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Schwarzlose

Notes: This weapon is the only blowback machinegun to see serious use by any country. This would normally lead to a fast, uncontrollable rate of fire; however, the Schwarzlose used a very heavy breech block and a toggle lever to create an actual mechanical disadvantage to dramatically slow the rate of fire. The first models, the M/05 and M/07, used an oil pump to lubricate the cartridges as they were loaded into the chamber; by 1912 and the M/07/12, this was realized to be unnecessary, and a little more weight was added to the breech block to force dry rounds into the action. One advantage to the blowback system is that it is mechanically simple; the disadvantage in a machinegun is that it is heavy. The Austro-Hungarians used the weapon in 8mm Austrian Service chambering. The Germans also used the Schwarzlose in World War 1, chambered for 8mm Mauser; the Greek and Dutch armies also used the Schwarzlose, the Greeks in 6.5mm Greek Service, and the Dutch in 6.5mm Dutch Mannlicher. The Hungarians and Italians used it as late as 1945, in 8mm Mauser.

Weapon	Ammunition	Weight	Magazines	Price
Schwarzlose	8mm Austrian Service	19.9 kg (23.9 kg with Water)	250 Belt	\$2464
Schwarzlose	8mm Mauser	21.04 kg (25.04 kg with Water)	250 Belt	\$2692
Schwarzlose	6.5mm Greek Service	17.33 kg (21.33 kg with Water)	250 Belt	\$1954
Schwarzlose	6.5mm Dutch Mannlicher	17.34 kg (21.34 kg with Water)	250 Belt	\$1957

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Schwarzlose (8mm Austrian)	5	4	2-3-Nil	9	1	1	131
Schwarzlose (8mm Mauser)	5	4	2-3-Nil	9	1	1	131
Schwarzlose (6.5mm Greek)	5	3	2-Nil	9	1	1	114
Schwarzlose (6.5mm Dutch)	5	3	2-Nil	9	1	1	115

FN MAG

Notes: Perhaps the most ubiquitous machinegun in the world at the moment, the MAG (perhaps more properly known as the MAG-58) is used in standard or modified form by over 70 countries at present. This is most likely due to the MAG's reliability, ease of care, and ruggedness. The MAG will probably find more customers as time goes on and serve for a long time into the future.

The British use the MAG, calling it the L7A1 GPMG. This led to the troops calling it the Jimpy. Several other countries have affectionate nicknames for the MAG.

The MAG's action is basically a greatly updated and upgraded form of the Browning Automatic Rifle, turned upside down and converted to belt-feed. It also takes inspiration from the Nazi MG-42 in its operation, particularly elements that give it a high rate of fire. The action is gas-operated and, in most cases, fed by a disintegrating-link belt (though it can also be fed by the DM-1 50-round continuous articulated belt). For the most part, construction is of steel, and the receiver itself is made from riveted steel plates, reinforced at the front and rear, making it very robust. Feed is from the right side, and empty case ejection is from the bottom of the receiver. The gas block includes a rate regulator, which allows the shooter to compensate for possible fouling as the MAG is fired; this gas regulator can also be used to adjust the rate of fire itself from 600-1000 rounds per minute. (Late MAGs ROF can be moved upwards to 1300 RPM, but this requires the user to partially disassemble the weapon to replace the buffer assembly with a different high-rate of fire buffer assembly.) The barrel is 19.7 inches long and tipped with a flash suppressor over 2.5 inches in length; the bore is also hard-chromed. The feed mechanism is one of the most reliable found in any machinegun in the world. Early stocks for the MAG were made from wood, but MAGs these days primarily are found with polymer stocks. The sights consist of a front blade and a rear aperture sight; the rear sight may be flipped up, becoming an adjustable leaf sight. The folding bipod is mounted at the front of the receiver and, while not adjustable for height, the right leg is adjustable to allow for cant. The MAG may be mounted on tripod or pintle mount; versions have also been designed with spade grips instead of a stock, primarily for use as helicopter door guns. An adapter also allows the MAG to be mounted on the old Browning M-1917/1919 tripods. Variations of the MAG can also be used as conventional helicopter armament, mounted in AFVs, and are even used to arm some aircraft.

Amazingly, a semiautomatic-only version of the MAG is made. This version, the M-240SLR made by Ohio Ordnance Works in the US, conforms for the most part to the MAG/M-240, though there are differences in the shape of the handguard, the length of the MIL-STD-1913 rail atop the receiver, and the trigger group, which is modified to be very difficult to convert to automatic fire.

A (presumably unlicensed) copy of the MAG is made by Norinco in China, they offer it for export, but their troops do not use it. It is virtually identical to a Belgian MAG, except for the pepperpot-type muzzle brake. This is the CQ 7.62x51.

Twilight 2000 Notes: Though you can amend the number of countries using the MAG to about 45-50, it is still the most common machinegun in the world. The M-240SLR does not exist in the Twilight 2000 timeline, nor does the CQ 7.62x51.

Weapon	Ammunition	Weight	Magazines	Price
MAG (Early)	7.62mm NATO	11.8 kg	50 Belt, 100 Belt, 200 Belt	\$3054
MAG (Current)	7.62mm NATO	10.15 kg	50 Belt, 100 Belt, 200 Belt	\$3064
CQ 7.62x51	7.62mm NATO	10.85 kg	50 Belt, 100 Belt, 200 Belt	\$3102

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MAG (Early)	5/10	4	2-3-Nil	8	2	6/12	61
(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	79
(With Tripod)	5/10	4	2-3-Nil	8	1	1/3	122
MAG (Current)	5/10/13	4	2-3-Nil	8	3	6/13/16	61
(With Bipod)	5/10/13	4	2-3-Nil	8	1	3/6/8	79
(With Tripod)	5/10/13	4	2-3-Nil	8	1	1/3/4	122
CQ 7.62x51	5/10	4	2-3-Nil	8	2	5/9	61
(With Bipod)	5/10	4	2-3-Nil	8	1	2/5	79
(With Tripod)	5/10	4	2-3-Nil	8	1	1/2	122

FN M-2HB/QCB

Notes: This is an M-2HB machinegun modified to allow quick changing of the barrel without the tedious headspace and timing adjustments normally necessary on the M-2HB. This also greatly reduces the chances of stoppages. An incidental effect is that the M-2HB/QCB can fire blanks without a special blank adapter. The new parts also make the weapon somewhat lighter than a standard M-2HB. These versions of the M-2HB have become more and more common as the years went by, and a QCB version of the M-2HB is now the standard M-2HB for the U S military (though I don't know if this is the Belgian kit or not). The M-2HB/QCB can use M-2HB barrels if they are machined to accept the QCB kit. The QCB kit makes the M-2HB a true sustained fire heavy support weapon, as the headspacing and timing is often impossible in combat conditions. The QCB has the same dimensions as the standard M-2HB and can be used on the same tripods or pintle mounts. This weapon cannot be fired without a tripod or vehicle mount.

Weapon	Ammunition	Weight	Magazines	Price
M-2HB/QCB	.50 Browning Machinegun	36 kg	110 Belt	\$9996

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range

M-2HB/QCB (Normal Ammo)	5	9	2-3-4	11	1	3	375
M-2HB/QCB (SLAP Ammo)	5	9	1-2-3	11	1	3	450

FN M-3M

Notes: The M-3M is an M-2HB modified for use as an aircraft door weapon. A variant is used as an aircraft weapon, particularly in World War 2 fighters and bombers. It is normally employed by the US and British Marines and special operations forces as a door gun for the rear ramp of heavy-lift helicopters such as the CH-46, CH-47, and CH-53 series. The primary differences are the change to fire from an open bolt and an air-cooling jacket on the barrel, allowing the rate of fire to be increased dramatically. The belt-pulling power has also been increased, allowing the use of longer belts with the weapon.

Twilight 2000 Notes: This is a very rare weapon in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
M-3M	.50 Browning Machinegun	48.22 kg	400 Belt	\$9996

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-3M (Normal Ammo)	10	9	2-3-4	11	1	5	375
M-3M (SLAP Ammo)	10	9	1-2-3	11	1	5	450

Lewis Gun

Notes: This was the first light machinegun used in large numbers in any war. It was actually first patented by a Belgian arms manufacturer, and designed by the Americans Samuel MacLean and Isaac Lewis, but the British company of BSA was the first to mass produce it and the British were the ones who made the Lewis Gun famous. Six Lewis Guns could be made in the time it took to make one Vickers machinegun, and the Lewis Gun was light enough to be carried and fired by one man, even while running, allowing it to be used during advancing fire. After the British began to use it, it sort of took off, and tens of thousands were eventually manufactured. The fame of the Lewis Gun was in it's being the first light machinegun; it was in fact a rather heavy weapon and the amount of ways in which it could jam was astounding.

Most versions of the Lewis Gun were essentially similar. The Mark 1 was the original model, declared obsolete in 1946 (though none had been seen for a while by that time). The Mark 1* was supposedly a conversion of the Mark 1 to the Mark 4 pattern, but it was approved and declared obsolete on the same day (16 August 1946) and probably none were actually built or converted. The Mark 2 has the cooling radiator removed, a 97-round magazine, and a spade grip instead of a stock; it was designed for aircraft use and the magazine will not fit ground Lewis Guns. The Mark 2* is a Mark 2 modified to nearly double the rate of fire. The Mark 3 is a Mark 2* which is of new manufacture instead of a conversion. The Mark 4 is a Mark 3 with the same story as the Mark 1*. The Lewis SS was made for the Royal Navy; it has a shorter stock and no radiator. The Savage-Lewis was made by the US company of Savage Arms Corporation; they were built specifically to sell to the British Navy and Home Guard under the Lend-Lease program in World War 2. It fires .30-06 Springfield instead of .303 British, and has numerous markings to denote this to users. In addition, the stock is skeletonized instead of wood. The Type 92 is a version of the Lewis Gun used as an aircraft gun by the Japanese in the 1920s and early 1930s; it is chambered for 7.7mm Arisaka instead of .303 British. A ground version was not produced, but it is suitable for a pintle mount.

Weapon	Ammunition	Weight	Magazines	Price
Lewis Mk 1	.303 British	11.8 kg	47 Pan	\$2656
Lewis Mk 2/Mk 2*/Mk 3	.303 British	10 kg	97 Pan	\$2685
Lewis SS	.303 British	10.4 kg	47 Pan	\$2651
Savage-Lewis	.30-06 Springfield	11.21 kg	47 Pan	\$2839
Type 92	7.7mm Arisaka	11.8 kg	47 Pan, 97 Pan	\$2636

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Lewis Mk 1	5	4	2-3-Nil	8	3	6	92
Lewis Mk 1 (Bipod)	5	4	2-3-Nil	8	1	3	119
Lewis Mk 2	5	4	2-3-Nil	8	1	2	183
Lewis Mk 2*/Mk 3	10	4	2-3-Nil	8	1	3	183
Lewis SS	5	4	2-3-Nil	8	3	7	91
Lewis SS (Bipod)	5	4	2-3-Nil	8	1	3	119
Savage-Lewis	5	4	2-3-Nil	8	3	7	81
Savage-Lewis (Bipod)	5	4	2-3-Nil	8	1	3	105
Type 92	5	4	2-3-Nil	8	1	3	117

Manroy L-7A2 GPMG

Notes: Sometimes known as the "Jimpy" within the British armed forces, the L-7A2 is the British variant of the Belgian MAG machinegun. Though the operation and performance of the two weapons are almost identical, the L-7A2 has so many modifications from the original MAG (primarily due to changes made to suit local manufacturing and British military requirements) that virtually no part of the L-7A2 and its variants are interchangeable with the parts of the MAG. Production of the L-7A2 was originally done by the Royal Small Arms Factory, but is now done by Manroy.

The basic L-7A2 looks externally similar to the MAG, but there are noticeable differences; internally, the parts also look virtually identical to those of the MAG, but a trained eye can tell the difference. The barrel, however, is 23.4 inches long, a full 4 inches longer than that of the MAG, and is tipped with a different flash suppressor. The L-7A2 can use the same tripod and pintle mounts as a MAG, but the folding bipod is made of wide stamped steel and has different feet than that of a MAG. The L-7A2 has a carrying handle, but it is derived from that of their SLR battle rifle. The gas cylinder is shaped differently, as is the plastic pistol grip and polymer stock. Sights are different, consisting of a simple protected front blade and rear adjustable aperture, as well as a versatile mounting rail atop the receiver which can use most NATO-compatible night vision devices. Feed is from disintegrating link belts; the German 50-round non-disintegrating link belts cannot be used with the L-7A2. Cyclic rate of fire is slightly slower than that of the MAG, but still variable through use of an adjustable gas block.

Most of the L-7A2's variants are for internal vehicle use, and are essentially L-7A2's with the changes necessary for such a role, such as a change to electrical triggers, no stock, pistol grip, flash suppressor, etc. The L-8A1 was designed specifically for use as a coaxial machinegun on the Chieftain, and the L-8A2 is an improved version of the L-8A1. The L-20A1 is mounted in gun pods for use on helicopters and light aircraft, and the L-20A2 is an improved version. The L-37A1 combines the features of the L-7A2 and L-8A2; it retains the standard stock and pistol grip with trigger group, but has an additional ability to be electrically fired, have the bipod and

carrying handle removed, and mounted in internal vehicle mounts. It can be removed and used in the same manner as an L-7A2. The L-37A2 is an improved model, designed specifically for coaxial use on the Challenger 1. The L-43A1 is a version similar to the L-8A1, and originally meant for use as a ranging machinegun on the Scorpion reconnaissance vehicle armed with the 76mm gun. It was later used as simply a coaxial machinegun on the Scorpion when better sights were fitted, but is no longer used by the British Army. The L-112A1 is essentially an L-7A2, but it is mounted on an anti-aircraft tripod or certain special anti-aircraft mounts that Manroy offers. It also has special anti-aircraft sights instead of the standard L-7A2 sights, and deletes the bipod. For the purposes of the *Twilight 2000* v2.2 rules, all of these are identical to the L-7A2 (except that most of the variants use the Tripod line exclusively, of course).

Weapon	Ammunition	Weight	Magazines	Price
L-7A2	7.62mm NATO	10.89 kg	100 Belt, 200 Belt	\$3180

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
L-7A2	5/10	4	2-3-Nil	8	3	6/13	78
L-7A2 (Bipod)	5/10	4	2-3-Nil	8	1	3/6	102
L-7A2 (Tripod)	5/10	4	2-3-Nil	8	1	1/3	157

Manroy M-2HB QCB

Notes: Manroy manufactures the standard M-2HB under license from FN/Browning; the standard version which they manufacture is basically identical to the FN/Browning model. However, their more popular version of the M-2HB is a model which uses a quick-change barrel with fixed headspace and timing (often called simply the M-2HB QCB or the Manroy M-2HB). The tedious and time-consuming headspace and timing adjustments which normally must be made any time a barrel is inserted or changed on the M-2HB is therefore not necessary, and the M-2HB QCB's barrel can therefore be changed in less than 10 seconds. The barrel is attached by simply locking the charging handle to the rear, rotating the barrel (the barrel designed for the QCB modification does not require as much rotation as a standard M-2HB barrel), then you simply put the new barrel in, rotate it until it stops, and release the charging handle. If necessary, the M-2HB QCB can also use standard M-2HB barrels, as the original threads are retained; however, use of the standard M-2HB barrel requires that the QCB kit's barrel locating stud be removed, and normal headspace and timing adjustments must be made as a standard barrel is used. The M-2HB QCB otherwise differs from the Browning M-2HB only in minor details and a slight weight difference. Several NATO countries are reportedly using the Manroy M-2HB QCB; however, the US has been slow to jump on the QCB bandwagon, and has only earlier this year (2006) decided to go with a General Dynamics QCB kit.

Weapon	Ammunition	Weight	Magazines	Price
M-2HB QCB	.50 Browning Machinegun	38.51 kg	105 Belt	\$9739

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-2HB QCB (With Tripod)	5	9	2-2-3	11	1	3	383

Vickers

Notes: This is an improvement of the earlier Maxim machinegun. The main difference is that the mechanism is reversed, oriented upwards instead of downwards, making it lighter and more compact. It was adopted by the British in 1912, and remained in service until the early 1960s when replaced by the L-7A1. Despite having gone through many patterns and modifications, it was still basically the same weapon after 50 years of service. Smaller armies were known to have used it well into the 1980s.

The Mark 1 is the original model, with a water jacket. The Mark 1* is air-cooled, with cooling fins on the barrel and a mechanism to allow the fitting of interrupter gears – it was intended for use on World War 1 aircraft. The Mk 2 is the same as the Mk 1*, but is further lightened and has a dual rate of fire (the SU setting, for "Speed Up."). The Mark 2* is the same weapon, but has a right hand feed. The Mark 3 is a Mark 2* with a long flash suppressor to protect the cowling of the firing aircraft. The Mark 4 is for armored vehicles; the 4A was originally made, but improvements were quickly made resulting in the 4B. They both were cooled by a water tank in the vehicle connected to the barrel jacket. They were never used in large numbers. The Mark 5 is a Mark 3 with an easier to open receiver. The Mark 6 is a 4B with a self-contained cooling jacket and provisions for left or right hand feed. The Mark 6* is a Mark 6 with an external cooling connection like the 4B. The Mark 7 is a Mark 6 with a heavy barrel casing and a more efficient cooling system. The M-1915 is a version of the Mark 1 used by the US Army; it is chambered for .30-06 Springfield. The "Argentine Vickers" was a Vickers made for Bolivia, Paraguay, and Argentina, firing 8mm Mauser ammunition.

Twilight 2000 Notes: Mark 1s showed up again in the Twilight War – first in several smaller South and Southeast Asian countries, then in South America. A few M-1915s were even seen to be used in Southern Mexico, and some Argentine Vickers were even pulled out in South America.

Weapon	Ammunition	Weight	Magazines	Price
Vickers Mk 1	.303 British	18.1 kg	250 Cloth Belt	\$2729
Vickers Mk 1*	.303 British	12.47 kg	250 Cloth Belt	\$2742
Vickers Mk 2/Mk 2*	.303 British	10 kg	250 Cloth Belt	\$3623
Vickers Mk 3	.303 British	10.15 kg	250 Cloth Belt	\$3638
Vickers Mks 4-7	.303 British	18.1 kg	250 Cloth Belt	\$2729

M-1915	.30-06 Springfield	19.01 kg	250 Cloth Belt	\$2911
Argentine Vickers	8mm Mauser	18.93 kg	250 Cloth Belt	\$2895

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Vickers Mk 1	5	4	2-3-Nil	7	1	1	204
Vickers Mk 1*	5	4	2-3-Nil	7	1	1	204
Vickers Mk 2/Mk 2*	5/10	4	2-3-Nil	7	1	1/3	204
Vickers Mk 3	5/10	4	2-3-Nil	7	1	1/3	204
Vickers Mks 4-7	5	4	2-3-Nil	7	**	**	204
M-1915	5	5	2-3-Nil	7	1	1	182
Argentine Vickers	5	5	2-3-Nil	7	1	1	209

**These are vehicle mounted weapons and have no recoil in that state.

Arsenal MG

Notes: This is a further improvement of the PK. The standard model is an infantry weapon for use on a bipod or tripod, but there are also variants for use on special anti-aircraft tripods or naval mounts. (The standard tripod is a light version of the Pact Light Tripod, weighing 4.5 kilograms.) The MG can be fed by standard PK ammunition belts or by Arsenal-manufactured belts of 100 or 200 rounds. It is capable of firing a wide variety of ammunition types including light and heavy bullets, tracers, AP, and SLAP-type rounds. Externally, the MG is similar in appearance to the PK, but where wood is used in the PK, plastic is used in the MG.

Twilight 2000 Notes: This weapon is so rare as to be virtually non-existent in its 7.62mm Nagant form. In the 7.62mm NATO chambering, it does not exist.

Merc 2000 Notes: As Bulgaria did not enter NATO in the Merc 2000 timeline, the 7.62mm NATO version is built only in very limited amounts for certain export customers.

Weapon	Ammunition	Weight	Magazines	Price
Arsenal MG	7.62mm Nagant	9 kg	100B, 200B	\$2511
Arsenal MG	7.62mm NATO	8 kg	100B, 200B	\$2411

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Arsenal MG (7.62mm Nagant)	5	4	2-3-Nil	8	3	6	81
(Bipod)	5	4	2-3-Nil	8	1	3	105
(Tripod)	5	4	2-3-Nil	8	1	1	161
Arsenal MG (7.62mm NATO)	5	4	2-3-Nil	8	3	6	80
(Bipod)	5	4	2-3-Nil	8	1	3	105
(Tripod)	5	4	2-3-Nil	8	1	2	161

Arsenal MG-M1S

Notes: This heavy infantry machinegun is the Bulgarian counterpart to the Russian NSV or DShK. It is designed for use on a special tripod which can vary in height from 500-1450 millimeters, depending upon the tactical situation. Special mounts are also available for anti-aircraft work or from naval vessels. The standard infantry tripod weighs 10 kilograms. The MG-M1S is fed by 70-round belts of ammunition, though it can also use Russian belts of 50 rounds. The MG-M1S may be set up to feed from the left or right side (but not both at once). The barrel is of the quick-disconnect type. It is built largely of steel, and the steel is high-grade but light in weight.

Twilight 2000 Notes: This weapon does not exist.

Weapon	Ammunition	Weight	Magazines	Price
MG-M1S	12.7mm Russian	25 kg	50B, 70B	\$10442

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-M1S (Tripod*)	5	10	2-2-3	13	1	3	242

*This weapon must be fired from a tripod.

Arsenal PK

Notes: This Bulgarian variant of the PK differs primarily in using plastic where the standard PK uses wood. Most of the other differences are to suit local manufacturing methods and the stature of the average Bulgarian soldier.

Weapon	Ammunition	Weight	Magazines	Price
Arsenal PK	7.62mm Nagant	9.4 kg	100 Belt, 200 Belt	\$2590

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Arsenal PK	5	4	2-3-Nil	7	3	7	91
Arsenal PK (Bipod)	5	4	2-3-Nil	7	1	3	118
Arsenal PK (Tripod)	5	4	2-3-Nil	7	1	2	182

Type 67

Notes: The Type 67 was designed to replace a host of earlier Russian-designed machineguns. The first Type 67s appeared in the early 1970s; some were even used by the North Vietnamese in the last stages of the Vietnam War. The Type 67 is a hybrid (some would say a hodgepodge) of several other weapons, including the Maxim, Zb-26, DPM, RPD, and SG-43. The mechanism is gas-operated, and the weapon is reputedly quite robust and reliable, but it was also quickly discovered that the Type 67 was simply too heavy for its intended role, which was as a squad automatic weapon, and it was changed to more of a GPMG role.

The Type 67 feeds from the right, and has a 23.9-inch quick-change barrel. The Type 67 is equipped with a folding bipod and can be mounted on a tripod which is sort of a standard in the Chinese military and weighs 5.58 kg. The Type 67 can also be placed upon an air-defense tripod with longer legs. Standard sights consist of a protected front post and a rear leaf sight; the rear of the receiver also has dovetails for the mounting of an anti-aircraft sight. Two versions of the Type 67 exist: the older Type 67-1 (the original model) is constructed largely of heavy steel and has a wooden stock and pistol grip, while the newer Type 67-2C is constructed using more modern steels and is much lighter. The Type 67-1 is typically used at the company and battalion levels, while the Type 67-2C is generally a platoon-level asset.

Weapon	Ammunition	Weight	Magazines	Price
Type 67-1	7.62mm Nagant	11.61 kg	50 Belt, 100 Belt	\$2501
Type 67-2C	7.62mm Nagant	9.98 kg	50 Belt, 100 Belt	\$2514

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 67-1	5	4	2-3-Nil	8	3	6	81
(With Bipod)	5	4	2-3-Nil	8	1	3	105
(With Tripod)	5	4	2-3-Nil	8	1	1	162
Type 67-2C	5	4	2-3-Nil	8	3	7	81
(With Bipod)	5	4	2-3-Nil	8	1	3	105
(With Tripod)	5	4	2-3-Nil	8	1	1	162

Type 75-1

Notes: Normally employed as an anti-aircraft gun, the Type 75-1 is a Chinese version of the KPV that has been lightened by using lighter metals and electrical components and smaller cooling fins on the barrel, as well as a lighter trailer/tripod combination which includes a battery to provide the electrical power for the firing of the gun. The tripod/trailer also includes a small seat for the gunner as well as an anti-aircraft sight.

That said, the Type 75-1 was not considered a successful design by the Chinese military; since it was meant to be used by the infantry, the fact that it is still a quite large and heavy gun means that it is still too cumbersome for the role it was intended.

Weapon	Ammunition	Weight	Magazines	Price
Type 75-1	14.5mm KPV	140 kg	80 Belt	\$13942

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 75-1 (Normal Ammo)	5	11	2-2-3	15	1	2	476

Type 77

Notes: The Type 77 heavy machinegun is designed targets ranging from aircraft to personnel. It is primarily meant for air defense, though it can also be used against ground targets. The Type 77 is essentially a streamlined version of the DShK action, with modifications taking inspiration from several other weapons also being incorporated in the design. It uses a direct-impingement gas system similar to the action of the M-16 assault rifle, but of course on a much larger scale and greatly modified. Ammunition feed is from the right. The Type 77 can use the same tripod as the Type 85, but is much more likely to be found on a special tripod which is adjustable for height to such a degree that it may be used as a ground mount from the prone position up to an anti-aircraft mount from a crouched position. (This tripod weighs about 20 kilograms; the light weight comes partially due to the tubular steel legs.) The Type 77 is provided with a hooded post front sight and an adjustable tangent rear sight; the rear sight may be flipped up, revealing a circular anti-aircraft sight which doubles as a leaf sight. The barrel is 40.2 inches long, tipped with a huge pepperpot-type muzzle brake. The Type 77 is fired using spade grips; no stock of any kind is provided. The Chinese liberally supplied the Type 77 to the Mujahedeen in the 1980s after the Russian invasion of Afghanistan; these same weapons are now being used both by the new Afghan Army and the Taliban and Al-Qaida in Afghanistan and Pakistan.

The Type 85 is a greatly-refined version of the Type 77; it is not only the successor to the Type 77 and DShK in Chinese service, one of its purposes is apparently to compete on the international market directly with other 12.7mm and .50-caliber-firing heavy machineguns. The Type 85 is a very light weapon for its role. Liberal use of light alloys and more-advanced steels is made, leading to its lightweight construction. The Type 85 often incorporates a rudimentary stock and replaces the Type 77's spade grips with a pistol grip that is offset to the right and doubles as a charging handle. The Type 85 can fire a new tungsten-cored APDS round, which has a similar effect to the .50 BMG SLAP round; the Type 85's muzzle brake is designed to allow the use of this round and the Type 89 version can also fire the .50 Browning Machinegun SLAP round though its muzzle brake. The muzzle brake itself is a new double-baffle design which is just as effective as the Type 77's brake, but much simpler in design and cheaper, easier to produce, and more

compact in size. The Type 85 also has a bracket to allow the use of night vision equipment or even a telescopic sight. Despite the light weight, the Type 85 is still constructed largely of steel, though it is thinner steel of higher strength. It uses a fluted barrel almost 39.4 inches long. The Type 85 also has a bracket to allow the use of night vision equipment or even a telescopic sight. It uses a new lightweight tripod weighing 18.7 kg, and can also use the tripods used with newer versions of the DShK, or antiaircraft mounts used by most of the 12.7mm-firing machineguns in the world. The tripod designed for use with the Type 85 has telescoping legs, allowing it to be used while the gunner is standing or as an antiaircraft mount.

The Type 89 is essentially a smaller version of the Type 85, designed for heavy support for smaller units than the larger Type 85. Though the Type 89 was designed to be used with a stock-and/or-pistol grip firing configuration like that of the Type 85, it is often seen with spade grips instead; this is a change that can be made quickly and easily by the average soldier (once the procedure is learned). Reliability has also been increased, particularly in the area of case and belt-link ejection. The Type 89 was designed to be a true infantry heavy machinegun, and uses many elements that are very different from those of the Type 85 (and its Type 88 tank machinegun version). The Type 89 was designed to be fired from a lightweight tripod made of light alloy and weighing only 8.5 kilograms. The barrel is slightly longer at almost 39.5 inches, and the muzzle brake, though still compact, is different.

None of these machineguns are designed to be fired without a tripod or vehicle pintle mount (or in some case, an internal vehicular mount).

Weapon	Ammunition	Weight	Magazines	Price
Type 77	12.7mm Russian	40.6 kg	60 Belt	\$10453
Type 85	12.7mm Russian	18.51 kg	60 Belt	\$10470
Type 89	12.7mm Russian	17.5 kg	60 Belt	\$10314
Type 89	.50 Browning Machinegun	17.5 kg	105 Belt	\$9753

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 77	5	9	2-3-4	11	1	2	304
Type 85	5	9	2-3-4	13	1	2	294
Type 89	5	9	2-3-4	13	1	2	296
Type 89	5	9	2-3-4	13	1	2	316

Type 80

Notes: For the most part an improved Chinese copy of the Russian PKM, the Type 80 has some weight and dimension differences, but has improved recoil buffers and is lighter in weight. The Type 80 can use the standard Pact Light Tripod, is but is more likely to be found on a tripod common in Chinese service with highly-extendible legs that allow it to be used anywhere from the prone position to a standing crouch for antiaircraft use. (This tripod is quite light in weight, weighing only 4.72 kg.) In addition to standard disintegrating-link belts, the Type 80 can be fed from a 50-round drum; feed is from the right in all cases. A modification of the Type 80 is an almost universal coaxial armament on Chinese armored vehicles; it is known as the Type 59 in this guise.

Weapon	Ammunition	Weight	Magazines	Price
Type 80	7.62mm Nagant	7.89 kg	50 Drum, 100 Belt, 200 Belt	\$2595

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 80	5	4	2-3-Nil	8	3	7	95
(With Bipod)	5	4	2-3-Nil	8	1	3	123
(With Tripod)	5	4	2-3-Nil	8	1	2	189

M-53

Notes: This Czech weapon is a quad mount for the DShK machinegun on a wheeled mount. It may be towed or carried on a light truck. By the Twilight War, this weapon was used only in a reserve role by Czechoslovakia and Egypt, but was widely used in Afghanistan for anti-aircraft, anti-vehicle, and anti-personnel work, and also used by Cuba, Vietnam, and in several African nations. Three phases are required for setup from the towed role, and the M-53 normally uses a crew of 5-6.

Weapon	Ammunition	Weight	Magazines	Price
M-53	12.7mm Russian	(Total) 2.83 kg, (Carriage) 2.2 tons, (Gun and Mount) 628 kg	50 Belt (x4)	\$45430

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-53 (Normal Ammo)	20	9	2-2-3	NA	**	**	324
M-53 (APDS Ammo)	20	9	1-1-1	NA	**	**	388

**This weapon is always mounted on a vehicle or field mounting and has negligible recoil in this state.

VZ-30

Notes: This very old light machinegun was still in use in many third-world nations by 2003, particularly in Africa and Southeast Asia, where they had been held in reserve stocks. It is a pre-World War 2 design, and the British Bren series was based on the VZ-30 and its predecessors, the VZ-26 and VZ-27. Although it uses an outdated cartridge, and most of the VZ-30s encountered by 2000 are very old, they are still capable weapons due to excellent construction.

Weapon	Ammunition	Weight	Magazines	Price
VZ-30	8mm Mauser	9.69 kg	30	\$2847

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
VZ-30	5	5	2-3-Nil	7	3	7	94
VZ-30 (Bipod)	5	4	2-3-Nil	7	1	3	123
VZ-30 (Tripod)	5	4	2-3-Nil	7	1	2	189

VZ-59 Rachot

Notes: The VZ-52 was the standard GPMG of Czech and Slovakian forces until the entrance of the Czech Republic and Slovakia into NATO; since then, it has been supplanted by the VZ-68 version. Both are an improved version of an earlier machinegun, the VZ-52. The two can, in fact, be easily converted into each other by changing the barrel, breechblock, feed cover, cocking lever, feed pawl, and ejector (in other words, most of the guts of the weapon).

The VZ-59 in many ways typical for a post-World War 2 GPMG: gas operation, fairly light in weight, equipped both for bipod and tripod mounting, and like most Eastern-Bloc weapons of the time, constructed primarily of steel. Early models were built with a wood stock and pistol grip, but later versions of the VZ-59 (and almost all of the VZ-68 production) use a polymer stock and plastic pistol grip. The VZ-59 version fires 7.62mm Nagant cartridges from either a 50-round non-disintegrating metal link belt or a 250-round disintegrating link belt. The VZ-59 may be fitted with a 22.3-inch light barrel, used primarily when the VZ-59 is operating in a SAW/LMG role, or a 27.3-inch heavy barrel, generally used when the VZ-59 is operating as a GPMG (and normally when the VZ-59 is being used on a tripod or pintle mount). When fitted with the light barrel, the gun is known as the VZ-59-L; when used with the heavy barrel, it is known as the VZ-59-T. The tripod weighs 9.98 kilograms. The 50-round belt is normally used with the light barrel, while the 250-round belt is normally used with the heavy barrel, though either belt can be used with either barrel length. Both barrels have folding bipods with fixed-length legs and simple conical flash suppressors. Feed is also unusual, being from the right side of the gun. The VZ-59 also has a gas regulator (primarily to compensate for fouling during long periods of firing; this is a two-position regulator that, in another unusual

feature, is regulated by moving the carrying handle. Sights consist of a front post adjustable for windage and elevation, and a rear V-notch type which is also adjustable for range. The VZ-59 can also be fitted with a 4x telescopic sight with an illuminated reticle, and can be equipped with Eastern-Bloc-type night-vision scopes.

Though the VZ-68 was developed in the late 1960s, at this time it was built primarily for export and found few takers (at the time). It is essentially a VZ-59 converted to fire 7.62mm NATO ammunition; as said above, the guts are different, and the VZ-68 is fed by standard NATO ammunition belts, but the VZ-59 and VZ-68 are otherwise essentially the same weapon. However, the sight mounts are different; the capability to mount a telescopic sight is retained, but the VZ-68 can also mount some NATO-type night vision devices and telescopic sights.

Twilight 2000 Notes: The VZ-68 is quite rare in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
VZ-59-L	7.62mm Nagant	8.67 kg	50 Belt, 250 Belt	\$2487
VZ-59-T	7.62mm Nagant	9.25 kg	50 Belt, 250 Belt	\$2611
VZ-68-L	7.62mm NATO	8.46 kg	50 Belt, 100 Belt, 200 Belt	\$2359
VZ-68-T	7.62mm NATO	9.03 kg	50 Belt, 100 Belt, 200 Belt	\$2516

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
VZ-59-L	5	4	2-3-Nil	7	3	7	78
(With Bipod)	5	4	2-3-Nil	7	1	3	101
(With Tripod)	5	4	2-3-Nil	7	1	1	156
VZ-59-T	5	4	2-3-Nil	8	3	7	97
(With Bipod)	5	4	2-3-Nil	8	1	3	126
(With Tripod)	5	4	2-3-Nil	8	1	1	194
VZ-68-L	5	4	2-3-Nil	7	3	7	73
(With Bipod)	5	4	2-3-Nil	7	1	3	95
(With Tripod)	5	4	2-3-Nil	7	1	1	146
VZ-68-T	5	4	2-3-Nil	8	3	7	95
(With Bipod)	5	4	2-3-Nil	8	1	3	123
(With Tripod)	5	4	2-3-Nil	8	1	1	189

Madsen-Saetter

Notes: This was Madsen's last military weapon design before they left the arms business. It is a GPMG designed for use from the hip, bipod, or tripod, similar to many such designs of that time. That competition from weapons such as the MAG, M-60, MG-3, and PK was its problem; the market was already saturated. It is built largely of steel stampings and pressings, and is a light yet strong weapon. Though the Madsen-Saetter was tested by several countries, only Indonesia (who produced it under license until the early 1970s) adopted it in any large numbers, and in 1960, Madsen decided to get out of the weapon business. One can also find a sprinkling of Madsen-Saetters in use in several South American countries.

Weapon	Ammunition	Weight	Magazines	Price
Madsen-Saetter	7.62mm NATO	10.65 kg	49 Belt, 100 Belt	\$3137

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Madsen-Saetter	5/10	4	2-3-Nil	7	3	6/13	73
Madsen-Saetter (Bipod)	5/10	4	2-3-Nil	7	1	3/6	95
Madsen-Saetter (Tripod)	5/10	4	2-3-Nil	7	1	1/3	145

AAT-52

Notes: The AAT-52 (*Arme Automatique Transformable Mle. 52*) was designed to replace the then-standard French light machinegun (the Mle 1924/29) with a GPMG. It was designed just after World War 2, and was a considerable improvement over previous designs. The AAT-52 (and its descendant, the AAT-F1) tend to operate on the edge of safety due to the design, yet it has served for over half a century, and is still France's standard GPMG and is also used on French vehicles of all types.

The AAT-52 is sort of a "Frankenweapon;" the operation is a modification of the Spanish CETME rifle, and the belt feed is a modified version of the German MG-42. Other ideas from various other weapons were also adopted to the AAT-52. The AAT-52 has two lengths of barrel available: a 23.5-inch heavy barrel, normally used when the AAT-52 is mounted on a tripod or a vehicle mount, and a 19.3-inch light barrel, normally used when the AAT-52 is being used as a man-portable bipod-fired GPMG. However, there is nothing that prevents the heavy barrel from being used when man-ported, or the light barrel being used from a pintle mount or tripod; it is more French military policy than anything else. The AAT-52 is fed by 50 and 200-round disintegrating link belts. Unfortunately, extraction and case ejection is quick and violent; this tends to cause the AAT-52 to rip a spent cartridge in half in the process of ejection, causing a stoppage which usually cannot be cleared until the gun cools and the ring of brass left in the chamber can be removed. In addition, the ejected brass is generally severely damaged and can't be reloaded. French AAT-52 gunners learned the best way to avoid this problem was to grease the rounds lightly before loading them into the links of the belt, but this causes a whole new problem of attracting dirt and pulling it into the gun (and stopping the weapon that way). The AAT-52 has another defect: the gun must be carried cocked and locked if a belt is in the weapon, making it inherently unsafe if dropped or bumped. The AAT-52 is built primarily of steel, and the stock is a folding strut with a rudimentary butt plate. (This is more for storage purposes than anything else, but the AAT-52 can be fired with the stock folded, and this makes it easier to be fired from the firing ports of an armored vehicle.) The tripod used with the AAT-52 (and AAT-F1) is the NATO Medium Tripod.

The AAT F-1 (or more accurately, the AAT N-F-1) was designed in 1964, during the period when France was a part of NATO. The biggest modification done to the AAT F-1 was it's conversion to 7.62mm NATO chambering, but the French also took the opportunity to do a number of other improvements, such as building the weapon out of lighter, stamped steel, and using a different, lighter bipod adjustable for height and cant. In addition, the sights were recalibrated for the new ammunition. However, the most important modification was to the extraction and ejection system, which no longer has the danger of ripping the spent brass in half. However, case ejection is still violent and often causes deformed brass.

The AAT-52 still equips some reserve French forces as well as being the primary GPMG of several former African colonies of the French, though many countries which were using the AAT-52 replaced or modified them into what were effectively AAT-F1 equivalents in the 1990s.

Twilight 2000 Notes: A considerable number of AAT-52s are still in use by French forces.

Merc 2000 Notes: Most AAT-52s were converted to the AAT F-1 configuration, since no one wanted the AAT-52s.

Weapon	Ammunition	Weight	Magazines	Price
AAT-52 (Light Barrel)	7.5mm MAS	9.87 kg	100 Belt	\$2393
AAT-52 (Heavy Barrel)	7.5mm MAS	11.37 kg	100 Belt	\$2515
AAT F-1 (Light Barrel)	7.62mm NATO	9.87 kg	100 Belt	\$2313
AAT F-1 (Heavy Barrel)	7.62mm NATO	11.37 kg	100 Belt	\$2437

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AAT-52 (Light)	5	4	2-3-Nil	6/7	3	6	61
AAT-52 (Light, Bipod)	5	4	2-3-Nil	6/7	1	3	79
AAT-52 (Heavy)	5	4	2-3-Nil	7/8	3	6	80
AAT-52 (Heavy, Bipod)	5	4	2-3-Nil	7/8	1	3	104
AAT-52 (Heavy, Tripod)	5	4	2-3-Nil	7/8	1	2	159
AAT F-1 (Light)	5	4	2-3-Nil	6/7	3	6	61
AAT F-1 (Light, Bipod)	5	4	2-3-Nil	6/7	1	3	79
AAT F-1 (Heavy)	5	4	2-3-Nil	7/8	3	6	80
AAT F-1 (Heavy, Bipod)	5	4	2-3-Nil	7/8	1	3	103
AAT F-1 (Heavy, Tripod)	5	4	2-3-Nil	7/8	1	2	159

Darne

Notes: This is a machinegun design from a company that was normally known for breech-loading double-barreled sporting shotguns. In World War 1, they were contracted to produce Lewis Guns for the French Army, and then used that experience to produce their own design. They did not feel the need to apply the same fine standard of finish to their military weapons as their civilian weapons; the result is that while the Darne is a rather crude and cheap-looking weapon, it is nonetheless an efficient design. Having designed them, Darne found that they could get them built in Spain for less money than they could in France, and thus Spain is where most Darne machineguns were actually built. Strangely enough, French ground forces did not like the Darne; they did not like the looks, and did not like the high rate of fire. Most of them were therefore mounted in aircraft or kept in fixed positions. Originally chambered for 8mm Lebel, the caliber was later changed to the new 7.5mm MAS cartridge. Some of them were also produced in

Czechoslovakia; these were chambered for 8mm Mauser. After World War 2, the Darne machineguns were sold off rapidly and they can now be found almost anywhere in the world, still functioning quite well despite their age.

Weapon	Ammunition	Weight	Magazines	Price
Darne	8mm Lebel	9.7 kg	100 Belt, 250 Belt	\$2516
Darne	8mm Mauser	10.99 kg	100 Belt, 250 Belt	\$2744
Darne	7.5mm MAS	9.3 kg	100 Belt, 250 Belt	\$2462

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Darne (8mm Lebel)	10	4	2-3-Nil	8	3	13	79
Darne (8mm Lebel, Bipod)	10	4	2-3-Nil	8	1	7	103
Darne (8mm Lebel, Tripod)	10	4	2-3-Nil	8	1	3	159
Darne (8mm Mauser)	10	4	2-3-Nil	8	3	13	80
Darne (8mm Mauser, Bipod)	10	4	2-3-Nil	8	1	6	104
Darne (8mm Mauser, Tripod)	10	4	2-3-Nil	8	1	3	160
Darne (7.5mm)	10	4	2-3-Nil	8	3	13	80
Darne (7.5mm, Bipod)	10	4	2-3-Nil	8	1	7	104
Darne (7.5mm, Tripod)	10	4	2-3-Nil	8	1	3	159

Hotchkiss M-1897

Notes: Not only was the Hotchkiss M-1897 one of the first self-operating machineguns, it was one of the first air-cooled machineguns. The M-1897 is gas-operated and fires from an open bolt. The gas block is rather complicated and large, with a full twenty positions at which it may be set; in addition, the M-1897 could be set for slow fire, with a cyclic rate of 100 rpm, or rapid fire, with a cyclic rate of 600 rpm. (For game purposes, the 100 rpm ROF is 2, even though it does not actually have a burst mechanism.) Perhaps the greatest weakness of the M-1897 is the feed method -- rather small-capacity rigid metal strips. The feed mechanism was quite reliable with rimmed cartridges such as the 8mm Lebel, but less so with rimless rounds. The long 32.5-inch barrel usually had a short length of brass cooling fins at the base, though a barrel with no cooling fins was also available. The M-1900 is almost identical except for a few minor modifications and steel fins on the barrel instead of brass fins.

The M-1907 Portative was a greatly lightened version of the M-1900, with numerous changes to the feed mechanism (it was literally turned upside down in relation to the M-1900) and a shorter 22.25-inch barrel without cooling fins. The M-1907 was designed for the "advancing fire" concept of the time, and is equipped with a wooden shoulder stock and a light, folding bipod, along with a folding monopod at the rear of the stock. The cyclic rate of fire was fixed at 500 rpm. The US used a version of this weapon, the M-1909 Benet-Mercie Machine Rifle, during World War 1; though at first it was manufactured by Hotchkiss in France, it was later license-produced in the US by both Springfield and Colt. The British also used a version, the Hotchkiss Mk 1.

The M-1914 is an updated version of earlier Hotchkiss machineguns of the same type, most notably the M-1900. It became the standard medium machinegun of the French Army and remained in service until 1945. It was fed from the metallic strip which was so much in vogue at the time, though it could also be fed by a series of 3-round metal strips joined together to form up to a 251-round faux belt of sorts. The capacity for "slow fire" was removed, with the gas regulator varying the rate of fire from 500-600 rpm (not important in game terms). It was used by France, Greece, and the Balkan States, as well as the US in 1917, in 8mm Lebel caliber. It was also exported to Mexico, Spain, and Brazil in 7mm Mauser caliber in the 1920s. Though rumors are heard every so often about one still being used somewhere, these may be just "war stories."

Weapon	Ammunition	Weight	Magazines	Price
M-1897	8mm Lebel	23 kg	30 Strip	\$3546
M-1907 Portative	8mm Lebel	12.5 kg	30 Strip	\$2454
M-1909	.30-06 Springfield	13.18 kg	30 Strip	\$2698
Hotchkiss Mk 1	.303 British	12.68 kg	30 Strip	\$2515
M-1914	8mm Lebel	23.58 kg	30 Strip, 251 "Belt"	\$2730
M-1914	7mm Mauser	22.52 kg	30 Strip, 251 "Belt"	\$2517

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-1897	2/5	5	2-3-Nil	8	1	1/1	226
M-1907 Portative	5	4	2-3-Nil	6	3	6	73
With Bipod	5	4	2-3-Nil	6	1	3	95
With Tripod	5	4	2-3-Nil	6	1	1	146
M-1909	5	4	2-3-Nil	6	3	6	63
With Bipod	5	4	2-3-Nil	6	1	3	82
With Tripod	5	4	2-3-Nil	6	1	1	127
Hotchkiss Mk 1	5	4	2-3-Nil	6	3	6	72
With Bipod	5	4	2-3-Nil	6	1	3	94

With Tripod	5	4	2-3-Nil	6	1	3	144
M-1914 (8mm)	5	5	2-3-Nil	8	1	1	211
M-1914 (7mm)	5	4	2-3-Nil	8	1	1	199

St. Etienne M-1907

Notes: This weapon has been described as the “second-worst machinegun ever made,” and “an object lesson in how not to design weapons.” The St. Etienne M-1907 was an attempt to improve an earlier St. Etienne design, which was itself an attempt to improve upon the Hotchkiss machineguns. It is one of the only weapons ever designed to use a “blow forward” operation; unfortunately, this meant that the gun required a rack and pinion system so that the bolt actually went back while the rest of the action went forward. The spring that moved the bolt backwards was coiled around the 26-inch barrel, so that the heat from the barrel weakened it and the spring often broke. Just to add another unnecessary amount of complication, the gun had an adjustable rate of fire from 8-600 rpm, and fed from 24 or 30-round metallic strips that proved time-consuming to load in the field. It could only be fired from a tripod; no provision was made for bipod or hand-held fire. The tripod for the M-1907 weighed 25.85 kilograms.

In 1906, the M-1907 was heavily-modified, hoping to cure the problems with the M-1907. The changes included a large ring gas regulator, a front sight heat compensator, changing the rear sight to an adjustable drum sight and modification to the feed sprocket to make loading and ejection more reliable. This modification also allowed the M-1907 to use a long cloth belt instead of feeding from the metallic strips. (The belt-fed models were also extremely rare, and most of the modified M-1907s still fed from metallic strips.)

Modifications were to be accomplished as the M-1907s as they came in for depot-level maintenance, but in reality few M-1907s were so modified. A steel rod, not as affected by the barrel heat, was added under the barrel jacket to eliminate barrel bending during long uses of the weapon. The barrel jacket had several cooling slits cut into it, which did aid barrel cooling, but also let in dirt. The receiver also received some cooling slots, which again let in dirt, into the receiver and feed mechanism. The front sight is built on an automatic compensator to automatically cope with barrel bending due to heat. A slightly lighter tripod, the M-1907 Omnibus, was also devised. These modified guns were designated the M-1907T, and though there will still reliability problems, it was now a much better machinegun. Unfortunately, they were also very scarce.

The M-1907 jammed with distressing regularity in the trenches of France, and it was decided to ship the entire lot off to Africa. The dry climate of the French colonies helped, but not much; the M-1907 was discarded so often that it became scattered far and wide across Africa. In the French Army, the St Etienne M-1907 was replaced by the far more reliable, though heavier, Hotchkiss M-1914. The Romanians were the only other country to use the M-1907 during World War 1; they bought 500 of them, and in the less dirty environment, they performed reasonably well, though they were discarded after the War.

Weapon	Ammunition	Weight	Magazines	Price
St Etienne M-1907	8mm Lebel	25.73 kg	24 Strip, 30 Strip	\$2652
St Etienne M-1907T	8mm Lebel	23.8 kg	25 Strip, 30 Strip (150 Belt)	\$2598

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
St Etienne M-1907	5	4	2-3-Nil	6	2	5	179
St Etienne M-1907T	5	4	2-3-Nil	6	2	6	179

Dreyse MG-13

Notes: The MG-13 was designed by rebuilding the old Dreyse light machinegun. The barrel jacket was replaced by a light perforated air-cooling jacket, a bipod was mounted near the muzzle, a simple butt was added, and a saddle-type magazine was developed. Unfortunately, the MG-34 was developed around the same time period, and was a much better and robust weapon. The MG-13s were then sold to Portugal, renamed the M-38, and served until the late 1940s. A large amount of them ended up in Angola, where they were still turning up in the hands of guerillas as late as the 1980s.

Weapon	Ammunition	Weight	Magazines	Price
MG-13	8mm Mauser	10.89 kg	25, 75 Drum	\$2881

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-13	5	5	2-3-Nil	9	3	6	104
MG-13 (Bipod)	5	5	2-3-Nil	9	1	3	135

Heckler & Koch HK-11/21 Series

Notes: The HK-21 was originally conceived in the mid-1970s as essentially a light machinegun version of the G-3 battle rifle, in order to provide infantrymen with a weapon that longer range and the ability to provide sustained fire for longer periods of time. As such, the original HK-21 did not differ very much from the G-3 externally; however, the HK-21 was internally a very different weapon. The HK-21 is a belt-fed weapon, able to feed from standard German, French, or US disintegrating link belts, or the German DM-1 50-round non-disintegrating link belt. For the most part, the operation of the HK-21 is the same as that of the G-3; however, the HK-21 fires from a closed bolt instead of an open bolt, primarily to increase accuracy and increase resistance to dirt. The selector mechanism of the G-3 is retained, including the ability to fire on semiautomatic, though the rate of automatic fire is increased to 900 rpm. The buttstock shape is changed to allow the nonfiring hand to grip it, the rear sight has been changed to an adjustable drum-type which is recalibrated to allow for the increased range (the hooded front sight post remains the same), and a folding bipod has been added to the front of the barrel sleeve. The barrel is 17.7 inches long, tipped with a flash suppressor, and is of the quick-change type. For the most part, the HK-21 is meant to be fired from its bipod, but it can also be mounted on a tripod developed for it (called Tripod Mount 1102), which weighs 9.2 kg.

The HK-21 also has several unusual features. By changing the barrel, feed plate, and bolt, the HK-21 can also fire either standard 5.56mm NATO or 7.62mm Kalashnikov belts. (The latter chambering was produced primarily with an eye towards possible export sales, and the parts for this version are rather rare these days.) In addition, the belt-feed mechanism and parts may be removed and replaced with a magazine adapter, allowing the HK-21 to feed from various magazines and drums.

By the late 1990s, the HK-21 was no longer being produced (it was superseded by later versions of the HK-21 series). However, it was in production for quite some time and can still be found in Portugal, Mexico (license production), and some African and Southeast Asian countries.

The HK-21A1 is essentially a modified and improved version of the HK-21. Perhaps the biggest change is that the HK-21A1 cannot be converted to magazine feed; it is a belt-feed-only weapon. The basic belt-feed mechanism is identical to that of the HK-21, but it can be rotated downward for easier reloading. The belt feed unit can also be completely removed as part of field stripping, which allows for easier cleaning of both the unit and the receiver itself. The HK-21A1 can be fed from pretty much any disintegrating or non-disintegrating link belt. The HK-21A1 can actually be loaded without raising the feed cover (though the charging handle must be cycled twice instead of once to do this). No option was provided to allow the HK-21A1 to fire 7.62mm Kalashnikov ammunition, but the HK-21A1 can still be converted in the same manner as the HK-21 to fire either 7.62mm NATO or 5.56mm NATO ammunition. The HK-21A1 is primarily meant for squad and platoon support, and is therefore meant to be fired from a bipod, but can also be mounted on the 1102 Tripod. The bipod is essentially the same as that of the HK-21, but in addition to folding, it is detachable, and can be mounted either at the end of the barrel sleeve (for better stability) or at the front of the receiver (for better balance).

Further improvements were made with the HK-21E and HK-23E versions. The two calibers available were essentially separated (the HK-21E is in 7.62mm NATO and the HK-23E is in 5.56mm NATO). The barrel of the HK-21E was lengthened to 22 inches, while the barrel of the HK-23E remained at 17.7 inches. A 3-round burst setting was added to the selective fire mechanisms of both versions. The HK-21E and HK-23E both have a receiver lengthened 3.7 inches over that of the HK-21A1, allowing for the installation of the new selector mechanism as well as new recoil buffer mechanisms, as well as an improved belt-feed unit which has far greater pulling power than the HK-21A1. The quick-change barrel's grip has been improved, and the trigger unit can be replaced with a winter trigger unit. The stock has a compartment for a cleaning kit. The bipod is adjustable for three increments of elevation, and the HK-21E and HK-23E are capable of traversing up to 30 degrees either way while the bipod remains still. The cyclic rates of automatic fire have been lowered somewhat (to 800 rpm for the HK-21E, and 750 rpm for the HK-23E, from the previous cyclic rate of 900 rpm), though this is not important in the mechanics of the *Twilight 2000 v2.2* rules.

Even with the development of the HK-21E and HK-23E, some customers (especially customers in Latin America and the Mexican Army) still perceived a need for a lighter version of those weapons which were magazine-fed instead of belt-fed, primarily for use as squad automatic weapons and heavy rifles. Heckler & Koch responded to this request with the HK-11A1 and HK-13A1, and later the HK-11E and HK-13E. The HK-11A1 (chambered for 7.62mm NATO) and the HK-13A1 (chambered for 5.56mm NATO) are essentially HK-21Es and HK-23Es which are primarily meant for magazine-feed (though they can still be turned into belt-fed weapons by use of a parts kit), sights calibrated for shorter ranges, and a forward assault grip underneath the barrel sleeve (which can be rotated and

locked to the left or right sides if the shooter desires). The folding bipod has different feet, and is not detachable (it is mounted at the front of the barrel sleeve), and the barrel length for both the HK-11A1/HK-11E and HK-13A1/HK-13E are 17.7 inches. The HK-11A1 can use 20-round G-3 magazines and also use a 50-round drum designed by Heckler & Koch; the HK-13A1 accepts 20 and 30-round magazines of German manufacture in addition to a 50-round drum. The HK-11E differs primarily in the magazine well, which will accept any 20 or 30-round magazine which conforms to NATO/US STANAG specifications; the HK-13E will accept any 5.56mm NATO magazine which conforms to NATO/US specifications, as well as older German magazines and the 50-round Heckler & Koch drum. These versions are not designed for tripod mounting, however.

Though the G-8 was designed more as a heavy rifle for sustained fire and as a sort of tactical marksman's weapon, it is in fact a modified version of the HK-11E, and is therefore included here for completeness. The operating system is essentially the same as that of the HK-11E, complete with a fire selection lever allowing semiautomatic fire, three-round bursts, and fully automatic fire. The G-8 was designed with a great deal of input from German border security police, SRT-type teams, and antiterrorist units (particularly GSG-9), as it was conceived of and designed specifically for their use. The G-8 is sort of a hybrid of battle rifle, light machinegun, and marksman's weapon; it has a barrel the same length as the G-3 (17.7 inches) but the barrel is heavier than that of the G-3 (it is almost a bull barrel). The barrel is tipped with a flash suppressor/muzzle brake combination. The barrel is also of the quick-change type, and includes a carrying handle (mostly for use when changing the barrel, though it is at the center of balance for the G-8). The sights are similar to those of the G-3, but can be adjusted more precisely, and both the front and rear sights may be so adjusted. The G-8 normally uses the 20 and 30-round Heckler & Koch magazines or the 50-round drum H&K developed for the HK-11A1 and HK-11E, but it can also be modified for belt feed in the same manner as the HK-11E. There is also a G-8A1 variant, which cannot be modified for belt feed. Some G-8s also have a forward assault grip under the handguard. The G-8 includes a mount allowing the use of most NATO telescopic and night vision devices, though a possible future modification is the replacement of this mount with a MIL-STD-1913 rail. An HK-11E-type bipod equips the G-8, but it is not equipped for tripod or pintle mounting.

Twilight 2000 Notes: The HK-21, HK-21A1, and HK-21E were also used by US Navy SEALs and Israeli armed forces, and US Marines operating in the Middle East. (The SEALs were often the ones using the 7.62mm Kalashnikov models.) The US Army's Delta special operations unit was said to be fond of the HK-21A1. All of these weapons were quite common in the Mexican military as well as several countries in Latin and South America; as a result of their widespread use by the Mexican military, many of them were captured in the American Southwest and used by everyone from marauders to resistance forces, or simply people protecting their homes in the area; examples were even used against the Russians in Canadian and US hands as far away as Alaska. The G-8 is an exception; it was issued exclusively to German special operations units and the Border Police, and only in limited quantities. (Special ops units typically got the G-8s, while Border Police got the G-8A1s.)

Weapon	Ammunition	Weight	Magazines	Price
HK-21	7.62mm NATO	7.94 kg	20, 80 Drum, 50 Belt, 100 Belt, 200 Belt*	\$2217
HK-21	5.56mm NATO	5.75 kg	20, 30, 40, 100 Belt*	\$1362
HK-21	7.62mm Kalashnikov	7.06 kg	30, 40, 75 Drum, 100 Belt*	\$1857
HK-21A1	7.62mm NATO	8.3 kg	50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2217
HK-21A1	5.56mm NATO	6.01 kg	100 Belt, 200 Belt	\$1362
HK-21E	7.62mm NATO	8.8 kg	50 Belt, 100 Belt, 200 Belt, 250 Belt	\$3210
HK-23E	5.56mm NATO	6.84 kg	100 Belt, 200 Belt	\$1801
HK-11A1	7.62mm NATO	8.15 kg	20, 50 Drum, 50 Belt, 100 Belt, 200 Belt, 250 Belt*	\$3077
HK-11E	7.62mm NATO	8.15 kg	20, 30, 50 Drum, 50 Belt, 100 Belt, 200 Belt, 250 Belt*	\$3077
HK-13A1	5.56mm NATO	5.9 kg	20, 30, 40, 100 Belt, 200 Belt	\$1801
HK-13E	5.56mm NATO	5.9 kg	20, 30, 40, 100 Belt, 200 Belt	\$1801
G-8	7.62mm NATO	8.15 kg	20, 30, 50 Drum, 50 Belt, 100 Belt, 200 Belt, 250 Belt*	\$3068
G-8A1	7.62mm NATO	8.15 kg	20, 30, 50 Drum	\$3068

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
HK-21 (7.62mm NATO)	5	4	2-3-Nil	7	3	7	52
(With Bipod)	5	4	2-3-Nil	7	1	3	67
(With Tripod)	5	4	2-3-Nil	7	1	1	104
HK-21 (5.56mm)	5	3	1-Nil	7	2	4	46
(With Bipod)	5	3	1-Nil	7	1	2	60
(With Tripod)	5	3	1-Nil	7	1	1	92
HK-21 (7.62mm Kalashnikov)	5	4	2-Nil	7	3	7	52
(With Bipod)	5	4	2-Nil	7	1	3	67
(With Tripod)	5	4	2-Nil	7	1	1	103
HK-21A1 (7.62mm)	5	4	2-3-Nil	7	3	7	52
(With Bipod)	5	4	2-3-Nil	7	1	3	67
(With Tripod)	5	4	2-3-Nil	7	1	1	104
HK-21A1 (5.56mm)	5	3	1-Nil	7	2	4	46
(With Bipod)	5	3	1-Nil	7	1	2	60

(With Tripod)	5	3	1-Nil	7	1	1	92
HK-21E	3/5	4	2-3-Nil	8	2	4/6	72
(With Bipod)	3/5	4	2-3-Nil	8	1	2/3	93
(With Tripod)	3/5	4	2-3-Nil	8	1	1/1	143
HK-23E	3/5	3	1-Nil	7	2	2/4	46
(With Bipod)	3/5	3	1-Nil	7	1	1/2	60
(With Tripod)	3/5	3	1-Nil	7	1	1/1	92
HK-11A1/HK-11E	3/5	4	2-3-Nil	7	2	4/6	52
(With Bipod)	3/5	4	2-3-Nil	7	1	2/3	67
HK-13A1/HK-13E	3/5	3	1-Nil	7	2	2/4	46
(With Bipod)	3/5	3	1-Nil	7	1	1/2	60
G-8	3/5	4	2-3-Nil	7	2	3/5	56
(With Bipod)	3/5	4	2-3-Nil	7	1	2/3	72

*These weapons may be assembled to fire from magazines or belts, but may not be assembled in such a way to allow the gun to use both at the same time (i.e. interchangeably).

Mauser MG-34

Notes: The MG-34 was an improved version of the MG-30, which was in of itself an improved version of the MG-15. The MG-34 introduced the general-purpose machinegun concept to large-scale use, and introduced the use of the machinegun as the primarily killing instrument with the rest of the infantry squad backing up the machinegun crew. The Germans of World War 2 even made regular use of beaten zones as a legitimate use of machinegun fire. Even the "light" mid-caliber machineguns of most other countries were heavy, often water-cooled affairs and could hardly be called light by today's standards or even next to the MG-34.

By the time Mauser and his team got finished with the MG-34, it had little resemblance to the MG-15 or MG-30. The magazine feed had been replaced by a disintegrating link belt (with a 75-round drum as an option), the weapon had a quick-change barrel, and the operation was greatly simplified. In a broad sense, the MG-34 was the ancestor of modern GPMGs and light machineguns. The bipod was a bit flimsy, and the MG-34 was unstable on it; however, it was light enough to deliver automatic fire from the hip and it was rock-solid on its bipod. It also tended to jam in dusty conditions. The MG-34 could use one of two tripods, a lightweight 6.75-kilogram tripod or the heavier Laffette tripod, which weighed 23.6 kilograms, incorporated a telescopic sight, special sighting equipment for indirect/plunging fire, and a bracket on the right leg for an ammo box from which the gun could feed. The Laffette tripod's legs could be extended to facilitate antiaircraft fire, or used with the legs spread wide and the shooter aiming using a periscopic sight. The MG-34 served throughout World War 2, even though it was officially superseded by the MG-42; it was perhaps more prevalent in World War 2 than the MG-42. MG-34 (and MG-42) design influenced a number of post-war machineguns, such as the German MG-3 and its derivatives and the US M-60.

Weapon	Ammunition	Weight	Magazines	Price
MG-34	8mm Mauser	12.1 kg	250 Belt or 75 Drum	\$2792

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-34	10	4	2-3-Nil	8	2	12	85
With Bipod	10	4	2-3-Nil	8	1	7	111
With Tripod	10	4	2-3-Nil	8	1	2	170

Maxim MG-08

Notes: This is an improvement of the Maxim machineguns that Germany adopted between 1887 and 1901. It is a typical Maxim pattern weapon, heavy with a toggle action. It was originally issued with a sledge that weighed 32 kilograms. The 28-inch barrel was almost entirely enclosed within a water jacket, used for cooling the barrel in sustained fire, but the cyclic rate of fire was only about 400 rpm. Feed was from non-disintegrating cloth belts. The MG-08 was very effective in World War 1, but also quite cumbersome, and could take as many as four men to move if one wanted it moved quickly. The MG-08 was produced from 1908-18. The M-1909 was a rare export version which used an early version of the light tripod mentioned below. It was manufactured by DWM and sold in small amounts to several Central American and South American countries as well as Switzerland, Belgium, Romania, China and Persia (now Iran). After receiving these guns, the Swiss and Chinese quickly copied them and built them in their own factories, but DWM-built versions are rather rare.

The MG-08 was replaced with the somewhat lighter MG-08/15, using a stock, pistol grip, and bipod, and also had a muzzle booster to increase the abysmal rate of fire. The cyclic rate was increased to only 500 rpm, however. The IMG-08/15 was a further lightened version for use on aircraft; it had a skeleton jacket that had a mechanism to use with interrupter gear so it can fire through propellers.

In 1916, a new light tripod was designed to replace the heavy sledge. (This tripod was copied by Belgium and Russia to use with their Maxim-pattern machineguns.) The MG-08/18 was the last World War 1 version of the MG-08 used by the Germans; it dispensed with the water jacket and used a light air cooling casing instead. Unfortunately, the barrel tended to overheat so much that German doctrine was to use the MG-08/18 in threes so two could cool while one fired.

The MG-08 was used by the Germans as late as 1938 in front line formations, and 1945 in reserve formations.

Weapon	Ammunition	Weight	Magazines	Price
MG-08	8mm Mauser	26.44 kg (30.5 kg with water)	100 or 250 Cloth Belt	\$2906
MG-08/15	8mm Mauser	18 kg (22 kg with water)	100 or 250 Cloth Belt	\$2905
IMG-08/15	8mm Mauser	22 kg	100 or 250 Cloth Belt	\$2906
MG-08/18	8mm Mauser	17 kg	100 or 250 Cloth Belt	\$2905

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-08 (Sledge)	3	5	2-3-Nil	7	1	1	208
MG-08 (Tripod)	3	5	2-3-Nil	7	1	2	208
MG-08/15	5	5	2-3-Nil	9	2	6	104
MG-08/15 (Bipod)	5	5	2-3-Nil	9	1	3	135
IMG-08/15	5	5	2-3-Nil	7	1	1	208
MG-08/18	5	5	2-3-Nil	9	2	6	104
MG-08/18 (Bipod)	5	5	2-3-Nil	9	1	3	135

Parabellum MG-1914/MG-1917

Notes: Sometimes known as the "Zeppelin Gun" for its employment in the gun mounts of World War 1 lighter-than-air craft, the Parabellum gun was designed in response to a German military need for a machinegun for use on aircraft flexible mounts. In 1918, when the Germans were beginning to have a hard time finding weapons of any sort, it was modified for use in the ground role. The Parabellum gun is basically a vastly-lightened Maxim MG-08 machinegun, with the toggle inverted so that it broke upwards instead of downwards. This allowed the designer to change the operation to short recoil, making for a lighter mechanism. The bulky water cooling jacket was also eliminated, replaced with a perforated air cooling jacket. This is also the easiest way to tell an MG-1914 from an MG-1917; the MG-1914 has a wide cooling jacket, while the MG-1917 has a slim cooling jacket. The MG-1917 also has a forward handgrip, and a bipod; it was meant to be used in the ground role as well as an aircraft gun.

Weapon	Ammunition	Weight	Magazines	Price
MG-1914	8mm Mauser	9.8 kg	250 Belt	\$2798
MG-1917	8mm Mauser	11 kg	250 Belt	\$2872

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-1914	5	5	2-3-Nil	8	1	2	202
MG-1917	5	5	2-3-Nil	8	2	6	101
MG-1917 (Bipod)	5	5	2-3-Nil	8	1	3	131
MG-1917 (Tripod)	5	5	2-3-Nil	8	1	1	202

Rheinmetall MG-3

Notes: The story of the MG-3, now the standard German GPMG, began shortly after World War 2 and the formation of the then-new West German Army (*Bundeswehr*). The West Germans needed small arms; they partially made do with surplus weapons from other countries, partially with newer designs from other countries, but it was quickly realized that as far as GPMGs were concerned, the MG-42 was pretty much still the best light machinegun in the world. Rheinmetall re-designed the MG-42 for the then-new 7.62mm NATO cartridge, producing what Rheinmetall called the MG-42/59. The West German Army called the new weapon the MG-1, with later versions (MG-1A1, MG-1A2, and MG-1A3) differing primarily in small details to ease production. (The Italians, in fact, still use a further-modified form of the MG-1A3, though they are phasing them out, and they still call it the MG-42/59.) The MG-1 series could only feed from the 50-round DM-1 non-disintegrating link belt. At the same time, Rheinmetall also directly re-chambered some MG-42s to fire the 7.62mm NATO cartridge; these were designated the MG-2. Both the MG-1 and MG-2 were used by the West Germans until 1968 (and unofficially, even longer than that).

In 1968, Rheinmetall introduced the MG-3; this version externally looks like an MG-1A3. The rate of fire of the MG-1 and MG-2 was considered way too high (they still had almost the original rate of fire of the MG-42, about 1100 rpm), so the weight of the bolt of the MG-3 was almost doubled, reducing the standard rate of fire to 900 rpm. The MG-3, like many GPMGs of the period, has a variable gas regulator, primarily for use when compensating for fouling, but it also allows the rate of fire to be adjusted from 700-1300 rpm. The receiver was modified so that the MG-3 could accept standard NATO disintegrating link ammunition belts (but could also accept the earlier DM-1 belts). The strength of the belt pull was also dramatically increased; though the standard NATO belt has 100 rounds, experiments were conducted with MG-3's feeding from *hanging* 1000-round belts! A new plastic drum was also designed to contain a 100-round belt and attach it to the receiver; most of it is of green or black plastic, but they also have a clear plastic rear to allow the gunner to check how much ammunition is left on the belt. Ammunition feed, like most Western belt-fed weapons, is from the left side.

The iron sights were also modified; they never really worked for the 7.62mm NATO cartridge, and were recalibrated. Barrel length was changed slightly (to 22.2 inches), and the rate of rifling was also changed due to new information gained from American experience in Vietnam. The muzzle of the barrel was given a modified recoil booster, but retained the conical flash hider. The barrel could still be changed quickly, but the procedure changed somewhat, mostly to protect the hands of the assistant gunner from the hot

barrel. An ability to use a blank firing adapter was added for training purposes.

The MG-3 may be fired from a folding bipod near the end of the barrel sleeve; this bipod is not adjustable for height, but the left leg may be adjusted to allow for cant. The feet of the bipod have spikes to help stabilize the gun. The MG-3 also fits on standard NATO light tripods as well as NATO medium tripods, as well as pintle mounts. A modified form of the MG-3 is also commonly used on German-made vehicles as coaxial armament, and a version with spade grips instead of a stock also exists which allows the MG-3 to be used as a door gun on helicopters.

It should be noted that, all in all, relatively few modifications were made to the original MG-42 design; a World War 2 Nazi soldier could easily mistake the MG-3 for an MG-42 at first glance.

Weapon	Ammunition	Weight	Magazines	Price
MG-3	7.62mm NATO	11.07 kg	50 Belt, 100 Belt, 250 Belt	\$3131

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-3	5/10	4	2-3-Nil	8	3	6/13	73
(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	94
(With Tripod)	5/10	4	2-3-Nil	8	1	2/3	133

Rheinmetall MG-15nA

Notes: This gun is generally known as a "Bergmann," though it was probably designed by Louis Schmeisser. It is a greatly lightened version of the MG-15 (nA stands for *neuer Art* – new pattern). The water jacket of the MG-15 was discarded in favor of a perforated air-cooling jacket. A bipod, pistol grip, and a rudimentary padded butt were added. The MG-15nA fed from a belt that was contained in a drum on the right side of the weapon. It was one of the first weapons to use a disintegrating link belt. The MG-15nA was a very robust and reliable weapon, but despite its good qualities, it was neither produced nor adopted in great quantities, except to German troops fighting in Italy.

Weapon	Ammunition	Weight	Magazines	Price
MG-15nA	8mm Mauser	12.92 kg	200 Belt	\$2942

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-15nA	5	5	2-3-Nil	7	2	6	105
MG-15nA (Bipod)	5	5	2-3-Nil	7	1	3	136
MG-15nA (Tripod)	5	5	2-3-Nil	7	1	1	210

Rheinmetall MG-42

Notes: This was designed in response to Nazi Germany's need for more machineguns that could be produced quickly and cheaply. This led directly to the roller-locking mechanism that later made Heckler-and Koch famous – though it was a Mauser invention. The MG-42 was made from parts pressed, stamped, and welded from sheet steel, yet yielded a better weapon than the MG-34. The rate of fire was so high that the barrel change procedure was simplified to the point a soldier could almost do it in his sleep, usually in less than 5 seconds. By the end of World War 2, over 750,000 had been built, and many of those were taken up by post-war armies, often with modifications to calibers of their countries. The MG-3 is basically an MG-42 in 7.62mm NATO caliber, and the US M-60 is an MG-42 after "Americanization" and sort of a Rube Goldberg selection and modification process.

Weapon	Ammunition	Weight	Magazines	Price
MG-42	8mm Mauser	11.5 kg	50 Belt	\$2677

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-42	10	4	2-3-Nil	7	3	13	67
MG-42 (Bipod)	10	4	2-3-Nil	7	1	7	87
MG-42 (Tripod)	10	4	2-3-Nil	7	1	3	134

Breda M-1931

Notes: This is a large, heavy-caliber machinegun, similar in concept (but not form) to the Russian KPV. It was designed primarily for antiaircraft use, but also used as a heavy support weapon. Operation is by long-stroke gas piston and, very different from most pre-World War 2 Italian automatic weapons designs, has a straightforward and simple operation. The M-1931 fires from an open bolt, and the M-1931 was used only from a tripod. The heavy 43.3-inch barrel is finned for the last two-thirds of the length to aid in cooling, and is tipped with a rather small flash suppressor considering the size of the weapon. Firing is automatic only, but the slow cyclic rate (450 rpm) makes single shots possible for a good gunner. The M-1931 uses spade grips and a butterfly thumb trigger. The weakness of the M-1931 is its feed method – by box magazines instead of belts.

Weapon	Ammunition	Weight	Magazines	Price
M-1931	13.2mm Hotchkiss	47.5 kg	20, 30	\$10560

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-1931	5	10	2-2-3	12	1	3	377

Brixia M-1923

Notes: Another weird pre-World War 2 Italian weapon, the M-1923 it fitted with a bipod and a sling for hip-firing – even though it has no shoulder stock and is fired with spade grips. Luckily, there is also provision for mounting it on a tripod, and that is how it was normally used. (Firing from the hip or bipod is, in game terms, one level more difficult than normal.) The action is based on the Fiat-Revelli M-1914, but uses a different-shaped locking wedge that helps mitigate recoil to an extent, and also serves as a sort of passive trigger safety. It has a two-stage trigger; the trigger is pushed all the way in to fire semiautomatic shots, and halfway to fire on automatic. The cyclic rate of fire is a mere 350 rpm. The short 18.1-inch barrel is tipped with a conical flash suppressor, and does not lend the M-1923 to long-range fire. A selector switch may also be used; this is better than trying to fire with thumb pressure, as trying to push a butterfly trigger only halfway in in the heat of battle is a real feat of skill. The M-1923 is fed by box magazines mounted on the right side; these magazines have large slots in the side to check ammunition levels; this also lets a lot of dirt into the magazines, duplicating the mistake the designers of the Chauchat did when they designed magazines for their gun.

Weapon	Ammunition	Weight	Magazines	Price
M-1923	6.5mm Carcano	11.5 kg	35	\$1809

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-1923	3	3	2-Nil	5	2	4	49
With Bipod	3	3	2-Nil	5	1	2	63
With Tripod	3	3	2-Nil	5	1	1	97

Fiat-Revelli M-1914

Notes: This was the first domestically-designed machinegun to appear in Italy. Like most Italian designs of the period, it is a mechanically strange weapon. It is fed from a 50-round “ammunition cage” that was itself loaded from 5-round clips of rifle ammunition. It has an external buffer rod that jumps up out of the receiver when firing; this is right in front of the spade grips and was said to be alarming when the weapon is fired, particularly when the gunner is aiming. It has an operation so strange that firearms experts are split on whether it is short-stroke recoil or delayed blowback. The M-1914 also has an oil tank to lubricate the rounds; without the oil, feeding and extraction is not a certain thing. Despite all this, the M-1914 served until 1945, when it was sold off to various countries around the world.

The M-1935 is an improved M-1914; in fact, many M-1935s were rebuilt M-1914s. The water jacket was removed and replaced with an air-cooling jacket with a quick-change capability; the caliber was changed to 8mm Breda; the lubrication system for the rounds was made unnecessary by improvements to the feed system; and the ammunition cage was replaced by a conventional belt feed. Unfortunately, the feed system that supposedly made lubrication of the cartridges unnecessary didn't work, and a lubrication mechanism had to be added back into the weapon. The M-1935 also had an alarming tendency to cook off, due to its firing from a closed bolt. The 23-kilogram tripod was quite a piece of equipment to lug around. The Italians used them until 1945, and then destroyed most of them.

The Breda M-1937 was a further development of the M-1935. In addition to the screwy operation of the M-1914 and M-1935, the M-1937 was saddled with small-capacity strip feeding. The entire feed strip moves through the M-1937, with empty cases being replaced in the feed strip after firing. Not only could these strips not be linked; no reloading is possible until the spent feed strip is removed. Firing is from an open bolt and on automatic fire only, but the low cyclic rate of fire (450 rpm) means that squeezing off single shots is possible with a minimum of practice. The barrel is also of heavier profile and longer (30.7 inches vs. 25.7 inches for the M-1935), but there is no flash suppressor or muzzle brake on the barrel. The M-1937 was accompanied by a new 19-kilogram tripod. The M-1938 was a vehicle-mounted version, designed as a coaxial weapon or for other internal vehicle mounts. It has no provisions for mounting on a tripod, and uses a shorter 26.8-inch barrel. Instead of spade grips, the M-1938 uses a pistol grip and trigger. It is also fed by a top-mounted box magazine, with downward extraction and provisions for mounting a case collection bag.

Weapon	Ammunition	Weight	Magazines	Price
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M-1914	6.5mm Carcano	17 kg	50 Strip-Feed Box	\$2071
M-1935	8mm Breda	18.1 kg	50 Belt	\$2939
M-1937	8mm Breda	19.4 kg	20 Strip	\$3080
M-1938	8mm Breda	19 kg	20	

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-1914	5	4	2-Nil	7	1	1	163
M-1935	5	5	2-3-Nil	8	1	1	177
M-1937	5	5	2-4-Nil	8	1	2	225
M-1938	5	5	2-3-Nil	7	*	*	188

*This machinegun is always mounted in internal vehicle mounts, and has no recoil in game terms.

MG-42/59

Notes: This is for all intents and purposes a World War 2-era MG-42 that has been given a change in caliber with as little other changes as possible. The 7.62mm NATO version is also used by Nigeria, Chile, Mozambique, Portugal, and Denmark. As deliveries of the Minimi to Italian troops have been greatly slowed for budgetary reasons, a version of the MG-42/59 has also been manufactured using 5.56mm NATO ammunition.

Twilight 2000 Notes: The 5.56mm NATO version became the standard squad automatic weapon as sources for the Minimi quickly dried up.

Merc 2000 Notes: The 5.56mm NATO version became a speedbump in the arms road as shipments of the Minimi were accelerated.

Weapon	Ammunition	Weight	Magazines	Price
MG-42/59	7.62mm NATO	12 kg	50 Belt, 100 Belt	\$2370
MG-42/59	5.56mm NATO	12 kg	50 Belt, 100 Belt	\$1506

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-42/59 (7.62mm)	5	4	2-3-Nil	8	2	6	73
MG-42/59 (7.62mm, Bipod)	5	4	2-3-Nil	8	1	3	95
MG-42/59 (7.62mm, Tripod)	5	4	2-3-Nil	8	1	2	146
MG-42/59 (5.56mm)	5	3	1-Nil	8	1	4	65
MG-42/59 (5.56mm, Bipod)	5	3	1-Nil	8	1	2	84
MG-42/59 (5.56mm, Tripod)	4	3	1-Nil	8	1	1	129

Type 03 Taisho

Notes: One of the standard tripod-mounted machineguns of the Japanese in World War 2, the Type 03 suffered, like many Japanese machineguns, from underpowered ammunition. Another weakness was the feed mechanism, which fed from rigid strips of limited capacity similar to the Hotchkiss machineguns. Action is by long-stroke gas piston, and generally reliable. The Type 03 was designed for tripod use, and has no bipod or stock; it is fired by the use of spade grips and a butterfly trigger. The Type 03 has only an automatic setting, but the 450-rpm cyclic rate makes single shots easy to make. Unfortunately, the Type 03's mechanism has no primary extraction device, meaning the cartridge cases had to be oiled, with the Type 03 having an integral oiler so that the rounds did not have to be stored in an oiled condition. The tripod for the Type 03 had cylindrical tubes on the front two legs and a detachable fork on the rear leg to allow the gun to be carried by putting poles through the slots and under the fork. This tripod weighs 24 kilograms. The 29-inch barrel has not only a heavy profile, but is finned through most of its length for cooling. Most Type 03s were destroyed after World War 2 by Allied forces, though some survive in museums or in the hands of private collectors.

Further evolution of the Type 03 resulted in the Type 92; the primary difference was the change to the more powerful 7.7mm Type 92 or 7.7mm Type 99 ammunition (the Type 92 machinegun being able to fire either one). It was a bit heavier, but included folding spade grips for travel and a safe setting on a selector switch. The Type I is a much-lightened version of the Type 92, and can only fire the Type 99 round. The Type 92 machinegun uses the same tripod as the Type 03, but the Type I uses a lightened 21-kilogram tripod. Both can feed from the same 30-round strips as the Type 03 or a semi-rigid 250-round belt. The barrel of the Type 92 is a bit shorter at 28.35 inches, while the Type I uses a much shorter 23.25-inch barrel.

Weapon	Ammunition	Weight	Magazines	Price
Type 03	6.5mm Arisaka	26.5 kg	30 Strip	\$2018
Type 92	7.7mm Type 92 or Type 99	28 kg	30 Strip or 250-Round Belt	\$2681
Type I	7.7mm Type 99	15 kg	30 Strip or 250-Round Belt	\$2525

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 03	5	4	2-3-Nil	8	1	1	185
Type 92	5	4	2-3-Nil	8	1	1	199
Type I	5	4	2-3-Nil	7	1	1	149

Type 62

Notes: This is the standard GPMG for Japanese forces, and was originally called the Model 9M. The gas and extraction system are unusual and complicated, but also reliable. They also lead to less recoil. It is also impossible to fire a round if there is no barrel mounted or if the weapon is accidentally dropped or bumped, and it will also not fire if the feed tray is open.

Twilight 2000 Story: After the Twilight War, these weapons began showing up in Korea and the Philippines.

Weapon	Ammunition	Weight	Magazines	Price
Type 62	7.62mm NATO	10.7 kg	100 Belt	\$2318

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 62	5	4	2-3-Nil	8	2	5	65
Type 62 (Bipod)	5	4	2-3-Nil	8	1	2	85
Type 62 (Tripod)	5	4	2-3-Nil	8	1	1	130

POF MG-3

Notes: This is a copy of the German MG-3 machinegun manufactured by the Pakistani Ordnance Factories. It is essentially the same weapon, differing only in minor details to suit local manufacturing methods.

Weapon	Ammunition	Weight	Magazines	Price
POF MG-3	7.62mm NATO	11.5 kg	50 Belt, 100 Belt, 250 Belt	\$2373

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
POF MG-3	10	4	2-3-Nil	8	3	6	73
POF MG-3 (Bipod)	10	4	2-3-Nil	8	1	3	95
POF MG-3 (Tripod)	10	4	2-3-Nil	8	1	2	145

CKM WZ-30

Notes: The WZ-30 is sort of a copy of the Browning M-1917, but has several differences from that machinegun. First, the WZ-30 is chambered for 8mm Mauser instead of .30-06 Springfield. The barrel and water-filled barrel jacket is lengthened to allow longer range fire; the barrel is 28.35 inches, with a conical flash suppressor. The diopter-type rear sight is replaced by a simpler open-notch sight. Further changes were made to decrease (real-life) cost and suit Polish manufacturing methods. A lighter 26-kilogram tripod was developed (the one for the Browning M-1917 weighs 29 kg). Fire is possible only from the bipod; the WZ-30, like the Browning, has only a simple pistol grip, and also has no trigger guard. The belt is non-disintegrating.

The WZ-30/39T was an export version made for Turkey, and was chambered for 7.65mm Mauser. In addition, the pistol grip and trigger were replaced by spade grips and a butterfly trigger.

Weapon	Ammunition	Weight	Magazines	Price
WZ-30	8mm Mauser	21 kg +4 kg Full Water Jacket	330 Belt	\$2791
WZ-30/39T	7.65mm Mauser	20.64 kg +4 kg Full Water Jacket	330 Belt	\$2530

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
WZ-30	5	5	2-3-Nil	9	1	1	208
WZ-30/39T	5	4	2-3-Nil	9	1	1	201

NSW Utios

Notes: The name "NSW Utios" will probably sound familiar to most of the readers of these pages – that's because the NSW Utios is essentially an identical Polish copy of the Russian NSV Utyos heavy machinegun, except for minor changes to suit local manufacturing methods; the parts are even interchangeable.

The reason I have included the NSW Utios here is not because of the standard version – it's because of its latest variant, which is believed to have been developed to help with ammunition commonality now that Poland is a part of NATO, and to make the weapon more attractive to export customers. This version is known as the WKM-B Utios, and it is also for the most part identical to the NSV – except that it is chambered for the .50 Browning Machinegun round, and has a number of changes to the mechanism of the weapon to enable the WKM-B to fire that cartridge. The WKM-B has recently received a large order from the new Iraqi Army, probably due to the fact that a modification kits to allow an NSV or NSVT to be converted to its WKM-B counterpart.

As with most weapons of this type, both versions can be fired only from a tripod, pintle, or vehicle mount.

Twilight 2000 Notes: The WKM-B does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
NSW Utios	12.7mm Russian	24.99 kg	50 Belt	\$10261
WKM-B Utios	.50 Browning Machinegun	24.27 kg	105 Belt	\$9699

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
NSW Utios (With Tripod)	5	9	2-3-4	10	1	3	312
WKM-B Utios (With Tripod)	5	9	2-3-4	10	1	3	333

Pirat

Notes: This Polish heavy machinegun fires the 14.5mm KPV round. It is essentially a KPV machinegun mounted on a heavy tripod for use as a heavy support weapon. As the KPV is normally fired electrically, the Pirat has been modified to allow it to fire mechanically. Normally the sights of a PK machinegun are employed, but the Pirat is often seen with optical sights. The Pirat is normally served by a crew of three, and can be broken into three or four loads for transport. It takes about 5 minutes to ready the Pirat for action from its broken-down state. The Pirat may only be fired from the tripod or a vehicle mount.

Weapon	Ammunition	Weight	Magazines	Price
Pirat	14.5mm KPV	202.2 kg	10 Belt, 100 Belt	\$13893

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Pirat (Normal Ammo)	5	11	2-2-3	14	1	3	475
Pirat (APDS Ammo)	5	11	1-1-1	14	1	3	569

Degtyarev DP Series

Notes: This weapon was perhaps the first truly original small arms design made by the Russians. It was adopted by the Soviets in 1928, and continued in use as the standard Soviet light machinegun until the 1950s. The DP was built in huge numbers and some can still be found in use in China, Southeast Asia, and Africa today.

The DP uses a simple design called the Friberg-Kjellman operating system; it is simple to build and maintain, yet is tough and highly resistant to dirt. The problem with the DP was the ammunition itself; the 7.62mm Nagant cartridge was not really suited to any of the automatic weapon designs of the time, and was difficult to load without jamming. The pan magazine helped greatly in this respect, but was in of itself a weak point. The DP has no semiautomatic fire setting, but the rate of fire is low enough that squeezing off single shots is not too difficult. No provision for tripod mounting is provided. The 23.8-inch barrel was tipped with a conical flash suppressor. The barrel could be changed in the field by the gunners, but required a special wrench – woe unto the crew that lost that wrench. The DP-27 has a rifle-type stock with a semi-circular grip at the bottom to steady the weapon while prone; the stock has a pistol-grip wrist with a conventional trigger. Though there is no manual safety, the DP-27 has an automatic grip safety.

The DPM was an upgraded version of the DP-27 introduced in 1944, and used by the Soviets for about two decades in front-line units and into the 1980s in Category 3 and Mobilization-Only units. The DPM's recoil spring was moved to the rear of the receiver, and contained in a short steel tube. The grip safety was replaced by a selector switch with safe and automatic settings, and a true pistol grip was added. A more robust bipod replaced the DP-27's bipod. For game purposes, the DPM is identical to the DP-27.

The RP-46 is a further improved DPM, introduced just after World War 2. Most of the differences are in the feed system; though the RP-46 can use the pan magazines of the DPM, it can also feed from non-disintegrating steel belts. The RP-46's primary feed was to be by belt; if the belt-feed mechanism is removed (it can be removed as a unit), then pan magazines can be used. The second major differences was the use of a slightly longer and much heavier barrel with better cooling and a larger conical flash suppressor. The RP-46 also had a quick-change barrel, aided by a carrying handle attached to the barrel. Construction was on the whole stronger and more robust. The RP-46 proved to be too light to be a GPMG (and had no provision for tripod mounting), and too heavy to be used as a light machinegun. Though long out of Russian and Chinese service, the RP-46 can still be found in some Chinese militia units, in the Vietnamese Army, and in use by several African nations and bandit groups.

In the US, Century Arms has imported from Eastern Europe DPMs which have been demilled to the point that modifying them for automatic fire would be difficult if not impossible. Most of these weapons are of new manufacture, with receivers purpose-built in the US for semiautomatic-only fire. These are essentially semiautomatic versions of the DPM, machineguns without the "machine." They load, feed, and fire in otherwise the same manner as a standard DPM. Trigger action is described as mushy and the bolt is very difficult to pull back.

Weapon	Ammunition	Weight	Magazines	Price
DP-27	7.62mm Nagant	8.5 kg	47 Pan, 49 Pan	\$2503
RP-46	7.62mm Nagant	13 kg	47 Pan, 49 Pan, 50 Belt, 250 Belt	\$2506

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
DP-27	5	4	2-3-Nil	8	3	7	81
With Bipod	5	4	2-3-Nil	8	1	3	105
RP-46	5	4	2-3-Nil	9	2	6	81
With Bipod	5	4	2-3-Nil	9	1	3	105

Degtyarev/Shpagin DShK

Notes: This design was a pre-World War 2 cooperative effort between Russian gun designers Degtyarev and Shpagin. It remained the standard Soviet and Russian heavy machinegun for almost the next 50 years before being replaced in Russian service by the NSV series. Most Russian-designed tanks in the world are still using the DShK as anti-aircraft/commander's machineguns.

Operation of the DShK is by gas, with a long-stroke gas piston and capable only of automatic fire. (With a cyclic rate of fire of 550 rpm, however, squeezing off single shots is generally not difficult.) The DShK has a gas regulator, but this requires a wrench to adjust. The internal mechanism sounds complex in description, but in reality it is not that complicated. The 42.13-inch barrel is heavy, finned for cooling, and is fitted with a large muzzle brake on the end. The barrel is definitely not "quick-change," as changing a barrel requires it to be unscrewed a long way from the receiver, and before this is done, a cross-bolt must also be removed. Fire is by spade grips and a butterfly trigger. Sights consist of ladder-type rear sight and a hooded front sight post. A kit exists to affix AA sights onto the DShK. The DShK ground mount is usually a wheeled carriage, but some countries have devised a variety of tripod mounts, and a special AA mount also exists.

In the design phases, the DShK was to be magazine-fed. This was changed to belt-feeding, but not until the design process was nearly over, and belt-feed was almost an afterthought. The feed mechanism is therefore a bit complex, but does reliably feed the rounds into the gun; it essentially links what would have been the magazine well with the belt-feed gate, using a mechanism similar to the running wheels one finds in a hamster's cage. The charging handle of the DShK is really too small to be gripped in the heat of battle; most crews put extensions on the handles or at least jam a spent cartridge case into a hole that is on the end of the charging handle.

After World War 2, several design changes were made to the DShK, resulting in the DShK-38/46 (also called the DShKM). The DShK-38/46 fixed the overly-complicated and somewhat jury-rigged belt-feed mechanism, making it much simpler and giving the

option of changing the feed direction of the belt. The muzzle brake was made lighter and easier to produce. Otherwise, it is identical to the DShK for game purposes.

The Chinese made the DShK-38/46 under license for nearly 50 years, though since the 1990s these guns were primarily built for export. The Chinese nomenclature was the Type 54. Recently, China sold its license to Pakistan, where it is still being manufactured as the Type 54. It is identical to the DShK-38/46 for game purposes, with the exception of an extended charging handle being standard.

Weapon	Ammunition	Weight	Magazines	Price
DShK	12.7mm Russian	35.5 kg	50 Belt	\$10275

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
DShK	5	9	2-2-3	11	1	3	326

Degtyarev DS-39

Notes: Just before World War 2, the Russians decided to replace the Russian version of the Maxim with a lighter, simpler, air-cooled weapon. This was the DS-39, and some 10,300 were built from 1939-41. The DS-39 by long-stroke gas piston, firing from an open bolt and on automatic fire only. The DS-39 has a dual cyclic rate of fire, either 600 or 1200 rpm. The 600-rpm rate of fire allows a practiced gunner to fire single shots; the 1200-rpm rate of fire was meant primarily for anti-aircraft use, but could be employed in other roles. In addition, the DS-39 had a manually-adjustable gas regulator. Fire is by spade grips and a butterfly trigger. The standard mount was a light 28-kilogram tripod with a thin gun shield attached (AV1 to the gunner only), and the 28.5-inch barrel was finned for cooling and tipped with a conical flash suppressor.

The problem with the DS-39 was, while it was in fact much lighter and simpler than the Maxim, it was also much less reliable than the Maxim or any other machinegun the Soviets had in service at the time. The biggest reasons for this lack of reliability was a feed mechanism that was not properly engineered to take the rimmed 7.62mm Nagant rounds, and the use of the Maxim's non-disintegrating fabric belts, which also did not work well in the DS-39. In addition, the feed mechanism has a rather violent movement, one that can literally rip the bullet out of the casing before it can be fired, and rip or greatly deform the spent casings upon extraction (reloading spent casings was very important to the Soviets in World War 2. Another problem was the relatively thin gas piston, which could become quickly mired in carbon and unburned powder.

The Tula Arsenal tried to fix the problems, but by 1941, the Russians decided to go back to producing the Maxim and later, the SG-43. The DS-39 was used as little as possible in World War 2 after the German invasion of the Soviet Union, but it could still be encountered. After World War 2, most were scrapped. The Finns tried to use some 200 captured DS-39s against the Soviets, but despite the best efforts at fixing the DS-39's problems (by Ahmo Lahti himself), they too realized that the DS-39's feed mechanism could not be fixed without basically starting from scratch. These guns were warhoused by the Finns until 1986 and then scrapped.

Weapon	Ammunition	Weight	Magazines	Price
DS-39	7.62mm Nagant	14.3 kg	100 or 250 Cloth Belt	\$3385

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
DS-39	5/10	4	2-3-Nil	8	1	1/3	202

Goryunov SG-43

Notes: This weapon was designed to replace the Maxim M-1910 in Russian service after the failure of the DS-39. As such, the SG-43 is a rather heavy weapon for its role, and normally retains the wheeled carriage of the Maxim; a second wheeled tripod is designed for AA fire. A tripod mount was also designed, but initially rejected by the Soviet High Command; later in World War 2, it was adopted for airborne and mountain troops. Like most Soviet machineguns of period, the machinegun uses a long-stroke gas piston operation, with automatic-only firing; also like most guns of the period, the cyclic rate is slow enough to allow for single shots. Fire is by spade grips and a butterfly trigger. Despite the complication of its mechanism, the Goryunov is surprisingly reliable and stoppages are quite uncommon; in addition, the SG-43 is also less complicated and cumbersome than the Maxim, and easier to manufacture. The 28.35-inch barrel is a quick-change type, but the handle tends to get as hot as the barrel, and gloves are normally necessary. The barrel is tipped by a conical flash suppressor.

The later SGM version was used exclusively with the tripod mount (with the exception of the initial models). The barrel was fluted to reduce weight, and dust covers were added to the feed and ejection ports. The charging handle was moved from the rear of the receiver to the right side. The SGMB is essentially the same, but designed for pintle mounts on APCs. Hungarian models of the SGM have a pistol grip, stock, and bipod. For game purposes, the SGM is the same as the SG-43, with the exception of the mount (30 kilograms for the wheeled mount vs. 14.2 kg for the tripod) and some minor weight differences.

By 2003, few countries are employing the Goryunov any more, but some Third World countries still have them, particularly as pintle-mounted guns for BTR-40 armored cars. However, Century International Arms has come out with a semiautomatic only (very difficult to convert to automatic fire), which is identical to the early SG-43 except for the lack of an automatic fire capability. They market this as the SA-43 Goriunov, and it is sold on a wheeled carriage.

Twilight 2000 Notes: As Category 3 and Mobilization-Only units began reaching the front lines, the Goryunov began to appear more and more often.

Weapon	Ammunition	Weight	Magazines	Price
SG-43	7.62mm Nagant	13.8 kg	250 Belt	\$2547
SGM	7.62mm Nagant	13.6 kg	250 Belt	\$2547
SGM (Hungarian Variant)	7.62mm Nagant	14.3 kg	250 Belt	\$2644

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SG-43	5	4	2-3-Nil	7	1	1	202
SGM	5	4	2-3-Nil	7	1	1	202
SGM (Hungarian)	5	4	2-3-Nil	9	2	6	101
SGM (Hungarian, Bipod)	5	4	2-3-Nil	9	1	3	131
SGM (Hungarian, Tripod)	5	4	2-3-Nil	9	1	1	202

Kalashnikov PK

Notes: This standard GPMG in Russian service fills the same role as the M-60, MAG, MG-3, and other such weapons in other armies. As such, it can be found in the armies of almost every country that is or was once a Russian or Soviet client state, or did business with China. The PK is sort of a mix of ideas from several previous machineguns; however, it is for the most part basically the same Kalashnikov action of the AK series of assault rifles, turned upside down and enlarged. This is added to the belt feed mechanism of a VZ-59, the trigger group of the DP, and the cartridge feed and quick change barrel of the Goryunov (though a shorter barrel). The Kalashnikov/Goryunov action makes it a very reliable and robust weapon, despite the light weight.

Introduced in 1964, the PK replaced the RP-46 and SGM in Russian service. The PK was designed to be used from a bipod or tripod (the tripod is known in *Twilight 2000* as the PLT, or Pact Light Tripod, though the weight is actually 7.47 kilograms), or pintle and vehicular mounts. The barrel is heavy, fluted for most of its length, and is 25.9 inches long with a short, conical flash hider at the end. The bipod folds forward and is attached to a reinforced section of the gas tube just behind the gas block. Feed is from the right, and the PK has been seen fed by several different lengths of non-disintegrating link belts and with several different types of ammunition boxes and containers ranging from small canvas bags holding 25 rounds to large boxes containing 250-round belts. (The box for the 250-round belt is not designed to be attached directly to the PK, but the others can be hung on a bracket on the side of the receiver.) Even larger containers are found for variants of the PK used as internal vehicular weapons. The pistol grip is of high-impact plastic, but the stock is made of wood, and its distinctive skeletonized shape is well-known to the troops of most countries.

The PKS is a variant of the PK designed for use as a support weapon and for antiaircraft use; it is normally issued in the Russian Army at the company level. It is essentially the same weapon as the PK, but the bipod is deleted, and the tripod used for the PKS is designed for use in both the ground role and antiaircraft role (the legs are collapsing and can be quickly raised up or collapsed again as necessary). This tripod weighs 9.3 kilograms.

The PKT is designed only for use in an internal vehicle mount, such as a coaxial weapon or the bow weapons found on some Russian-built vehicles. As is typical for such a weapon, it has no sights, stock, pistol grip, trigger mechanism, etc. – it is electrically fired by whatever trigger is used on the vehicle in question, using the vehicle's sighting devices. The PKT also uses a much longer 28.4-inch barrel.

Kazakhstan has converted many PKT's into a new version of the PK, which they call the PKD. They essentially took the PKT and put all the manual features back on, turning it into a PK with a longer barrel. The stock is also different, being made from simple tubular metal with an additional buttplate which has a thick rubber recoil pad.

The PKM is the current Russian production version of the PK (and has been since 1969); it is version of the PK which has been lightened by removing the flutes from the barrel and making it from lighter (but stronger) steel, as well as removing any excess metal possible, using almost entirely steel stampings instead of machined steel, and replacing the stock with one made from high-impact plastic (and later, polymer). A hinged support plate was also added to the stock to help support the weapon on the shooter's shoulder when it is fired from a bipod. There are several variants of the PKM which differ only in minor details; the PKMS uses a different bipod which allows the ammunition boxes (even the large one) to be secured to the right rear leg so that the gun and ammunition can be moved easier. The PKMSN is a PKMS with a bracket allowing the use of Russian night vision devices. The PKMB is a PKM with the stock, pistol grip, and trigger mechanism replaced with spade grips and the associated trigger, for use as a helicopter door gun. Later, a bracket for night vision devices was added to the PKMB.

Though the current standard *production* version is the PKM, there is in fact another, newer version of the PK, called the 6P41 Pecheneg. The Pecheneg is apparently in limited production and issue, and has been observed in the hands of Russian troops in Chechnya. The Pecheneg looks generally similar to the PKM, but the PKM's light, quick-change barrel has been replaced by a heavy, fixed barrel tipped with a slightly different flash hider. The Pecheneg also has a carrying handle attached on top of the barrel at the gun's point of balance. The Pecheneg's bipod is also attached near the muzzle instead of being near the gas block. The barrel is the same length as that of the PK and PKM (25.9 inches), but the Russians say that the Pecheneg is 2.5 times more accurate than the PKM when fired from a bipod and 1.5 times more accurate when fired from a tripod – something most Western analysts consider impossible simply by making the barrel heavier and fixed. (One also has to wonder about barrel heating during sustained fire.) The Pecheneg does, however, have a mount which can take a wide variety of optics and accessories – which might account for the added accuracy the Russians claim. A new tripod has also been designed for the Pecheneg, which weighs only 4.49 kilograms and is made of lightweight alloys.

Perhaps the newest version of the PK series is KMZ's AEK-999 Barusk. This weapon is meant to address some of the biggest

complaints from the troops about the PK series: a fragile, rapidly-heating barrel, deafening report, a point of high stress where the bipod is attached to the barrel, and a highly-visible firing signature. As with the PKM and Pecheneg, the Barusk utilizes primarily polymer instead of wooden parts. The new barrel has stiffening flutes on its length, and the barrel is made of the same grade of steel as those for aircraft cannons. The bipod is moved further back and is attached to rib under the barrel instead of to the barrel itself. Above the barrel, there is a long bar to reduce aiming errors due to barrel heat. The entire weapon is reduced in length. Perhaps the most unusual feature is a large, removable muzzle brake/low-efficiency suppressor that almost totally removes the muzzle flash of the Barusk, as well as making the muzzle cracks of the ammunition inaudible beyond 600 meters.

The Polish have a version of the PKM called the UKM-2000; this version is chambered for 7.62mm NATO ammunition, and the UKM-2000 can be mounted on both NATO and Eastern tripods, and in both NATO and Eastern armored vehicles and pintles. The barrel is also short at 21.5 inches, making a handier weapon. A version of this gun, the UKM-2000D, is designed for airborne troops and close combat and has a side folding stock that does not inhibit reaching the trigger.

Twilight 2000 Notes: The Pecheneg and PKD do not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
PK/PKS	7.62mm Nagant	8.8 kg	25 Belt, 50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2569
PKT	7.62mm Nagant	*	*	*
PKD	7.62mm Nagant	8.8 kg	25 Belt, 50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2726
PKM	7.62mm Nagant	8.21 kg	25 Belt, 50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2574
Pecheneg	7.62mm Nagant	8.21 kg	25 Belt, 50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2609
Barusk	7.62mm Nagant	8.74 kg	25 Belt, 50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2530
Barusk	N/A	4 kg	25 Belt, 50 Belt, 100 Belt, 200 Belt, 250 Belt	\$800
Suppressor				
UKM-2000	7.62mm NATO	8.4 kg	50 Belt, 100 Belt, 250 Belt	\$2327
UKM-2000D	7.62mm NATO	8.4 kg	50 Belt, 100 Belt, 250 Belt	\$2347

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
PK/PKS	5	4	2-3-Nil	8	3	7	91
(With Bipod)	5	4	2-3-Nil	8	1	3	118
(With Tripod)	5	4	2-3-Nil	8	1	2	182
PKT	5	4	2-3-Nil	*	*	*	202
PKD	5	4	2-3-Nil	8	2	6	101
(With Bipod)	5	4	2-3-Nil	8	1	3	131
(With Tripod)	5	4	2-3-Nil	8	1	1	202
PKM	5	4	2-3-Nil	8	3	7	91
(With Bipod)	5	4	2-3-Nil	8	1	3	118
(With Tripod)	5	4	2-3-Nil	8	1	2	182
Pecheneg	5	4	2-3-Nil	8	3	7	94
(With Bipod)	5	4	2-3-Nil	8	1	3	123
(With Tripod)	5	4	2-3-Nil	8	1	2	189
Barusk	5	4	2-3-Nil	8	3	7	84
(With Bipod)	5	4	2-3-Nil	8	1	3	109
(With Tripod)	5	4	2-3-Nil	8	1	1	167
Barusk (w/Suppressor)	5	4	2-4-6	9	2	6	77
(With Bipod)	5	4	2-4-6	9	1	3	100
(With Tripod)	5	4	2-4-6	9	1	1	154
UKM-2000	5	4	2-3-Nil	7	3	7	69
(With Bipod)	5	4	2-3-Nil	7	1	3	90
(With Tripod)	5	4	2-3-Nil	7	1	1	139
UKM-2000D	5	4	2-3-Nil	5/7	3	7	69
(With Bipod)	5	4	2-3-Nil	5/7	1	3	90
(With Tripod)	5	4	2-3-Nil	5/7	1	1	139

*Since this is strictly an internal vehicular-mounted version, these factors are not important with regards to the *Twilight 2000 v2.2* rules.

Kovrov KORD

Notes: When the Soviet Union broke up, one of the (many) problems Russia faced was that the facilities for the design and manufacturing of the NSV series of heavy machineguns (their standard heavy machinegun) was located in the then-new country of Kazakhstan, a country reluctant to supply Russia with any weapons. The Russians needed a domestically-produced version of the

NSV. At the same time, Kovrov had some new ideas for the NSV. The result is the KORD, which entered service in 1998.

Externally, the KORD looks almost identical to the NSV, but internally, it is essentially a new weapon. The biggest change internally is the new locking mechanism, called by Kovrov a "tilting breech slide." Essentially, the tilting breech slide makes the entire action work more smoothly. Kovrov also modified the gas mechanism to work less violently, and added a multi-baffle muzzle brake to the barrel; the result of those changes significantly reduces vibration of the action, increases the stability of the KORD, and reduces the recoil – so much that the KORD can actually be fired from a bipod (and some sources say, from the hip) without wrecking the shooter's shoulder. The KORD can also use any NSV tripod, pintle mount, or internal vehicular mount, as well as the tripods or pintle mounts designed for the AGS-17 and AGS-30 automatic grenade launchers. The barrel (approximately 41 inches in length, but I have not been able to find any solid figures on this) is designed to distribute and dissipate heat evenly without requiring fluting or fins. Sights for the infantry versions consist of a protected front post and a rear folding adjustable tangent sight; provisions are also made for mounting an SPP telescopic sight or special anti-aircraft sights.

There are at least six variants of the KORD, most of which vary only in minor details from each other. The 6P49 is designed for internal vehicular mounts, is electrically fired, and is aimed using the vehicle's sights; the 6P49 is also designed so that the spent shells are ejected forward, outside of the vehicle. The 6P51 is similar, but further specialized (somewhat more compact) for use as a coaxial weapon or for mounting in turrets with limited space, such as that of the BTR-60, 70, and 80. The 6P50 is the basic infantry model, equipped with spade grips and designed to be fired only from tripod or pintle mounts. Feed is from the left, and spent rounds are ejected to the left and forward. The gun portion of the 6P50, 6P50-2, 6P50-3 are identical; they simply have different designations depending upon what they are mounted upon (6P50 refers to the KORD when it is on standard 16.01-kilogram NSV-type tripods or pintles; 6P50-2 refers to the KORD when it is mounted on the heavier 26.99-kilogram 6T99 tripod; 6P50-3 is the KORD when it is mounted on the 49.99-kilogram 6U6 multipurpose mount.) The 6P50-1 is also an infantry model, with a bipod, standard trigger unit, and NSV-type stock added. The bipod is designed to allow traverse up to 15 degrees in either direction.

In 2005, an export variant of the Kord was being offered, chambered for .50 Browning Machinegun ammunition. Parts are 80% interchangeable with those of the standard KORD, but a quick caliber change is not possible.

Twilight 2000 Notes: The KORD never got very far, but did appear on mounts on some armored vehicles such as T-90, T-94, T-95, and Black Eagle tanks and on ground and vehicular mounts in some airborne, air assault, and special operations units. The .50 Browning Machinegun chambering does not exist in the Twilight 2000 timeline.

Merc 2000 Notes: Budget problems led to the premature cancellation of the KORD.

Weapon	Ammunition	Weight	Magazines	Price
KORD 6P50-1	12.7mm Russian	31.99 kg	50 Belt, 70 Belt	\$10571
KORD 6P50/-2/-3	12.7mm Russian	24.99 kg	50 Belt, 70 Belt	\$10377
KORD 6P50-1	.50 Browning Machinegun	31.13 kg	50 Belt, 70 Belt, 105 Belt	\$10007
KORD 6P50/-2/-3	.50 Browning Machinegun	24.32 kg	50 Belt, 70 Belt, 105 Belt	\$9977

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
KORD 6P50-1 (12.7mm)	5	9	2-3-4	12	4	7	156
(With Bipod)	5	9	2-3-4	12	2	4	203
(With Tripod)	5	9	2-3-4	12	1	2	313
KORD 6P50/-2/-3 (12.7mm, With Tripod)	5	9	2-3-4	11	1	2	313
KORD 6P50-1 (.50)	5	9	2-3-4	12	4	7	167
(With Bipod)	5	9	2-3-4	12	2	4	217
(With Tripod)	5	9	2-3-4	12	1	2	334
KORD 6P50/-2/-3 (.50, With Tripod)	5	9	2-3-4	11	1	2	334

Maxim PM-1910

Notes: The first machineguns the Russians had were Maxims supplied to the Tsar's Army by England. By 1905, Tula was capable of reproducing the design and the Russians began producing their own copy as the PM-1905, with a bronze water jacket. The next step was to replace the bronze jacket with a steel one and produce the Maxim in a local caliber, 7.62mm Nagant, with the feed mechanism suitably altered to properly use the rimmed round. The PM-1910 also has a very large port to fill the water jacket to allow it to be filled or topped off faster. This version of the Maxim was produced in huge numbers and remained in service until replaced by the SG-43. It can still be seen in reserve formations of the Chinese Army, Vietnamese Army, Mongolian Army, and even some Eastern European military forces, as well as some of the Third World countries once aligned with Russia or China.

Weapon	Ammunition	Weight	Magazines	Price
PM-1910	7.62mm Nagant	23.8 kg (27.8 kg with Water)	250 Belt	\$2634

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
PM-1910	5	4	2-3-Nil	9	1	1	202

Maxim/Tokarev MT

Notes: The MT was an interim light machinegun design; about 2500 were produced at Tula in 1926-27. Most were later sold to

Republican Spain, and they were not used for long in the Soviet Army. The MT was sort of a combination of the German IMG-08/18 and the Russian version of the Maxim, the M-1910. The water-filled barrel jacket was discarded at the outset, and a shorter 25.8-inch barrel was used with a barrel jacket that helped cool the barrel. The barrel could be changed in the field, but it takes several minutes to do so. The spade grips were replaced with a rifle-type stock with a pistol-grip wrist and a conventional trigger. A folding bipod was located at the end of the barrel jacket; this bipod had spikes at the end of it. No provision for tripod mounting is provided. The MT was fed by non-disintegrating belts; the standard was a 100-round belt contained in a drum that attached to the gun, but older 250-round belts could also be used.

Weapon	Ammunition	Weight	Magazines	Price
MT	7.62mm Nagant	12.9 kg	100 Belt, 250 Belt	\$2551

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MT	5	4	2-3-Nil	8	2	6	90
With Bipod	5	4	2-3-Nil	8	1	3	118

Molot NSV Utyos

Notes: Work on the machinegun that became the NSV began in 1969, but the first examples were not observed by the West until several years later. The NSV heavy machinegun was designed to replace the DShK in Russian and Warsaw Pact service, as well as for export sales, and it can be found almost anywhere in the world now. Until recently, the Russians no longer manufactured the NSV; however, it *is* still being manufactured -- by Metallist Uralsk and Kaspex in Kazakhstan, where the facilities for NSV manufacture were located after the breakup of the Soviet Union, as well as by Molot.

The NSV is for the most part a conventional gas-operated heavy machinegun. The gas system uses a three-position gas regulator, which allows the gunner to compensate for fouling or dirt. The barrel, approximately 41 inches long (as with the KORD, I have not been able to find any solid figures on this) is tipped with a large conical flash hider, and though the barrel looks thin and flimsy, it is actually quite robust. Feed may be from the right or left, but the side from which the NSV feeds is set at the factory according to the needs of the buyer and cannot be changed afterwards without considerable work by an armorer. The receiver is of stamped steel with a combination of welds and rivets holding it together. For the most part, sights consist of a front hooded post and a rear folding adjustable tangent leaf sight. Ground-mounted versions and those on pintle mounts may also mount an SPP telescopic sight; this sight is a 3x/6x sight with an illuminated reticle similar to that of the PSO-1 telescopic rifle scope. The ground-mounted NSV is also able to mount a 1PN52-1 night vision device. There are a several versions of the NSV, both for ground and pintle use and for internal vehicular use, most of which differ little from each other except in the direction from which they feed or the iron sights they use (or in the case of internal vehicular mountings, the use of electrical triggers instead of manual ones). Ground-mounted versions have what amounts to a rudimentary wooden stock on a strut attached to the bottom of the receiver and a conventional trigger group, while pintle-mounted models normally have spade grips and the associated trigger group. Many NSVs on Russian and Eastern European-built or designed tanks can often be aimed and fired from either inside the turret by the commander, or directly by the commander while standing in his hatch; these use electrical firing mechanisms and the firing controls are just inside the commander's hatch. The NSV can be fired only from a tripod, pintle, or vehicular mount; while early rumors stated that the NSV could be fired from a bipod, this is in fact incorrect (though it can be fired from the prone position using the rudimentary stock). The standard ground-mount tripod weighs 16.01 kilograms, but there is also a version of this tripod which has a thick armored gun shield in front (AV3) which is meant for used in fixed fortified positions. A special antiaircraft tripod is also available, which is essentially a taller version of the standard tripod that also comes with an antiaircraft sight reticle and lead arms.

After the breakup of the Soviet Union, Kazakhstan began manufacturing an updated form of the NSV, called the NSVP. This version is for the most part identical to the standard NSV, but the barrel of the NSVP is tipped by a muzzle brake, and a new soft-mount-type tripod was designed specifically for use with the NSVP (and can only be used by the NSVP). This soft mount also has a special cradle on the right side of the tripod for the ammunition box, which improves the balance of the NSVP. The weight of this special soft mount is approximately 27 kilograms. The NSVP is also able to use a standard NSV tripod or pintle mount.

Twilight 2000 Notes: the NSVP does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
NSV	12.7mm Russian	24.99 kg	50 Belt, 70 Belt	\$10261
NSVP	12.7mm Russian	25.19 kg	50 Belt, 70 Belt	\$10345

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
NSV (With Tripod)	5	9	2-3-4	10	1	3	312
NSVP (With Soft Mount)	5	9	2-3-4	10	1	2	312
NSV (With NSV Tripod)	5	9	2-3-4	10	1	3	312

Vladimirov KPV

Notes: Design work on the KPV began shortly after World War 2; it was at the time the machinegun firing the largest round in the world, and is still the heaviest-caliber machinegun in any sort of mass production. (Much bigger, and you cross into autocannon land...) At first, the KPV was meant for single, double, and quadruple antiaircraft mount use (the ZPU-1, ZPU-2, and ZPU-4), but it

was quickly realized that the KPV could be easily adapted to vehicle use, and it quickly became the primary armament of the BTR-60, BTR-70, BTR-80, and BRDM-2, and some other Russian and then-Warsaw Pact vehicles.

The basic KPV is a short recoil-operated machinegun with a muzzle booster, using a heavy quick-change 53-inch barrel tipped with long conical flash hider. The standard belts are 100 rounds, but cases of these belts are split into 10-round sections which must be linked together to produce these belts. In addition, the belt-pulling strength of the KPV is such that it can easily use belts 10 times that length without compromising the reliability of the KPV. The standard mount is either one of several antiaircraft mountings, a heavy wheeled mount (called the Pact Heavy Carriage by the *Twilight 2000* rules. There are some rare pintle mountings, but most of those seen are actually makeshift pintle mounts (such as sometimes seen in use by the pickup trucks used by "techincals" in some parts of Africa). The KPV (as a ground weapon) sometimes includes a rudimentary sort of "stock" (more something to brace one's shoulder against than anything else), and antiaircraft mountings generally include a seat, special antiaircraft sights, and in some cases, a small electrical motor to allow quick traverse and elevation of the weapons. The very rare infantry version uses a wheeled carriage similar to that of the DShK, and fires from spade grips; the feed box is attached to the right-side axle with feed being from the right side.

Versions of the KPV designed for internal mounting in vehicles (such a version is known as the KPVT) differ in that they use electrical firing instead of a trigger, and do not have the shoulder brace or the necessary parts to allow them to be mounted upon a PHC or pintle.

Weapon	Ammunition	Weight	Magazines	Price
KPV	14.5mm KPV	49.08 kg	100 Belt	\$13794

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
KPV (With Carriage)	5	11	2-2-3	13	1	3	475

ST Kinetics 50MG

Notes: Design work on the 50MG was begun in 1983 by ST Kinetics (then called CIS – Chartered Industries of Singapore). Their first idea was simply to simplify, lighten and improve the M-2HB, but this idea was quickly discarded and the Singaporeans started fresh. ST Kinetics states that the design has been quite successful in the export market.

The 50MG is a gas-operated weapon with a conventional design for .50 BMG-firing heavy machineguns; the rear part of the weapon contains most of the mechanism, and it uses a spade-grip-type trigger group, firing only from tripods, pintles, or other vehicle mounts. The 50MG is a dual-feed gun; it can have two belts loaded at once on both sides of the top of the receiver, and a switch selects which belt will be fired. The ammunition belts used can be standard disintegrating link belts or non-disintegrating link belts (as found sometimes on helicopter door guns). Case ejection is from the bottom of the receiver. The 50MG is a modular design, which allows the feed mechanism to be changed to exclusively left or right-handed feed, a trigger module which either does or does not allow semiautomatic fire, and a quick-change barrel which requires no headspace and timing adjustments (which may be of several lengths, though ST Kinetics has offered only one so far). The modular design also allows the 50MG to be adapted to internal vehicular, aircraft, and helicopter mounts, or be installed in gun pods for aircraft and helicopters. The 44.9-inch barrel is lighter than that of the M-2HB, yet allows for better heat dispersion, and the barrel is tipped by a muzzle brake. The cyclic rate of fire may be varied from 400-600 rpm by adjusting the gas regulator (though this is not important from a *Twilight 2000* rules standpoint), and it also allows the gunner to compensate for fouling during sustained firing. The 50MG requires some kind of mount for firing, but can be put on US, NATO, Russian, East European, and Chinese tripods – it can fit on virtually any tripod manufactured or used in the world today except the lightweight ones used by some of the lighter machineguns. Sights consist of M-2HB-type iron sights, but a special sight bracket is also installed that allows for the use of most NATO-standard optics.

Weapon	Ammunition	Weight	Magazines	Price
50MG	.50 Browning Machinegun	29.98 kg	105 Belt (x2), 110 Belt (x2)	\$9876

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
.50 CIS (With Tripod)	5	9	2-2-3	11	1	3	382

Vektor MG-4

Notes: This South African weapon is basically an updated M-1919A4, to take the 7.62mm NATO cartridge. (Vektor also offers the MG-4 in .30-06 Springfield and .303 British, but what customers they have had for these calibers, if any, are unknown.) Vektor also makes a kit to convert a standard M-1919A4 to the MG-4 specification.

The feed mechanism has been changed to improve reliability and allow the use of the disintegrating link belt that the 7.62mm NATO cartridge uses. Also useable are South African-redesigned M-2A1 disintegrating link belts designed for use with .30-06 cartridges. (Versions in .30-06 or .303 can also use old-style non-disintegrating cloth loop or metal melts.) A safety was also added and other minor changes were made to improve safety and reliability, The MG-4s 23.4-inch barrel is a quick-change type, but otherwise has no sort of muzzle brake or flash hider. Standard sights consist of a post at the front of the receiver and a folding leaf-type sight in the rear just behind the feed cover, but the rear sight may be replaced with a special antiaircraft sight.

The MG-4 may only be fired from a tripod mount; the trigger mechanism is essentially unchanged from the M-1919A4 and the MG-4 is therefore unsuited to firing from the hip. It may use most NATO-compatible light or medium tripods; other common mountings include a double mount, a mount with the MG-4 and M-2HB, an antiaircraft tripod, and a mount with the MG-4 and a 20mm KAB autocannon. This weapon is also common on South African armored vehicles. (The MG-4 can also use the M-1917A1 tripod designed for use with the M-1919A4, but SANDF do not use it in that manner.)

Weapon	Ammunition	Weight	Magazines	Price
MG-4	7.62mm NATO	15.01 kg	100 Belt	\$2283
MG-4	.30-06 Springfield	16.47 kg	100 Belt	\$2656
MG-4	.303 British	15.82 kg	100 Belt	\$2475

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-4 (7.62mm)	5	4	2-3-Nil	6	1	2	157
MG-4 (.30-06)	5	4	2-3-Nil	6	1	1	137
MG-4 (.303)	5	4	2-3-Nil	6	1	1	155

Vektor SS-77

Notes: The design of the SS-77 GPMG began in 1977. At the time, South Africa was in the midst of an intermittent arms embargo due to its apartheid policies. The design, for whatever reason, proved to be especially problematic, and the SS-77 was not actually first issued until 1986.

The SS-77 is essentially a gas-operated GPMG that has a very high rate of fire; some sources even claim that the SS-77 is sort of an extreme variation of the R-4, which is South Africa's version of the Israeli Galil assault rifle. The quick-change barrel is 21.7 inches long and tipped with a long flash suppressor. Feed is from the right, and the SS-77 can feed from a variety of disintegrating link and non-disintegrating link belts, with spent cases ejecting from the bottom of the receiver. Unusual for a GPMG, the SS-77 uses a folding polymer stock with a skeletonized profile and a recoil pad on the butt. This stock (and the pistol grip and trigger group) may be easily removed and replaced with spade grips and a thumb trigger, or even with a remote firing device. A folding bipod is attached to a lug just behind the gas block, and a carrying handle is located above the point of balance just in front of the receiver (and is also used when changing barrels). The SS-77 can also be mounted on standard NATO light or medium tripods, or on pintle mounts. The SS-77 has no gas regulator, and therefore no way to compensate for fouling during extended firing or even slow down the early SS-77's ridiculous rate of fire (said by Vektor to be 700-900 rpm, but measured by some weapons experts to be as high as 1200 rpm). The SS-77 has no selective fire capability – it is an automatic-only weapon. On early SS-77s, this means that even skilled shooters of the SS-77 have virtually no chance of squeezing off single shots, and even trying a short burst is extremely difficult.

That said, even Vektor eventually acknowledged that the SS-77 had reliability problems (of an unspecified nature; neither SANDF nor Vektor will talk about what was wrong with the SS-77). They also did eventually agree that the cyclic rate of fire was way too high. In 2003, they began a modification program for the SS-77, resulting in a far more reliable gun with a much lower cyclic rate (600-800 rpm).

Some time after the development of the SS-77, the South Africans needed a squad automatic weapon, and they wanted one chambered for the same cartridge as the R-4 series of assault rifles – 5.56mm NATO. The solution was simple – they made a conversion kit for the SS-77 to give it the ability to fire the smaller cartridge. The conversion kit includes a new barrel assembly with chamber, feed cover, breech assembly, locking shoulder, and gas piston. This kit weighs 3.6 kilograms and costs \$400.

The result is essentially a smaller version of the SS-77, called the Mini SS. The Mini SS for the most part looks identical to the SS-77, except for the lighter 20.2-inch barrel with its four-prong flash suppressor. The disintegrating link belts may be kept loose or placed in a canvas assault pack which attaches to the side of the receiver. The sights are also different from those of the SS-77, being a simple post front sight and the rear being an adjustable tangent leaf, both having tritium inlays. The Mini SS may also take a variety of quick-detach optical sights. The bipod of the SS-77 is retained, and the stock may be the same folding stock as the SS-77 or a fixed one. The Mini SS may still be mounted on the same tripods or pintle mounts as the SS-77.

Twilight 2000 Notes: The post-2003 version of the SS-77 does not exist as such, but many unit armorers took to making modifications that essentially accomplished the most important part of the post-2003 modifications – the reduction of the cyclic rate of fire.

Weapon	Ammunition	Weight	Magazines	Price
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SS-77 (Early)	7.62mm NATO	9.6 kg	50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2361
SS-77 (Late)	7.62mm NATO	9.62 kg	50 Belt, 100 Belt, 200 Belt, 250 Belt	\$2361
Mini SS	5.56mm NATO	8.26 kg	100 Belt	\$1460

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SS-77 (Early)	10	4	2-3-Nil	6/8	3	13	70
(With Bipod)	10	4	2-3-Nil	6/8	1	7	91
(With Tripod)	10	4	2-3-Nil	6/8	1	3	140
SS-77 (Late)	5	4	2-3-Nil	6/8	3	7	70
(With Bipod)	5	4	2-3-Nil	6/8	1	3	91
(With Tripod)	5	4	2-3-Nil	6/8	1	1	140
Mini SS	5	3	1-Nil	5/7	2	4	56
(With Bipod)	5	3	1-Nil	5/7	1	2	73
(With Tripod)	5	3	1-Nil	5/7	1	1	112

Alfa

Notes: This Spanish machinegun was designed when the Spanish needed replacements for their machineguns and no outside source was available due to World War 2. It is fired from a tripod, and is gas-operated. Feed is by non-disintegrating link belts. The trigger mechanism is from spade grips and a butterfly trigger, with safe and automatic settings. The M-44 has a cyclic rate of fire of 750 rpm and single shots can be difficult to make, but the M-55 uses a slower rate of fire of 610 rpm and single shots are easier to squeeze off. The barrel of the M-44 is 29.5 inches, but the M-55's barrel is shorter at 24 inches; both are finned for cooling for part of their length. The original M-44 model was chambered for 8mm Mauser, but later the M-55 was developed to fire the 7.62mm NATO cartridge. (A number of M-44's were also converted to this configuration, since some older Spanish-built vehicles still use the Alfa as a coaxial machinegun.) Though some were used as vehicular machineguns, most were used by infantry, firing from large and heavy tripods weighing 27 kilograms that provided excellent stability. The Alfa served with the Spanish until the late 1960s, when they were sold off to various countries in Africa and Central America. Most of these were also sold off by those countries, and they might now turn up almost anywhere.

Weapon	Ammunition	Weight	Magazines	Price
Alfa M-44	8mm Mauser	12.92 kg	250 Belt	\$2827
Alfa M-55	7.62mm NATO	12.7 kg	100 Belt, 250 Belt	\$2302

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Alfa M-44	5	5	2-3-Nil	9	1	1	217
Alfa M-55	5	4	2-3-Nil	8	1	1	163

Ksp m/39

Notes: This Swedish machinegun is the standard coaxial armament on Swedish AFVs, including the CV-9040, Swedish Leopards and Centurions, and newer designs (but not the S-Tank). It is an update of the old Browning M-1919A4 (a cousin, the Ksp m/42, is sometimes used from tripod mounts or on pintle mounts on vehicles, but is very rare). The weapon is modified to allow the use of 7.62mm NATO ammunition, and the pistol grip-type trigger mechanism is replaced by a spade grip and trigger similar to that of the M-2HB. This weapon was introduced just prior to World War 2, at the time modified to fire 6.5x55mm Swedish Mauser ammunition; with a change in the barrel and bolt, this ammunition can still be fired, and sometimes is used due to the vast quantity the Swedish military still has on hand. When this ammunition is used, the weapon uses a cloth loop non-disintegrating link belt. The Ksp m/39, when used on a tripod or vehicle mount, is used with the NHT. The Ksp m/39 is built largely of stamped steel parts and is much lighter than the M-1919A4.

Weapon	Ammunition	Weight	Magazines	Price
Ksp m/39	7.62mm NATO	13 kg	100 Belt, 250 Belt	\$2415
Ksp m/39	6.5mm Swedish Mauser	13 kg	250 Belt	\$2084

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Ksp m/39 (7.62mm)	5	4	2-3-Nil	6	1	2	163
Ksp m/39 (6.5mm)	5	4	2-Nil	6	1	2	140

Ksp m/58

Notes: Sweden was Belgium's first foreign customer of the MAG machinegun. At the time they were still using the 6.5mm Swedish Mauser cartridge in great quantities, and the MAGs they bought were modified to fire that ammunition. Later, they were modified back to fire 7.62mm NATO ammunition; however, the Ksp m/58 still retains the ability to fire 6.5mm ammunition through some parts changes. The Ksp m/58 is otherwise identical to the standard MAG machinegun.

In 2002, the Swedish Army decided to convert some of its Ksp m/58 inventory to the Ksp m/58D standard. The Ksp m/58D is essentially an "assault machinegun" version of the standard Ksp m/58, designed for use not only by some special operations troops but also by some mechanized infantry troops to make them easier to use in the firing ports of IFVs. The primary change is a large reduction in weight and a shorter barrel; the buttstock and fore-end have been replaced by more advanced (and lighter) composites), and the barrel is an extremely short 11.2 inches, along with a much more compact flash suppressor. The Ksp m/58D is intended only for limited issue and will not appear in large numbers in the Swedish Army. Oddly enough, the ability for the Ksp M/58D to be mounted on a tripod or pintle mount has been retained, though the usefulness of such a short-barreled weapon on a tripod is questionable.

Weapon	Ammunition	Weight	Magazines	Price
Ksp m/58	7.62mm NATO	10.15 kg	50 Belt, 100 Belt, 200 Belt	\$3064
Ksp m/58	6.5mm Swedish Mauser	10.15 kg	50 Belt, 100 Belt	\$2550
Ksp m/58D	7.62mm NATO	8.15 kg	50 Belt, 100 Belt, 200 Belt	\$2799

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Ksp m/58 (7.62mm)	5/10	4	2-3-Nil	8	3	6/13	61
(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	79
(With Tripod)	5/10	4	2-3-Nil	8	1	1/3	122
Ksp m/58 (6.5mm)	5/10	4	2-Nil	8	3	6/13	50
(With Bipod)	5/10	4	2-Nil	8	1	3/6	65
(With Tripod)	5/10	4	2-Nil	8	1	1/3	100
Ksp m/58D	5/10	4	2-Nil	6	3	7/13	25
(With Bipod)	5/10	4	2-Nil	6	1	3/7	32
(With Tripod)	5/10	4	2-Nil	6	1	1/3	49

MG-11

Notes: Also known as the "Swiss Maxim," this is an improved version of the MG-00, which was simply a Maxim machinegun chambered for the 7.5mm Swiss cartridge. As newer, lighter machineguns came on the market, the MG-00 became more and more obsolete, and since Maxim's patents had expired, the Swiss redesigned the Maxim to be much lighter than the original Maxim. On top of that, shipments from Germany of Maxim machineguns stopped during World War 2, and the Swiss were forced to make their own machineguns, finding no other suppliers. The MG-11 started production in 1915 and did not stop until 1946. Through the years, the MG-11 was steadily improved, with a metal non-disintegrating link belt replacing the cloth belt, new ammunition boxes made from metal instead of wood, a simplified flash suppressor incorporating a recoil booster added, a new trigger group requiring only one hand to operate, a mount for an anti-aircraft sight added, and an aiming stripe added to the water jacket. The tripod was the biggest improvement, which was very light (for the period) and one of the most stable machinegun tripods ever designed.

Weapon	Ammunition	Weight	Magazines	Price
MG-11	7.5mm Swiss	47.7 kg (w/tripod + water)	250 Belt	\$2678

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-11 (tripod)	5	4	2-3-Nil	8	1	1	205

M-51

Notes: This Swiss machinegun is based upon the World War 2 German MG-42. It used machined parts instead of steel stampings, and is thus better made, but nearly 4kg heavier. The M-51 also has a quick-change barrel. The M-51 uses a tripod equal in weight to a NMT. A version of this weapon, the MG-83, is the coaxial armament on Swiss tanks.

Weapon	Ammunition	Weight	Magazines	Price
M-51	7.5mm Swiss	16 kg	50 Belt, 250 Belt	\$2461

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-51	10	4	2-3-Nil	8	2	12	69
M-51 (Bipod)	10	4	2-3-Nil	8	1	6	89
M-51 (Tripod)	10	4	2-3-Nil	8	1	3	137

SiG 710-3

Notes: This weapon is a direct derivation of the STGW battle rifle (see Swiss Battle Rifles). It is developed from the earlier 710-1 and 710-2 machineguns, and is used by Swiss forces, by Brunei, and by some South American nations. Though less expensive to produce than the 710-1 and 710-2, the 710-3 is still a costly weapon to manufacture, and that has limited its service. The quality of the weapon is high, though.

Weapon	Ammunition	Weight	Magazines	Price
SiG 710-3	7.62mm NATO	9.25 kg	100 Belt, 200 Belt	\$2865

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SiG 710-3	10	4	2-3-Nil	7	3	13	72
SiG 710-3 (Bipod)	10	4	2-3-Nil	7	1	7	93
SiG 710-3 (Tripod)	10	4	2-3-Nil	7	1	3	143

T-74

Notes: In the early 1970s, Taiwan decided to replace their US-built (and essentially cast-off) M-60 GPMGs with the FN MAG machinegun. However, they also bought a license to manufacture the MAG locally, modify the design to suit local manufacturing methods, and make some other modifications to the design. This resulted in the T-74 GPMG (also called the Type 74). For the most part the T-74 is still essentially a late-production MAG, but the T-74 has a barrel which is finned along part of its length to aid in cooling, and uses the bipod of an M-60 instead of the standard MAG bipod. The barrel the Taiwanese use is also longer than that of a standard MAG at 21.5 inches. It can also be fired from any NATO-type tripod or pintle mount, or any tripod or pintle mount designed for the MAG. The Taiwanese military also typically feeds their T-74s with 200-round disintegrating link belts instead of the standard 100-round belts used by the military forces of most countries using the MAG (though these belts are simply two standard NATO-type belts linked together; the 200-round belt is merely a usage doctrine and not a new type of belt); the T-74 can also use any belt that is compatible with a standard late-production MAG. The Taiwanese have developed plastic, metal, and canvas "assault packs" to attach to their T-74s which can hold up to 200-round belts for this purpose. They also often use a locally-designed AP round in the T-74. The T-74 is normally issued at the platoon level in the Taiwanese Army and Marines.

Weapon	Ammunition	Weight	Magazines	Price
T-74	7.62mm NATO	12.61 kg	50 Belt, 100 Belt, 200 Belt	\$3120

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
T-74	5/10	4	2-3-Nil	8	2	6/12	69
(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	90
(With Tripod)	5/10	4	2-3-Nil	8	1	1/3	138

Browning M-2HB

Notes: Known affectionately by US troops as the "Ma Deuce" or just "The Fifty," the M-2HB was originally introduced in 1923 as the M-1921. Though when the M-2HB was first designed, shortly after World War 1, it was meant to be an antitank weapon, development of tank armor quickly made this idea obsolete. However, since the M-2HB was still a fantastic antipersonnel, antiaircraft, and anti-light armor/soft-skinned vehicle weapon, development of what would become the M-2HB continued, and it has since become the primary commander's machinegun on Western armored vehicles. Especially during the World War 2 and the Korean War, it was also the primary armament for aircraft on virtually all US aircraft and many Allied aircraft as well. The M-2HB is still manufactured in the US by General Dynamics (and formerly by Saco), in Belgium by FNH (where most are manufactured today), in Britain by Manroy, and to a limited extent by other countries around the world. Many other companies and countries also make spare parts for the M-2HB. Despite recurring rumors of its impending replacement by several newer designs over the years, and despite the fact that the M-2HB is one of the oldest small arms designs still in use in the world, it does seem that the M-2HB will be around for a long time to come.

The M-2HB is tough, heavy, and robust; I've personally seen vehicles basically totaled in rollovers, but their externally-mounted M-2HBs were able to be put back into service after just a simple cleaning. Operation is by short-recoil; feed is normally from the left, but a qualified armorer can reverse this. Ammunition boxes can be mounted on a tray which attaches to the M-2HB or its tripod. Originally, both air-cooled and water-jacketed models were made; the water jacket proved to be unnecessary, though that version was used until just after World War 2 as an antiaircraft weapon. The heavy barrel is 45 inches long and though it does have a sort of crowned muzzle, there is no sort of flash suppressor or muzzle brake. Sights are a simple blade at the front of the receiver and an adjustable folding leaf sight at the rear of the receiver; when the rear sight is folded, an adjustable aperture sight is used. There have also been over the years a large amount of basically jury-rigged mounts for various sorts of optics and night vision devices. (The famous Marine Scout/Sniper Carlos Hathcock, holder of the world record for long-distance sniping until recent years, made his longest shot with a scoped M-2HB set on semiautomatic.) There is no stock or conventional trigger mechanism; instead, the M-2HB is fired using spade grips and a butterfly-type thumb trigger. The M-2HB is designed only to be fired from vehicular, aircraft, tripod, or pintle mounts. (I know many of you have seen war movies where the hero picks up an M-2HB and hip-fires it, but I assure you that this is quite impossible!) Just under the trigger is a cylinder/dial; this is in effect a selector device. One rotates it to the right and locks it to allow semiautomatic fire.

However, the M-2HB does have a defect, and it can be a significant one: the variable headspace and timing, which must be adjusted perfectly to allow proper functioning and prevents any sort of quick changing of the barrel. The headspace and timing can also go out of adjustment simply from the vibrations of the M-2HB as it fires. Adjusting headspace and timing on an M-2HB is a difficult and, quite frankly, annoying procedure that takes a lot of practice (and continuing practice) in order to do quickly; a lot of troops literally never manage to do it quite right. And if you don't adjust the headspace and timing properly, you can end up with an M-2HB that may do anything from refuse to fire at all to one that jams to one that rips brass in half as it extracts. (I have seen a lot of bizarre malfunctions in the M-2HB, virtually all related in some way to incorrect headspace and timing adjustments.)

That said, several countries have been making (for a long time) kits which convert the M-2HB into a configuration that gives it a quick-change barrel and eliminates the need for the headspace and timing adjustments (the QCB, or Quick-Change Barrel kit, in effect provides the M-2HB with fixed headspace and timing which is optimized for the weapon and round). Many nations using the M-2HB, including most NATO countries, have already installed these kits into their M-2HBs. The US, however, as with many things, is a latecomer to the QCB bandwagon; the US military has only recently selected a kit made by General Dynamics (a kit originally designed by Saco Defense all the way back in 1978!) to update the M-2HBs already in service. For the most part, this kit retains the configuration of the basic M-2HB (except for the modifications required to change it to a QCB configuration). The new barrel's bore, however, is Stellite-lined and chromium-plated. The General Dynamics M-2HB QCB may use standard M-2HB barrels, but this requires removal of the QCB parts and effectively turns it into a standard M-2HB requiring headspace and timing adjustments. The General Dynamics M-2HB QCB is slightly heavier, but its firing characteristics are identical to a standard M-2HB.

The US military has recently, after experience in Iraq and Afghanistan, begun to upgrade their M-2HBs. This is also a sort of stopgap program due to the failure of the XM-312 and delays in the XM-806 (LW-50) programs. The upgrades that turn the M-2HB into an M-2A1 can be issued as a kit to unit armorers, or retrofitted to guns undergoing depot-level maintenance and refurbishment. The M-2A1 incorporates the improvements used by QCB kits by making the headspace and timing fixed, and giving the M-2A1 a quick-change barrel (it now takes less than ten seconds to change a barrel). The new barrel is the same length, but has heavy flash suppressor claimed to reduce muzzle flash by 95%. The bolt has been modified to make injury to soldiers less likely if the M-2A1 is improperly disassembled, it also increases the cyclic rate of fire to 600 rpm (which unfortunately has no effect in game terms). The M-2A1 also has a trigger block safety in addition to the safety setting on the selector. A length of MIL-STD-1913 rail has been added to the top of the feed cover and rear end of the barrel jacket. Weight is a bit more than for the M-2HB, and the weapon is a bit longer, but stats remain the same except for the Bulk.

Twilight 2000 Notes: Virtually all M-2HBs used by NATO, the US, and other US allies use QCB kits; the one mentioned above was in fact put into high-rate production by Saco Defense as the request of the Pentagon when the winds of war began to blow. The M-2A1 is not available in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
M-2HB	.50 Browning Machinegun	38.01 kg	105 Belt	\$9773
M-2HB QCB	.50 Browning Machinegun	38.19 kg	105 Belt	\$9820
M-2A1	.50 Browning Machinegun	38.2 kg	105 Belt	\$10006

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-2HB (With Tripod)	5	9	2-2-3	11	1	3	397
M-2A1 (With Tripod)	5	9	2-2-3	14	1	3	397

Browning M-1917

Notes: After experimenting for a while with gas operation, John Browning decided that recoil operation was far better for heavy automatic weapons and developed the M-1917 series of machineguns. He had the design perfected by about 1910, but was unable to interest the US military until World War 1, when the Army suddenly placed a huge order with Browning.

The M-1917 is very similar in appearance to the Vickers and Maxim guns of the same time period, though the Browning gun can be immediately identified by the pistol grip at the rear. More than 68,000 were made before the end of World War 1. In 1936, the weapon was partially redesigned, with the feed mechanism being made more reliable, the sights re-graduated to be more accurate, the tripod made lighter, and other small changes were made. This weapon became the M-1917A1.

The M-1917 is water-cooled, and therefore unsuitable for aircraft operation. The water jacket was removed, and lighter components were used whenever possible, to create the M-1918. The M1919 is similar to the M-1918, but was designed for use on tanks. It also uses a heavier barrel than the M-1917 or M-1918. The M-1919A1 is the same weapon as the M-1919, but designed specifically for the Mark VIII tank. The M-1919A2 is again similar, but with a normal weight barrel. It was designed for horse cavalry, having a special small tripod and a special saddle for transportation. (It cannot be fired from the top of a horse!) The M-1919A3 was a prototype for the M1919A4 (below).

Weapon	Ammunition	Weight	Magazines	Price
M-1917	.30-06 Springfield	14.97 kg (24.5 kg with water)	250 Cloth Belt	\$2775
M-1917A1	.30-06 Springfield	14.22 kg (23.75 kg with water)	250 Cloth Belt	\$2775
M-1918	.30-06 Springfield	13.92 kg	250 Cloth Belt	\$2775
M-1919	.30-06 Springfield	14.28 kg	250 Cloth Belt	\$2797
M-1919A2	.30-06 Springfield	14.23 kg	250 Cloth Belt	\$2775

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M1917	5	4	2-3-Nil	8	1	1	142
M-1917A1	5	4	2-3-Nil	8	1	1	142
M-1918	5	4	2-3-Nil	6	1	1	142
M-1919	5	4	2-3-Nil	6	1	1	148
M-1919A2	5	4	2-3-Nil	6	1	1	142

Colt-Browning M-1895

Notes: This weapon was based on an original John Browning design. He was trying to see whether the muzzle blast of an automatic weapon could be put to any use. The result was a weapon that was nicknamed by troops the "potato digger;" the weapon had a swinging arm beneath the barrel that connected to a linkage that opened the breech, and extracted the spent cartridge and loaded another. This arm meant that the weapon could not be mounted too close to the ground unless a pit was dug for the arm. It was a very clumsy arrangement, but the recoil was very mild and the action smooth. In the 1890s, large numbers of the M-1895 were bought by the US Navy in .30 Krag and 6mm Lee calibers; the US Army used .30 Krag and later converted them to .30-06 Springfield. The M-1895 was not used in large numbers in World War 1, though they were used in large numbers for training purposes until almost World War 2. Note: The M-1895 cannot be fired without a tripod or vehicle pintle mount. Tripod weight is 6.1 kg.

Weapon	Ammunition	Weight	Magazines	Price
M-1895	6mm Lee Navy	6.39 kg	250 Cloth Belt	\$2107
M-1895	.30-40 Krag	9.64 kg	250 Cloth Belt	\$2757
M-1895	.30-06 Springfield	10.34 kg	250 Cloth Belt	\$2896

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-1895 (6mm)	5	4	2-Nil	6	1	1	149
M-1895 (.30-40)	5	4	2-3-Nil	6	1	1	191
M-1895 (.30-06)	5	5	2-3-Nil	6	1	1	178

EX-34 Chain Gun

Notes: This is an electrically driven 7.62N machinegun used on some US and British armored vehicles. The weapon ejects spent brass overboard and incorporates a fume extractor. This weapon can also be used on a pintle mount, and is installed on some light helicopters.

Weapon	Ammunition	Weight	Magazines	Price
EX-34 (Long Barrel)	7.62mm NATO	17.86 kg	100 Belt, 200 Belt, 1000 Belt	\$2560
EX-34 (Short Barrel)	7.62mm NATO	13.7 kg	100 Belt, 200 Belt, 1000 Belt	\$2410

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
EX-34 (Long)	10	4	2-3-Nil	8	1	3	192
EX-34 (Short)	10	4	2-3-Nil	6	1	3	151

FNH USA M-240

Notes: This is the US variant of the Belgian MAG machinegun. The first versions of the M-240 appeared in US service as early as 1976 as coaxial machineguns in US tanks, IFVs, and some other armored vehicles; however, the first personnel and pintle-mounted models did not appear until 1994, when the US Marines adopted the M-240G. At first, these M-240Gs were excess US Army and Marine coaxial machineguns modified for ground and pintle use, but these were quickly superseded with purpose-built M-240Gs. By 1996, virtually all M-60s in US Marine use had been replaced by the M-240G, as well as many M-60s in use by the US Navy. The Marines quickly developed a fondness for the M-240G due to its reliability, ruggedness, and easier field-stripping procedures (and, I suspect, because the Marines rarely get first crack at anything new). The US Army, noting these attributes, asked that a forward handguard be added and called it the M-240B; it is otherwise the same weapon.

That said, one of the few complaints about the M-240 is the size of the weapon; at 48.5 inches long, it can be quite the handful for smaller shooters and even a detriment in QCB. Otherwise, the M-240 series has had remarkably few complaints for weapons in US military use. The M-240 series does use a barrel a full 24.7 inches long, and is tipped with a somewhat different flash suppressor than is used by its MAG ancestor. The polymer stock is also different; it actually looks more like the stocks used on current versions of the M-249 than the standard MAG polymer stock, and has folding shoulder plate to help support the weapon when used from the bipod. Sights are also slightly different; the front sight is a protected blade, while the rear is an adjustable aperture sight, which may be flipped up to reveal a U-notch leaf sight. Cyclic rate of fire has been slowed by about 50 rpm, primarily by use recoil springs and buffers which are modified to suit US manufacturing methods. The pistol grip also has a slightly different shape. The M-240G and B are otherwise essentially the same as the standard MAG, except that the M-240 is further modified to allow it to use M-60 tripods and pintle mounts. The US military has also adopted their own version of the MAG's helicopter door-gun, called the M-240H; this version has spade grips and a thumb trigger instead of the pistol grip and standard trigger group, no bipod, and no handguard. This version can also be mounted on tripods and ground vehicle pintle mounts.

In early 2000, improvements were made to lighten the M-240, resulting in a reduction in weight of 1.36 kg. Starting in 2005, studies were undertaken to lighten the M-240 even further; this entailed replacing the receiver with one made from a titanium/steel alloy, and possibly in the future replacing plastic and polymer parts with ones made from advanced carbon-fiber composites, and even the bipod by one made from titanium/steel alloy. Currently (early 2006), some 20 examples of the titanium/steel receiver version have been procured for testing; designated the M-240E6, they are lighter than the standard M-240B and G models by some 1.81 kg. Target weight reductions for further models call for a total lightening of the weapon by 3.18 kg. It is not known whether this study will lead to a future operational version of the M-240, but the soldiers testing it seem to be enthusiastic about the reductions in weight, and one of the complaints coming out of Iraq and Afghanistan about the standard M-240 is the weight of the weapon. There is a concern that these weight reductions may literally make the M-240 too light for controllability and adjustments may have to be made to the buffer system of the M-240E6 to provide sort of a recoil absorber system. (For that matter, experiments are also being conducted with a lightweight titanium/steel alloy tripod, though this is not covered here.) If they do get fielded, it probably won't be before 2008 at the earliest.

Twilight 2000 Notes: This weapon did not have much of a chance to be adopted; the Marines only replaced about half of their M-60s with it, and the Army got almost none. The post-2000 M-240 variants do not exist in the Twilight 2000 timeline, nor does the M-240E6 in any version (and in fact, is not even in service in real life as of early 2006).

Weapon	Ammunition	Weight	Magazines	Price
M-240 (pre-2000)	7.62mm NATO	12.25 kg	100 Belt, 200 Belt	\$3219
M-240 (post 2000)	7.62mm NATO	10.89 kg	100 Belt, 200 Belt	\$3219
M-240E6 (Current)	7.62mm NATO	10.44 kg	100 Belt, 200 Belt	\$3256
M-240E6 (Future)	7.62mm NATO	9.07 kg	100 Belt, 200 Belt	\$3259
M-240E6 (Future, with Improved Buffer)	7.62mm NATO	9.07 kg	100 Belt, 200 Belt	\$3334

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-240 (Pre/Post-2000)	5/10	4	2-3-Nil	8	3	6/13	85
(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	110
(With Tripod)	5/10	4	2-3-Nil	8	1	1/3	170
M-240E6 (Current)	5/10	4	2-3-Nil	8	3	6/13	85
(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	110
(With Tripod)	5/10	4	2-3-Nil	8	1	1/3	170
M-240E6 (Future)	5/10	4	2-3-Nil	8	3	7/13	85
(With Bipod)	5/10	4	2-3-Nil	8	1	3/7	110
(With Tripod)	5/10	4	2-3-Nil	8	1	1/3	170
M-240E6 (Improved Buffer)	5/10	4	2-3-Nil	8	2	6/11	85

(With Bipod)	5/10	4	2-3-Nil	8	1	3/6	110
(With Tripod)	5/10	4	2-3-Nil	8	1	1/2	170

FNH USA Mk 48 Mod 0

Notes: US Navy SEAL teams like the light weight of the M-249; they also like the firepower of the MAG (M-240) and its 7.62mm NATO round. What they don't like is the relatively low hitting power of the 5.56mm NATO round of the SAW, nor do they like the huge size and heavy weight of the M-240. They wanted a blend of the two. They also didn't like totally like the M-60E3s they were currently using in the role, feeling that the M-60E3 was essentially a compromise what didn't work out.

FN therefore designed the Mk48 Mod 0 specifically for them. It is basically an M-249 scaled up to fire the 7.62mm NATO round. (FN had sort of a head-start on this; it's a little-known fact that the Minimi was originally designed in both 5.56mm NATO and 7.62mm NATO versions.) The SEALs were also given a few other things they asked for in a light machinegun: Teflon coating for resistance to weather and salt water, a little extra weight to keep barrel climb down, a quick-change barrel, and a stronger build. The entire machinegun is, in fact, only a little longer than the M-16 assault rifle.

The Mk 49 Mod 0 is built largely of steel, with some light alloy components, and a polymer pistol grip, stock, and fore-end. It's rumored that the stock can be replaced with a collapsing one, but I have not been able to confirm this. The standard stock has a shape similar to newer M-249s with fixed stocks, making it somewhat lighter. It uses standard NATO disintegrating-link belts, feeding from the left and ejecting spent rounds through the bottom of the receiver. The Mk 48 Mod 0 can be equipped with a total of five MIL-STD-1913 rails: one atop the receiver/feed cover, three on the fore-end on the bottom and sides, and one over the barrel where it rests on the fore-end. The folding bipod is adjustable for height and cant. The 16.5-inch barrel is tipped with a compact flash suppressor and the bore is hard-chromed, as is the chamber. The standard sights consist of a protected front post and a rear sight similar to that of the MAG, an adjustable aperture rear which may be flipped up to reveal an adjustable leaf. Recently, a version of the Mk 48 Mod 0 with a suppressed barrel has been in use in Iraq and Afghanistan, the suppressor design is similar to that mounted to some versions of the Mk 46 Mod 0 automatic rifle, but larger and beefier.

Though there are rumors of the deployment of the Mk 48 in Kosovo, the first confirmed use was in Afghanistan. The US Army's Rangers have used it in the recent fighting in Iraq. Though an FN design, the Mk 48 Mod 0 is actually manufactured in FN's US facilities in South Carolina.

Twilight 2000 Notes: This weapon does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
Mk 48 Mod 0	7.62mm NATO	8.39 kg	50 Belt, 100 Belt, 200 Belt	\$2216
Mk 48 Mod 0 (Suppressed)	7.62mm NATO	10.56 kg	50 Belt, 100 Belt, 200 Belt	\$2862

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Mk 48 Mod 0	10	4	2-3-Nil	7	3	13	47
(With Bipod)	10	4	2-3-Nil	7	1	6	60
(With Tripod)	10	4	2-3-Nil	7	1	3	93
Mk 48 Mod 0 (Suppressed)	10	3	1-Nil	10	1	7	28
(With Bipod)	10	3	1-Nil	10	1	4	37
(With Tripod)	10	3	1-Nil	10	1	2	57

GE GAU-19/A

Notes: This is an electrically driven .50 caliber Gatling gun, capable of delivering a massive volume of large-caliber fire. An optional gas drive may be added if external power is undesirable, and the GAU-19 can also be driven from an air compressor. It can fire both linked and linkless rounds.

Twilight 2000 Notes: The GAU-19 is made in a 3-barrel short version and a 6-barrel long version. The 6-barreled version is very rare.

Weapon	Ammunition	Weight	Magazines	Price
GAU-19/A (3-Barrel)	.50 Browning Machinegun	33.6 kg	1500 or 1500 Belt	\$14371
GAU-19/A (6-barrel)	.50 Browning Machinegun	49 kg	1500 or 1500 Belt	\$21839

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
GAU-19/A (3-Barrel, Normal Ammo)	30	9	2-3-4	7	1	5	275
GAU-19/A (3-Barrel, SLAP)	30	9	1-2-3	7	1	5	330
GAU-19/A (6-Barrel, Normal Ammo)	60	9	2-2-3	9	1	6	383
GAU-19/A (6-Barrel, SLAP)	60	9	1-1-1	9	1	6	460

**This weapon is always found on a vehicular or heavy mount, and in this state has negligible recoil.

US Ordnance M-60

Notes: The M-60 (originally designed and manufactured by Saco Defense, but later built by the Maremont division of General Dynamics, and now built under license by US Ordnance) began as an attempt to “Americanize” the Nazi MG-42 for use by US troops. The MG-42 and FG-42 assault rifle was then blended, and the feed system of the MG-42 was simplified, by essentially combining the two-piece feed pawl of the MG-42 into a single unit. In addition, the much of the action was moved into the stock, making the M-60 into a compact, “semi-bullpup” design which is only 43.5 inches long in its basic form.

The M-60 has a mostly conventional, gas-operated firing system. Feed is from the left, like most Western machineguns (though some versions of the M-60 have been made at the request of certain customers to feed from the right, mostly to fit in specific internal vehicle mounts). The standard belt is a 100-round disintegrating link NATO-standard belt, but I have personally seen M-60s in demonstrations which could pull in a 400-round hanging belt. The 100-round belt is usually contained in metal, plastic, or cardboard-lined canvas containers for carrying by soldiers, or it can be fed from boxes set beside the gun. The M-60 has always had a quick-change barrel, but initial versions had no carrying handle, and asbestos mitts were issued along with replacement barrels and cleaning kits in order to allow the gunner or assistant gunner to change the barrel. Later, a carrying handle attached to the barrel was added, but hot barrels on the M-60 can be a bit balky, often requiring two hands to unlock them, so the asbestos mitts continued to be issued. Unfortunately, the front sight is a non-adjustable blade mounted on a triangular mount that is attached directly to the barrel; this means that when you change a barrel, the gunner loses the M-60’s zero. The barrel itself is 22 inches long, tipped by a long flash suppressor, and chrome-lined. The M-60 does not have any sort of gas adjustment device; the system adjusts itself to fouling. Though there is no semiautomatic setting, the cyclic rate is so slow (about 550 rpm) that it only takes a minimum of practice to squeeze off single shots. Though it is officially frowned upon (at least by the US Army), one can actually load a belt into the M-60 without raising the feed cover, though you have to insert and hold the belt in place, brace the stock against your shoulder, stomach, or hip, and cycle the charging handle twice instead of only once. The folding bipod is also attached directly to barrel; it is a simple affair, built mostly of stamped steel (it looks like aluminum to me, but I was assured in the Army that it is made of steel). The bipod is adjustable to a very limited extend for height and cant. It can be mounted on a standard NATO Light Tripod, or on compatible pintle mounts.

Reviews of the basic M-60 by the troops have been mixed – they range from those who think it is crap (some even call it “the Pig”) to those who like it so much they wish the M-240 hadn’t replaced it in the US military. It is still used around the world by a lot of military forces. (My personal opinion is that while changing hot barrels can be a bitch, I still love the thing.)

Variants of the basic M-60 include the M-60C, which is electrically fired and was designed specifically for use on external helicopter mounts (especially early UH-1 Huey helicopters converted for use as gunships in Vietnam before the advent of the AH-1 Cobra). It is no longer in production. The M-60D is an M-60 with the conventional trigger group and stock replaced with spade grips and a thumb trigger; this version is designed for use as a helicopter door gun and from certain fixed positions and vehicle pintle mounts. The M-60E2 is another electrically-fired model, for use in internal vehicle mounts. It is no longer in production in the US, though some other countries (most notably Taiwan) still make it.

The M-60E3 was designed in the early 1980s by Saco at the request of US special operations units (especially the SEALs), to provide them with a lighter, more versatile version of the M-60. Saco also took the opportunity to fix some of the M-60s problems. The standard barrel is the same length as the standard M-60 (22 inches) and is thicker than the M-60’s barrel, but it is also built from lighter and stronger steel, so it is actually lighter than the standard M-60 barrel. The M-60E3 can also use two other barrels: a 17.36-inch short barrel, and a 16.65-inch assault barrel. All three use a more compact flash suppressor than the standard M-60. All three have an extended lower handguard made from polymer, with a forward grip for control when firing from the hip; the upper part of the barrel jacket has been deleted. The carrying handle remains a part of the barrel, but the locking mechanism for the barrel has been improved so one-handed barrel changing without mitts is assured. The bipod has been moved to the front of the lower handguard, which provides better balance. The bipod is also made from lighter but stronger metal; it is physically smaller than a standard M-60 bipod, but is not adjustable. The M-60E3 retains the ability to be tripod or pintle-mounted. The M-60E3 is “officially” able to be loaded without raising the feed cover, and the charging handle requires only one cycling to do this. Standard M-60s must be loaded with the charging handle locked to the rear; the M-60E3 can be loaded with the bolt open or closed. The M-60 feeds from the same belts as the standard M-60, though US special ops troops are known to often use 50-round belts during close assaults, and containers are made for these shorter belts. The trigger guard is enlarged to allow the M-60E3 to be fired by a gunner wearing heavy gloves. The front sight is adjustable for elevation and windage on the M-60E3. A kit is also made, allowing standard M-60s to be converted to the M-60E3 configuration. In addition to use by special ops units of the US military, the M-60E3 is listed as being in use by “several foreign countries.”

The M-60E4 is essentially a further-modified M-60E3, adding many features requested by US and other countries’ special operations units. The forward handguard is different; it has been replaced with one that wraps around three sides of the barrel and gas tube, and has three wide MIL-STD-1913 rails and two narrow ones on each side of the barrel itself. The flash suppressor has been further modified so that it also acts as muzzle brake. The bipod has been strengthened, and also has a limited amount of adjustability for height and cant. The front sight remains the same as the M-60E3, but the rear iron sight has been moved to a position in front of the feed cover, to allow room for a MIL-STD-1913 rail atop the feed cover. Belt pull strength is 35% greater, and in general, the M-60E4 is a much more robust weapon than the M-60E3 (user feedback brought complaints of the relative fragility of the M-60E3). The M-60E4 can use the same barrels as the M-60E3; in a pinch, it can also use a standard M-60 barrel. The pistol grip is more ergonomic, and the attachment of the pistol grip and trigger assembly has been modified, since some troops did complain that the pistol grip/trigger mechanism would fall off during sustained fire. The M-60E4 can also be modified for use with a spade grip/thumb trigger or an electrical trigger for internal vehicle use. US Ordnance also makes a kit to convert the M-60 or M-60E3 to the

M-60E4 specification. The primary users of the M-60E4 were the US Navy SEALs (who call it the Mk 43 Mod 0), though it has been largely replaced by the FN Mk 48 Mod 0 (see Belgian Machineguns) in SEAL use. The M-60E4 is also listed by several sources as being used by "several unnamed parties."

Twilight 2000 Notes: The M-60 is still the primary US GPMG, as the M-240 (US version of the MAG) did not have a chance to be adopted in large numbers except as a vehicular weapon. The M-60E3 is a fairly-common special ops weapon, especially in the US military, ROK Army, Taiwanese Army and Marines, and the Thai Army and Marines. The M-60E4, a relative latecomer, is a much rarer weapon, and most of them are used by US special ops units; however, limited quantities are also used by the British and Australian SAS.

Weapon	Ammunition	Weight	Magazines	Price
M-60	7.62mm NATO	11.07 kg	100 Belt	\$2330
M-60E3 (Long Barrel)	7.62mm NATO	8.8 kg	50 Belt, 100 Belt	\$2333
M-60E3 (Short Barrel)	7.62mm NATO	8.53 kg	50 Belt, 100 Belt	\$2189
M-60E3 (Assault Barrel)	7.62mm NATO	8.21 kg	50 Belt, 100 Belt	\$2167
M-60E4 (Long Barrel)	7.62mm NATO	10.48 kg	50 Belt, 100 Belt	\$2371
M-60E4 (Short Barrel)	7.62mm NATO	10.21 kg	50 Belt, 100 Belt	\$2228
M-60E4 (Assault Barrel)	7.62mm NATO	9.89 kg	50 Belt, 100 Belt	\$2206
Barrel Set (3 Lengths)	NA	4.27 kg	NA	\$1709

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-60	5	4	2-3-Nil	7	3	6	64
(With Bipod)	5	4	2-3-Nil	7	1	3	84
(With Tripod)	5	4	2-3-Nil	7	1	1	129
M-60E3 (Long Barrel)	5	4	2-3-Nil	7	3	7	64
(With Bipod)	5	4	2-3-Nil	7	1	3	84
(With Tripod)	5	4	2-3-Nil	7	1	1	129
M-60E3 (Short Barrel)	5	4	2-3-Nil	6	3	7	45
(With Bipod)	5	4	2-3-Nil	6	1	3	59
(With Tripod)	5	4	2-3-Nil	6	1	1	90
M-60E3 (Assault Barrel)	5	4	2-3-Nil	6	3	7	42
(With Bipod)	5	4	2-3-Nil	6	1	3	55
(With Tripod)	5	4	2-3-Nil	6	1	1	85
M-60E4 (Long Barrel)	5	4	2-3-Nil	7	2	5	64
(With Bipod)	5	4	2-3-Nil	7	1	2	84
(With Tripod)	5	4	2-3-Nil	7	1	1	129
M-60E4 (Short Barrel)	5	4	2-3-Nil	6	2	5	45
(With Bipod)	5	4	2-3-Nil	6	1	2	59
(With Tripod)	5	4	2-3-Nil	6	1	1	90
M-60E4 (Assault Barrel)	5	4	2-3-Nil	6	2	5	42
(With Bipod)	5	4	2-3-Nil	6	1	2	55
(With Tripod)	5	4	2-3-Nil	6	1	1	85

GE M-85

Notes: The M-85 is a heavy machinegun designed for coaxial and cupola use; it equipped the commander's cupolas of the M-60 series of tanks and the AAPV-7, amongst other vehicles. Though still found on the AAPV-7 series and such older vehicles, it has largely been withdrawn from service in the US and in most other countries.

The M-85 is a recoil-operated machinegun fed by standard .50 BMG disintegrating link belts. Cocking is done by pulling back on handles on either side of the gun (connected by chains to the gun). It is normally used on vehicles, and is in that case fired by solenoid connected to a firing switch (with a hand trigger backup). It can also be mounted on a standard M-2HB tripod and fired from it, but in actual practice this was quite rare. The M-85 has a dual rate of fire; normally, the gun is kept at the ground target cyclic rate of 400 RPM, but it can also be switched to a ROF of 1050 RPM for use against aircraft or a large amount of targets. The fire selector is a dial-type on the rear of the gun. No provision is made for semiautomatic fire, but when set for the lower ROF, single shots or short burst are easily squeezed off. The barrel length is 36 inches, and the muzzle is tipped by a large flash suppressor. No sights or sight mounts are provided, since its primary use is as a vehicle weapon.

Weapon	Ammunition	Weight	Magazines	Price
M-85	.50 Browning Machinegun	27.9 kg	105B	\$13707

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-85 (Vehicular Mount)	5/10	9	2-3-4	9	*	*	276

GE/Dillon Aero M-134 Minigun

Notes: The M-134 is basically an electric Gatling gun, a six-barreled machinegun with an electric motor. Development of these modern "electric Gatling guns" started shortly after World War 2, and the first of these was the famous 20mm M-61 Vulcan series, but early in the US involvement in Vietnam, the Army realized that a scaled-down version of the Vulcan would be wonderful for providing massive volumes of fire when used as helicopter armament. They were first mounted on the various *ad hoc* UH-1 Huey gunships deployed, and then on the first AH-1 Cobra gunships. Quickly, mounts were designed to allow the M-134 to be used on pintle mounts as helicopter door guns, on patrol boats, in pods on light aircraft and helicopters, and of course, the famous AC-47 "Puff" gunships. The cyclic rate of fire for the original M-134s was originally set at 4000 rpm, and the rotating six-barreled configuration kept the barrels from overheating because each barrel essentially had a much lower rate of fire. Later versions of the M-134 could be set for later rates of fire, ranging from short 10, 50, and 100-round bursts to twin rates of fire of either 3000 or 6000 rpm; this is the rate of fire for most "current: GE-built M-134s, with the burst length essentially controlled by how long the trigger is depressed. (A skilled gunner is capable of squeezing off 100-round bursts, and I've even heard of some gunners able to squeeze off bursts as small as 50 rounds when the Minigun is set on its 3000 rpm setting).

The reason I wrote "current" GE-built models because GE no longer builds the original M-134s (they built the last one in 1975) – in fact, parts for original M-134s are not even being made in the US anymore. Some can be procured from countries still making these parts, but as far as I've been able to discover, complete M-134s in their original configuration are not being made anywhere anymore, and most countries that still make spare parts will not sell them to civilians or even directly to military forces – a country's government has to ask for them. Most parts available in the US these days are the result of cannibalization or their being made from scratch in machine shops.

The GE-built M-134 is, as all modern Gatling-type GE guns, electrically powered from the vehicle in which it is mounted or an external power source; potentially any external power source may be used, from a battery pack to a generator, but it must be able to provide 28-Volt DC or 115-Volt AC power at 260 amps (though sustained fire requires only 130 amps). If the length of an ammunition belt exceeds 1.5 meters in length, an additional electrical motor must be added at the top of the ammunition chute to provide more belt-pulling power. In addition to their use as aircraft, helicopter, and internal vehicle armament, M-134s can be mounted on pintle mounts, used as helicopter door guns (a very common method of use), or even mounted on standard heavy tripods of various sorts, including those designed for use with heavy machineguns such as the M-2HB and Mk-19 automatic grenade launchers. (I even have a picture of three Miniguns on a single ground mount.) Feed may be from either side; belt length is effectively unlimited, but the normal lengths of belt used with manually-operated M-134s are listed below. If special ammunition boxes and feed chutes are used, the M-134 can be fed from unlinked ammunition. The length of each barrel is 22 inches; the barrels are normally parallel, but barrel clamps are available that allow a variable convergence point. Individual barrels are heavy, designed to fire at least 40,000 rounds between failures (some say as much as 100,000 rounds).

However, 1975 was not the end of US M-134 production. US special operations units still loved the Minigun, but theirs were rapidly wearing out by the early 1990s. There were still a lot of M-134s used as door guns, armament on foreign helicopters, and even by some variants of the AC-130. GE was no longer tooled-up to produce the M-134 or its parts, and they were unwilling to re-establish the production line for the Minigun. Parts could be obtained to a certain extent by cannibalization or by buying them from foreign sources, but this essentially reduced the supply of available Miniguns and buying parts from foreign sources was much more expensive than having a domestic supplier. A company in Arizona called Dillon Aero stepped up to the plate, they essentially bought the complete rights to production and sale of the M-134 from GE. At the same time, they took the opportunity to correct a number of small deficiencies with the M-134, as well as simplifying the design and improving its reliability. The result was the M-134D. Externally, the M-134 largely resembles the original M-134; internally, the M-134D is a very different weapon. The original magazine hoppers and feed mechanism have been redesigned to allow slightly greater capacity, eliminate unnecessary parts, and the actual belt feed repositioned to the top so that weight of the belt pull is minimized. A small electrical booster was also added to the feed mechanism, eliminating the need for a separate electrical motor if very long belts or feed chutes are used. A common cause of jamming on the original M-134 was misaligned rounds (especially when unlinked rounds were used); this problem has been eliminated. Spent rounds and duds are ejected from the bottom of the M-134D, where they can be ejected outside of the vehicle or aircraft or collected in an attached container (or simply fall on the ground). A mechanism has been added which essentially spins the barrels backwards for a fraction of a second in the case of a stoppage, in order to eject the stuck round or case. The M-134D uses coatings and other modifications to reduce friction and increase tolerance to dirt. The bolt is strengthened by building it from a nickel-steel alloy instead of standard steel. Further modifications to the M-134D's bolt helps ensure that the firing pin consistently strikes the primer (another problem with the original M-134). Variable cyclic rate mechanisms have been removed, and the M-134D fires only at 3000 rpm (mostly to stop wasteful ammunition usage). Normally, manually-fired M-134Ds have no sights (aim is to be corrected by tracers), but sights can be added. The amount of possible mountings for the M-134D (and other Dillon M-134s) are so vast that they cannot all be mentioned here; they have even modified a Chevy Suburban to fire a Dillon M-134 out of the rear!

Dillon has recently designed a new version of the M-134D, called the M-134D-T. Designed to reduce weight, the M-134D-T uses some skeletonized components where possible, but most of the weight reduction has come from replacing the rotor, housing, parts of the feed mechanism, and the barrel clamp/flash suppressor with versions made from titanium instead of steel.

In all cases, Dillon Miniguns can be had with three lengths of barrels: the standard 22-inch barrel, a heavy 22-inch barrel, and a short 18-inch barrel. Currently, Dillon does not built tripods or soft mounts for their Miniguns, but they can still use M-2HB tripods and

soft mounts, as well as a large amount of pintle mounts, internal aircraft and helicopter mounts, pods, internal and pintle vehicle mounts, boat and ship mounts, and even on mounts like the new remote weapons stations. It has even been used successfully with some of the experimental combat robots DARPA is testing. Dillon also offers rebuild kits to convert existing M-134s to the M-134D or M-134D-T specifications.

Statistics below are for Miniguns mounted designed for mounting on tripods or pintle mounts; Miniguns designed for internal vehicular, helicopter, or aircraft use are typically 4-6 kilograms lighter (depending upon the installation type). The weight includes a typical power source and electrical motors (but, as usual, not a tripod).

Since the early Vietnam War, the M-134 has been available in a pod which can be attached to various aircraft. The Army called it the M-18; the Air Force called it the SUU-11/A. The firing tables are identical to those below for the M-134; the pod has its own separate weight and cost difference. The only difference in the firing tables is that there is no Recoil factor. Case ejection is downward, about one-third back from the front.

Twilight 2000 Notes: M-134D development and production was dramatically ramped up prior to the Twilight War; in addition, Dillon agreed to make spare parts for older M-134s in addition to making conversion kits. The M-134D-T does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
M-134	7.62mm NATO	33.76 kg	1000 Belt, 1500 Belt, 4000 Belt	\$7945
M-134D (Standard Barrels)	7.62mm NATO	29.98 kg	500 Belt, 1000 Belt, 1500 Belt, 4000 Belt, 4400 Belt	\$6622
M-134D (Heavy Barrels)	7.62mm NATO	31.07 kg	500 Belt, 1000 Belt, 1500 Belt, 4000 Belt, 4400 Belt	\$6824
M-134D (Short Barrels)	7.62mm NATO	28.35 kg	500 Belt, 1000 Belt, 1500 Belt, 4000 Belt, 4400 Belt	\$5889
M-134D-T (Standard Barrels)	7.62mm NATO	24.09 kg	500 Belt, 1000 Belt, 1500 Belt, 4000 Belt, 4400 Belt	\$6681
M-134D-T (Heavy Barrels)	7.62mm NATO	25.18 kg	500 Belt, 1000 Belt, 1500 Belt, 4000 Belt, 4400 Belt	\$6883
M-134D-T (Short Barrels)	7.62mm NATO	22.46 kg	500 Belt, 1000 Belt, 1500 Belt, 4000 Belt, 4400 Belt	\$5948
M-18 Pod	7.62mm NATO	147.14 kg	1500 Linkless Feed	\$15890

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-134*	30/60	4	2-3-Nil	8	**	4/12	143
M-134D (Standard Barrel)*	30	4	2-3-Nil	8	**	4	143
M-134D (Heavy Barrel)*	30	4	2-3-Nil	8	**	4	154
M-134D (Short Barrel)	30	4	2-3-Nil	7	**	4	106
M-134D-T (Standard Barrel)*	30	4	2-3-Nil	8	**	4	143
M-134D-T (Heavy Barrel)*	30	4	2-3-Nil	8	**	4	154
M-134D-T (Short Barrel)	30	4	2-3-Nil	7	**	4	106

M-1919A4/M-1919A6

Notes: This weapon grew out of John Browning's experiments with recoil operation for automatic weapons. He had the basic design for the M-1919 series finished by 1910, but wasn't able to get any government interested until World War 1 became thick in 1917.

The M-1919A4 is a development of John Browning's earlier M-1917 design; it is basically an M-1917 without the water cooling jacket around the barrel. This allowed it to be made much lighter, and it became virtually the definitive support weapon for US troops during World War 2.

The M-1919A6 was an attempt to make the M-1919A4 into a squad automatic weapon. The M1919A6 is fitted with a stock, pistol grip, and quick-change barrel and is made from lighter materials. It has a bipod and can be fired from a tripod (NLT). It was a poor attempt at a GPMG and was never popular.

When the SEALs first arrived in Vietnam, a commonly-available weapon was the ancient M-1919A4. These weapons, while somewhat useful, were generally unacceptable to the SEALs, with their then-odd caliber ammunition (for military purposes) and rather worn condition. The SEALs began a modernization program for the M-1919A4, for use on their patrol and assault boats. The modernization consisted of a change to 7.62mm NATO caliber and other modifications to the gun necessary to fire this weapon and accommodate the belts; a long, slotted flash suppressor, and more modern sights. This modified weapon was designated the Mk 21 Mod 0.

In 2005, the company of Barrel X Change began offering a conversion kit for the M-1919A4 to allow it to fire 7.62mm Kalashnikov ammunition. This enables it to fire the mounds of cheap Russian and former Eastern Bloc ammunition flooding the market. This conversion makes no permanent changes to the M-1919A4. The kit itself consists of a barrel, a bolt, a booster nut, a front cartridge stop, a modified top cover extractor spring, a modified recoil spring, and 100 links for 7.62mm Kalashnikov ammunition.

In late 2008, The Rollin Lofdahl Company made a duel-feed adaptation kit for the M-1919A4. Other than the duel-feed capability, and a premium of \$10, this is identical to the standard M-1919A4. It is only for .30-06 Springfield-firing guns.

Twilight 2000/Merc 2000 Notes: Despite its age, these weapons (especially the M-1919A4) continue to soldier on, often converted to 7.62mm NATO. The 7.62mm Kalashnikov conversion, however, does not exist.

Weapon	Ammunition	Weight	Magazines	Price
M-1919A4	.30-06 Springfield	14.05 kg	100 Belt, 250 Belt	\$2775

M-1919A6	.30-06 Springfield	14.73 kg	100 Belt, 250 Belt	\$2785
Mk 21 Mod 0	7.62mm NATO	16.33 kg	100 Belt	\$2445
M-1919A4	7.62mm Kalashnikov	12.94 kg	100 Belt	\$2045

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-1919A4 (.30-06, Tripod)	5	4	2-3-Nil	6	1	1	142
M-1919A6	5	4	2-3-Nil	8	2	6	71
M-1919A6 (Bipod)	5	4	2-3-Nil	8	1	3	92
M-1919A6 (Tripod)	5	4	2-3-Nil	8	1	1	142
Mk 21 Mod 0 (Tripod)	5	4	2-3-Nil	8	1	1	163
M-1919A4 (7.62mm Kalashnikov, Tripod)	5	4	2-3-Nil	6	1	1	146

RAMO Lightweight M-2

Notes: As implied by the name, this is an improved, light version of the Browning M-2HB. In addition to a QCB barrel, the RAMO Lightweight M-2 uses a shorter, lighter barrel, an adjustable rate of fire, and some lighter components. However, 75% of the parts of this weapon are interchangeable with the standard Browning M-2HB.

Twilight 2000 Notes: This weapon exists only in very small numbers.

Weapon	Ammunition	Weight	Magazines	Price
RAMO Lightweight M-2	.50 Browning Machinegun	26.72 kg	110 Belt	\$13811

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
RAMO Lightweight M-2 (Normal Ammo)	5/10	9	2-3-4	10	1	3/5	275
RAMO Lightweight M-2 (SLAP)	5/10	9	1-2-3	10	1	3/5	330

Saco Fifty/.50

Notes: This is one of several upgraded versions of the M-2HB. Improvements include an adjustable fire rate (from 500 to 750 rounds per minute), while retaining the semiautomatic fire capability. The receiver has been strengthened by replacing most of the riveted construction with welding; this has also lightened the weapon. The charging handle is much easier to pull back than on the standard M-2HB. Most importantly, the need for the tedious headspace and timing adjustments of the standard M-2HB have been eliminated, making the weapon easier to maintain and more reliable. There is a short muzzle break on the end of the barrel.

Weapon	Ammunition	Weight	Magazines	Price
Saco Fifty/.50	.50 Browning Machinegun	25 kg	110 Belt	\$14136

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Saco Fifty/.50 (Normal Ammo)	3/5	9	2-2-3	11	1	1/2	383
Saco Fifty/.50 (SLAP)	3/5	9	1-1-1	11	1	1/2	460

Stoner 63A MMG (M-207)

Notes: The M-207 was the only version of the Stoner officially type-standardized by the US Army, and was also used by the Navy. It is basically a larger version of the Stoner 63A series that uses a longer barrel, belt-feed exclusively, and extra rails for vision equipment. It has a provision for mounting on a tripod. It is perhaps easier to find these days than other members of the family, but is still a museum or collector's piece.

Twilight 2000 Notes: As with other members of the M-63A family, improved versions showed up in the hands of SEALs and Marines during the Twilight War.

Weapon	Ammunition	Weight	Magazines	Price
M-207	5.56mm NATO	6.9 kg	100 Belt, 150 Belt, 250 Belt	\$1492

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-207	10	3	1-Nil	7	2	8	62
M-207 (Bipod)	10	3	1-Nil	7	1	4	81
M-207 (Tripod)	10	3	1-Nil	7	1	2	124

Tippman Miniature M-1919A4

Notes: This is a "novelty gun," designed for collectors more than for any sort of serious combat use. It is, as the name suggests, a vastly scaled down Browning M-1919A4, firing .22 Long Rifle instead of .30-06. The Tippman Miniature breaks down and is cleaned almost exactly like the original, and fires just like the original. It is not meant to be a serious firearm, just something to have fun with. Because of its construction, it is very clumsy to fire apart from its tripod (-3 to hit).

Twilight 2000 Notes: This weapon does not exist.

Weapon	Ammunition	Weight	Magazines	Price
Miniature M-1919A4	.22 Long Rifle	3.9 kg	25, 50, 100, 150, 200, 250 Cloth Belt	\$513

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Miniature M-1919A4	5	1	Nil	3	2	4	70
With Tripod	5	1	Nil	3	1	1	139

Zastava M-53

Notes: While common in Yugoslavian service, the M-53 was not normally encountered outside that country. It is basically a German World War 2 MG-42 with a few modifications to suit local manufacturing methods and slightly lighten and strengthen the design. The changes are not always immediately obvious and a World War 2 soldier would probably mistake the M-53 for an MG-42 at first glance.

Weapon	Ammunition	Weight	Magazines	Price
M-53	8mm Mauser	11.5 kg	50 Drum, 50 Belt	\$2728

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-53	10	4	2-3-Nil	8	3	13	72
M-53 (Bipod)	10	4	2-3-Nil	8	1	7	94
M-53 (Tripod)	10	4	2-3-Nil	8	1	3	144

Zastava M-84

Notes: This is basically a locally-made copy of the Russian PK machinegun. It differs very slightly from that weapon, mostly in the stock, bipod, flash suppressor, and quality of metal.

Weapon	Ammunition	Weight	Magazines	Price
M-84	7.62mm Nagant	10 kg	100 Belt, 250 Belt	\$2433

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-84	5	4	2-3-Nil	7	3	6	68
M-84 (Bipod)	5	4	2-3-Nil	7	1	3	88
M-84 (Tripod)	5	4	2-3-Nil	7	1	2	136