M2 has varying cyclic rates of fire, depending upon the model. The M2HB (heavy barrel) air-cooled ground gun has a cyclic rate of 450-575 rounds per minute. The early M2 water-cooled AA guns had a cyclic rate of around 450–600 rpm. The AN/M2 aircraft gun has a cyclic rate of 750–850 rpm; this increases to 1,200 rpm or more for AN/M3 aircraft guns fitted with electric or mechanical feed boost mechanisms. These maximum rates of fire are generally not achieved in use, as sustained fire at that rate will wear out the bore within a few thousand rounds, necessitating replacement. For the M2HB, slow fire is less than 40 rounds per minute and rapid fire more than 40 rounds per minute.

A U.S. Marine mans a .50 caliber machine gun as part of a security force during an exercise

The M2 has an effective range of 1,830 meters (2,000 yd) and a maximum effective range of 2,000 meters (2,200 yd) when fired from the [M3 tripod](https://en.wikipedia.org/wiki/M3_tripod). In its ground-portable, crew-served role as the M2HB, the gun itself weighs in at a hefty 84 pounds (38 kg), and the assembled M3 tripod another 44 pounds (20 kg). In this configuration, the V-shaped "butterfly" trigger is located at the very rear of the weapon, with a "spade handle" hand-grip on either side of it and the bolt release the center. The spade handles are gripped and the butterfly trigger is depressed with one or both thumbs. Recently new rear buffer assemblies have used squeeze triggers mounted to the hand grips, doing away with the butterfly triggers.

When the bolt release is locked down by the bolt latch release lock on the buffer tube sleeve, the gun functions in fully automatic mode. Conversely, the bolt release can be unlocked into the up position resulting in single-shot firing (the gunner must press the bolt latch release to send the bolt forward). Unlike virtually all other modern machine guns, it has no safety (although a sliding safety switch has recently been fielded to USMC armorers for installation on their weapons). Troops in the field have been known to add an improvised safety measure against accidental firing by slipping an expended shell casing under the butterfly trigger.

Twin M2HB .50 caliber machine gun during a Pre-aimed Calibration Fire (PACFIRE) exercise.

Because the M2 was intentionally designed to operate in many configurations, it can be adapted to feed from the left or right side of the weapon by exchanging the belt-holding pawls, and the front and rear cartridge stops (three-piece set to include link stripper), then reversing the bolt switch. The operator must also convert the top-cover belt feed slide assembly from left to right hand feed as well as the spring and plunger in the feed arm. This will take a well-trained individual less than two minutes to perform.

The charging assembly may be changed from left to right hand charge. A right hand charging handle spring, lock wire and a little know how are all that are required to accomplish this. The weapon can be battle ready and easily interchanged if the weapon is fitted with a retracting slide assembly on both sides of the weapon system to eliminate the need to have the weapon taken in to accomplish this task.

**Ammunition**

There are several different types of ammunition used in the M2HB and AN aircraft guns. From [World War II](https://en.wikipedia.org/wiki/World_War_II) through the [Vietnam War](https://en.wikipedia.org/wiki/Vietnam_War), the big Browning was used with standard ball, armor-piercing (AP), armor-piercing incendiary (API), and armor-piercing incendiary tracer (APIT) rounds. All .50 ammunition designated "armor-piercing" was required to completely perforate 0.875 inches (22.2 mm) of hardened steel armor plate at a distance of 100 yards (91 m) and 0.75 inches (19 mm) at 547 yards (500 m). The API and APIT rounds left a flash, report, and smoke on contact, useful in detecting strikes on enemy targets; they were primarily intended to incapacitate thin-skinned and lightly armored vehicles and aircraft, while igniting their fuel tanks.

Current ammunition types include: M33 Ball (706.7 grain) for personnel and light material targets, M17 tracer, M8 API (622.5 grain), M20 API-T (619 grain), and M962 SLAP-T. The latter ammunition along with the M903 SLAP (Saboted Light Armor Penetrator) round can perforate 1.34 inches (34 mm) of HHA (face-hardened steel plate) at 500 meters (550 yd), 0.91 inches (23 mm) at 1,200 meters (1,300 yd), and 0.75 inches (19 mm) at 1,500 meters (1,600 yd). This is achieved by using a 0.30-inch-diameter (7.6 mm) tungsten penetrator. The SLAP-T adds a tracer charge to the base of the ammunition. This ammunition was type classified in 1993.

When firing blanks, a large [blank-firing adapter](https://en.wikipedia.org/wiki/Blank-firing_adapter) (BFA) must be used to keep the gas pressure high enough to allow the action to cycle. The adapter is very distinctive, attaching to the muzzle with three rods extending back to the base. The BFA can often be seen on M2s during peacetime operations.

**Deployment**

An M2 fired from a [rigid-hulled inflatable boat](https://en.wikipedia.org/wiki/Rigid-hulled_inflatable_boat).

[B-25H](https://en.wikipedia.org/wiki/B-25_Mitchell) "Barbie III" showing four M2 feeds and [75mm M5 gun](https://en.wikipedia.org/wiki/75_mm_gun_%28US%29#Variants)

The M2 .50 Browning machine gun has been used for various roles:

* A medium infantry support weapon
* As an [anti-aircraft](https://en.wikipedia.org/wiki/Anti-aircraft) (AA) gun in some ships; up to six M2 guns could be mounted on the same turret.
* As an anti-aircraft gun on the ground. The original water-cooled version of the M2 was used on a tall AA tripod or vehicle-mounted anti-aircraft weapon on a sturdy pedestal mount. In later variants, twin and quadruple M2HB Brownings were used, such as the [M45 Quadmount](https://en.wikipedia.org/wiki/M45_Quadmount) used on the US [M16 half-track](https://en.wikipedia.org/wiki/M3_Half-track) carrier. Twin or quad-mount .50 M2 guns normally used alternating left-hand and right-hand feed.
* Primary or secondary weapon on an [armored fighting vehicle](https://en.wikipedia.org/wiki/Armored_fighting_vehicle).
* Primary or secondary weapon on a naval patrol boat.
* Spotting for the primary weapon on some [armored fighting vehicles](https://en.wikipedia.org/wiki/Armored_fighting_vehicle).
* Secondary weapon for anti-boat defense on large naval vessels (corvettes, frigates, destroyers, cruisers, etc.).
* [Coaxial gun](https://en.wikipedia.org/wiki/Coaxial_gun) or independent mounting in some tanks.
* Fixed-mounted primary armament, with the light-barrel version only, in World War II-era U.S. aircraft such as the [P-47 Thunderbolt](https://en.wikipedia.org/wiki/P-47_Thunderbolt), [P-51 Mustang](https://en.wikipedia.org/wiki/P-51_Mustang), and the Korean-era U.S. [F-86 Sabre](https://en.wikipedia.org/wiki/F-86_Sabre), sometimes synchronized to fire through the propeller arc in a twin mount atop the engine, as on the [P-40B Tomahawk](https://en.wikipedia.org/wiki/Curtiss_P-40) fighter.
* [Turret](https://en.wikipedia.org/wiki/Gun_turret)-mount or flexible-mounted defensive armament, again only with the light-barrel version, in World War II-era bombers such as the [B-17 Flying Fortress](https://en.wikipedia.org/wiki/B-17_Flying_Fortress), and [B-24 Liberator](https://en.wikipedia.org/wiki/B-24_Liberator).

**United States**

A U.S. soldier in [Normandy](https://en.wikipedia.org/wiki/Normandy) stands guard with the M2HB installed on a dual-purpose mounting.

At the outbreak of the Second World War the United States had versions of the M2 in service as fixed aircraft guns, anti-aircraft defensive guns (on aircraft, ships, or boats), infantry (tripod-mounted) guns, and as dual purpose anti-aircraft and anti-vehicular weapons on vehicles.

The .50 AN/M2 light-barrel aircraft Browning used in planes had a rate of fire of approximately 800 rounds per minute, and was used singly or in groups of up to eight guns for aircraft ranging from the [P-47 Thunderbolt](https://en.wikipedia.org/wiki/P-47_Thunderbolt) to the [B-25 Mitchell](https://en.wikipedia.org/wiki/B-25_Mitchell) bomber, which in the last J-version of the Mitchell could have upwards of fourteen M2s firing forward for ground attack missions - eight in a solid metal-structure nose, four more mounted in a pair of conformal twin-gunned [gun pods](https://en.wikipedia.org/wiki/Gun_pod) on the lower cockpit sides, and two more if the forward dorsal turret's pair of M2 guns were also aimed straight forward.

In the dual-purpose vehicle mount, the M2HB (heavy barrel) proved extremely effective in U.S. service: the Browning's .50 caliber AP and API rounds could easily penetrate [the engine block](https://en.wikipedia.org/wiki/Daimler-Benz_DB_605) or fuel tanks of a German [Bf 109](https://en.wikipedia.org/wiki/Bf_109) fighter attacking at low altitude, or perforate the hull plates and fuel tanks of a German [half-track](https://en.wikipedia.org/wiki/SdKfz_251) or [light armored car](https://en.wikipedia.org/wiki/Leichter_Panzerspahwagen). While the dual-purpose mounting was undeniably useful, it did normally require the operator to stand when using the M2 in a ground role, exposing him to return fire. Units in the field often modified the mountings on their vehicles, especially tanks and tank destroyers, to provide more operator protection in the anti-vehicular and anti-personnel role. The weapon was particularly hated by the Germans, whose attacks and ambushes against otherwise helpless stalled motor convoys were frequently broken up by .50 caliber machine gun fire. Vehicles would frequently "recon by fire" with the M2 Browning i.e. firing continuously at suspected points of ambush while moving through areas still containing enemy forces. One vehicle would fire exclusively to the right, the following vehicle to the left, the next one to the right, and so on in order to cover both flanks of the advancing convoy.

Besides vehicle-mounted weapons, the heavy weapons companies in a World War II U.S. Army infantry battalion or regiment were each issued one M2 Browning with tripod (ground) mount. Mounted on a heavily sandbagged tripod, the M2HB proved very useful in either a defensive role or to interdict or block road intersections from use by German infantry and motorized forces. The hammering of a heavy Browning could usually be relied upon to put a German infantry company face-down in the dirt. There are numerous instances of the M2 Browning being used against enemy personnel, particularly infantry assaults or for interdiction or elimination of enemy artillery observers or snipers at distances too great for ordinary infantry weapons.

An M2 overlooking the [Korengal Valley](https://en.wikipedia.org/wiki/Korengal_Valley) at [Firebase Phoenix](https://en.wikipedia.org/wiki/Firebase_Phoenix), Afghanistan, in 2007

The M2HB was not widely used in the Pacific campaign, due to several factors, including weight, the inherent nature of infantry jungle combat, and because road intersections were usually easily outflanked. However, it was used by fast-moving motorized forces in the Philippines to destroy Japanese blocking units on the advance to Manila. The quad mount .50 was also used to destroy Japanese emplacements.

The M2HB was used in [Korea](https://en.wikipedia.org/wiki/Korean_War) and [Vietnam](https://en.wikipedia.org/wiki/Vietnam_War), and later in [Iraq](https://en.wikipedia.org/wiki/Iraq_War). In 2003, U.S. Army SFC [Paul Ray Smith](https://en.wikipedia.org/wiki/Paul_Ray_Smith) used his M2HB mounted on an [M113 armored personnel carrier](https://en.wikipedia.org/wiki/M113_armored_personnel_carrier) to kill 20 to 50 enemies who were attacking a U.S. outpost, preventing an aid station from being overrun and allowing wounded soldiers to be evacuated, SFC Smith was killed during the firefight and was posthumously awarded the [Medal of Honor](https://en.wikipedia.org/wiki/Medal_of_Honor).

**M45 Quadmount**

Main article: [M45 Quadmount](https://en.wikipedia.org/wiki/M45_Quadmount)

M16 .50 AA Quad aka the 'Meat Chopper'

The M45 Quadmount was a quadruple mounting of four .50 M2HB guns with a single gunner situated behind an armored housing. This was used by U.S. AA battalions, fitted either on a towed trailer or mounted in a half-track carrier (M16 AA half-track). With 200 rounds per gun in a powered tracking mount, the guns proved very effective against low-flying aircraft. The use of four guns adequately compensated for the fact that the individual M2HB's rate of fire (450-550 rounds per minute) was low for an effective anti–aircraft weapon.

Towards the end of the war, as [Luftwaffe](https://en.wikipedia.org/wiki/Luftwaffe) attacks became less frequent, the quad .50 (nicknamed the *Meat Chopper* or *Krautmower*) was increasingly used in an anti-personnel role, similarly to the more powerful German 20mm [Flakvierling](https://en.wikipedia.org/wiki/2_cm_FlaK_30#2_cm_Flakvierling_38). Snipers firing from trees were engaged by the quad gunner at trunk level - the weapon would cut down and destroy the entire tree, and the sniper with it.

The M45 Quadmount was still in use during the Vietnam War.

**Commonwealth and other forces**

Australian M113 with twin mounted [M1919 Browning](https://en.wikipedia.org/wiki/M1919_Browning_machine_gun) and M2 Browning Quick Change Barrel machine guns.

[Commonwealth](https://en.wikipedia.org/wiki/Commonwealth_of_Nations) use of the M2 Browning .50 caliber machine gun (known as the .5 Browning in British and Commonwealth service) was limited in the Second World War, though from 1942 it was standard armament on US-built AFVs provided under lend-lease such as the [M4 Sherman](https://en.wikipedia.org/wiki/M4_Sherman), [M7 Priest](https://en.wikipedia.org/wiki/M7_Priest), [M8 Greyhound](https://en.wikipedia.org/wiki/M8_Greyhound), or [M10 Wolverine](https://en.wikipedia.org/wiki/M10_Wolverine) variously used by [British](https://en.wikipedia.org/wiki/United_Kingdom), [Canadian](https://en.wikipedia.org/wiki/Canadian), [Australian](https://en.wikipedia.org/wiki/Australian), [South African](https://en.wikipedia.org/wiki/South_African) and [New Zealand](https://en.wikipedia.org/wiki/New_Zealand) units. Nevertheless, the heavy Browning's effectiveness was praised by many British and Commonwealth soldiers in infantry, armored, and ordnance branches. Many commanders thought the .50 Browning the best weapon in its class, certainly the best of the American weapons, including the M1 Garand and carbine. In North Africa, after Commonwealth units began to obtain sufficient parts, manuals, gauges, and ammunition for the new weapon, the .50 Browning was increasingly used, eventually replacing the 15 mm Besa, but in Italy was often deleted from top turret mountings because the mount exposed the operator to low branches and enemy fire. Some [SAS](https://en.wikipedia.org/wiki/Special_Air_Service) units used the aircraft (AN/M2) version of the gun, while turret-mounted .5 Brownings were used later in the war in such aircraft as the [Lancaster bomber](https://en.wikipedia.org/wiki/Avro_Lancaster).

M2 Browning Machine Gun of Portuguese Army

After the Second World War, the .50 Browning continued to see action in [Korea](https://en.wikipedia.org/wiki/Korean_War) and other theaters, in aircraft, tripod (ground), ground AA (hip-ring), and vehicle mounts. One of its most notable actions in a ground role was in a fierce battle with a nine-man SAS team at the [Battle of Mirbat](https://en.wikipedia.org/wiki/Battle_of_Mirbat) in [Oman](https://en.wikipedia.org/wiki/Oman) in July 1972, where the heavy Browning and its API ammunition was used to help repulse an assault by 250 Yemeni [Adoo](https://en.wikipedia.org/wiki/Popular_Front_for_the_Liberation_of_Oman) guerrillas, though the more famous weapon from the battle is a [25 pounder gun](https://en.wikipedia.org/wiki/25_pounder_gun)

A .50 caliber Browning was installed along with a .30 caliber Browning machine gun in each compact one-man turret on M113 APCs used by the Royal Australian Armored Corps in South Vietnam.

**M2 as a sniper rifle**

The M2 machine gun has also been used as a long-range [sniper rifle](https://en.wikipedia.org/wiki/Sniper_rifle), when equipped with a telescopic sight. Soldiers during the Korean War used scoped M2s in the role of a sniper rifle, but the practice was most notably used by US Marine Corps sniper [Carlos Hathcock](https://en.wikipedia.org/wiki/Carlos_Hathcock) during the Vietnam War. Using an Unertl telescopic sight and a mounting bracket of his own design, Hathcock could quickly convert the M2 into a sniper rifle, using the traversing-and-elevating (T&E) mechanism attached to the [tripod](https://en.wikipedia.org/wiki/Tripod_%28weapon%29) and a bolt on pistol grip kit that converts the M2 to fire semi-automatically by activating the trigger on the side plate to assist in aiming at stationary targets. When firing semi-automatically, Hathcock hit man-size targets beyond 2000 yards—twice the range of a standard-caliber sniper rifle of the time (a [.30-06](https://en.wikipedia.org/wiki/.30-06) [Winchester Model 70](https://en.wikipedia.org/wiki/Winchester_Model_70)). In fact, Hathcock set the record for the longest confirmed kill at 2,460 yards or 1.3 miles (2,250 m), a [record](https://en.wikipedia.org/wiki/Longest_recorded_sniper_kills#Confirmed_kills_1.2C250_m_.281.2C367_yd.29_or_greater) which stood until 2002.

**Variants and derivatives**

**M2 variants**

An M2HB in the [French Foreign Legion's 2nd Infantry Regiment](https://en.wikipedia.org/wiki/2nd_Foreign_Infantry_Regiment) during an exercise.

The basic M2 was deployed in US service in a number of subvariants, all with separate complete designations as per the US Army system. The basic designation as mentioned in the introduction is Browning Machine Gun, Cal. .50, M2, with others as described below.

The development of the [M1921](https://en.wikipedia.org/wiki/M1921_Browning_machine_gun) water-cooled machine gun which led to the M2, meant that the initial M2s were in fact water-cooled. These weapons were designated Browning Machine Gun, Cal. .50, M2, Water-Cooled, Flexible. There was no fixed water-cooled version.

Improved air-cooled heavy barrel versions came in three subtypes. The basic infantry model, Browning Machine Gun, Cal. .50, M2, HB, Flexible, a fixed developed for use on the [M6 Heavy Tank](https://en.wikipedia.org/wiki/M6_Heavy_Tank) designated Browning Machine Gun, Cal. .50, M2, HB, Fixed, and a "turret type" whereby "Flexible" M2s were modified slightly for use in tank turrets. The subvariant designation Browning Machine Gun, Cal. .50, M2, HB, TT was only used for manufacturing, supply, and administration identification and separation from flexible M2s.

M2HB heavy machine gun

A number of additional subvariants were developed after the end of the Second World War. The Caliber .50 Machine Gun, Browning, M2, Heavy Barrel, M48 Turret Type was developed for the commander's cupola on the [M48 Patton](https://en.wikipedia.org/wiki/M48_Patton) tank. The cupola mount on the M48A2 and M48A3 was thoroughly disliked by most tankers, as it proved unreliable in service. An externally mounted M2 was later adopted for the commander's position on the [M1 Abrams](https://en.wikipedia.org/wiki/M1_Abrams) tanks. Three subvariants were also developed for use by the [US Navy](https://en.wikipedia.org/wiki/United_States_Navy) on a variety of ships and watercraft. These included the Caliber .50 Machine Gun, Browning, M2, Heavy Barrel, Soft Mount (Navy) and the Caliber .50 Machine Gun, Browning, M2, Heavy Barrel, Fixed Type (Navy). The fixed types fire from a [solenoid](https://en.wikipedia.org/wiki/Solenoid) trigger and come in left or right hand feed variants for use on the Mk 56 Mod 0 dual mount and other mounts.

**M2E2/M2A1**

The M2E2 modification with quick-change barrel

There is an upgrade program for existing infantry M2HBs and other M2s currently in U.S. Army service. The E50 provides a quick-change barrel capability, a rail accessory mount, an improved flash hider, and a manual safety. When modified with the barrel, the weapon is designated as an M2E2, while the total conversion is referred to as the M2A1. The E50 designation refers to "Enhanced 50", the modification program and conversion kit, rather than the weapon itself. In February 2012, the Army announced that it will upgrade all M2s to M2A1 standard.

**Aircraft guns**

**AN/M2**

[P-47](https://en.wikipedia.org/wiki/P-47) firing its eight M2 .50 machine guns during night gunnery

U.S. Marines man pintle-mounted M2HB machine guns

A [German Army](https://en.wikipedia.org/wiki/German_Army) door gunner mans an M3M onboard a [CH-53](https://en.wikipedia.org/wiki/Sikorsky_CH-53_Sea_Stallion) helicopter

The M2 machine gun was widely used during World War II and in later postwar conflicts as a remote or flexible aircraft gun. For fixed (offensive) or flexible (defensive) guns used in aircraft, a dedicated M2 version was developed called the .50 Browning AN/M2. The "AN" stands for "Army/Navy", since the gun was developed jointly for use by both services (unusual for the time, when the delineations between the Army and Navy were much stricter, and relations between armed services were often cool, if not outright hostile). The AN/M2 had a cyclic rate of 750–850 rounds per minute, with the ability to be fired from an electrically operated remote-mount solenoid trigger when installed as a fixed gun. Cooled by the aircraft's slip-stream, the air-cooled AN/M2 was fitted with a substantially lighter barrel, which also had the effect of increasing the rate of fire. The official designation for this weapon was Browning Machine Gun, Aircraft, Cal. .50, AN/M2 (Fixed) or (Flexible).

The XM296/M296 is a further development of the AN/M2 machine gun for the [OH-58 Kiowa Warrior](https://en.wikipedia.org/wiki/Bell_OH-58_Kiowa) helicopter. The M296 differs from previous remote firing variants in that it has adjustable firing rate (500–850 rpm), while lacking a bolt latch (allowing single-shot operation). As an air-cooled gun used aboard a relatively slow rotary-wing aircraft, the M296 has a burst restriction rate of 50 rounds per minute sustained fire or 150 rounds per minute maximum while conducting peacetime training requirements; the combat firing rate is unrestricted but does mandate a ten-minute cooling period after prolonged firing to avoid stoppages due to overheating.

**XM213/M213, XM218, GAU-15/A, GAU-16/A, and GAU-18/A**

The XM213/M213 was a modernization and adaptation of existing .50 caliber AN/M2s in inventory for use as a [pintle](https://en.wikipedia.org/wiki/Pintle) mounted door gun on helicopters using the [M59 armament subsystem](https://en.wikipedia.org/wiki/U.S._Helicopter_Armament_Subsystems#UH-1_Iroquois).

The GAU-15/A, formerly identified as the XM218, is a lightweight member of the M2/M3 family. The GAU-16/A was an improved GAU-15/A with modified grip and sight assemblies for similar applications. Both of these weapons were used as a part of the [A/A49E-11 armament subsystem](https://en.wikipedia.org/wiki/U.S._Helicopter_Armament_Subsystems#UH-1_Iroquois) (also known as the Defensive Armament System).

The GAU-18/A, is a lightweight variant of the M2/M3, and is used on the USAF's [MH-53 Pave Low](https://en.wikipedia.org/wiki/MH-53_Pave_Low) and [HH-60 Pave Hawk](https://en.wikipedia.org/wiki/HH-60_Pave_Hawk) helicopters. These weapons do not use the M2HB barrel, and are typically set up as left-hand feed, right-hand charging weapons, but on the HH-60 Pavehawks that use the EGMS (External Gun Mount System) the gun is isolated from the shooter by a recoil absorbing cradle and all weapons are set up as right hand charge but vary between left and right hand feed depending on what side of the aircraft it is on. A feed chute adapter is attached to the left or right hand feed pawl bracket allowing the weapon to receive ammunition through a feed chute system connected to externally mounted ammunition containers holding 600 rounds each.

**AN/M3, GAU-21/A, and M3P**

During World War II, a faster-firing Browning was developed for aircraft use. The AN/M3 features a mechanical or electrically boosted feed mechanism to increase the rate of fire to around 1,200 rounds per minute. The AN/M3 was used in Korea on the [F-86 Sabre](https://en.wikipedia.org/wiki/F-86_Sabre), and in Vietnam in the [XM14/SUU-12/A](https://en.wikipedia.org/wiki/U.S._aircraft_gun_pods) [gun pod](https://en.wikipedia.org/wiki/Gun_pod). Today, it can be found on the [Embraer EMB 314 Super Tucano](https://en.wikipedia.org/wiki/Embraer_EMB_314_Super_Tucano).

The [FN Herstal](https://en.wikipedia.org/wiki/FN_Herstal) license-produced M3-series is used by the U.S. military in two versions; the M3M and M3P. The fixed, remote-firing version, the FN M3P, is employed on the [Avenger Air Defense System](https://en.wikipedia.org/wiki/AN/TWQ-1_Avenger), and is currently being used on the [OH-58D](https://en.wikipedia.org/wiki/OH-58_Kiowa); augmenting the XM296 .50 cal. machine gun. The M3M flexible machine gun has been adopted by USN under the designation GAU-21/A for use on helicopters. The GAU-21/A is also being used by the United States Marine Corps to upgrade from the XM-218/GAU-16 .50 cal. machine gun for the CH-53E, on the UH-1Y Venom, and on the Canadian Forces' CH-146 Griffon via the INGRESS upgrade.

**Users**

The M2 family has been widely used abroad, primarily in its basic infantry configuration. A brief listing of designations for M2 family weapons follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Country** | [**NATO**](https://en.wikipedia.org/wiki/NATO) **Member** | **Designation** | **Description** |
| [Argentina](https://en.wikipedia.org/wiki/Argentina) | No | M2HB | 12.7 × 99 mm Browning M2HB machine gun |
| [Australia](https://en.wikipedia.org/wiki/Australia) | M2HB-QCB |
| [Austria](https://en.wikipedia.org/wiki/Austria) | üsMG M2 |
| [Bahrain](https://en.wikipedia.org/wiki/Bahrain) |  |
| [Belgium](https://en.wikipedia.org/wiki/Belgium) | Yes |  |
| [Benin](https://en.wikipedia.org/wiki/Benin) | No |  |
| [Bolivia](https://en.wikipedia.org/wiki/Bolivia) |  |
| [Brazil](https://en.wikipedia.org/wiki/Brazil) | Mtr .50 M2 HB "BROWNING" |
| [Bulgaria](https://en.wikipedia.org/wiki/Bulgaria) | Yes |  |
| [Burkina Faso](https://en.wikipedia.org/wiki/Burkina_Faso) | No |  |
| [Burundi](https://en.wikipedia.org/wiki/Burundi) |  |
| [Cameroon](https://en.wikipedia.org/wiki/Cameroon) |  |
| [Canada](https://en.wikipedia.org/wiki/Canada) | Yes | FN M2HB-QCB, GAU-21 |
| [Chad](https://en.wikipedia.org/wiki/Chad) | No |  |
| [Chile](https://en.wikipedia.org/wiki/Chile) |  |
| [Colombia](https://en.wikipedia.org/wiki/Colombia) |  |
| [Cote d'Ivoire](https://en.wikipedia.org/wiki/Ivory_Coast) |  |
| [Croatia](https://en.wikipedia.org/wiki/Croatia) | Yes |  |
| [Democratic Republic of Congo](https://en.wikipedia.org/wiki/Democratic_Republic_of_the_Congo) | No |  |
| [Denmark](https://en.wikipedia.org/wiki/Denmark) | Yes | M/50 TMG |
| ? | 12.7 × 99 mm FNH M3M machine gun |
| [Djibouti](https://en.wikipedia.org/wiki/Djibouti) | No |  | 12.7 × 99 mm Browning M2HB machine gun |
| [Dominican Republic](https://en.wikipedia.org/wiki/Dominican_Republic) |  |
| [Ecuador](https://en.wikipedia.org/wiki/Ecuador) |  |
| [Egypt](https://en.wikipedia.org/wiki/Egypt) |  |
| [El Salvador](https://en.wikipedia.org/wiki/El_Salvador) |  |
| [Estonia](https://en.wikipedia.org/wiki/Estonia) | Yes | *Browning M2* sometimes as *Raskekuulipilduja Browning M2* | 12.7 × 99 mm Browning M2HB. Usually mounted on vehicles, such as the [Pasi XA-180 and XA-188](https://en.wikipedia.org/wiki/Patria_Pasi#Operators), but the tripod version is also in use. |
| [Ethiopia](https://en.wikipedia.org/wiki/Ethiopia) | No |  | 12.7 × 99 mm Browning M2HB machine gun |
| [France](https://en.wikipedia.org/wiki/France) | Yes |  |
| [Finland](https://en.wikipedia.org/wiki/Finland) | No | 12,7 RSKK 2005 |
| [Gabon](https://en.wikipedia.org/wiki/Gabon) |  |
| [Gambia](https://en.wikipedia.org/wiki/The_Gambia) |  |
| [Ghana](https://en.wikipedia.org/wiki/Ghana) |  |
| [Germany](https://en.wikipedia.org/wiki/Germany) | Yes | M3M, MG50 |
| [Greece](https://en.wikipedia.org/wiki/Greece) |  |
| [Guatemala](https://en.wikipedia.org/wiki/Guatemala) | No |  |
| [Honduras](https://en.wikipedia.org/wiki/Honduras) |  |
| [Hungary](https://en.wikipedia.org/wiki/Hungary) | Yes |  |
| [India](https://en.wikipedia.org/wiki/India) | No |  |
| [Indonesia](https://en.wikipedia.org/wiki/Indonesia) |  |
| [Iran](https://en.wikipedia.org/wiki/Iran) |  |
| [Ireland](https://en.wikipedia.org/wiki/Republic_of_Ireland) | .5 Heavy Machine Gun (HMG)  |
| [Israel](https://en.wikipedia.org/wiki/Israel) |  |
| [Italy](https://en.wikipedia.org/wiki/Italy) | Yes |  |
| [Jamaica](https://en.wikipedia.org/wiki/Jamaica) | No |  |
| [Japan](https://en.wikipedia.org/wiki/Japan) | 12.7mm Heavy Machine Gun M2 |
| [Jordan](https://en.wikipedia.org/wiki/Jordan) |  |  |
| [Republic of Korea](https://en.wikipedia.org/wiki/South_Korea) | K6 | 12.7 × 99 mm Browning M2HB with additional modification; licensed by [Daewoo Precision Industries](https://en.wikipedia.org/wiki/S%26T_Daewoo) |
| [Kuwait](https://en.wikipedia.org/wiki/Kuwait) |  | 12.7 × 99 mm Browning M2HB machine gun |
| [Lebanon](https://en.wikipedia.org/wiki/Lebanon) |  |
| [Liberia](https://en.wikipedia.org/wiki/Liberia) |  |
| [Libya](https://en.wikipedia.org/wiki/Libya) | No |  |
| [Lithuania](https://en.wikipedia.org/wiki/Lithuania) | Yes |  |
| [Luxembourg](https://en.wikipedia.org/wiki/Luxembourg) | Mitrailleuse .50 M2 HB |
| [Madagascar](https://en.wikipedia.org/wiki/Madagascar) | No |  |
| [Malaysia](https://en.wikipedia.org/wiki/Malaysia) |  |
| [Mauritania](https://en.wikipedia.org/wiki/Mauritania) |  |
| [Mexico](https://en.wikipedia.org/wiki/Mexico) |  |
| [Morocco](https://en.wikipedia.org/wiki/Morocco) |  |
| [Myanmar](https://en.wikipedia.org/wiki/Myanmar) |  |
| [Netherlands](https://en.wikipedia.org/wiki/Netherlands) | Yes |  |
| [New Zealand](https://en.wikipedia.org/wiki/New_Zealand) | No |  |
| [Nicaragua](https://en.wikipedia.org/wiki/Nicaragua) |  |
| [Niger](https://en.wikipedia.org/wiki/Niger) |  |
| [Nigeria](https://en.wikipedia.org/wiki/Nigeria) |  |
| [Norway](https://en.wikipedia.org/wiki/Norway) | Yes | 12,7 mitraljøse |
| [Oman](https://en.wikipedia.org/wiki/Oman) | No |  |
| [Pakistan](https://en.wikipedia.org/wiki/Pakistan) |  |
| [Panama](https://en.wikipedia.org/wiki/Panama) |  |
| [Paraguay](https://en.wikipedia.org/wiki/Paraguay) |  |
| [Peru](https://en.wikipedia.org/wiki/Peru) |  |
| [Philippines](https://en.wikipedia.org/wiki/Philippines) |  |
| [Portugal](https://en.wikipedia.org/wiki/Portugal) | Yes |  |
| [Qatar](https://en.wikipedia.org/wiki/Qatar) | No |  |
| [Romania](https://en.wikipedia.org/wiki/Romania) | Yes |  |
| [Rwanda](https://en.wikipedia.org/wiki/Rwanda) | No |  |
| [Saudi Arabia](https://en.wikipedia.org/wiki/Saudi_Arabia) |  |
| [Senegal](https://en.wikipedia.org/wiki/Senegal) |  |
| [Serbia](https://en.wikipedia.org/wiki/Serbia) |  |
| [Singapore](https://en.wikipedia.org/wiki/Singapore) |  |
| [Somalia](https://en.wikipedia.org/wiki/Somalia) |  |
| [South Africa](https://en.wikipedia.org/wiki/South_Africa) |  |
| [Soviet Union](https://en.wikipedia.org/wiki/Soviet_Union) | No | M2 AA variant, [Lend-Lease](https://en.wikipedia.org/wiki/Lend-Lease), 3100 pieces |
| [Spain](https://en.wikipedia.org/wiki/Spain) | Yes |  |
| [Sweden](https://en.wikipedia.org/wiki/Sweden) | No | *Kulspruta 88 (Ksp 88)* |
| [Switzerland](https://en.wikipedia.org/wiki/Switzerland) |  |
| [Taiwan](https://en.wikipedia.org/wiki/Taiwan) |  |
| [Thailand](https://en.wikipedia.org/wiki/Thailand) |  |
| [Togo](https://en.wikipedia.org/wiki/Togo) |  |
| [Tonga](https://en.wikipedia.org/wiki/Tonga) |  |
| [Tunisia](https://en.wikipedia.org/wiki/Tunisia) |  |
| [Turkey](https://en.wikipedia.org/wiki/Turkey) | Yes |  |
| [United Arab Emirates](https://en.wikipedia.org/wiki/United_Arab_Emirates) | No |  |
| [United Kingdom](https://en.wikipedia.org/wiki/United_Kingdom) | Yes | L2A1 |
| L6, L6A1 | 12.7 × 99 mm Browning M2HB machine gun; [ranging gun](https://en.wikipedia.org/wiki/Ranging_gun) for the [L7 105 mm](https://en.wikipedia.org/wiki/Royal_Ordnance_L7) tank gun on the [Centurion tank](https://en.wikipedia.org/wiki/Centurion_tank) |
| L11, L11A1 | 12.7 × 99 mm Browning M2HB machine gun; ranging gun |
| L21A1 | 12.7 × 99 mm Browning M2HB machine gun; ranging gun for the 120 mm tank gun on the [Chieftain tank](https://en.wikipedia.org/wiki/Chieftain_tank) |
| L111A1 | 12.7 × 99 mm M2QCB machine gun |
| M3M | 12.7 × 99 mm Browning M2HB machine gun; Upgraded M2 for use on [Commando Helicopter Force](https://en.wikipedia.org/wiki/Commando_Helicopter_Force) and other units as helicopter door guns. |
| [United States](https://en.wikipedia.org/wiki/United_States) | Browning Caliber .50 M2, M2HB, XM218/GAU-16, GAU-21 | Browning Caliber .50 M2 Heavy Barrel machine gun |
| [Uruguay](https://en.wikipedia.org/wiki/Uruguay) | No |  | 12.7 × 99 mm Browning M2HB machine gun |
| [Venezuela](https://en.wikipedia.org/wiki/Venezuela) |  |
| [Yemen](https://en.wikipedia.org/wiki/Yemen) |  |
| [Zimbabwe](https://en.wikipedia.org/wiki/Zimbabwe) |  |

**See also**

* [FN BRG-15](https://en.wikipedia.org/wiki/FN_BRG-15) extra-large caliber machine gun
* [KPV heavy machine gun](https://en.wikipedia.org/wiki/KPV_heavy_machine_gun) extra-large caliber machine gun
* [List of U.S. Army weapons by supply catalog designation](https://en.wikipedia.org/wiki/List_of_U.S._Army_weapons_by_supply_catalog_designation)
* [MG 131 machine gun](https://en.wikipedia.org/wiki/MG_131_machine_gun), [World War II](https://en.wikipedia.org/wiki/World_War_II) 13 mm German aircraft-mounted gun
* [List of individual weapons of the U.S. Armed Forces](https://en.wikipedia.org/wiki/List_of_individual_weapons_of_the_U.S._Armed_Forces)
* [List of crew-served weapons of the U.S. Armed Forces](https://en.wikipedia.org/wiki/List_of_crew-served_weapons_of_the_U.S._Armed_Forces)
* [DShK](https://en.wikipedia.org/wiki/DShK), [NSV](https://en.wikipedia.org/wiki/NSV_%28machine_gun%29) & [Kord](https://en.wikipedia.org/wiki/Kord_machine_gun) 12.7 mm machine guns, Soviet/Russian equivalents.
* [M45 Quadmount](https://en.wikipedia.org/wiki/M45_Quadmount)

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