

M2 Browning

Browning Machine Gun, Caliber .50, M2, HB



M2HB heavy machine gun

Type	Heavy machine gun
Place of origin	United States of America

Service history

In service	1933 – present (M2HB)
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Production history

Designed	1918
Produced	1921 – present (M2HB)
Number built	3 million

Specifications

Weight	38 kg (83.78 lb.) 58 kg (127.87 lb.) with tripod and T&E
Length	1,656 mm (65.2 in)
Barrel length	1,143 mm (45.0 in)
Cartridge	.50 BMG (12.7×99mm NATO)
Action	Short recoil-operated
Rate of fire	485–635 rounds/min (M2HB) 750–850 rounds/min (AN/M2) 1,200 rounds/min (AN/M3)

Muzzle velocity	2,910 ft./s (890 m/s) for M33 ball
Effective range	1,800 m (2,000 yd.)
Maximum range	6,800 m (7,400 yd.)
Feed system	Belt-fed (M2 or M9 links)

The **M2 Machine Gun** or **Browning .50 Caliber Machine Gun**, is a heavy machine gun designed towards the end of World War I by John Browning. It is very similar in design to Browning's earlier M1919 Browning machine gun, which was chambered for the .30-06 cartridge. The M2 uses the much larger and much more powerful .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", as a GI phonetic slang 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, Caliber .50, M2, HB, Flexible**. It is effective against infantry, unarmored or lightly armored vehicles and boats, light fortifications and low-flying aircraft. The M2 has had the longest continuous service for a machine gun in the world.

The Browning .50 caliber machine gun has been used extensively as a vehicle weapon and for aircraft armament by the United States from the 1920s to the present. It was heavily used during World War II, the Korean War, the Vietnam War, and during the Iraq War and War in Afghanistan in the 2000s and 2010s. It is the primary heavy machine gun of NATO countries, and has been used by many other countries. The M2 has been in use longer than any other small arm in U.S. inventory except the .45 ACP M1911 pistol, also designed by John Browning.

The current M2HB is manufactured in the United States by General Dynamics and U.S. Ordnance for use by the United States government and for U.S. Foreign Allies via FMS sales.

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

The United States did not have many machine guns when it entered World War I, and most were old technology. The machine gun was heavily used in World War I, and weapons of larger than rifle caliber were appearing. Both the British and French had large caliber machine guns. The larger rounds were needed to defeat the armor that was being introduced to the battlefield. Armor was also appearing in the skies. During World War I, the Germans introduced a heavily armored airplane, the Junkers J.I. The armor made aircraft machine guns using conventional rifle ammunition (such as the .30-06) ineffective. Consequently, American Expeditionary Force's commander General John J. Pershing asked for a larger caliber machine gun. 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). U.S. Col. John Henry Parker, commanding a machine gun school in France, observed the effectiveness of a French 11 mm (0.43 in) incendiary armor-piercing round. The Army Ordnance Department ordered eight experimental Colt machine guns re-chambered for the French 11-mm cartridge. The French had developed a prototype machine gun for an even larger caliber.

The French 11-mm round was not suitable because its velocity was too low. Pershing wanted a bullet of at least 670 gr (43 g) and a muzzle velocity of 2,700 ft/sec (820 m/sec). Development with the French round was dropped.

Around July 1917, John M. Browning started redesigning his .30 caliber machine for a larger caliber. Winchester worked on the cartridge, which was a scaled up version of the .30/06.

Winchester initially added a rim to the cartridge because it wanted to use the cartridge in an anti-tank rifle, but Pershing insisted the cartridge be rimless. The first .50 machine gun underwent trials on 15 October 1918. It fired at less than 500 rounds per minute, and the muzzle velocity was only 2,300 ft/sec (700 m/sec). Cartridge improvements were promised. The gun was heavy, difficult to control, fired too slowly for anti-personnel, and was not powerful enough against armor.

While the .50 was being developed, some German anti-tank rifles and ammunition were seized. The German rounds had a muzzle velocity of 2,700 ft/sec (820 m/sec), an 800 gr (52 g) bullet, and could pierce 1 in (25 mm) at 250 yd. (230 m). Winchester made the .50 caliber round have similar performance. Ultimately, the muzzle velocity was 2,750 ft/sec (840 m/sec).

Efforts by John M. Browning and Fred T. Moore resulted in the water-cooled Browning machine gun, caliber .50, M1921. 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 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). The lightweight "Army/Navy" prefixed AN/M2 "light-barrel" version of the Browning M2 weighing 60 lb. (27 kg) was also developed, and became the standard aviation machine gun of the World War II-era for American military aircraft of nearly every type.

Design details

The Browning M2 is an air-cooled, belt-fed machine gun. The M2 fires from a closed bolt, operated on the short recoil principle. The M2 fires the .50 BMG cartridge, which offers long range, accuracy and immense 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 fighter.

The M2 is a scaled-up version of John Browning's M1917 .30 caliber 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.

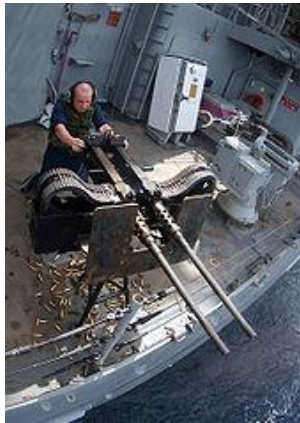


A U.S. Marine mans a .50 caliber machine gun as part of a security force during a training exercise with the 24th Marine Expeditionary Unit in November 2002.

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. 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. The upgraded M2A1 has a manual trigger block safety.



Twin M2HB .50 caliber machine gun during a Pre-aimed Calibration Fire (PACFIRE) exercise in May 2005.

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 M2 can be battle ready and easily interchanged if it is preemptively fitted with a retracting slide assembly on both sides of the weapon system. This eliminates the need to have the weapon removed from service to accomplish this task.

Ammunition

There are several different types of ammunition used in the M2HB and AN aircraft guns. From World War II through the 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 (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.



B-25H "Barbie III" showing four M2 feeds and 75mm M5 gun

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

- A medium infantry support weapon
- As an 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 Quad mount used on the US M16 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.
- Primary or secondary weapon on a naval patrol boat.
- Spotting for the primary weapon on some armored fighting vehicles.
- Secondary weapon for anti-boat defense on large naval vessels (corvettes, frigates, destroyers, cruisers, etc.).
- Coaxial gun or independent mounting in some tanks.
- Fixed-mounted primary armament, with the AN/M2 light-barrel version only, in World War II-era U.S. aircraft such as the P-47 Thunderbolt, P-51 Mustang, and the Korean-era U.S. F-86 Sabre, sometimes synchronized to fire through the propeller arc in a twin mount atop the engine, as on the P-40B Tomahawk fighter.
- Turret-mount or flexible-mounted defensive armament, again only with the AN/M2 light-barrel version, in World War II-era bombers such as the B-17 Flying Fortress, and B-24 Liberator.

United States



A U.S. soldier in 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 to the 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 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 or fuel tanks of a German Bf 109 fighter attacking at low altitude, or perforate the hull plates and fuel tanks of a German half-track or light armored car. 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 at 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 and Vietnam, and later in both Operation Desert Storm, the Afghan theater of Operation Enduring Freedom and in Iraq. In 2003, U.S. Army SFC Paul Ray Smith used his M2HB mounted on an 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.

M45 Quad mount



M16 .50 AA Quad aka the 'Meat Chopper'

The M45 Quad mount 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 attacks became less frequent, the quad .50 (nicknamed the *Meat Chopper* or *Krautmower*) was increasingly used in an anti-personnel role, similarly to the earlier-introduced (1940) and more powerful German 20mm Flakvierling. 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 Quad mount was still in use during the Vietnam War.

Commonwealth and other forces



Australian M113 with twin mounted M1919 Browning and M2 Browning Quick Change Barrel machine guns.

Commonwealth 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, M7 Priest, M8 Greyhound, or M10 Wolverine variously used by British, Canadian, Australian, South African and 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. All LRDGs, and some SAS units used the aircraft (AN/M2) version of the gun, while beam-mounted and turret-mounted .50 Brownings were used later in the war in such aircraft as the Short Sunderland and Lancaster bomber respectively.



USMC M2 fitted with a Leupold CQBSS variable power scope.

After the Second World War, the .50 Browning continued to see action in Korea 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 in Oman in July 1972, where the heavy Browning and its API ammunition was used to help repulse an assault by 250 Yemeni Adoo guerrillas, though the more famous weapon from the battle is a 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, 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 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 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 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 which stood until 2002.

Variants and derivatives

M2 variants



An M2HB in the French Foreign Legion's 2nd Infantry Regiment during an exercise.

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

The development of the M1921 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, Caliber .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, Caliber .50, M2, HB, Flexible, a fixed developed for use on the 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 sub variant designation Browning Machine Gun, Caliber .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 sub variants 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 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 tanks. Three sub variants were also developed for use by the U.S. 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 trigger and come in left or right hand feed variants for use on the Mk 56 Mod 0 dual mount and other mounts.

M2A1



The M2E2 modification with quick-change barrel

On October 15, 2010, the **M2A1** heavy machine gun was type classified by the U.S. Army. The M2A1, formerly known as the M2E2, incorporates improvements the design including a quick change barrel (QCB) with removable carrying handle, a new flash suppressor that reduces muzzle flash by 95 percent, fixed

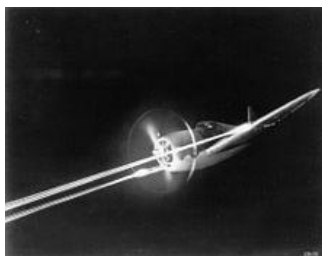
headspace and timing, a modified bolt, and a manual trigger block safety. "Headspace" is the distance between the face of the bolt and the base of the cartridge case, fully seated in the chamber. "Timing" is the adjustment of the gun so that firing takes place when the recoiling parts are in the correct position for firing. When a standard M2 had a barrel change, the headspace and timing had to be manually set. Improper adjustment could damage the weapon and cause serious injury to the user. Fixed headspace and timing reduces risk, and the carrying handle allows the barrel to be switched in seconds. In June 2011, the Army began conversion of M2HB machine guns to M2A1s. In February 2012, the Army announced that it will upgrade all 45,000 M2s to M2A1 standard. The M2A1 was named one of the greatest Army inventions of 2011. As of November 30, 2012, 8,300 built or converted M2A1s have been fielded by the U.S. Army.



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

Aircraft guns

AN/M2



P-47 firing its eight M2 .50 machine guns during night gunnery



A German Army door gunner mans an M3M on board a CH-53 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 36 inch (91.4 cm) length barrel, lightening the complete unit to 61 pounds (27.7 kg), which also had the effect of increasing the rate of fire. The official designation for this weapon was Browning Machine Gun, Aircraft, Caliber .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 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 mounted door gun on helicopters using the M59 armament subsystem.

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 (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 and 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, and in Vietnam in the XM14/SUU-12/A gun pod. Today, it can be found on the Embraer EMB 314 Super Tucano.

The 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, and is currently being used on the OH-58D; 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.