

BEST WEAPONS THAT NEVER WERE

A group of weapons that range from entirely fictional (from books, games, etc.) to one-off experiments by gunsmiths to rare weapons of which few were ever built.

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Raytheon AGM-289 Coral Snake

Notes: For some reason, this did not occur to me until years after I came up with the R-5D Aurora hypersonic reconnaissance/strike aircraft: If the R-5D was going to be conducting a surprise nuclear strike against a North Korean division in the Twilight War, it would need to have an even faster weapon to fire to conduct that strike. That is the reason for this entry – something for the R-5D to use in its strike, and potentially planned for other strikes. Thus, the Coral Snake ASM.

Twilight 2000 Notes: As war clouds loomed over the world in the early 1990s, it was thought that the Aurora aircraft could, with its modularity, be repurposed on occasion as a strike aircraft for use against strategic targets where conventional bombers or strategic missiles would not be appropriate or advisable. In addition, the Aurora could also be used to strike targets where further a rapid response time would be needed and pinpoint accuracy would be warranted. However, no such weapon was at that time in the US inventory. In January of 1993, Raytheon was secretly contracted by DARPA and the US Air Force to come up with such a weapon. The new weapon would need to be even faster than the Mach 5+ the R-5D was capable of, have a range enough to keep the R-5D reasonably out of danger, and be able to carry enough of a warhead to make the strike worth it. Ideally, it would also need to be capable of bunker busting, able to penetrate through up to 25 meters of reinforced concrete and earth with a conventional warhead, or carry a decent throw weight of nuclear warhead. Raytheon felt that this was too much for the DoD to ask, but gave it their best shot, with excellent results, producing the AGM-289 in record time for such a weapon – the XAGM-289 prototypes were flying by July of 1995, with LRIP (there was never any full-rate production) beginning about a year later. The prototypes were noted for their elaborate paint schemes, reflecting the color pattern of the snake from which their name is drawn.

Raytheon began with a modified Phoenix missile, but quickly found that the Phoenix's airframe, intended for use as an air-to-air missile, could not carry a large enough warhead for the task. Raytheon then enlarged the Phoenix, increasing its size by over 50%. This also allowed for the fitting of a new high-impulse rocket motor which accelerated the Coral Snake to Mach 7 in less than a minute when dropped from a Mach 5-flying Aurora aircraft. The high speed allowed the Coral Snake a satisfyingly long range when fired from an R-5D at speed. (Attempts to mate the Coral Snake with other aircraft, such as the B-52, B-1 and B-2 did not lead to as dramatic results, with the AGM-289 able to accelerate to only Mach 4.5 when fired from such an aircraft, and the AGM-289 became an Aurora-only weapon until late in the War.) As the airfoils were not enough to give the missile enough control in flight, thrusters were added near the tail to give the missile more control authority.

The carriage of an AGM-289 required a slight modification to the R-5D's weapon bays due to the weapon's large size and the need to kick the missile into the slipstream and away from the aircraft quickly. In addition, the use of Coral Snakes required the replacement of some of the R-5D's reconnaissance fit with fire control avionics.

Warheads initially tested were conventional, and primarily HE warheads with nose of the missile tipped by a thick tungsten cap for additional penetration. These proved to be effective enough to meet and even exceed the original DoD specifications for penetration. Initial guidance was to be by GPS, but as satellites began to fall, inertial positioning was fitted with a TERCOM kicker. This of course required the pilot of the Aurora to fix the position of the target and link it to the AGM-289 before launch, something which required about 15 seconds of minimal maneuvering. However, a nuclear warhead was always considered for the Coral Snake, and one modified from that of the B-61 bomb was fitted onto six Coral Snakes.

Perhaps the best known, and most controversial, use of a Coral Snake from an Aurora aircraft was the November 1997 nuclear strike on a North Korean division that was closing in on Allied forces in North Korea. The strike was until the 2030s known as "the nuclear strike from nowhere", as no side had any launch indications from any weapon system or aircraft carrying a nuclear warhead in theater, and no one was going to send a relatively inaccurate missile from out of theater. Nonetheless, the Coral Snake scored an almost center-mass bullseye on the North Korean division in question, with a warhead programmed for 100 kilotons of yield. This saved the Allied Forces' bacon for a while, but the use of a tremendously expensive and irreplaceable asset like an R-5D was discussed among military leaders until it didn't matter anymore.

Weapon	Difficulty	Guidance	Weight	Price
AGM-289A	Easy	Inertial/TERCOM	715 kg	\$209560
AGM-289B	Easy	Inertial/TERCOM	715 kg	\$479560
AGM-289C	Easy	Inertial/TERCOM	715 kg	\$20956000

Weapon	Speed*	Round	Min Range	Max Range	Damage	Pen
AGM-289A	12741/7645	KEP/HE	3400	273300	C452 B215	695
AGM-289B	12741/7645	KEP/Thermobaric	3400	273300	C565 B162	695
AGM-289C	12741/7645	Variable Yield Thermonuclear	3400	273300	40-150 kt	695

*The speed is when fired from an R-5D at speed/subsonic launch.

AAI ACR

Country of Origin: US

Appears in: US ACR competition of the late 1980s and early 1990s.

Notes: The AAI ACR (also called the AAI Low-Impulse ACR, as part of the design includes an internal anti-recoil device) was based on AAI's previous work during the SPIW program of the 1970s. The AAI ACR design presented for evaluation outwardly looked almost completely conventional, but was quite unconventional in many ways. Like all the other ACR candidates of the time, the AAI ACR was rejected by the US Army and became a museum piece.

The 18.5-inch barrel was tipped by a compact pepperpot-type muzzle brake; the bore used a very lazy twist rate (1:85), since the ammunition was essentially self-stabilizing. Most of the was of steel or light alloy, but the stock, fore-end, and pistol grip were of polymer/plastic construction using materials that were advanced for the time. (Early versions of the AAI ACR did not have a pistol grip, but instead a pistol grip wrist.) The fire selector used a 3-round burst mechanism that fired at a cyclic rate of 1800 rpm – so fast that the third round would be well downrange before the shooter would feel the recoil from the first round. The firing mechanism also fired from a closed bolt for semiautomatic fire and from an open bolt on burst; this optimized the AAI ACR for both aiming in semiautomatic fire and cooling in rapid burst fire. Strangely, though AAI's round for its ACR had naturally low recoil, AAI decided use primarily mechanical means in the firing mechanism to limit dispersion of the rounds. Atop the receiver was a mount able to use most US and NATO optics and night vision equipment; in addition, AAI used an early version of Trijicon's ACOG-type sights that are now so common on assault rifles and submachineguns today. This ACOG, though roughly twice as large as modern ACOGs, set the stage for future developments. The ACOG had 4x magnification and limited night vision, and even worked well at night. Standard adjustable iron sights were also developed, with the rear sight assembly being removable and fitting onto the receiver's sight base, and a low sighting rib was also found above the barrel for quick shooting.

The ammunition that AAI used was based on flechette rounds developed well before the SPIW program. The muzzle velocity of the flechettes was very high (over 1400 meters per second), and the flechette had excellent penetration. The flechette (like most flechettes) twisted into a fishhook-shape upon striking a person, causing wounds out of proportion to the size of the flechette – so much so that it was briefly thought that AAI's round might be a violation of the Geneva Accords. However, the AAI flechette was not without its problems; the long, finned, needle-like shape (about 1.6x41mm) together with its very light weight (about 0.56 grams) made it extremely susceptible to wind. The round, nestled in its casing and liquid-crystal boot, was almost identical in size to the 5.56mm NATO round, and the magazines themselves were based on M16-type magazines. The AAI ACR could not fire 5.56mm NATO rounds, though – doing so would cause a chamber explosion, usually accompanied with the bolt assembly blowing backwards out of the weapon at high speed, possibly injuring or even killing its shooter. The M16-based magazines were quickly modified before such an accident could happen so that one could not load 5.56mm NATO rounds into AAI ACR magazines and standard M16-type magazines would not fit into the AAI ACR. (A 62-round drum was also developed for the AAI ACR, as the company planned to develop a whole family of small arms based on its ACR if the military decided to adopt it – including a SAW.) The problems with the ammunition were one of the main strikes against the AAI ACR; in addition, the cost per round was very high.

Weapon	Ammunition	Weight	Magazines	Price
AAI ACR	5.56mm AAI Flechette	3.53 kg	30, 62 Drum	\$920

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AAI Low-Impulse ACR	3	2	1-1-Nil	7	2	3	49

Baryshev/LCZ B-10

Country of Origin: Czech Republic

Appears In: Czech competition for both international markets and to replace the Vz-58.

Notes: The genesis of this weapon is a design by Russian Anatoly Baryshev in the early 1960s. However, it remained a private venture until Baryshev was able to work with LCZ in the mid-1990s. This weapon appears at first to be a reworked AK, but in fact employs a form of delayed blowback action similar to that of the Hungarian M39 and M43 submachineguns, instead of the gas operating system of the AK series. It is part of a series of weapons, including the B-20 battle rifle, the B-30 sniper rifle, and the B-40 grenade launcher. Versions of the B-10 were also designed in 5.56mm NATO caliber and 7.62mm NATO caliber (produced in very small numbers, and producing virtually no sales), 7.62mm Nagant (again, with little sales) and 9mm Parabellum caliber (mostly as a technology demonstrator, with almost no sales). Whether the 7.62mm Kalashnikov version is very much an open question at this time, but prospects do not look good; though the new operating system produces less felt recoil, it also proved vulnerable to harsh elements and difficult to field-strip. Barrel lengths for 7.62mm Kalashnikov, 5.56mm NATO, and 9mm Parabellum are 16.34 inches; for 7.62mm NATO and 7.62mm Nagant, the barrel is a bit longer at 17.9 inches. These barrels are tipped by a compact muzzle brake/flash suppressor.

Twilight 2000 Notes: This weapon was in very limited issue during the Twilight War, and for most of the war, its existence was regarded as only a rumor.

Merc 2000 Notes: Though not a big seller in the Czech or the Slovakian military, the B-10 was quite popular among several Southeast Asian and African nations who felt the need to replace their tired old AK-series weapons. (The modular nature of the weapon also helped in this regard.)

Weapon	Ammunition	Weight	Magazines	Price
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B-10	7.62mm Kalashnikov	3.6 kg	30, 40, 75	\$948
B-10	5.56mm NATO	3.6 kg	20, 30, 40	\$708
B-10	7.62mm NATO	3.9 kg	5, 10, 20	\$1148
B-10	7.62mm Nagant	3.9 kg	5, 10, 20	\$1198
B-10	9mm Parabellum	3.6 kg	20, 30, 40	\$408

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
B-10 (7.62mm Kalashnikov)	5	4	2-Nil	5/6	2	6	46
B-10 (5.56mm NATO)	5	3	1-Nil	5/6	2	4	41
B-10 (7.62mm NATO)	5	4	2-3-Nil	5/6	2	6	53
B-10 (7.62mm Nagant)	5	4	2-3-Nil	5/6	2	6	53
B-10 (9mm Parabellum)	5	2	2-Nil	5/6	1	2	36

Boeing/HK-USA XM8

Country of Origin: Germany/US

Appears In: Abortive competition to replace the M16 series in the early 2000s.

Notes: This weapon was designed to address the numerous flaws of the M16/M4 series, and to provide a sister weapon to the OICW. The XM8 is derived from the rifle portion of the OICW (which is itself derived from the G-36), but does not have the grenade launcher or computerized sight attached. It is a modular construction weapon allowing the weapon to be modified for a variety of different uses and with a large amount of accessories and optics. The furniture is almost entirely made of high-strength polymer, and does not get hot to the touch like a metal rifle. It can also be molded with a variety of camouflage finishes. The XM8 boasts an operation that does not foul as easily as the M4/M16, and can be stripped and cleaned much faster. Ambidextrous controls allow the weapon to be easily used by left or right handed shooters. The 3-round burst setting has been dispensed with (to be replaced with better training in fire control), and the weapon is issued with a day/night 3.6x optical sight integrated with a laser aiming module. There are mounts on all sides of the handguard and on top for virtually any sort of optic or accessory. The XM8 was a Heckler & Koch invention, but in 2004, the rights to manufacture the XM8 were acquired by Boeing in the US.

Five models of the XM8 assault rifle are contemplated at present: the standard XM8 Carbine, the XM8 Compact carbine, two other XM8s with 10-inch and 14.5-inch barrels, and a Designated Marksman (DMAR) version with a 20-inch barrel, bipod, and a higher-powered scope. The Compact Carbine can be used with or without a buttstock; both have a telescoping stock (which in the case of the Compact Carbine can be removed completely, reducing the weight to 2.23 kg). The two intermediate-length XM8's are being experimented with, but probably will not make the cut, though they may be built and issued in small number for special applications. The DMAR is not exactly a sniper rifle, but more a tactical sharpshooting weapon; while the standard "scope" of the XM8 has no magnification, and is used only to increase efficiency of aiming, the DMAR has an actual 3.5x scope. The magazines are semitransparent polymer 30-round magazines. It is anticipated that the XM8 will begin field tests in 2005.

Twilight 2000/Merc 2000 Notes: This weapon does not exist in these timelines.

Weapon	Ammunition	Weight	Magazines	Price
XM8 Carbine (12.5" Barrel)	5.56mm NATO	2.92 kg	30	\$698
XM8 Compact Carbine (9" Barrel)	5.56mm NATO	2.73 kg	30	\$662
XM8 (10" Barrel)	5.56mm NATO	2.77 kg	30	\$672
XM8 (14.5" Barrel)	5.56mm NATO	2.91 kg	30	\$719
XM8 DMAR (20")	5.56mm NATO	4.13 kg	30	\$1293

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XM8 Carbine	5	3	1-Nil	4/5	3	6	27
XM8 Compact Carbine	5	2	1-Nil	3/4	3	6	16
XM8 Compact Carbine (No Stock)	5	2	1-Nil	3	3	7	11
XM8 (10")	5	2	1-Nil	3/4	3	6	19
XM8 (14.5")	5	3	1-Nil	4/5	3	6	34
XM8 DMAR (20")	5	3	1-Nil	5/6	2	6	55
XM8 DMAR (Bipod)	5	3	1-Nil	5/6	1	3	72

BSA Model 28-P

Country of Origin: Britain

Appears in: Competition to replace the standard British service rifle after World War 2.

Notes: This rifle was developed to compete with the EM2 and other weapons during the British Army weapon trials of 1949-50. As such, it fires what was supposed to be the new standard British military cartridge – the .280 British. The Model 28-P had a squared receiver incorporating an optical sight, but a rather conventional pistol-gripped half-stock similar to that of the US M1 Carbine. The trigger mechanism was made deliberately heavier than required to slow the rate of fire. The flash suppressor could double as a grenade launcher (though it is not capable of launching modern-pattern rifle grenades). Unfortunately, testing showed that it was not a

particularly accurate weapon (by the standards of the time); the Model 28-P also suffered breech explosion during testing. Though the breech design was revised and proved reliable, the Model 28-P was cut from the testing program. No more than 15 of these rifles were ever built.

Weapon	Ammunition	Weight	Magazines	Price
Model 28-P	.280 British	4.01 kg	20	\$951

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Model 28-P	5	3	2-Nil	7	4	9	62

Bulkin AB-46

Country of Origin: Soviet Union

Appears In: TKB-415 competition to produce the Soviet Union's first assault rifle.

Notes: Designed by Tula's A Bulkin, the AB-46 was, for almost a year, the only real competitor for a new Soviet assault rifle. Other competitors in TKB-415 had no real chance of being chosen, and Kalashnikov's prototypes were late, almost too late for submission. The AB-46 appears very similar to the AK-47, and Bulkin also borrowed heavily from captured examples of the Stgw-44. His rifle had longer handguards, a ventilated cooling rib above the barrel, and an Stgw-44-type gas block and front sight, while the rear sight was of an original design that later showed up in the AK-47. The stock, pistol grip, and handguard was of weatherproofed beech. The slab-like receiver was of milled steel, with a top cover for access to the internal parts or for field stripping. The barrel was 18 inches long, tipped with a compact flash suppressor. Magazines were steel, again similar to the AK-47. The rifle was designed to fire the SKS's 7.62x39mm round. Internals are very similar to the AK-47's.

At this point, you may be asking yourself, "Why did the AB-46 resemble the Kalashnikov's design's so much, even though it came months before the first Kalashnikov prototype?" There is a very ugly story out there, which is gaining more credence as time goes by. It seems that Mikhail Kalashnikov saw Bulkin's design, and noted that it was superior to any of the designs he had on the drawing board. So Kalashnikov borrowed heavily from the AB-46. Essentially, he took Bulkin's prototype, made some tweaks, and improved upon it to produce the later-accepted AK-47 and its prototypes. This apparently irritated Bulkin so much that he never tried to produce any sort of assault rifle. (It also seems that the Soviet Army also had sort of a hard-on towards Kalashnikovs, partially because of his story and partly of his heavily-decorated chest. He was also one of them – Soviet Army.) Regardless of the reason, the AB-46 was rejected by the testers and Soviet Army, though it was reportedly a close competition. Many at the time felt the AB-46 was the superior assault rifle.

Weapon	Ammunition	Weight	Magazines	Price
AB-46	7.62mm Kalashnikov	3.68 kg	30	\$824

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AB-46	5	4	2-Nil	7	4	9	53

CEAM Mle 1950

Country of Origin: France

Appears In: Prototype assault rifle work developed in the late 1940s and early 1950s, for possible use by French Armed Forces.

Notes: This rifle may be thought of as a waypoint between the Nazi StG45(M) and the Spanish CETME-58 and German G3 designs. Using the StG45(M) as a start point, Ludwig Vorgrimler and Theodor Löffler began work on an improved model, first chambering their rifle in 8mm Kurz, then two rounds Vorgrimler devised, the 7.65x35mm and 7.65x38mm, but most work was done on a version chambered in .30 Carbine due to the round's wide availability in France at the time. The CEAM 1950 looks very much like an StG45(M) (and also very much like the later CETME-58). The fore-end of the CEAM 1950 featured a lower handguard that hinged downward in two sections to form a bipod. The stock was solid and folded sideways to the right. The trigger guard was enlarged for use with heavy gloves, and also hinged downward to allow firing while wearing mittens. Operation was by roller-delayed blowback, a method of operation which would later come to be associated with Heckler & Koch firearms. Unfortunately, France was ensnared in fighting in Vietnam at the time and also with being the second largest contributor to NATO at the time; they opted to go with their current crop of rifles instead of funding the CEAM 1950, despite its promise. Vorgrimler then accepted an offer from CETME of Spain and took his design with him, and they later became the CETME series, which with more development, became the Heckler & Koch G3 series.

Weapon	Ammunition	Weight	Magazines	Price
CEAM Mle 1	8mm Kurz	4.33 kg	30	\$787
CEAM Mle 1	7.65x35mm Vorgrimler	4.33 kg	30	\$778
CEAM Mle 1	7.65x38mm Vorgrimler	4.33 kg	30	\$825
CEAM Mle 1950	.30 Carbine	4.33 kg	30	\$721

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
CEAM Mle 1 (8mm)	5	4	2-Nil	5/6	3	8	47

CEAM Mle 1 (7.65x35mm)	5	3	2-Nil	5/6	3	8	47
CEAM Mle 1 (7.65x38mm)	5	4	2-Nil	5/6	3	8	47
CEAM Mle 1950	5	3	2-Nil	5/6	3	8	46

Colt ACR

Country of Origin: US

Appears in: US ACR competition of the late 1980s and early 1990s.

Notes: Colt's ACR was a result of the US military's Advanced Combat Rifle (ACR) program. The Colt entry was based on the M16A2; one can see the family resemblance, but the Colt ACR is still a greatly-modified version. Like the rest of the ACR candidates, the Colt ACR was rejected and they were placed in museums (I saw one on display at the Infantry Museum at Ft Benning) or taken back to Colt for further study.

The Colt ACR used an adjustable stock similar to the XM177/M4 carbine series, but with seven positions. The standard M16A2 handguards were replaced with handguards with heavy heat shielding as well as a long sighting rib, used for short-range reflex shooting in the same manner as the rib on a shotgun. The 20.5-inch heavy barrel was tipped with new muzzle brake designed to be effective, compact and low-profile, yet allow for the use of rifle grenades and underbarrel grenade launchers. Fire controls were ambidextrous. The receiver was topped with a very early version of what became the MILSTD-1913 rail; on this rail, an integral Leitz Wildcat 3.5x sight was meant to be mounted for troops who needed it, or it could be replaced with other US/NATO optics or a simple carrying handle with iron sights.

The ACR was specially designed to fire a new 5.56mm duplex round, which features two smaller-than-normal bullets point-to-tail. This increases hit probability (and effectively doubles rate of fire), but also significantly reduces effective range, as the two rounds are each much lighter and less stable. Standard 5.56mm NATO ammunition could still be fired from the Colt ACR.

Twilight 2000 Notes: As this project was shelved several years before the Twilight War, it was largely a non-participant in the Twilight 2000 timeline. The Infantry Museum at Fort Benning had one that was taken along with most of the weapons, and it was put to use by US Army troops; in addition, at least 4 others were known to have been used during the war (all in the US). Duplex ammunition was extremely limited in quantity and the Colt ACRs were almost always used with standard 5.56mm NATO ammunition.

Weapon	Ammunition	Weight	Magazines	Price
Colt ACR	5.56mm NATO and 5.56mm Duplex	3.31 kg	20, 30, 40	\$890

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Colt ACR (5.56mm Duplex)	5	2	1-Nil	5/6	2	5	41
Colt ACR (5.56mm NATO)	5	3	1-Nil	5/6	2	5	59

*The duplex round consists of two smaller bullets within one cartridge case instead of one standard-sized one. Upon achieving a hit upon a target, the firer will hit the target with at least one bullet. The second bullet will automatically hit at short range, hit 75% of the time at medium range, 50% of the time at long range, and 25% of the time at extreme or longer range. The damage listed is per individual bullet.

Colt Dream M16s

Country of Origin (sort-of)

Appears in: A strange dream I had. (I *did* slay the monster).

Fictional Notes: I am one of those people who are capable of lucid dreaming. In the dream, there was monster plaguing the people I found myself protecting. I had an M16, but was not a normal M16 – it fired necked brass versions with the same measurements, but with a single bullet. I might also note that I seemed to be immune to the recoil, or I was at least able to quickly regain my sight picture.

Let's assume a few things for this entry. The magazines are based on 50-round magazines. Whatever the internals are, they are modified and adequate for my use without jamming or fouling. Engineering-wise, they were masterpieces. And they had large muzzle brakes, a recoil pad, and a bipod. The round for these weapons are all standard 2.75-inch ammunition. (Even if nonesuch actually exists.) Ammunition was brass-based.

Weapon	Ammunition	Weight	Magazines	Price
Colt Dream M16	.410 Gauge Bullet	4 kg	10, 12, 30, 34, 30	\$2682
Colt Dream M16	10 Gauge Bullet	8.25 kg	10, 12, 30, 34, 30	\$7828

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Colt Dream M16 (.410)	5	6	2-4-Nil	8	3	7	62
With Bipod	5	6	2-4-Nil	8	1	4	80
Colt Dream M16 (10 GA)	5	11	2-2-3	10	4	10	62
With Bipod	5	11	2-2-3	10	2	5	80

Colt M16A1 (Experimental)

Country of Origin: US

Appears in: A company experiment on the M16A1 in the mid-1970s.

Notes: This oddball variant of the M16A1 was modified from a standard M16A1 in 1974 to fire an experimental cartridge (essentially a standard 5.56mm NATO round necked down to 4.32mm). The idea was to further lighten the M16A1 as well as the ammunition. This experimental M16A1 was never given an official designation. The M16A1 was simply rebarreled to fire the 4.32mm ammunition, and the bolt and chamber were also modified for the same purpose (in the case of the bolt, most of the modifications were in the bolt face; the bolt and bolt carrier assembly were otherwise almost a standard M16A1 bolt carrier assembly). This experimental M16A1 also had some other unusual features – the carrying handle was removed and replaced with a reflex collimator sight, barrel was tipped with a muzzle brake, and it used a 3-round burst setting in addition to a full-auto setting. (The 3-round burst setting was the only feature kept, and reappeared on the M16A2 in a simplified form; however, a similar sight was used on the Colt ACR.)

30 of these rifles were so modified, and extensive field trials were done with them. Despite the fact that the objective of lighter weight was achieved, and the collimator sight made the modified M16A1 quite accurate, the bullet was simply *too* light in weight, and was highly subject to long-range dispersion from wind due to that light weight; it also did not have the damaging potential of even the lightweight 5.56mm NATO round. The cartridge and the rifle were therefore dropped from testing.

Weapon	Ammunition	Weight	Magazines	Price
M16A1 (Experimental)	4.32mm Rodman	3.36 kg	30	\$749

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M16A1 (Experimental)	3/5	2	1-Nil	6	1	2/3	42

Colt M16EZ

Country of Origin: United States

Appears in: *Twilight 2000 First Edition Small Arms Guide*, though I have embellished the story a little.

Fictional (Twilight 2000-Only) Notes: The M16EZ is a crude copy of the M16A1 issued to US militia units starting in 1999. They were built by both Milgov and Civgov so that their militia forces could have something that is better (and gives them more credibility) than deer rifles and shotguns. They are made from reconditioned parts that were originally tagged by the US military as too worn out for military use, and what newer parts were still available. They vary in quality and appearance, often having wooden stocks and handguards, telescopic sights, and other modifications limited only by imagination. Unfortunately, due to the generally poor condition of the parts involved, they also vary widely in reliability and performance. The figures given below are for an average M16EZ.

(The M16EZ could also be used in other Twilight 2000 campaign areas, or even in some Merc 2000 or Dark Conspiracy games, representing the sort of weapon that sometimes appears in various parts of the world -- a crude copy of an existing weapon built in local machine shops, or even someone's garage.)

Weapon	Ammunition	Weight	Magazines	Price
M16EZ	5.56mm NATO	3.6 kg	10, 20, 30	\$575

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M16EZ	5	3	1-Nil	6	2	6	45

Colt M4 Mods

Country of Origin: US

Appears in: Late-2000s tests of "new" technology for the M4 Carbine (ie, they were meant to be technology demonstrators and not issue weapons).

Notes: Inundated by a number of gas-piston M4/M16-type designs that are vying for military attention (particularly the US military), Colt has recently (as of the time I write this, December 2009) been experimenting with several gas piston and hybrid designs to keep up with the Joneses. Gas piston designs are, by and large, more reliable and less subject to fouling than the Stoner direct gas impingement system, and allow for reliable functioning with shorter barrel lengths.

The Colt APC (Advanced Piston Carbine) is an M4 that uses a gas piston operation, but that's not all there is to it. The APC also has a monolithic upper receiver with a MILSTD-1913 rail and the upper receiver being one piece. The front sight post remained and a flip-up rear sight may be attached to the rear end of the MIL-STD-1913 rail. The barrel, while still 14.5 inches, is free-floating to increase accuracy. The combination of a floating barrel and a gas piston system required that the APC have a specially-designed piston system, as standard piston systems would warp or break under the stresses imposed by a floating barrel. The barrel used is also a heavier than standard barrel. The APC comes in two variants: one with an integral suppressor (with the standard flash suppressor extending from the end of the suppressor, and a standard one with no suppressor. The suppressor can use standard

5.56mm NATO ammunition; though the suppressor is designed for long life, the use of standard ammunition cuts life considerably, so subsonic ammunition is recommended.

The AHC (Alternative Hybrid Carbine) is sort of a middle-of-the-road solution, designed to be retrofitted to existing M4s. The new operating system is basically a gas piston operated by direct gas impingement, allowing for retrofitting while cutting down on some of the fouling and increasing reliability. The gas tube essentially has a piston system halfway down the gas tube. Most combustion gasses and their deposits are released under the handguard rather than being directed back towards the chamber and into the barrel. Other than the different operation, the AHC is identical to the APC for game purposes, including having a suppressed and non-suppressed option.

The SCW (Subcompact Weapon) is essentially a short, PDW variant of the M4, though you wouldn't know it by looking at it. The basic M4 body upper and lower receiver is there, and the operation is the same as the M4 as well. However, the handguards have four MIL-STD-1913 rails, and the upper receiver also has a monolithic MIL-STD-1913 rail. The stock is designed to fold even shorter than that of the M4; it not only slides back and forth, it folds to the right just behind the buffer tube. The barrel is a mere 10.3 inches, and tipped with a compact muzzle brake. (An 11.5-inch barrel has also been tested.) The SCW is designed to be used with a foregrip; the one Colt uses is a Lasermax foregrip that incorporates a laser sight. The charging handle is also relocated; instead of being at the rear of the receiver, the SCW uses an ambidextrous handle that extends from the forward quarter of the handguard and uses a short charging stroke. The SCW-P is identical, but uses gas piston operation. In addition to being useful as a PDW, the SCW is also a good CQB weapon and for use from firing ports.

Going the opposite direction, we have the ERC (Extended-Range Carbine). This is designed for use by designated marksmen, and are not meant to be dedicated sniper rifles. There are two versions, the ERC-16 and ERC-20, with a 16 and 20-inch floating match-quality barrel, respectively. These retain the sliding stock of the M4, but have a monolithic MIL-STD-1913 rail and four more rails on the handguards. They are designed with bipods in mind, though they could still mount underbarrel grenade launchers instead. Iron sights are flip-up; primary sights are meant to be anything from simple Trijicon ACOG sights to low-power telescopic sights. The muscle memory of the M4 is retained, but the ERC is a much more accurate weapon. (The price below includes an ACOG and a light bipod.)

Weapon	Ammunition	Weight	Magazines	Price
APC	5.56mm NATO	2.81 kg	20, 30	\$579
APC (Suppressed)	5.56mm NATO Subsonic	4.11 kg	20, 30	\$884
AHC	5.56mm NATO	2.81 kg	20, 30	\$575
AHC (Suppressed)	5.56mm NATO Subsonic	4.11 kg	20, 30	\$880
SCW/SCW-P (10.3" Barrel)	5.56mm NATO	2.83 kg	20, 30	\$982
SCW/SCW-P (11.5" Barrel)	5.56mm NATO	2.89 kg	20, 30	\$994
ERC-16	5.56mm NATO	3.58 kg	20, 30	\$1155
ERC-20	5.56mm NATO	3.71 kg	20, 30	\$1285

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
APC	5	3	1-Nil	4/5	3	7	35
APC (Suppressed)	5	2	1-Nil	6/7	1	3	25
AHC	5	3	1-Nil	4/5	3	6	34
AHC (Suppressed)	5	3	1-Nil	6/7	1	2	24
SCW/SCW-P (10.3")	5	2	1-Nil	3/4*	2	5	20
SCW/SCW-P (11.5")	5	2	1-Nil	3/5*	2	5	24
ERC-16	5	3	1-Nil	4/6	2	6	42
With Bipod	5	3	1-Nil	4/6	1	3	55
ERC-20	5	3	1-Nil	5/6	2	6	59
With Bipod	5	3	1-Nil	5/6	1	3	77

*The Bulk rating is 3 if the stock is side-folded.

Footnote R-68

Country of Origin: United States

Appears in: Pamphlets and several firearms magazines in the 1970s

Notes: Firearms designer JP Foote, towards the end of the Vietnam War, looked at the major trends in US military firearms – the perceived failure and unpopularity of the M16, the high (RL) cost of the AR-15 to civilians, the unreliability of Stoner's direct gas impingement system, and the fact that perhaps billions of 5.56mm NATO rounds were available everywhere and a weapon that fired a new round would go nowhere fast. Foote designed the operation of the R-68 around a gas tappet system, which, while it did increase the weight of the R-68, also dramatically increased reliability. It also means that by adjustment of the gas block, a wide range of ammunition types could be used. Cost was further kept low with simple steel stampings for much of R-68's parts, and "off-the-rack" tubings and parts were used when possible. A rotating bolt along with an interrupted buttress thread makes this whole assembly stronger, lighter, and more reliable. The charging handle is above the barrel, but kept low enough to not interfere with the operation of the sights. The safety is a simple which is inside the bottom of the trigger guard. The only tool required to disassemble most parts of

the R-68 is a bullet. Any magazine which would fit into an AR-15/M16 will fit into an R-68.

The first set of figures below are the stats of the actual prototype produced. The second are what Foote felt he could achieve with more development, using higher-quality steel, more polymers, etc. I have put in automatic fire stats as Foot's intended customer was the US military.

Weapon	Ammunition	Weight	Magazines	Price
R-68 (Prototype)	5.56mm NATO	4.63 kg	5, 10, 20, 30	\$593
R-68 (Developed)	5.56mm NATO	4.22 kg	5, 10, 20, 30	\$606

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
R-68 (Both)	5	3	1-Nil	6	2	5	55

Enfield EM2

Country of Origin: Britain

Appears in: Competition to replace the standard British service rifle after World War 2.

Notes: This bullpup rifle, years ahead of its time, really looked for a short time like it was going to become the new infantry rifle of the British Commonwealth. It was a very unconventional rifle for its time; not only was it a bullpup weapon reminiscent of the much-later L85 series, it fired a small, short cartridge – the .280 British round, developed specifically for the purpose. The weapon incorporated a carrying handle and an optical sight to increase aiming accuracy. Experience with bullpup-type rifles at the time was small, and there were initially some difficulties with an overly-complicated operating mechanism in its predecessor, the EM1. (The EM1 borrowed heavily from another rather complicated design, the Nazi Gerät 06, a gas-operated roller-locking experimental rifle designed by Mauser.)

Enfield then turned to a less complicated (but still rather modern) gas-operated system with flap locking, and instead of the stamped steel of the EM1, returned to largely machined parts, which were more suited to British manufacturing methods of the time. Another modern feature was that the primary sight was a 1x reflex-type sight which could be replaced with a compact 3.5x sight, with backup iron sights. The EM2 was ergonomically sound, well balanced with easy-to-reach controls and quite controllable in automatic fire. The EM2 design worked quite well and was very reliable, and about the only thing that stopped its adoption by British armed forces was politics – in this case, the beginning of NATO, the demand for a common NATO round for its members' rifles, and an absolutely intractable United States, who insisted on what would become the 7.62mm NATO round. The British briefly considered going its own way rifle-wise – The EM2 even received the British Army designation of "Rifle, Automatic, No. 9 Mk 1" – and Belgium and Canada also produced experimental designs firing the .280 British cartridge. The US essentially bullied the rest of NATO into adopting the 7.62mm NATO cartridge.

Enfield tried converting the EM2 to fire 7.62mm NATO, but the result was a rifle that (like most of the 7.62mm NATO rifles designed at the time) was uncontrollable in automatic fire. They then converted the EM2 to fire only on semiautomatic, but the British Government, citing the costs and the length of the development program, decided to license a variant of the FN FAL (which became the L1A1). Only 25 examples of the EM2 were built in .280 British, plus the very few experimental 7.62mm NATO versions. I feel this is a shame, as the British would have had an exceptional assault rifle at least a decade before anyone else in NATO; in addition, the .280 British is a much better intermediate round than the 5.56mm NATO that we eventually ended up with. (In addition, this would not be the last time that the US would use political bullying to stop the British from fielding a superior assault rifle...)

Just for the heck of it, I included a 7.62mm version below, though I don't even know if any examples of those experimental versions of the EM2 even exist anymore.

Weapon	Ammunition	Weight	Magazines	Price
EM2	.280 British	3.41 kg	20	\$974
EM2	7.62mm NATO	3.62 kg	20	\$1194

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
EM2 (.280)	5	4	2-3-Nil	6	3	8	71
EM2 (7.62mm)	5	4	2-3-Nil	6	4	10	76

Enfield XL64

Country of Origin: Britain

Appears in: Experiment into a possible new assault rifle for British Forces in Mid to late 1970s.

Notes: In 1960s, the British were (as many countries) looking for smaller, lighter assault rifles to replace their larger, bulkier battle rifles firing high-powered ammunition. The British MoD liked the compactness and light weight of the US M16 series and its 5.56mm NATO round, but had also paid close attention to the numerous deficiencies of the M16 series and its ammunition that were being revealed in Vietnam. The idea of a lightweight rifle firing small-caliber, high-powered ammunition was a good idea, but they felt they could do better. This led to the predecessor of the L85, called the XL64.

Enfield and the British MoD had always liked their EM2 design (and rightly so). The bullpup design made for a compact, handy weapon, suitable for a variety of roles, from a cook who has it slung over his shoulder for emergencies to infantrymen on the attack. Enfield felt that improvements in ammunition propellant and bullet construction meant that they could use a far smaller round than that

of the EM2 – it wouldn't be as powerful as the .280 British round, but could outclass the 5.56mm NATO. Radway Green, the company contracted to produce the ammunition, started with a necked-down and trimmed 5.56mm NATO case, eventually ending up with a 4.85x49mm round. (This round was very close in dimensions to the 5.56mm NATO round, and many 5.56mm-firing weapons could be easily converted to fire it using a kit that Enfield also intended to produce.)

The XL64 could easily be mistaken for an early L85 at first glance – because they are essentially the same weapons. (More on this later.) The XL64 had been long in the design and finalization of its configuration, and it was the mid-1970s before it was revealed; trials didn't even start until 1978. Once trials started, problems began immediately – and they were almost entirely political (and monetary) problems. Once again, the United States had already decided that the new version of the 5.56mm NATO round, the FN-designed SS-109, was going to be the new NATO standard assault rifle round, and weren't interested in anyone else's cartridge designs. (Of course, tons of money were also on the line.)

Enfield had realized almost from the beginning that the same thing that happened to their .280 British cartridge would almost certainly happen to their new 4.85mm round. Therefore, they designed into the XL64 almost from its inception the capability to be easily converted to fire the 5.56mm NATO round and use M16-type magazines. Though the SS-109 round was in its infancy when Enfield began working on the XL64, only a few modifications were needed to accommodate the SS-109. That, and some more cost-cutting measures, morphed the XL64 into the L85.

One good thing did survive the XL64 program – the SUSAT 3.5x light weapons sight. This compact scope would go to equip many L85s, and draw the attention of the entire world.

Weapon	Ammunition	Weight	Magazines	Price
XL64	4.85mm British	3.89 kg	20, 30	\$711

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XL64	5	3	1-1-Nil	5	2	5	48

Heckler & Koch G-11

Country of Origin: Germany

Appears in: German weapon competition of the 1970s and 1980s, and later the US ACR competition.

Notes: The initial design work for the G-11 began in 1969, in response to a German Army request for a new rifle with a high first-round hit-probability, even when fired on automatic, yet would be light, compact, and extremely resistant to harsh climates. Many designs came and went, but by the late 1980s, Heckler and Koch presented the G-11 in final form. The G-11, though reportedly a very effective weapon, suffered from rumors that the ammunition could cook off, that its construction made maintenance difficult for both armorers and users, and that its looks and design were so exotic as to assault the sensibilities of traditional weapons. In addition, it did not fire 5.56mm NATO ammunition, which was a cardinal sin in NATO at the time. On top of this came the reunification of Germany, and the massive amounts of AKM and AK-74-type weapons the former East German Army already had available. Finally, the G-11 was going to be an expensive weapon to produce, and retooling for series production would take even more expense. By 2006, despite reports of very limited use by special operations forces in various countries, the G-11 is largely a curiosity piece, found mainly in museums or gun collections.

The G-11 was a revolutionary design, almost completely encased in plastic composites, with 50-round composite magazines that were sealed in plastic until they were loaded. Operation is by gas with a hint of blowback, with a cocking "dial" on the side of the stock and a fire selector above the pistol grip. Original G-11's had selector settings for safe, semiautomatic, 4-round burst, and fully automatic. Once a magazine is loaded into the G-11 (slid into a track atop the handguard), the rounds face downward, and rounds are pushed downwards into the breech/chamber. The breech/chamber then rotates 90 degrees to line up with the 21.26-inch barrel. The cocking "dial" does not move when the G-11 fires, and can also be used as a decocker. The magazine moves back and forth in its track as the rifle fires; this actually helps dampen recoil, along with some other recoil-dampening mechanisms inside the G-11. When firing on full automatic, the cyclic rate is rather slow, at about 600 rpm; but when on burst, the cyclic rate rises to over 2000 rpm – so fast that the fourth round is well downrange before the recoil from any of the rounds is felt. (This kind of burst feature served as a model for future burst-firing weapons, and is now quite common on such weapons.) This makes bursts extremely accurate and virtually immune to barrel climb. There is, of course, no spent case ejection, but dud rounds are automatically ejected from a port with a hinged cover under the "receiver." This port closes again after the round is ejected. The "receiver" is topped with a carrying handle that contains a simple 1x aiming tube with a Mil-Dot reticule, with provisions for the removal of this aiming tube and replacement with a special 3.5x scope or certain other optics. The G-11 is also a very compact assault rifle, only a little over 29.5 inches long, despite the length of its barrel. The barrel is tipped by a cylindrical flash suppressor. The original version of the G-11 had no provision for the mounting of a bayonet, but this was quickly rectified.

Heckler & Koch went through a number of prototypes over the intervening years, but the initial production model was *supposed* to be the G-11K2; this model used 45-round magazines, but there were three mounted above the handguard (which was also larger, rounded on the bottom, and otherwise rather squarish). (The G-11K2 is still capable of being loaded with the original 50-round magazines, but they will not fit into the spare magazine tracks on the sides of the loaded magazine.) One of these magazines was to be carried inserted into the rifle, with the other two on separate tracks on either side of the inserted magazine to allow for quick magazine changes. The three magazines were carried lower on the top of the handguard than on the original G-11. A locking slot for a special bayonet was added, and the cylindrical flash suppressor was replaced by semi-flash suppressor combined with a muzzle set well back from the front of the weapon, effectively doing the same job. The carrying handle was replaced with one which could be

completely removed, with a mount for various NATO-compatible optics. (A future modification was to include a length of MILSTD-1913 rail.) The burst setting was changed from four to three rounds, to simplify the fire mechanism. A number of other mechanical and ergonomic modifications were also carried out, and the shape of the G-11K2 is very different from that of the original G-11.

Of course, the most revolutionary aspect of the G-11 is its ammunition, which is caseless. The bullet and combustible primer is embedded in a block or propellant, and nothing needs to be ejected after firing; there is no spent brass. The ammunition is therefore extremely light in weight and compact in size, allowing for a large magazine capacity without undue weight or magazine size. (I personally think this sort of ammunition for small arms may be the wave of the near future, but that's just my opinion.) When the US military announced its competition for the ACR (Advanced Combat Rifle), Heckler and Koch sent some G-11K2s for that competition, where it picked up monikers like "space rifle" and "plastic plank," despite the fact that the troops testing the G-11 liked its performance and compact size. However, the US military had such a large investment in M16-type weapons, and especially in the 5.56mm NATO cartridge, at the time of testing, which was probably the biggest reason for its ultimate rejection.

Twilight 2000 Notes: Production of the G-11 began very rapidly in 1990, and just as quickly slowed in 1991; by 1994, Heckler & Koch were concentrating on the G-41 and then-upcoming G-36. Despite some 20,000 examples of the G-11 being made, by 2000, most of them had been discarded as pre-war stocks of ammunition were largely expended and new stocks were almost impossible to make using the production methods available by 2000.

Merc 2000 Notes: This is a popular weapon for special ops forces operating in harsh climates. If you encounter a force armed with the G-11, they are probably clandestine forces of a large national government or of someone who has a lot of money to spend on exotic weapons and ammunition.

Weapon	Ammunition	Weight	Magazines	Price
G-11	4.7mm Caseless	3.6 kg	50	\$805
G-11K2	4.7mm Caseless	3.6 kg	45, 50	\$805

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
G-11	4/5	3	1-1-Nil	5	2	3/5	48
G-11K2	3/5	3	1-1-Nil	5	2	3/5	48

Interdynamic MKS/MKR

Country of Origin: Sweden

Appears in: Company experiment into an alternative type of assault rifle.

Notes: These were very unusual-format assault rifles designed by Interdynamic in the late 1970s. The idea was to provide a compact weapon for vehicle crews, paratroopers, and special operations troops. They are "semi-bullpup" designs; the layout is fairly standard, but the magazine is used as the pistol grip of the weapon, and this contributes to a shorter length. The bodies of the rifles are largely of high-impact plastic. The MKS fires 5.56mm NATO ammunition, but the MKR fires an experimental 4.7x26mm rimfire cartridge in addition to a version firing 5.56mm NATO. The MKR has a longer barrel and uses a standard stock, while the MKS uses a folding stock. Both of these weapons were rejected by Sweden and everyone else, and there were only tiny amounts of civilian sales; the Swedish Army's primary strike against the 4.7mm version was the lack of stopping power from the unusual ammunition. The biggest strike against the MKS was, though it had a semi-standard layout, used the magazine as a pistol grip, which was very awkward except for those with very big hands. Barrel length for the MKR was a nice 23.6 inches, due to the bullpup layout; the MKS Rifle had a barrel of 18.4 inches, and the Carbine 13.75 inches. They are presented as a "what-if."

Weapon	Ammunition	Weight	Magazines	Price
MKS Rifle	5.56mm NATO	2.72 kg	30	\$609
MKS Carbine	5.56mm NATO	2.36 kg	30	\$562
MKR	5.56mm NATO	2.99 kg	30	\$622
MKR	4.7mm Interdynamic Rimfire	2.99 kg	50	\$398

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MKS Rifle	5	3	1-Nil	4/5	3	7	49
MKS Carbine	5	3	1-Nil	4/5	3	7	32
MKR (5.56mm)	5	3	1-Nil	5	3	7	61
MKR (4.7mm)	5	2	1-Nil	5	2	6	55

Kalashnikov AKMR

Country of Origin: Russia (Soviet Union)

Appears In: *Twilight 2000* game since its inception.

Notes: This weapon was never produced in the real world, at least not officially, though it is possible that some early AK-74s were in fact modified AKMs. Any such weapons, however would still be of better quality than a hypothetical AKMR.

Twilight 2000 Notes: Early in the Twilight War, the Russians and some of its Eastern European allies had a problem: they had invested heavily in the new 5.45mm Kalashnikov round, but production of the AK-74s to fire them was seriously lagging. At the same time, there were large amounts of AK47s and even AKMs that were no longer mechanically reliable due to wear. The decision was made to “fix” those old rifles; they were rebarrelled and rechambered to accept 5.45mm Kalashnikov ammunition and the new magazines designed for it, other worn out parts were sometimes replaced, and rotting wooden stock were replaced with new ones (or sometimes even ones made of plastic or fiberglass). These weapons were then issued back out to the hordes of Category III, Mobilization only, and militia units being raised. The “AKMR,” as the weapon was dubbed, was regarded as being unreliable compared to the average AK series weapon, and modification standards were generally poor and got poorer as the war went on. Depending on the base weapon, a soldier might either be issued a standard AKMR or a folding stock AKMRS.

Weapon	Ammunition	Weight	Magazines	Price
AKMR	5.45mm Kalashnikov	3.7 kg	30, 40, 75D	\$496
AKMRS	5.45mm Kalashnikov	3.2 kg	30, 40, 75D	\$521

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AKMR	5	2	1-Nil	5	2	6	42
AKMRS	5	2	1-Nil	4/5	2	6	42

Kalashnikov AK-47 – the Prototypes

Country of Origin: Russia (Soviet Union)

Appears In: Russian research leading up to the AK-47.

Notes: There have been a lot of prototypes, experimental versions, and variants of the AK series from Soviet and Russian designers over the years. Many of them failed or were never adopted, for a variety of reasons – they didn’t work, they were too complicated, they were technologically infeasible at the time of their inception, the improvements weren’t necessary, too complex, or too expensive, their designers were not in political favor at the time, etc. Some of them were good, solid weapons, some sucked, and some were quite interesting. This entry will describe some of these variants and put them into game terms.

There is much evidence that work on the rifle that became the AK-47 may have started as early as late 1943 (most experts believe Kalashnikov started with captured Nazi StG-44s, though Mikhail Kalashnikov himself insisted until his death that his was an original, independent design, with no influence from any other weapon). However, the first prototype of the AK-47 that is generally known was actually the AK-46 No. 1 of 1946. The AK-46 No. 1 fired the predecessor of the current 7.62mm Kalashnikov round, which is generally called the 7.62x41mm Kalashnikov or 7.62x41mm M1943 (both cartridges were designated by the Russians the M1943). The AK-46’s design was quite similar to that of the AK-47, though the receiver has features reminiscent of the StG-44 – it actually looks like a sort of blend of the StG-44 and AK-47. Unlike the AK-47, the AK-46 used a gas piston and rod assembly that are separate from the bolt carrier. The pistol grip is actually made of a steel frame with thick wooden grip plates. The 15.63-inch barrel was ported with 3 holes on either side of the barrel, just behind the front sight assembly – a feature later dropped, reportedly as a cost-cutting and manufacturing time-saving measure. (The front sight assembly actually sits directly above the muzzle.) The safety and selector switch were separate, and located on the left side of receiver above the trigger. Ironically, the receiver was made of stamped steel instead of milled and machined steel, in order to make the AK-46 lighter and cheaper to produce – a feature that would not be found on production AK rifles until the introduction of the AKM.

Prototypes rapidly moved along to the AK-46 No. 2 version. Though for the most part similar to the No. 1, the No. 2 changed to a sectional receiver built out of a combination of stampings that are welded and/or riveted as necessary. (This made production easier and cheaper, but led to a somewhat weaker receiver assembly.) The charging handle could be detached from the bolt carrier in order to prevent it from being caught on equipment, clothing, or other possible snags; the AK-46 No. 2 could still be operated with the charging handle removed by a finger hole in the bolt carrier face (similar to that of the M3A1 Grease Gun submachinegun). The barrel porting was deleted, and the handguards and gas tube made shorter. The barrel length was increased to 17.72 inches, though it included a substantial length of unprotected barrel from the end of the gas block to the muzzle – and the barrel itself is of a rather narrow cross-section, leading one to believe that bending could be a problem. The AK-46 No. 3 is based on the No. 2, but has a forward-folding stock of the type found on the later AKS-47 and AKMS; in addition, the barrel length is reduced to 15.75 inches.

The first AK-47 prototype, the AK-47 No. 1, was still chambered for the 7.62x41mm cartridge. In external appearance, it looked more like the AK-47 we all know and love, though the stock had more of a drop and the handguards looked a bit lumpish. The barrel length remained at 15.75 inches, but the barrel porting reappeared. The gas piston and rod assembly assumed their current form, integral with the bolt carrier, joined by a threaded portion and secured by a pin. The receiver of the AK-47 No. 1 was once again made of stamped steel, with a chamber extension to ensure a proper fit with the barrel. Changes were made to the operation to make locking more reliable and case extraction simpler *and* more reliable. The safety and fire selector were relocated to the now-familiar position on the right side, with a paddle switch almost identical in shape to production AK-series weapons. The gas system did not have the regulator of production AKs.

The AK-47 No. 2 prototype lengthened the barrel somewhat to 15.94 inches, and the barrel porting was replaced by a two-chamber muzzle brake; the front sight assembly was moved behind this brake. (The barrel length does include this brake; the nominal length of the barrel was still 15.75 inches.) The assembly was also of stronger construction. The handguards were a bit shorter. The structure of the front end of the gas tube and the gas block are rather striking – they look almost identical to those of the StG-44. There were two brass strips on the right side of the receiver near the front; these were used to mount various vision devices for testing purposes. The stock had a slightly-raised cheekpiece and much less of a drop than the AK-47 No. 1; the wood of the pistol grip was checkered. The AK-47 No. 3 was virtually identical to the No. 2, but the end of the gas tube and gas block assumed their now-familiar shape, and the two-chamber muzzle brake was replaced by two simple, oval shaped barrel ports. The AK-47 No. 4 was basically the same weapon as the AK-47 No. 3, but used the same folding stock as the AK-46 No. 2. The AK-47 No. 5 is the AK-47 No. 4, but without the barrel porting, and a few other measures to lighten the weapon.

The AK-48 No. 1 and No. 2 were the last prototypes of the AK-47 before the rifle that is known today as the AK-47 began mass production (which began in late 1948, with first issues to units starting in mid-1949). These prototypes were generally in the same form as the production AK-47 and AKS-47; the No. 1 corresponded to the production AK-47 and the No. 2 the production AKS-47. The ammunition had been revised, and both examples of the AK-48 fired what is now called the 7.62mm Kalashnikov round. The barrel assumed the length of production AK-47s – 16.34 inches. However, while the barrel porting was deleted, the muzzle was threaded to allow the attachment of various muzzle devices, including silencers and suppressor, muzzle brakes, or even an adapter for use with a possible (at the time) vehicular firing port that might be later developed. The No. 2 used a folding wire stock, though it was simplified in construction over the folding stock used on the other AK-47 prototypes.

Weapon	Ammunition	Weight	Magazines	Price
AK-46 No. 1	7.62x41mm Kalashnikov	3.91 kg	30	\$833
AK-46 No. 2	7.62x41mm Kalashnikov	4.03 kg	30	\$830
AK-46 No. 3	7.62x41mm Kalashnikov	3.9 kg	30	\$835
AK-47 No. 1	7.62x41mm Kalashnikov	4.21 kg	30	\$835
AK-47 No. 2	7.62x41mm Kalashnikov	3.85 kg	30	\$860
AK-47 No. 3	7.62x41mm Kalashnikov	3.89 kg	30	\$835
AK-47 No. 4	7.62x41mm Kalashnikov	3.95 kg	30	\$860
AK-47 No. 5	7.62x41mm Kalashnikov	3.77 kg	30	\$835
AK-48 No. 1	7.62mm Kalashnikov	3.95 kg	30	\$797
AK-48 No. 2	7.62mm Kalashnikov	4.03 kg	30	\$822

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AK-46 No. 1	5	4	2-Nil	6	3	8	43
AK-46 No. 2	5	4	2-Nil	6	3	9	52
AK-46 No. 3	5	4	2-Nil	4/6	3	9	44
AK-47 No. 1/No. 2	5	4	2-Nil	6	3	8	44
AK-47 No. 3	5	4	2-Nil	6	3	8	44
AK-47 No. 4	5	4	2-Nil	4/6	3	8	44
AK-47 No. 5	5	4	2-Nil	4/6	3	9	44
AK-48 No. 1	5	4	2-Nil	6	3	9	46
AK-48 No. 2	5	4	2-Nil	4/6	3	9	46

Korobov Assault Rifle Prototypes

Country of Origin: Soviet Union

Appears in: Various literature and espionage reports, as web pages, about experimental assault rifle in the mid-1940s to late 1960s.

Notes: Like the US and many other countries, the Soviets and Russians have produced a number of prototype assault rifles that for one reason the other didn't make the grade. We'll look at some of these here.

In 1957, the Soviets began trials for a version of the AK-47 that was cheaper to produce, easier to maintain, lighter, and above all, maintained muscle memory for the troops that were used to the AK-47. Several candidates emerged, with the AKM, a simple modification of the AK-47, emerging the winner. The Korobov TKB-517 appears to be another AK-47 clone, but has several important differences. The receiver is made from stamped steel like the AKM, and used a laminated wood stock, grip, and handguards., It resembles the AK-47 externally and field-strips in nearly the same manner, but used the superior Kiraly operating system, based on a lever-delayed blowback design by John Pederson. The TKB-517 turned out to be more reliable and accurate, 30% cheaper to produce, and easier to produce and maintain, as well as being much lighter in weight. However, at that time, Kalashnikov had a lock on Russian assault rifles, and the greater base of soldiers who knew the AK-47. The TKB-517 retained the 14.5-inch barrel of the AK-47, but the barrel was of overall better quality.

Korobov's TKB-059, on the other hand, was a wide departure from the AK series. Design work began in 1962, and the first prototypes were ready in 1966. To begin with, the TKB-059 was a bullpup design, though the control set was the same as that of the AKM. Second, instead of having three-round burst and automatic fire going through one barrel, the TK-059 took a page from the earlier Pribor 3B of Tula Arms, and made the fire from the rifle come from a group of three barrels, with burst and automatic fire

independently-fed from the three columns of the magazine. (Semiautomatic fire comes from an alternation of the three barrels, one shot at a time.) The barrels are in a line, the three side-by-side. Feed is from a single 90-round magazine, with each barrel independently fed from the magazine (again, alternating the barrels), as the magazine was designed to have three independent 30-round columns. Case ejection is downwards from forward of the magazine. Sights are mounted high on struts above the barrels of the weapon. The 14.5-inch barrel length was used for the TKB-059. Korobov felt that the soldiers might benefit from the increase in firepower and technology, but the TKB-059 was literally the opposite of what the modernization program was looking for – it was more expensive, (IRL *and* in Twilight terms), technologically complex, and more difficult for soldiers to maintain in the field. (It was not soldier-proof.) Actual manufacturing of the prototypes was done by Tula.

The TKB-408, also designed by Korobov, was a competitor to what became the AK-47, and was a bullpup-layout gas-operated locked-breech weapon. It looks like a bullpup version of the AK-47, though the designs are not related and the TKB-408's design precedes that of the AK-47's prototypes by several months, with testing started in early 1946. Korobov skipped the experimental 7.62x41mm Kalashnikov round and opted for the more compact 7.62mmx39mm Kalashnikov round. The fire controls were ergonomically-positioned above the pistol grip, though the charging handle is positioned just above the left side of the handguard. On the right side of the weapon above the magazine is the ejection port, with dust cover. The magazine release is a button inside the trigger guard; it falls out of the magazine well, to be caught by the pistol clip, from which it must be unhooked (takes less than a second). Due to the bullpup design, a long 20.7-inch barrel was able to be fitted to the TKB-408, though the TKB-408 had no sort of flash suppressor or muzzle device. The gas tube ended in a gas block and looks much like that of the AK-47, though the front sight is on a strut that connects to the gas block at the top and is a post with protective ears. The rear sight is an adjustable aperture sight on a mounting block just behind the upper portion of the handguard. The pistol grip is sharply raked, and the magazines connect to the heel of the pistol grip for additional stability by the use of triangular clip. Construction, even of internal parts, is largely of stamped steel and wood, though some internal parts of course require more attention in manufacturing. Some evaluators judged it as a better rifle than the AK-46 No. 1 (arguments may be made either way), some pointed out shortcomings like the pistol grip angle and the slightly increased times to replace a magazine due to the necessity to connect it to a strut while inserting it in the magazine well, and many thought it was just too weird (this was the era when bullpup designs were just appearing).

The design of the TKB-022 was finalized in 1962, and it was already several decades out of the box. Though the TKB-022 appears to be rather lumpish, it incorporated many features that would not appear until several decades later – a bullpup configuration to provide a full-length barrel in a smaller package (the magazine feed is at the end of the buttstock), folding iron sights, sight bases that allowed the mounting of several (Soviet) optics of the time, several passive and manual safeties, and the use of large amounts of polymer. The base operation is that of the AK-47/AKM, but modified to reduce recoil through an innovative add-on to the operation. The TKB-022 appears to have fallen to the “just too weird” method of thinking – it was and still is a very strange-looking weapon – and not really that ergonomic. Barrel length is a full 16.3 inches, with no flash suppressor or muzzle brake. Primary chambering is in 7.62mm Kalashnikov, but a few were made for 5.6mm Kalashnikov, at that time an experimental cartridge.

<i>Weapon</i>	<i>Ammunition</i>	<i>Weight</i>	<i>Magazines</i>	<i>Price</i>
TKB-517	7.62mm Kalashnikov	3.5 kg	30	\$779
TKB-059	7.62mm Kalashnikov	4.3 kg	90	\$3196
TKB-408	7.62mm Kalashnikov	4.3 kg	30	\$827
TKB-022	7.62mm Kalashnikov	2.8 kg	30, 40	\$786
TKB-022	5.6mm Kalashnikov	2.4 kg	30	\$489

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
TKB-517	5	3	2-Nil	5	4	9	42
TKB-059	3/10	3	2-Nil	5	3	4/15	38
TKB-408	5	4	2-3-Nil	5	3	9	56
TKB-022 (7.62mm)	5	4	2-Nil	4	4	10	41
TKB-022 (5.6mm)	5	3	1-Nil	4	3	7	41

Knight's Armament SR-47

Country of Origin: US

Appears In: US experiments by US Navy SEALs.

Notes: Early in Operation Iraqi Freedom, the US found itself with a shortage of 5.56mm NATO ammunition and mountains 7.62mm Kalashnikov ammunition as well as magazines for it. A temporary fix was to issue AKs to rear area troops and some scouts, but many at the Pentagon thought a better solution would be an M4 that could use AK magazines and fire AK ammunition, and such a weapon could also be used by special operations troops behind enemy lines. This was the reason the SR-47 was designed. Six were selected for field and combat evaluation under the temporary designation SPR-V (Special Purpose Rifle – Variant). The SR-47 was not successful, and after evaluation was drawn into the SCAR program, where the idea died.

The problem was that modifying the M4 (or M16, for that matter) in such a way that it could take an M4 lower presents a number of problems, ranging from the larger magazines of the AK, to the fact that the small diameter gas tube of the M4 did not lend itself to smooth operation with 7.62mm Kalashnikov ammunition. The result was a weapon that was the bane of any soldier – a weapon that consistently failed at the wrong moment. Continual modifications and fixes were tried, but no satisfactory solution was achieved.

The SR-47 did have a number of features that set it above the AK. It had MILSTD-1913 rails atop the receiver and lower

handguard and the ergonomic advantages of the M4. The SR-47 was designed to work with a silencer, which required a great deal of modification on an AK platform.

Weapon	Ammunition	Weight	Magazines	Price
SR-47	7.62mm Kalashnikov	3.52 kg	20, 30, 40, 75D	\$663

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SR-47	5	3	1-Nil	4/6	2	6	45

KRASA

Country of Origin: Czechoslovakia

Appears in: Czech research into a new short assault rifle for special Ops and police forces.

Notes: The KRASA (for *Kratky Samopol* – short automatic weapon) was an extremely small and compact short assault rifle, more a submachinegun in appearance but firing assault rifle ammunition, developed in the late 1970s for Czechoslovakia's special operations troops and for police. The KRASA was a gas-operated weapon with a tilting block mechanism, and the magazine under the barrel forward of the chamber and bolt in order to make the KRASA more compact. A two-stage feeding system moved rounds out of the magazine and back to the chamber for firing. The barrel, only 6.7 inches long, was tipped with a compact but useful muzzle brake. Feed is from 10 or 20-round magazines built for the KRASA or from AK-type magazines. Much of the KRASA was built using light alloys and high-strength polymers, and the folding stock was of tubular light alloy struts with a plastic/rubber buttplate. Prototypes of the KRASA were built in both calibers, but apparently that is all that was built of this interesting little design, despite the fact that it apparently (at least in a mechanical sense) worked quite well.

Weapon	Ammunition	Weight	Magazines	Price
KRASA	7.62mm Kalashnikov	2.8 kg	10, 20, 30, 40, 75 Drum	\$779
KRASA	5.45mm Kalashnikov	2.2 kg	10, 20, 30, 40, 75 Drum	\$484

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
KRASA (7.62mm)	5	3	2-Nil	3/4	2	6	10
KRASA (5.45mm)	5	2	1-Nil	2/4	2	6	10

LAPA FA M03

Country of Origin: Brazil

Appears in: Competition to replace the LAR in the mid-to-late 1980s.

Notes: This weapon was seriously considered to replace the LAR in the mid-to-late 1980s. However, using the LAPA would have meant extensive retooling and updating of weapon factories, as well as possible importation of the plastics used to make the body of the weapon. In addition, retraining of the troops for a new type of weapon would have been required. Finally, the Brazilian troops themselves did not trust this very non-traditional rifle, particularly those who had grown up with firearms. As a result, the LAPA was quickly withdrawn from consideration by the Brazilian armed forces, and had no luck on the international market either. It was, perhaps, a weapon that was just too far ahead of its time. The M03 is a bullpup design, molded almost entirely out of two pieces of plastic. The M03 has a single-action setting instead of a safety (but can still be fired at the BA rate at this setting). It can use standard US/NATO-pattern magazines, or a 40-round magazine designed for it.

Twilight 2000 Notes: Factories could not be geared up quickly enough to produce this weapon in large quantities, and after the November Nuclear Strikes, the materials to produce it were almost unobtainable. However, the troops who did use the LAPA loved it, since it was virtually indestructible and idiot-proof.

Merc 2000 Notes: This is a Brazilian assault rifle that was adopted for a short time by Brazilian armed forces, and also had some success with foreign sales.

Weapon	Ammunition	Weight	Magazines	Price
LAPA FA M03	5.56mm NATO	3.16 kg	20, 30, 40	\$760

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
LAPA FA M03	3/5	3	1-Nil	4	2	4/6	47

Nikonov Project Abakan Prototypes

Country of Origin: Soviet Union

Appears in: Prototypes for Project Abakan, then meant to find a rifle to replace the AK-74.

Notes: Shortly before Gennadiy Nikonov designed the AN-94 for Project Abakan, he also designed the NA-2, which was essentially a bullpup version of the AN-94. He also designed this rifle for Project Abakan. (Nikonov admits that the NA-2 design was in part due to the "vanguardism of youth," as well as a desire to show off.) It has the same operation as the AN-94, modified by the needs of a bullpup system; this includes the BBSP (BlowBack Shifted Pulse) recoil-reducing system. Nikonov was not satisfied with the NA-2 and developed the AS and ASM, which were later combined and became the AN-94.

The pistol grip of the NA-2 is unusual, being raked slightly forward instead of back. This made firing a bullpup design easier, though it conflicted with the muscle memory of Nikonov engineers and testers. It also cured the problem of the pistol grip being very close to the magazine. It forced the shooter to lean significantly into the NA-2 when firing, which is a good firing posture for automatic longarms and submachineguns, but the NA-2 required too much of this posture. The NA-2 was designed to fire 3-round bursts and on automatic, instead of the 2-round bursts of the AN-94. Due to the compact dimensions of the NA-2, use of the 75-round drum of the RPK-74 is not possible from the NA-2. It uses a 16.34-inch barrel, the same as the AN-94, with the same flash suppressor as the AN-94. The sights were modified forms of those of the AK-74.

The NA-4 followed closely in the form of the NA-2, but has several differences. The barrel is also 16.34 inches, but made of stainless steel and tipped with the same flash suppressor as the NA-2. The barrel is also ported near the end, with four small holes on the upper sides of each side of the barrel. The front sights are again borrowed from the AK series, but from the AKM instead of the AK-74. The rear sight is a diopter sight. Inside the light alloy receiver are steel rails for the sliding of part of the operating system. Under the barrel are two bayonet lugs (absent from the NA-2) instead of one end slipping over the barrel. The pistol grip and handguard are of laminated plywood, and the magazine is moved further back so the pistol grip is more or less straight instead of being raked forward. The selector lever moves anticlockwise.

After the NA-4 and its rejection by Project Abakan, Nikonov designed a more conventional rifle, the AS-1. The NA-2 NA-4 could not be fired by left-handed shooters, as it ejected spent cases directly into their faces. The exhaust gasses of the NA-4 vented into the shooter's face, creating discomfort, with the shooter sometimes having to put the NA-4 down to gulp some fresh air. The NA-2 continued testing for special operations forces, but the NA-4 was completely dropped.

The AS-1 has a short Lshaped folding stock made from laminated plywood, and has a recoil pad on the butt. The hinge is proprietary, designed by Nikonov himself. The laminated plywood handguard is very long – it almost covers the entire barrel. Only a short portion of the barrel is exposed, along with the flash suppressor, to allow the attachment of a bayonet, with locking lugs found under the barrel and handguard. The rear sight is a simple peep sight, non-adjustable. The front sight is borrowed from the AK-74. The rear sight was made non-adjustable, as the rear stock, even when extended, was thought to be too short for aiming by a shooter. The barrel is the standard 16.34 inches, tipped with a flash suppressor of the type that would be later fitted to the AN-94. The BBSP operation was retained in the AS-1, as it would be in all of Nikonov's Abakan prototypes and on the AN-94.

There were three flavors of the rifle designated the AS; the OA-222 began the shift towards the eventual AN-94. It is rather short, with a stainless steel barrel of only 14.5 inches, tipped with a muzzle brake. It borrows the folding stock from the AKS -74. The operating parts are made from stamped steel, machined to their final measurements. The sights are similar to the AS-1. It has no bayonet lugs; Nikonov felt that the bayonet was a relic of old tactics. Like the AN-94, the OA-222's magazine and magazine well is at an angle to the receiver. It was well received, being said to be controllable and comfortable to fire, despite the short range; the testers also liked its light weight. That short range led to its rejection.

After the OA-222's rejection, Nikonov modified the OA -222 to make is more palatable to the testing officers, producing the VS-229. The barrel was restored to 16.34 inches, though still stainless steel and tipped with a muzzle brake. The receiver, handguards, and stock are largely of aluminum alloy, lightening the what is otherwise a heavy rifle design. The VS-229 has a magazine that slides back and forth while firing (about the width of one round), leading to it being more difficult to keep on target, especially on automatic fire. An underbarrel rod was added, to allow a clamp-type bayonet to be mounted, another strike against the OA-222.

The third iteration of the AS was the PU-192. This prototype marked the last use by Nikonov of a moving magazine; it simply threw off aim and follow-up shots and automatic shots too much. It uses the standard 16.34-inch barrel, but the barrel is reciprocating. An underbarrel extension rod hooks joins the flash suppressor and operating rod and obviates the need for a gas piston. The PU-192 had new handguards of Polyamide, which incidentally shields for extended operating rod. Under the lower handguard is a folding, integral bipod. It also functions has a magazine protector when folded backward – something important when fired from the firing ports of an APC. It also protects the hand, as when used in an APS, the reciprocating barrel means that the weapon itself will move back and forth in a firing port. The stock is still laminated plywood. The operating controls have been moved to the right side of the receiver, behind the magazine. It uses the same sights as the OA-222 and VS-229.

Just the AS had several iterations, the ASM also had several versions. The OK-158 was getting close to the final form of what became the AN-94. Polymer content increased, with both the pistol grip and handguards being polymer. The receiver and its cover are of aluminum alloy. The barrel is 16.34 inches, and is tipped with an impressive muzzle brake/flash suppressor, consisting of an integrated front sight, an adjustable two-chambered flash suppressor, and three angled cuts on each side of the flash suppressor. The result is very effective, but complex and not easy or cheap to produce. The sliding firing group is retained with a reciprocating barrel. At the front of the handguard is a plastic cap; this is a recognition feature which means that the rifle incorporates an internal spring buffer; it's presence led to the deletion of the recoil pad. It uses a 2-round-burst setting instead of a 3-round burst.

The MA-49 was very similar to the OK-158, but had an optic CQB sight on the rear of the receiver cover. This sight is not detachable, but has small posts to aim at longer-range targets. (At the time, the Soviet Army dictated that all future assault rifles and submachineguns would have to have some kind of CQB sight instead of standard iron sights. These scopes were later dropped as unnecessary, fragile, and possibly an impediment.) The stock is of laminated plywood, but is fixed. The bayonet lugs are on the right side of the barrel, in a horizontal position. The MA-50 is almost identical for game purposes to the MA-49; the primary differences is that the CQB optic is detachable, the front sight is moved to the end of the handguard, the underbarrel guide rod is altered so that a grenade launcher can be mounted under the barrel, and a base plate for more traditional scopes is mounted on the left side of the receiver. There is also a minor weight difference. The firing table used is that of the MA-49.

The PA-33 takes a further step on the road to the AN-94. The rear sight is asterisk-shape, and is a peep sight that is rotated for

range adjustments. The front sight, derived from the AK-74, is moved back to the barrel. The flash suppressor is simpler and cheaper to produce; it is similar to that of the AK-74 but there are also two ports on each upper side that allows the flash suppressor to also work as a muzzle brake. For game purposes has the same effectiveness as those of the previous members of the ASM series. The bayonet lugs are placed so that they are at an angle from the barrel on the left side. It is designed so that it never interferes with aiming. The barrel slides along the guide rail of the handguard extension rod, which would make it through to the AN-94's design. The trigger pack is user removable and adjustable, and tightens into place with a knob above the pistol grip. There was a change to a synthetic stock, which greatly lightens the PA-33.

The 6P33 was the last prototype, and was essentially the AN-94 with minor differences from the AN-94. The 6P33 passed all technical test and field trials set to it, and with some tweaking, brought down the IRL cost of producing it. The Army, on the other hand, was still hesitant about the rifle, especially the complex field stripping and soldier care of the weapon. They wanted the 6P33 produced only for special operations forces, who had better training and made a virtual religion of keeping their weapons maintained. Boris Yeltsin, however, was quite impressed with the 6P33, and this led to GRAU giving its blessing to the prototype. The Army, however, wanted a plethora of small changes (since they were prohibited from asking for any big changes). Nikonov and his team tinkered with the 6P33 for three years, eventually producing what we know as the AN-94 today. The three years of work were primarily to adapt the 6P33 to full-scale mass production; the design was generally finished.

One of the biggest changes from earlier models was the barrel, which was shortened to 15.95 inches. Another big change was the reciprocating barrel and guide rod; this action, which was straight back, tended to throw off aim and lead to barrel climb. Therefore, the barrel and guide rod were matched to a slideway that angles up. Which pushes the barrel downward. The stock, though still synthetic, was changed in composition to thermosetting polyamide. The pistol grip and handguards were also made of the same material. The moving magazine reappeared, and the issue magazines chosen were plastic instead of the steel of the AK-74 (though it can still use AK-74 magazines). Late in the tweaking process, the moving magazine was deleted, as it gave little benefit while increasing complexity and making mass production more difficult. The detachable CQB sight was replaced with one that can be used in CQB as well as increasing the accuracy of longer shots, much like US Trijicon sights. The complete construction is a wide departure from the AK-74M that was the issue weapon at the time and the AK-100 series.

Weapon	Ammunition	Weight	Magazines	Price
NA-2	5.45mm Kalashnikov	3.88 kg	20, 30, 40	\$727
NA-4	5.45mm Kalashnikov	3.83 kg	10, 20, 30, 40	\$776
AS-1	5.45mm Kalashnikov	4.18 kg	20, 30, 40	\$844
AS (OA -222)	5.45mm Kalashnikov	3.18 kg	20, 30, 40	\$872
AS (VS-229)	5.45mm Kalashnikov	3.9 kg	20, 30, 40	\$891
AS (PU-192)	5.45mm Kalashnikov	4.07 kg	20, 30, 40	\$1237
ASM (OK-158)	5.45mm Kalashnikov	4.26 kg	20, 30, 40	\$888
ASM (MA-49)	5.45mm Kalashnikov	4.21 kg	20, 30, 40	\$933
ASM (MA-50)	5.45mm Kalashnikov	4.26 kg	20, 30, 40	\$933
ASM (PA-33)	5.45mm Kalashnikov	3.75 kg	20, 30, 40	\$953
6P33	5.45mm Kalashnikov	3.8 kg	20, 30, 40, 75D	\$949

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
NA-2	3/5	3	1-Nil	4	2	3/5	41
NA-4	3/5	3	1-Nil	4	2	2/4	42
AS-1	3/5	3	1-Nil	4/5	2	3/5	46
AS (OA-222)	3/5	3	1-Nil	4/5	2	2/4	39
AS (VS-229)	3/5	3	1-Nil	4/6	2	3/5	46
AS (PU-192)	3/5	3	1-Nil	4/6	2	3/5	46
With Bipod	3/5	3	1-Nil	4/6	2	2/3	59
ASM (OK-158)	2/5	3	1-Nil	4/6	2	3/5	46
ASM (MA-49)	2/5	3	1-Nil	6	2	3/4	46
ASM (PA-33)	2/5	3	1-Nil	6	2	3/5	46
6P33	2/5	3	1-Nil	5	1	2/4	44

Objective Individual Combat Weapon (XM29 OICW)

Country of Origin: US

Appears in: Advanced weapon experiment in the early 2000s.

Notes: This weapon was designed in the aftermath of the failure of the US Army and Marines to choose a new assault rifle in the late 1980s. The OICW bears no resemblance to any assault rifle, having a 20mm grenade launcher and a 5.56mm NATO carbine, as well as newly-designed optics which greatly-increase hit probability, and a computer-controlled 20mm round which is designed to shower enemy soldiers hiding behind cover with shrapnel.

Development of the weapon began in 1994, but development has been a very slow process. The OICW's 20mm round explodes over the target, showering the target(s) with 1d6+2 pieces of shrapnel. Point-detonations are also possible, with 1d6 pieces of shrapnel being produced, or attacking fortifications with a DPW of 6. The OICW's sight is equivalent to both an image intensifier and a

starlight scope, as well as being an electronic sight. A sticking point of the OICW is the weapon's high cost and high weight. The OICW, as presented here, is probably not in the final form. It was cancelled in 2010, but the grenade launcher component was put into service in Afghanistan in the early 2010s as the M25 (known to the troops as "The Punisher").

Twilight 2000 Notes: The OICW does not exist in the Twilight 2000 World.

Merc 2000 Notes: As the Notes, except that the service date is delayed until 2008 due to budgetary concerns.

Weapon	Ammunition	Weight	Magazines	Price
OICW	5.56mm NATO + 20mm OICW Grenade	8.42 kg	20, 30 + 6	\$5834

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
OICW (Carbine)	2	2	1-Nil	5	2	2	39
OICW (GL, HE)	SA	C1 B7	Nil	5	1	Nil	DF 140, IF 830
OICW (GL, HEDP)	SA	C1 B7	2C	5	1	Nil	DF 140, IF830

POF-USA/Vltor P-415/P-416

Country of Origin: US

Appears in: *Special Weapons for Military & Police* April 2009 issue; the weapon is a special modification done by Charlie Cutshaw. The P-416 version was something I added in as a "what-if."

Notes: Noted firearms expert and gunsmith Charlie Cutshaw took a POF-USA P-415 chambered for 6.5mm Grendel and modified it using a Vltor VIS (Versatile Interface Structure) kit for the upper receiver, along with a Vltor Rifle Modstock. Then Cutshaw added some other extras, such as a Vltor top-mounted bipod, attached to the top of the handguard. The trigger group is match-quality. The rifle uses an 18.5-inch match-quality tipped with a Vltor VC-65 flash suppressor/brake. The handguards have four-point MILSTD-1913 rails, and the upper receiver has its own MILSTD-1913 rail. The receiver rail is topped with a Leupold Mk 4 1.5-5x20mmMR/T telescopic sight, and the upper handguard rail uses an AN/PVS-22 UNS (Universal Night Sight), a 3rd-Generation night vision scope. The two can be used together day or night since the AN/PVS-22 has a day and a night channel. On the lower rail is a SureFire M900 Foregrip WeaponLight with an IR filter attached to allow night use without showing a bright visible light source. It also includes a vertical foregrip behind the light. (The SureFire M900 is required since the AN/PVS-22 needs a light source to function.)

Charlie Cutshaw's conversion job is based on the semiautomatic P-415; simply use only the semiautomatic figures for this version.

Weapon	Ammunition	Weight	Magazines	Price
POF-USA/Vltor P-415/P-416	6.5mm Grendel	3.63 kg	16, 25	\$1877

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
POF-USA/Vltor P-415/P-416	5	3	1-2-Nil	5/6	2	5	68
With Bipod	5	3	1-2-Nil	5/6	1	2	89

Red Dawn Steyr-Maadi AKM

Notes: The 1984 movie *Red Dawn*, about a hypothetical invasion of the US by Soviet, Cuban, Central American, and some Eastern European countries, was a fan and cult favorite; I literally know no soldiers or gamers who hasn't seen it. (And I'm not talking about the 2000's abortion, either.) The working "AKMs" were actually built by Steyr of Austria, to plans supplied by Maadi of Egypt. About 50 of these were built, and they did most of the heavy lifting in the movie; most of the rest were Valmet M76 VISMODs, Chinese AKMs, non-firing examples, and "rubber dummies." 32 were converted to selective fire configuration, and the rest left in their semiautomatic configuration. (Just a note: In an actual invasion, the Russian troops, especially airborne troops, would be using AK-74s...) The Steyr-Maadi AKMs were acquired for the Wolverine characters and some of the Russian and Cuban troops, as they had Steyr-quality construction and reliability, while being faithful to the original design. Barrels were just a bit shorter than the actual AKM at 16.25 inches, to fit Steyr's manufacturing processes at the time. Then the fx department of *Red Dawn* got them, and roughed them up, with scratches, flaked off finish, nicked and scarred and took chunks out of the stock, and other treatments to make them look like they had seen considerable wear. The Steyr-Maadis were actually more accurate and lighter than the real AKMs of the time.

In 1988, Stembridge, who was the fx contractor for *Red Dawn* and had ownership of the Steyr-Maadis, offered them for sale at the price of \$1250 apiece (which was an absolute fortune in those days). They were mostly converted back to semiautomatic-only fire (some were allowed to stay in automatic fire configuration for Class III dealers and owners), and otherwise left in their movie state, complete with "years" of use and abuse. They were all sold within about 2 years.

Internally, the Steyr-Maadis are immaculate, with the actors being drilled repeatedly on preventative maintenance and field stripping, to the extent that they were taught to disassemble and reassemble them blindfolded. The actors were also put on ranges and worked with ex-military advisors to make sure their use of the rifles were accurate, and so that they could actually hit something with them. The rifles were fitted with a removable blank adapter kit that fit inside the barrel and gas block; they could be quickly returned to their firing state. An error, from a realism point of view, is that they were marked "Made Egypt" and had Factory 54 markings on them; Steyr faithfully followed the Egyptian plans and marked them as such. The rifles were left as they were, since the director felt that such small markings would not be visible on film. (I never noticed it.)

Weapon	Ammunition	Weight	Magazines	Price
Steyr-Maadi AKM (Automatic)	7.62mm Kalashnikov	3.18 kg	30	\$798

Steyr-Maadi AKM (Semiautomatic)	7.62mm Kalashnikov	3.18 kg	30	\$793
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Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Steyr-Maadi AKM (Automatic)	5	4	2-Nil	6	4	9	48
Steyr-Maadi AKM (Semiautomatic)	SA	4	2-Nil	6	4	Nil	48

Saurian Game Gun

Appears in: *Dinosaur World*, a book by Stephen Leigh.

Fictional Notes: This personal Gatling gun was featured in Stephen Leigh's book *Dinosaur World* (a concept he developed from an idea by Ray Bradbury). In this book, the hero uses a time machine to explore the Age of Dinosaurs, and has for dinosaur hunting a six-barreled rotary weapon that fires .357 Magnum ammunition. Just imagine it as an antipersonnel weapon! This weapon includes telescopic sights for long-range use and an Aimpoint-type laser sight for short-range work. The ammunition is carried in a backpack in belted form.

Weapon	Ammunition	Weight	Magazines	Price
Saurian Game Gun	.357 Magnum	7.5 kg	100 Belt	\$2384

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Saurian Game Gun	20	3	1-Nil	6	1	14	59

Simonov Prototype Assault Rifles

Country of Origin: Soviet Union

Appears In: Development of a short assault rifle for special purposes and rear-area troops.

Notes: In the mid-1970s (shortly after the adoption of the AK-74), the Soviets were looking for a short, light assault rifle for use by special operations and as a PDW. It was a part of Project Modern, which was also the father of Abakan. Sergei Simonov, already the father of several experimental and successful designs, went into this competition in 1975, using an updated form of an earlier short assault rifle design, the AO-31. This was the AO-043. The conceptual inspiration of the AO-043 was the XM177E2. The eventual winner of this competition was the AKS-74U.

The AO-043 looked an AK-74 that had been compacted from nose to stock – with a shorter barrel, smaller muzzle brake, smaller receiver, and shorter stock. It operated by direct gas impingement and fed from AK-74-compatible magazines. The barrel was shorter too, at 8.46 inches. The wooden stock was replaced by a sliding wire stock, though a fixed stock version, the AO-042, was also designed. Even with the stock retracted, the length was a mere 68 centimeters. The control set was above and slightly ahead of the pistol grip, in an ergonomic position, and the magazine release was ahead of the front of the trigger guard.

Roll back about a decade, and the source of the AO-043, the AO-31, was in competition with the AKM, as the Army was looking for a replacement (like it did several times in the 1950s, 60s, and 70s). The AO-31 generated a number of prototypes, such as the AO-30-1, which chambered for 5.45 Kalashnikov, the AO-30-2, which was chambered for the 7.62mm Kalashnikov round, and the most unusual AO-31-7, which used a caseless variant of the 5.45mm Kalashnikov round. Simonov based the AO-31 on the AKM, as the basic rifle was quite reliable.

Weapon	Ammunition	Weight	Magazines	Price
AO-043	5.45mm Kalashnikov	2.1 kg	20, 30, 40, 75D	\$500
AO-042	5.45mm Kalashnikov	2.3 kg	20, 30, 40, 75D	\$470

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AO-043	5	2	1-Nil	3/4	2	5	16
AO-042	5	2	1-Nil	4	2	5	16

Smith & Wesson M1945 Carbine

Appears in: Smith & Wesson weapon experiment post-World War 2.

Notes: This carbine was intended primarily for European military and police units, to fill the same role as the M1 Carbine filled in the US military – to be a light rifle for use by rear-area troops and drivers and for police to use as a heavier firearm than pistols. Smith & Wesson did not seriously consider it something the US military would pick up, since the standard US military pistol round was the .45 ACP cartridge. Nonetheless, they still submitted it to the US military at Aberdeen Proving Ground for testing, as well as to several European countries. Surprisingly, the testers at Aberdeen gave it high marks, though the 9mm cartridge it fired meant it would never see US use. European countries also did not bite, stating that such a weapon was unnecessary in the wake of World War 2.

Smith & Wesson put wartime manufacture of the M1 Carbine and M1 Garand; the M1945 strips in a similar manner to the M1 Carbine, and the safety mechanism and some parts of the trigger mechanism are similar to those of the M1 Garand. Operation is by locked Breech Inertia, a type of blowback operation. The 12-inch barrel is free-floating and of good quality, better than the typical military weapon of the time. The stock and fore-end are in one piece and are again similar to the M1 carbine's stock. The rear sight is adjustable for windage and the front sight a fixed blade. The M1945 is designed to use with Sten magazines, but can also accept the

magazines of the M3 Grease Gun conversion to 9mm Parabellum (which are also essentially slightly-modified Sten magazines). The M1945, at the time of its inception and prototype status, was a semiautomatic only weapon, an automatic version was projected, which would make it into a submachinegun of sorts.

Weapon	Ammunition	Weight	Magazines	Price
M1945	9mm Parabellum	2.96 kg	32	\$236

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M1945	5	2	Nil	4	1	3	26

Socimi AR-832/FS

Country of Origin: Italy

Appears in: Attempted weapon sale by Socimi in the late 1980s.

Notes: This weapon was designed in the late 1980s to provide a rugged weapon for Italian special forces and the San Marcos Marines that also has a good punch. The Italian government decided to concentrate on the AR-70/90 series instead. The AR-832/FS is considered heavy for an assault rifle, but this also has the effect of fighting recoil and barrel climb. It has the novel feature of a special gas regulator that allows the firing of rifle grenades with normal ammunition that can normally only be fired using ballistite cartridges. It is also a simple weapon to strip and maintain, and is very tolerant to dirt and abuse. Socimi withdrew the weapon from the market after a few years, and it was never heard from again.

Twilight 2000 Notes: A number of these weapons were obtained by their intended users and could be encountered in their hands during the Twilight War; the San Marcos Marines were said to be especially fond of the AR-832/FS.

Weapon	Ammunition	Weight	Magazines	Price
AR-832/FS	7.62mm NATO	4.3 kg	20, 30	\$1032

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-832/FS	5	4	2-3-Nil	5/6	3	9	52

Socimi AR-871

Country of Origin: Italy

Appears in: Entry into assault rifle to replace the AR-70.

Notes: This was another competing entry to the AR-70/90, and despite its good qualities, also lost that competition. The AR-871 is able to take a modular sight mount to use the array of optics that were becoming available at the time. It is basically a scaled-down AR-832/FS, fitted with a Picatinny rail that could be replaced with a conventional carrying handle/rear sight combination. In addition to the light alloy construction of the AR-832/FS base, plastics are used for the stock and pistol grip. Like the AR-832/FS, it basically disappeared from the market after the Italian military chose the AR-70/90.

Twilight 2000 Notes: Italian special operations personnel liked the punch of the AR-832/FS, but soon requested a smaller version using the 5.56N cartridge. Socimi's response was the AR-871. Like the AR-832/FS, it was a favorite of Italian special ops units, and the San Marcos Marines.

Weapon	Ammunition	Weight	Magazines	Price
AR-871	5.56mm NATO	3.6 kg	20, 30	\$784

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-871	5	3	1-Nil	5/6	2	4/6	46

Steyr-Mannlicher ACR

Country of Origin: Austria

Appears in: US ACR competition of the late 1980s and early 1990s.

Notes: This assault rifle was one of the finalists in the US military's ACR competition. Unlike the other three finalists in the ACR competition, Steyr has slowly and quietly continued its development; Steyr believes that such rifles represent a possible path in the future of assault rifles. However, like all of the ACR competitors, the Steyr-Mannlicher ACR was rejected by the US military and Steyr is not trying to sell it to anyone else at this point.

Though the Steyr-Mannlicher ACR bears a superficial resemblance to the AUG, its appearance is very different than that of the AUG; it looks rather odd and vaguely ugly (at least to me, anyway). The Steyr-Mannlicher ACR used a bullpup layout, with the exterior of the rifle made of a two-part polymer shell that hinges open for stripping and cleaning. The polymer shell is strengthened with light alloy or steel reinforcement where necessary. Like the AUG, the mechanism is largely made of steel or light alloy, with the exception of a high-strength polymer hammer. Though the Steyr-Mannlicher ACR is a bullpup, it is completely ambidextrous; fire controls are duplicated on the right and left, and case ejection is downward, with the ejection port being forward of the magazine almost halfway between the magazine well and pistol grip. (This just sounds like a bad idea from an ergonomic standpoint to me – like a good way to get shells down your shirt.) The magazine well is close to the butt itself, making quick magazine changes virtually impossible in most cases, and the magazine release is behind the magazine well. The trigger mechanism, pistol grip, and large

trigger guard are taken directly from the AUG, though at request of the Pentagon, the Steyr-Mannlicher ACR has a standard selector mechanism instead of the two-stage trigger of the AUG. Atop the rifle is a long carrying handle/sighting rib; this rib has a mount for a Steyr-developed 1.5-3.5x compact telescopic sight that is quite useable as a sort of ACOG-type sight, and the scope can be removed and replaced with a standard adjustable rear sight.

The operation of the Steyr-Mannlicher ACR is quite novel. The chamber's barrel extension is not a part of the barrel; instead, it is an independent piece. Between firing cycles, this chamber piece is below barrel and in front of the magazine; a rammer picks up a round from the magazine and pushes it into the chamber piece, which then moves it to the breech where it is locked in place. The rammer mechanism also acts as the extractor and ejector. The purpose of this operation is to provide a weapon that fires from an open bolt for cooling, yet does not have the jarring motion of the typical open-bolt weapon that can easily throw off the aim of the shooter. Steyr Mannlicher apparently supplied two versions: one that used a 3-round burst setting, and one that used a full-automatic setting. The Steyr-Mannlicher ACR also uses a gas-piston mechanism to power its operation cycle, and, unusually for an assault rifle, utilizes a modification of a telescoping bolt design in the form of an annular ring gas piston that surrounds the bolt. The result is a very low recoil weapon firing a high-velocity cartridge and does not need a muzzle brake to reduce recoil, but uses a very complicated mechanism. The 20.25-inch barrel projected only for a very short length outside of the shell, making a specially-designed proprietary bayonet necessary.

The ammunition designed for the Steyr-Mannlicher ACR is as novel as the rifle itself. The cases are of high-strength, heat-resistant polymer, and are actually rimfire rounds. The round is a flechette, and is entirely contained within the cartridge. The muzzle velocity of the flechette is about 1500 meters per second, and the flechette reaches it's designed maximum effective range of 600 meters in less than half a second. The trajectory is thus very flat and the high speed means that compensation for drop at even long ranges is rarely necessary – except for wind. The Steyr SCF's flechette (about the same size as AAI's flechette, though even lighter in weight) suffers from the same problem that most flechettes do – it is long, needle-like, very light, and fin-stabilized, making it very susceptible to wind. Steyr also had problems with the synthetic casings during the US ACR tests – the cases suffered from inconsistent strength due to manufacturing difficulties, and this led to the rounds producing inconstant chamber pressures when fired. This in turn led to differences in muzzle velocity, and the trajectory of the flechettes tended to change from round to round as they were fired. Though in the figures below I have assumed perfected cartridges, the fact was that during the ACR tests, the Steyr-Mannlicher ACR could vary from dead-on accuracy to utter inaccuracy (and everywhere in between) from shot to shot. This problem was the greatest strike against the Steyr-Mannlicher ACR (apart from the usual political and bureaucratic problems.)

Twilight 2000 Story: In the Twilight 2000 timeline, the Steyr-Mannlicher ACR is used in small numbers by the Austrian Army and also by some Bosnian Army troops which maintain loose contact with Austria. The Bosnians found them almost impossible to make spare parts for them domestically, and by 2001, almost no one was actually using the rifle. In addition, the handful of US examples of the weapon are all missing.

Weapon	Ammunition	Weight	Magazines	Price
Steyr-Mannlicher ACR	5.56mm Steyr Synthetic-Cased Flechette	3.23 kg	24	\$948

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Steyr-Mannlicher ACR	3	2	1-1-Nil	5	2	3	56
Steyr-Mannlicher ACR	5	2	1-1-Nil	5	2	5	56

Thorpe EM1

Country of Origin: Britain

Appears in: Competition to replace the standard British service rifle after World War 2.

Notes: This was the primary competitor to the Enfield EM2. Externally, it looked similar to the EM2, but was an even more compact design, with a different-looking fore-end and a flat-sided receiver. It used the same optical tube sight as the EM2. That receiver, made from thin steel stampings, was rather flimsy and could fail on occasion. The firing mechanism was very efficient and the trigger pull especially crisp, but it was also very complicated and the EM1 could be a nightmare to field strip. The EM1 was basically a weapon ahead of its time; it could not be designed or manufactured efficiently with the technology of the time.

Weapon	Ammunition	Weight	Magazines	Price
EM1	.280 British	4.68 kg	20	\$974

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
EM1	5	4	2-3-Nil	6	3	9	74

TRW LMR

Country of Origin: US

Appears in: Weapon experiment post-Vietnam War.

Notes: The LMR (Low-Maintenance Rifle) was born of US experience in Vietnam, particularly the ridiculous information at first given to US troops that the M16 required virtually no maintenance of any sort. The idea of a rifle which requires little or no maintenance is a pipe dream, but in 1971, a study was started by the Pentagon to come up with a rifle for which this was really true, and a company named TRW (Thompson-Ramo-Wooldridge) was given the contract to develop it.

TRW's LMR is a rather odd-looking assault rifle; it appears to have been built with the idea of using as little materials of any sort, and therefore has a sort of bare and spartan appearance. (In fact, the LMR actually was designed to use as few parts as possible!) Construction was largely of lightweight, yet strong steel, finished with a new, TRW-designed coating which proved to be highly-resistant to corrosion and the elements. The LMR has perhaps the straightest, most in-line design I have ever seen in an assault rifle; unfortunately, this means that the sights had to be put on high mounts. The simple stock is adjustable for length to an extent. Operation is by gas and uses a roller-locked design powering a gas piston. The LMR had only full-automatic and safe settings, but the cyclic rate of fire is so low (450 RPM) that single shots and bursts are easy to squeeze off. (This was done on purpose; it allowed for a simpler fire mechanism.) The LMR fired from an open bolt, ejecting rounds to the left through an ejection port with a spring-loaded cover that automatically opened and closed after each case ejection. Feed was from standard M16 magazines, which were side-mounted directly opposite of the ejection port. Operating parts, as well as the chamber and the inside of the receiver, are coated with a dry lubricant designed by TRW to allow the LMR to function with no need for the shooter to add lubrication. The pistol grip and selector switch are an almost unmodified version of that of the M60 machinegun. The LMR used the standard M16-type bayonet, but it was mounted *above* the muzzle, below the sight line. It could also mount the "scissors" bipod developed for the M16. The 19.4-inch barrel had no flash suppressor or muzzle brake, nor was it intended to have one.

Virtually all of the LMR prototypes were designed for the 5.56mm NATO round (the M193 version, not the modern SS-109 rounds, which didn't exist at the time), but at least one was designed for an experimental flechette round called the XM216. This round had virtually the same external dimensions as the 5.56mm M193 NATO round (to allow it to use the same magazines).

LMR development lasted until 1973. In the end, the LMR was a victim of the winding down of the Vietnam War, politics, budget cutbacks, and the "weirdness factor" of a rifle that simply looked "too futuristic."

Weapon	Ammunition	Weight	Magazines	Price
LMR	5.56mm NATO	3.08 kg	20, 30	\$581
LMR	5.6mm XM216	3.08 kg	20, 30	\$586

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
LMR (5.56mm)	5	3	1-Nil	6	3	6	53
LMR (5.6mm)	5	2	1-1-Nil	6	3	6	64

TSNIITOCHMASH 80.002

Notes: The prototype designated only as 80.002 is a sort of predecessor to the Kalashnikov Kanareyka assault rifle/grenade launcher complex. The 80.002 was designed by Yu V Minaev, VI Chelkin, and GA Yanov between 1975 and 1979. The designation would seem to indicate a weapon that in computer terms an "Alpha" – a very early prototype – and did not go far before being dropped. The 80.002 was based on the AK-74, and differs primarily in the twin barrels and twin magazines. The upper barrel was fed by a standard AK-74 magazine (though some magazines, like the 75-round drum, could not be used because of the second magazine). The lower magazine was chambered for a special 12.7x50mm Russian round which could fire ball ammunition, AP ammunition, or a small grenade. The 80.002 was designed as a weapon for special operations forces in the military and police and was not envisioned to be a general issue weapon. Another difference was the receiver, which was double the thickness of a standard AK-74 receiver, to house the extra working parts for the second barrel and round. The receiver was also a bit longer than normal, again to access the second magazine and house working parts. The 12.7mm lower barrel magazine fits into the left side just behind that barrel's breech. Operation is by gas for the 12.7mm chambering, and standard gas piston for the 5.45mm part of the rifle. The handguards, stock, and pistol grip are of laminated wood, and the grip and stock are taken from the AK-74.

There is evidence that the Russians saw the US advancement with its OICW and tried to come up with their own version. The Russians felt that the 12.7mm round, especially in its grenade launcher ammunition form, was inadequate for its purpose, though the entire weapon was very light for its size. (That light weight also contributed to felt recoil, something that was also counted against it. The 12.7mm barrel was selected for with a special selector switch above the pistol grip; in addition, the 80.002 had to be set on semiautomatic, and would not fire if the rifle was set on automatic. The barrel of the 5.45mm rifle was 16.34 inches; the 12.7mm barrel length is a guess on my part, but seems to be around 14 inches.

Though several prototypes were produced and MVD Alpha Teams tested it, production was not proceeded with.

Weapon	Ammunition	Weight	Magazines	Price
80.002	5.45mm Kalashnikov and 12.7mm Russian	4.9 kg	30, 40 and 10	\$1580

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
80.002 (5.45mm)	5	3	1-Nil	7	2	4	46
80.002 (12.7mm, Ball)	SA	6	2-4-Nil	7	4	Nil	36
80.002 (12.7mm, Grenade)	SA	C1 B4	Nil	7	4	Nil	27

TSNIITOCHMASH AO-46

Country of Origin: Soviet Union

Appears in: A private venture by TSNITOCHMASH in 1974, emulating the US XM177.

Notes: The Russians saw the utility of a short assault rifle after reports about the effectiveness of the XM177 in CQB, used by special operations forces in Vietnam. Starting with the AK-74, Peter Andreevich Tkachev of TSNITOCHMASH designed the AO-46, with was an AK-74 with a greatly abbreviated barrel of 9.7 inches. The AO-46 used an unusual method of operation; it used the standard gas piston, but instead of a gas block, the gas for operation was collected directly from a highly-modified flash suppressor. The AO-46 has a modified version of the AKMS's forward-folding stock. With the stock folded, the AO-46 is a mere 45.72 centimeters long. Despite this modified flash suppressor, the powerful cartridge and short barrel produced massive muzzle flash and blast, similar to that of a 12-Gauge sawed-off shotgun. Though not accepted for service, the AO-46 was successful enough for the Soviets to start Project Modern, which eventually led to the AKS-74U.

Weapon	Ammunition	Weight	Magazines	Price
AO-46	5.45mm Kalashnikov	2 kg	15, 30, 40	\$466

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AO-46	5	2	1-Nil	¾	3	7	20

TSNITOCHMASH Unified Assault Rifle

Country of Origin: Russia

Appears in: Russian weapon experiment of the late 1980s and early 1990s.

Notes: Developed at the same time as the Unified Machinegun (see Russian Automatic Rifles), the so-called Unified Assault Rifle (and Machinegun) were to be a family of small arms firing the same cartridge – hence the name “Unified.” The assault rifle and light machinegun were first shown at various arms shows in 1993, but they have not been seen again after 1997, although the Russians are still distributing literature about the weapons and the possibilities of a weapons family based around the 6mm cartridge designed for these weapons. The lineage of the Unified Assault Rifle can be traced to experiments first done in the late 1960s by Kalashnikov, on an AKM variant called the AL7. (Strangely enough, the UAR looks, externally at least, more crude than the AL7.) The UAR is, however, a much more polished design. There are many speculations on why the UAR and its 6mm brethren have not been adopted by the Russian military despite the greatly superior round, but cost of the fielding a weapon with a new cartridge and the logistical problems of the same are probably the two biggest reasons.

The Unified Assault Rifle (UAR) is essentially a highly-modified AK-74, with the primary modifications made to accommodate the larger, longer cartridge. As with the AK-74, the UAR is largely constructed of stamped steel, but the buttstock, pistol grip, and handguards are of polymer. (The buttstock and pistol grip appear to be the same as used on the AK-74M.) The UAR appears to use the same flash suppressor/muzzle brake as the AK-74, and it feeds from modified versions of AK-74 magazines. The barrel is 20 inches long, and the UAR uses standard AK-type sights.

Two rare variants of the UAR were also built in the hopes of better attracting foreign sales and Russian military sales. One was chambered for 5.45mm Kalashnikov, and the other was chambered for 5.56mm NATO. No one sees interested in them either; they are essentially no better than any other rifle chambered for the same rounds.

Twilight 2000 Notes: Like the Unified Machinegun, virtually no UARs appeared in the Twilight War; the ones that did were primarily in the hands of Spetsnaz troops.

Merc 2000 Notes: Also like the Unified Machinegun, the UAR never appeared except at a few arms shows, a victim of the world recession.

Weapon	Ammunition	Weight	Magazines	Price
Unified Assault Rifle	5.45mm Kalashnikov	3.06 kg	30, 40, 45, 60, 75 Drum	\$597
Unified Assault Rifle	5.56mm NATO	3.11 kg	30	\$647
Unified Assault Rifle	6mm UMG	3.2 kg	30	\$727

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Unified Assault Rifle (5.45mm)	5	3	1-Nil	6	2	5	61
Unified Assault Rifle (5.56mm)	5	3	1-Nil	6	2	5	55
Unified Assault Rifle (6mm)	5	3	1-2-Nil	6	2	5	64

Type 87

Country of Origin: China

Appears in: Tests of a rifle to fire the then-new 5.8xmm Chinese cartridge.

Notes: After the introduction of smaller-caliber rifles by the US, NATO, and then the Soviet Union and some of her satellite states, the Chinese began research into their own version of a small-caliber-firing military rifle. They were, however not totally convinced as to the effectiveness of the small-caliber military cartridge concept, and not impressed by either the 5.56mm NATO or 5.45mm Kalashnikov cartridges. The Chinese there decided to develop their own small-caliber military cartridge, eventually resulting in the 5.8mm Chinese cartridge.

However, the QBZ-95 series was not the first weapon to be chambered for the new round; before the QBZ-95, there was the Type 87.

The initial Type 87 was essentially a Type 81 with just enough modifications to enable it to fire the 5.8mm Chinese cartridge. In addition, the Type 87 was built only in a folding stock version, but not the same type of folding stock as the Type 81. In addition, the muzzle of the Type 87 has a different flash suppressor.

The Type 87 underwent extensive manufacturer and military evaluation; in addition, it also underwent limited field training with Chinese troops. Its reliability was found wanting; this is most likely because the gas system was not modified sufficiently to handle the new cartridge. It was also considered to be too heavy for a small-caliber-firing military rifle (especially since the Type 87 was *supposed* to have been much lighter than the Type 81). The Type 81 was therefore quickly withdrawn, without achieving any sort of operational status.

In the late 1980s, the Chinese were still working on the Type 87 and had made a number of improvements to the rifle. These improvements led to the Type 87A. It was a much lighter rifle due to the extensive use of high-impact plastics and light alloys, and with a modified gas system, it was also much more reliable. A small production run of Type 87A rifles was ordered by the PLA – about enough to equip one battalion of Chinese Airborne troops, who conducted the field tests. Though reportedly quite pleased with the Type 87A, they were trumped by higher command – the PLA brass didn't feel that the Type 87A was enough of a technological advance over the Type 81. The Type 87A was therefore withdrawn from service, and again never reached any sort of operational status. The ultimate fate of the small production run of Type 87As actually built is unknown, but much of the technology and lessons learned from the Type 87 and Type 87A later went into developing the QBZ-95 and improving the 5.8mm Chinese cartridge.

Weapon	Ammunition	Weight	Magazines	Price
Type 87	5.8mm Chinese	3.95 kg	30	\$598
Type 87A	5.8mm Chinese	3.33 kg	30	\$600

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Type 87	5	3	1-Nil	5/6	2	6	53
Type 87A	5	3	1-Nil	5/6	2	6	53

Valmet M82

Country of Origin: Finland

Appears in: A paratrooper assault rifle experimental program in the early 1980s.

Notes: The M82 was a rare variant of the M76 (and is also referred to as the M76B). The change in the design is easily apparent – the M82 has a bullpup construction, enclosed in an almost one-piece synthetic shell. (Pre-production versions were actually enclosed in a wooden shell, which had to be carved in an expensive, time-consuming, and laborious process.) The barrel is tipped by an M16-type birdcage flash suppressor, and is capable of launching most rifle grenades in the world today. The trigger guard is larger than the rest of the M76 series, allowing for the use of bulky gloves, and can be hinged away from the trigger as well. The M82 was designed for airborne troops and special operations troops, both for domestic use and for export. However, during field trials and early in the short deployment of the M82, Finnish Paratroopers discovered a problem with the M82: the position of the sights. While the front sight remained near the muzzle (a protected post upon a large raised triangular mount), the rear sights were moved to a position near the center of the weapon. Since Finnish paratroopers parachuted with the M82 uncased atop their reserve chute, a bad PLF often led to facial injuries, sometimes to the point of broken noses or teeth. A fall atop the M82 could do the same thing. Such dislike of the weapon by the troops using it may have led to the very short production run of the M82, mostly for evaluation purposes; it was never used in any operational role by any country.

Twilight 2000 Notes: Though an emergency production order for 1200 M82s was authorized by the Finnish government in 1997, only 776 examples were actually produced. These mostly went to security troops and certain bodyguard details.

Merc 2000 Notes: This is just one of those weapons normally found only as curiosities among weapon collectors or in museums.

Weapon	Ammunition	Weight	Magazines	Price
M82	7.62mm Kalashnikov	3.3 kg	20, 30	\$797
M82	5.56mm NATO	3.3 kg	20, 30	\$549

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range

M82	5	4	2-Nil	4	4	9	42
M82	5	3	1-Nil	4	2	6	38

W+F SG C-42

Country of Origin: Switzerland

Appears in: Swiss arms competition of the late 1980s.

Notes: Designed for the Swiss arms competition that eventually produced the SG-550 family, the C-42 nearly won that competition. The breaking point with the Swiss government was the new ammunition that the family was designed around; 5.56mm NATO ammunition was simply too readily-available, and SiG was ready with a 5.56mm-firing family of rifles. W+F found redesigning the C-42 for 5.56mm ammunition difficult without retaining the performance of the C-42 family. Two of the family are essentially submachineguns firing large rounds, and the Swiss Army has never really been that fond of submachineguns. (Technically, they're short-barreled assault rifles, but...) Added to that is that the C-42 family requires two new ammunition types, and the fate of the C-42 family was sealed. However, apart from the performance of the new ammunition, the C-42 family had a number of interesting features, such as a detachable bipod, a new bayonet lug stronger than standard Swiss bayonet lugs (except for the MP E-21, which is too short to mount a bayonet), and a sight base able to mount a wide variety of optics. Again, except for the MP E-21, any of the family can mount a grenade launcher adapter, which is removable. The rifles have a gas cutoff lever to allow older rifle grenades to be launched using ballistite. They can fire on semiautomatic, automatic, or burst settings. The C-42 family are sound weapons, beaten by sounder and more expedient weapons.

Weapon	Ammunition	Weight	Magazines	Price
SG C-42	5.6mm NSK	4.18 kg	20, 25, 30	\$1306
MP C-41	5.6mm NSK	3.96 kg	20, 25, 30	\$1113
SG E-22	6.45mm NSK	4.12 kg	20, 25, 30	\$1540
MP E-21	6.45mm NSK	3.91 kg	20, 25, 30	\$1346

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SG C-42	3/5	3	1-Nil	5/6	2	3/6	59
Bipod	3/5	3	1-Nil	5/6	1	2/3	77
MP C-41	3/5	3	1-Nil	4/5	2	3/5	35
Bipod	3/5	3	1-Nil	4/5	1	2/3	45
SG E-22	3/5	3	1-2-Nil	5/7	2	4/6	77
Bipod	3/5	3	1-2-Nil	5/7	1	2/3	100
MP E-21	3/5	3	1-2-Nil	4/6	2	4/6	45
Bipod	3/5	3	1-2-Nil	4/6	1	2/3	58

WAT Lantan Assault Rifle

Notes: From 1973-75, the WAT (Wojskowa Akademia Techniczna, or Military University of Technology) was working on a new intermediate cartridge with superior ballistics to the 7.62mm Kalashnikov round. The result of this was the 7x41mm Lantan round. Work then started on the Lantan Project proper, which was to produce a series of related, modular small arms, including an assault rifle, carbine, sniper rifle, light machinegun/automatic rifle, a medium machinegun, and even a minigun-type weapon. Work on the small arms was to be done at Radom, with plenty of WAT input. However, work on this promising cartridge and its small arms complex was scotched, at first because the Polish MoD felt that the introduction of a new cartridge when there were mountains of 7.62mm Kalashnikov cartridges was too expensive, and finally by the Soviet Union, who wanted Poland and the entire Warsaw Pact to pay for licenses for the 5.45mm Kalashnikov cartridge and its small arms complex, which was being introduced at about the same time. In the end, only two assault rifle prototypes of the Lantan were made. Work on the Lantan Project ended in 1980.

The Lantan assault rifle takes the basic form of the AK, though the receiver is larger, blockier, and longer. The stock and pistol grip were taken directly from the Polish version of the AKM, though a second prototype had an experimental foam/hard rubber stock which was none too durable. The fore-end was polymer instead of wood, and much longer than that of an AK. Controls took the form of a rotary switch on the left side of the weapon instead of the paddle switch of the AK. The Lantan is fed by magazines which, while they look similar to the AKM's 30 and 40-round magazines, have a greater degree of curve in them, as the 7x41mm Lantan round has a wider rim than the 7.62mm Kalashnikov. They mate to the magazine well in the same manner, however. Sights are based on those of the AK, though graduated to the new cartridge. The barrel was longer at 17.52 inches, and tipped with an extended flash suppressor which doubled as an adapter for launching rifle grenades. The barrel also had a quick-change feature. Cyclic rate of automatic fire was deliberately set low as 450 rpm to make the Lantan assault rifle more controllable. The Lantan assault rifle's weight was high, though this was more an effect of the prototypical nature of the rifle.

I think that the use of a non-standard cartridge would have eventually doomed the Lantan Project, even if it had been allowed to proceed by the Soviet Union. The modular nature of the projected Lantan complex has merit, however, but has been tried several times without success, most notably with the Stoner 63 system.

Weapon	Ammunition	Weight	Magazines	Price
Lantan Assault Rifle	7mm Lantan	5.9 kg	30, 40	\$711

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Lantan Assault Rifle	5	3	2-Nil	6	2	5	61

Weyland-Yutland M41A Pulse Rifle

Appears in: *Aliens 2*

Notes: This is the signature weapon of the Colonial Marines in the sequel to *Aliens*, *Aliens 2*. It is a short barreled assault rifle that fires 10mm caseless explosive-tipped armor-piercing ammunition. The rounds are caseless chemically-propelled rounds; however, the primer is electrically-ignited. It uses a rotating breech mechanism and the barrel is free-floating, granting a bit more accuracy. The M41A is constructed largely of what would be considered in our time exotic composites, such as carbon nanotubes. The weapon has a gyroscopic recoil compensator to help control recoil, as well as a conventional muzzle brake. On the side of the magazine well is a digital ammunition counter; this device counts the ammunition as it is being fired or reloaded in clear, easy-to read red LED numbers.

Of course, the assault rifle portion is only half the weapon. The M41A includes a 30mm grenade launcher under the barrel for heavier work. This is a pump-action weapon which, though not designed for sustained fire use (its magazine holds only four rounds), is useful for quick explosive work.

Weapon	Ammunition	Weight	Magazines	Price
M41A Pulse Rifle	10x24mm Caseless	4.9 kg	99	\$9710

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M41A (Ball Ammo)	4/10	4	2-3-Nil	4/5	1	2/6	55
M41A (AP)	4/10	4	1-2-3	4/5	1	2/6	66
M41A (HE)	4/10	C0 B4	Nil	4/5	1	2/6	40
M41A (HEAP)	4/10	(5) C0 B4	1-2-3 (5C)	4/5	1	2/6	53

Weapon	Ammunition	Weight	Magazine	Price
PN Grenade Launcher	30x45mm Medium Velocity	Integral to Rifle	4 Tubular	Integral to Rifle

Weapon	ROF	Round	SS	Burst	Range	IFR
PN Grenade Launcher	PA	APERS	2	Nil	15	Nil
	PA	CHEM	2	Nil	120	730
	PA	Flash-Bang	2	Nil	120	730

	PA	Flechette	2	Nil	20	Nil
	PA	HE	2	Nil	120	730
	PA	HEAT	2	Nil	120	730
	PA	HEDP	2	Nil	120	730
	PA	HE Airburst	2	Nil	120	730
	PA	ILLUM	2	Nil	120	730
	PA	Thermobaric	2	Nil	120	730
	PA	WP	2	Nil	120	730

PN Grenade Launcher Ammunition

Round	Round Weight	Round Price	Damage	Penetration
APERS	0.08 kg	\$2	1d6x8	Nil
CHEM	0.15 kg	\$2/\$4/\$6	C2 (B1)	Nil
Flash-Bang	0.12 kg	\$3	(C4)	Nil
Flechette	0.08 kg	\$4	1d6x8	1-2-Nil
HE	0.16 kg	\$2	C2 B11	Nil
HEAT	0.16 kg	\$6	C1 B9	29C
HEDP	0.16 kg	\$4	C2 B11	4C
HE Airburst	0.17 kg	\$6	C3 B14	Nil
ILLUM	0.15 kg	\$2	(B145)	Nil
Thermobaric	0.18 kg	\$10	C6 B6	14C
WP	0.15 kg	\$5	C2 B6	Nil

AAI LSAT

Notes: The LSAT (Lightweight Small Arms Technology) is currently in the very early stages of development; projected field test are not even until 2013 at the earliest. Currently, LMG/SAW versions and MMG versions are being developed, with only very limited working models actually existing at this time, and fewer than 1000 rounds having been fired through each of them as of yet. The US Military is participating in the development, though there are significant questions as to how soon it will be economically feasible to field such weapons due to the radically different ammunition it is currently being tested with and projected future ammunition. The primary goal of the program (at present) is to produce weapons which are significantly lighter than current SAWs and GPMGs.

Most of the current development is being conducted with the LMG/SAW model. This version has (depending what source you consult) construction of 35-60% advanced composite materials, including (possibly) an entirely polymer shell, trigger, trigger guard, ammunition belt (disintegrating) links, handguard, front sight post, sliding stock, and perhaps some other parts. The barrel is of course steel; the barrel is fluted to save weight, yet made from steel which is both stronger and lighter than the steel used to make most small arms. The fluting also greatly assists in heat dissipation, and the barrel is also a quick-change barrel which requires no tools (or stupid asbestos mittens) for the barrel changes. The most common barrel length mentioned is approximately 20.5 inches, though an interchangeable barrel of approximately 22.5 inches is also mentioned in several sources. Both are most commonly mentioned as using a compact muzzle brake (which is how I have treated it here), but the use of a standard SAW-type flash suppressor is also mentioned in some sources. The receiver and some of the internal parts are made from lightweight titanium alloy. The handguards have molded-in MIL-STD-1913 rails at the 3, 6, and 9 o'clock position, and the receiver behind the feed cover also has a MIL-STD-1913 rail. At least 4 sling swivels are projected, allowing several different sling configurations and types. Operation is described as "long-stroke, soft recoil," further decreasing felt recoil to the shooter.

An MMG version is also projected, using an approximately 24-inch barrel, and either 5.56mm or 7.62mm-equivalent ammunition. (This will be explained more below.) Common features for both the LMG/SAW and MMG include a titanium-alloy folding bipod, the ability to be mounted on both standard NATO tripods or special light tripods being developed, and of course, its special ammunition.

The ammunition currently being tested with the prototype weapons is plastic-cased ammunition based on the 5.56mm NATO and 7.62mm NATO rounds. Furthermore, this ammunition is case-telescoped, making it much more compact as well as being significantly lighter. Current prototypes are being tested with 100-round belts, but longer and shorter belts are projected for the future, along with soft Kevlar containers attached to the bottom of the receiver. Future models are also projected (though they are still on the drawing board) that use belts of advanced caseless ammunition, and are even lighter than the current prototypes. There are no current projections of when (or even if) the caseless-ammunition versions will appear, even as prototypes, but I have included them below as "what-ifs." (For that matter, the entire entry is a "what-if," considering that, due to the ammunition, the US Military may never actually adopt them.)

Twilight 2000 Notes: The AAI research program which produced these prototypes started much earlier in the Twilight 2000 timeline; however, no more than about 200 LSAT LMG/SAW versions (designated XM-324) were ever fielded, and only in the case-telescoped ammunition version.

Merc 2000 Notes: Budgetary difficulties prevented AAI from ever taking the LSAT off the drawing boards.

Weapon	Ammunition	Weight	Magazines	Price
LSAT LMG/SAW (20.5" Barrel)	5.56mm CTA	4.25 kg	50B, 100B, 200B	\$1890
LSAT LMG/SAW (22.5" Barrel)	5.56mm CTA	4.3 kg	50B, 100B, 200B	\$1952
LSAT LMG/SAW (20.5" Barrel)	5.56mm CLS	3.84 kg	50B, 100B, 150B, 200B, 250B	\$1909
LSAT LMG/SAW (22.5" Barrel)	5.56mm CLS	3.89 kg	50B, 100B, 150B, 200B, 250B	\$1972
LSAT MMG	5.56mm CTA	4.38 kg	50B, 100B, 200B	\$2015
LSAT MMG	5.56mm CLS	3.96 kg	50B, 100B, 150B, 200B, 250B	\$2036
LSAT MMG	7.62mm CTA	5.82 kg	50B, 100B, 200B	\$3119
LSAT MMG	7.62mm CLS	5.26 kg	50B, 100B, 150B, 200B, 250B	\$3151

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
LMG/SAW (20.5", CTA)	5	3	1-2-Nil	5/6	1	4	46
With Bipod	5	3	1-2-Nil	5/6	1	2	60
With Tripod	5	3	1-2-Nil	5/6	1	1	92
LMG/SAW (22.5", CTA)	5	3	1-2-Nil	5/7	1	4	53
With Bipod	5	3	1-2-Nil	5/7	1	2	69
With Tripod	5	3	1-2-Nil	5/7	1	1	106
LMG/SAW (20.5", CLS)	5	3	1-1-Nil	5/6	1	4	55
With Bipod	5	3	1-1-Nil	5/6	1	2	72
With Tripod	5	3	1-1-Nil	5/6	1	1	111
LMG/SAW (22.5", CLS)	5	3	1-1-Nil	5/7	1	4	64
With Bipod	5	3	1-1-Nil	5/7	1	2	83
With Tripod	5	3	1-1-Nil	5/7	1	1	127
MMG (5.56mm, CTA)	5	3	1-2-Nil	6/7	1	4	60
With Bipod	5	3	1-2-Nil	6/7	1	2	82

With Tripod	5	3	1-2-Nil	6/7	1	1	120
MMG (5.56mm, CLS)	5	3	1-2-Nil	6/7	1	4	72
With Bipod	5	3	1-2-Nil	6/7	1	2	94
With Tripod	5	3	1-2-Nil	6/7	1	1	144
MMG (7.62mm, CTA)	5	4	1-2-Nil	6/8	2	5	72
With Bipod	5	4	1-2-Nil	6/8	1	3	94
With Tripod	5	4	1-2-Nil	6/8	1	1	145
MMG (7.62mm, CLS)	5	4	1-2-3	6/7	2	5	87
With Bipod	5	4	1-2-3	6/7	1	3	113
With Tripod	5	4	1-2-3	6/7	1	1	174

ABRL XM-106

Country of Origin: United States

Seen In: SAW competition, mid-late 1970s.

Notes: Though it may seem that the XM-106 had two big points in its favor – its genesis in the US Army's Ballistics Research Lab, and its use of the M-16A1 as a base – but the XM-106 was only incrementally better than an M-16 on a scissor bipod, and only *just* so. Design changes included an easy-to-change but complex-to-replace heavy barrel, a bipod which attached to a boss above the center of the handguards, a foregrip just to the front of this (and somewhat difficult to use if the bipod was extended), and a fire controls which only allowed safe or automatic (with further changes bringing down the XM-106's ROF to 750 RPM). The front sight is moved slightly closer to the muzzle, and the new barrel is 21.5 inches, tipped by an M-16A2-type flash suppressor. Firing was from an open bolt.

Shortcomings of the XM-106 became more and more apparent as the tests went on. At first, it was a problem with parts breakage and damage – not that the parts were any more susceptible to damage, but the XM-106 was basically hand-built at the ABRL, and many parts had to be carefully machined and/or hand-fitted when a failure of a part did occur. The XM-106, after all, was a hand-modified M-106A1, and the XM-106 appeared to be a rush job that wasn't ready for prime time. The method of barrel change was borrowed from the M-60 machinegun, and had the same defect – each barrel change usually threw off the zero of the weapon. ABRL went with a magazine feed; this was not conducive to sustained fire, and at the time, there were no reliable high-capacity magazines. ABRL did design a special three-magazine clip that allowed three magazines to be clipped together, making reloads faster.

The XM-106 showed all the signs of a rush job; someone at ABRL seems to have had the genesis of good ideas, but not enough time was taken to sharpen it. On the other hand, the shortcomings list was a bit long. Today, there are no surviving XM-106s; survivors were used for parts for other projects, and the concepts introduced on the XM-106 were largely dispensed with; however, Diemaco (formerly Colt Canada) went on to use the open-bolt firing, automatic-only lockwork, and a heavier barrel in other projects.

Weapon	Ammunition	Weight	Magazines	Price
XM-106	5.56mm NATO	4 kg	20, 30	\$1497

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XM-106	5	3	1-Nil	6	2	5	60
(Bipod)	5	3	1-Nil	6	1	2	78

Boeing XM-8 SAW

Notes: This is basically an XM-8 with a 24-inch fluted heavy barrel, a standard XM-8 optical sight tube, and a bipod. The standard magazine for the SAW version is the 100-round C-Mag; there is no provision for belt-feeding, though it can also use the 90-round MWG (with some clumsiness). The XM-8 SAW is not intended to replace the M-249, merely to supplement it; in addition, the SAW is intended to be used in a secondary role as a designated marksman rifle, and can use the 3.5x scope used on the DMAR. Field trials of the XM-8 SAW are expected in late 2005, with combat trials commencing some time around 2008. As with the XM-8 assault rifle, the XM-8 SAW was designed by Heckler & Koch, but the design was bought by Boeing in 2004.

Twilight/Merc 2000 Notes: This automatic rifle does not exist in either timeline.

Weapon	Ammunition	Weight	Magazines	Price
XM-8 SAW	5.56mm NATO	4.74 kg	20, 30, 100C	\$1749

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XM-8 SAW	5	3	1-Nil	6/7	2	5	71
(Bipod)	5	3	1-Nil	6/7	1	2	93

Colt CMG-2

Notes: The testing program for what eventually became the SAW (filled by the M-249) actually began way back in 1967, when Colt began a private venture hoping to create a new weapon requirement for the US military. (Eventually the military saw the usefulness of a small-caliber light machinegun, but it took a long, long time.) To this end, Colt designed the CMG-1 (Colt Machinegun). This gun turned up numerous faults during company testing and only a small amount of prototypes were built. However, the CMG-1 was

eventually developed into the CMG-2; this was a much more reliable and robust design that was tested in combat in Vietnam by US Navy SEALs in the early 1970s, where it was given the nomenclature of EX-27 Mod 0. The SEALs and Colt began an extensive feedback program, and eventually about 25 examples were used by the SEALs (though only a couple made it to Vietnam). The CMG-2 was well-liked by the SEALs who had a chance to use one, but the Department of Defense decided that such a weapon was not necessary, especially as the Vietnam War was winding down. Development of the CMG-2 ended in 1982, and even the nomenclature was withdrawn from use.

The CMG-2 is a belt-fed weapon with a quick-change barrel. The belt was familiar to the SEALs; it is the same one used in the Stoner 63 system. The CMG-2 can be fed from either side with only a few minutes of modifications, with case ejection being downward from the receiver. The weapon has a forward pistol grip to help stabilize it during hip fire. A bipod, borrowed from the M-14A1, could be attached to the CMG-2, and normally was. The method of cocking the CMG-2 is a little unusual – there are two cocking levers, one for sear (and which also functions as a safety), and one for the operating group. This means that the CMG-2 can be carried fully cocked, with a belt loaded into the weapon, with complete safety. The weapon fires from an open bolt with a long recoil system, making felt recoil relatively light. The drum for the belts was unusual; it employed a helical-feed chute which could make it awkward to carry spares, and makes the CMG-2 difficult to load in a hurry.

In the end, stocks of the CMG-2 were relegated to museums and the weapons rooms of Crane Naval Warfare Center, and they were basically forgotten. I think it was a weapon with a few faults, but was basically ahead of its time.

Weapon	Ammunition	Weight	Magazines	Price
CMG-2	5.56mm NATO	6.31 kg	150 Belt	\$1435

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
CMG-2	5	3	1-Nil	6	2	4	55
CMG-2 (Bipod)	5	3	1-Nil	6	1	2	72

Heckler & Koch LMG-11

Notes: This weapon was developed by Heckler and Koch as a squad automatic weapon variant of the G-11 assault rifle. Only a few prototypes were built before development of all caseless ammunition weapons was stopped. The weapon resembles an enlarged G-11, but the magazine is a package that is fed into the stock of the LMG-11. The LMG-11 fires the same ammunition (4.7x33mm caseless) as the G-11 assault rifle. The fire mechanism involves three rotating chambers to decrease the probability of cook-off during sustained automatic fire. An interesting what-if weapon, and I can see some employees of H&K pulling out the prototypes for use against the Italian or French invasion.

Weapon	Ammunition	Weight	Magazines	Price
LMG-11	4.7mm Caseless	5.36 kg	200	\$1698

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
LMG-11	10	3	1-1-Nil	6	2	9	73
LMG-11 (Bipod)	10	3	1-1-Nil	6	1	4	95

Hughes Lockless Rifle/Machinegun

Notes: An innovative design, this automatic rifle was simply too innovative and different to be afforded the infrastructure necessary for acceptance into the Army and Marines. Perhaps its most modern feature is its synthetic-cased telescoped ammunition – something that would not appear until 25 years later in AAI's LSAT program. The synthetic case was completely combustible and an extraction step in firing was unnecessary, the round requiring to be ejected only after a misfire or when clearing the weapon. This made the Lockless Rifle/Machinegun quite resistant to dirt. Unfortunately, though it passed initial testing and was well liked by the soldiers testing it, the Lockless Rifle/Machinegun was not accepted by the brass, and did not even receive a testing designation.

As the name suggests, the Lockless Rifle/Machinegun could be used as a heavy rifle or as a SAW. The locking step of the ammunition was unnecessary, increasing reliability and giving resistance to fouling. Unlike belt-fed weapons, the Lockless Rifle/Machinegun could be loaded on the move with one hand. (A disadvantage is that the 64-round magazines were huge, despite the significantly smaller size of the SCT ammunition.) At the heart of the block-shaped ammunition was a modified 5.56mm NATO round. The Lockless Rifle/Machinegun used the same caliber rifle, but was hotloaded due to its heavier 68-grain bullet. The 22-inch barrel gave it greater accuracy – and a pepperpot-type muzzle brake kept recoil down. It was not unduly heavy, however, useable either from a bipod or in an assault situation. (Another disadvantage, one that was to be rectified in the future is the program, was that a good fourteen inches of the barrel was unsupported.) The rear sights were on a riser, and were of the adjustable ladder type. The front sight was a post with ears. Both were adjustable. Advanced optics were being designed for the Lockless Rifle/Machinegun, but did not materialize due to its non-acceptance by the military.

Weapon	Ammunition	Weight	Magazines	Price
Lockless Rifle/Machinegun	5.56mm Synthetic-Cased Telescoped	3.54 kg	64	\$1727

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
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Lockless Rifle/Machinegun	5	3	1-2-Nil	7	2	5	51
Bipod	5	3	1-2-Nil	7	1	3	67

Rodman Arsenal XM-235

Notes: In the late 1970s, the US Army held a competition to bring a new weapon class into the Army – the Squad Automatic Weapon or SAW – in other words, a very light machinegun. The XM-235 was one of the last competitors in the competition, and came close to winning. It was dreamed up by small arms engineers at Rodman Laboratories, then charged by the US Army with developing and maintaining the Army's small arms and ammunition.

Rodman developed the XM-235, but they had no facilities to produce even the small amounts needed to conduct the initial operational training – Rodman was not in any way a manufacturing facility. So, interestingly enough, the Army chose one of the manufacturers that the XM-235 (and XM-249) had beaten – Ford Aerospace.

Rodman designed the XM-235 from a clean slate, designed to break convention and fix the problems inherent to automatic weapons. The found that in most automatic weapons, parts of the weapon were still in motion before any bullets left the barrel, and this threw off aim from the start. High power meant high felt recoil. Light machineguns had excessive barrel climb and also contributed to felt recoil. They tended to have ROFs of 800-1200 RPM, an excessive ROF for most purposes, and also contributing to the lack of ability to aim. What Rodman did was to use long recoil operation, use a buffer system that permitted a relatively soft amount of felt recoil, almost halve the ROF (compared to the M-16), ergonomic design, the use of a compact muzzle brake, changed the way in which the gun handled the belt so that it moved smoothly instead of the “stop-and-go” motion of most belt-fed weapons, and move the belt feed as close to the center of gravity as possible, with the ammo box ending up almost directly under the receiver. They also built maintainability into the XM-235, with most of the gun being modular and not requiring tools for assembly or disassembly.

What looks like an upper and lower receiver are actually sheet metal covers. The actual receiver is a pair of long tubes (upper and lower), which essentially connect the working parts together. You could literally run an XM-235 without the receiver covers, but it would be highly un-ergonomic and look pretty silly. The stock, also a sheet metal assembly, was in an almost perfect straight line from the muzzle brake at the tip of the 24-inch barrel. With all these sheet metal covers and assemblies, the XM-235 was a “semi-bullpup” weapon, with a significant amount of its action in the stock, though with the belt feed in front of the pistol grip and trigger. The upper receiver cover was peppered with small holes for ventilation. Case ejection is above the pistol grip, though the charging handle was well forward in the upper receiver. The simple but innovative bipod was folding, light alloy, and adjustable for height and cant. The trigger guard was enlarged.

The XM-235 has been called the “best weapon the Army ever rejected.” But why did it get rejected when it was an outstanding weapon? There were some minor points, like all that sheet metal getting dented during hard use. There were points from its competitor, the XM-249 version of the Minimi – the Minimi was already in service in some countries and had a proven track record. And then there was the ammunition – a version of the 5.56mm NATO design that was necked out to 6mm and with a steel core. And in the end, this was enough.

Rodman also designed a SAW that fires the 5.56mm NATO round, though it fires the SS-109 round that had been developed for the Minimi. This was the XM-248.

Weapon	Ammunition	Weight	Magazines	Price
XM-235	6mm Rodman	5.26 kg	100, 200 Belt	\$1720
XM-248	5.56mm NATO	5.26 kg	100 Belt, 200 Belt	\$1521

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XM-235	5	3	1-2-Nil	7	1	4	75
Bipod	5	3	1-2-Nil	7	1	2	98
XM-248	5	3	1-Nil	7	1	4	70
Bipod	5	3	1-Nil	7	1	2	90

Unified Machine Gun

Notes: This weapon was designed as an experiment at the behest of Spetsnaz and Russian Airborne Forces, who were looking for a combination of punch, light weight, and long range. The first examples were seen in 1993, but it is still considered a developmental weapon, with ammunition even harder to find. (Development of the UMG has been delayed primarily due to financial reasons, as have the AK-74 variants firing the same ammunition.) There are probably no more than a dozen or so examples of this weapon currently in existence. The UMG is equipped with an integral 2.5x sight that greatly increases the effectiveness of the weapon by decreasing aiming errors. The sight can be easily removed, and night or other optical sights of either Pact or Western origin can be mounted instead. Backup iron sights may also be used. The UMG can be mounted on a standard Pact Light Tripod.

Twilight 2000 Notes: If you encounter a Russian soldier armed with this weapon, chances are that you have run into some sort of special operations unit.

Merc 2000 Notes: Development of this weapon was delayed indefinitely due to financial reasons.

Weapon	Ammunition	Weight	Magazines	Price
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Unified Machine Gun	6mm Russian UMG	6.5 kg	100 Belt, 200 Belt	\$2621
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Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
UMG	5/10	3	1-2-Nil	7	2	5/10	110
UMG (Bipod)	5/10	3	1-2-Nil	7	1	3/5	143
UMG (Tripod)	5/10	3	1-2-Nil	7	1	1/3	221

AK-53

Country of Origin: Switzerland

Appears In: In-company weapons research by SiG

Notes: I decided to include this weapon not because it was used in any great numbers (or any numbers at all), but because it is so weird. The AK-53 is the only working example of a blow-forward automatic rifle. When the rifle is fired, the barrel moves forward and back instead of the bolt. This means that the overall length of the weapon is quite short despite a long barrel, but it also means that the firer's aim can be easily thrown off. It also lends itself to rapid barrel heating, which in the case of the AK-53, usually means that the remaining rounds in the weapon cook off, and then the reciprocating barrel jams in its sleeve until it cools again. Needless to say, SiG could not get anyone interested in the AK-53 and it rapidly became a museum piece.

Weapon	Ammunition	Weight	Magazines	Price
AK-53	7.5mm Swiss	4.9 kg	30	\$1121

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AK-53	3	4	2-3-Nil	7	3	5	79

Armalite AR-3

Country of Origin: US

Appears in: Gene Stoner's entry for the competition for the new battle rifle after World War 2.

Notes: Most of the design work for the AR-3 was actually done by the time that Gene Stoner joined Armalite. He used the signature light alloys, fiberglass, glass fiber, and plastic construction that were so common in his works. The original design was semiautomatic-only, and operated by the gas system that would later become famous (or some say, infamous) in the AR-10 and AR-15. The design looked very much like an enlarged M-1 Carbine, with a light alloy frame, polymer fore-end, and a fiberglass/glass fiber stock. The 22-inch barrel was tipped by a large flash suppressor.

Unfortunately, Stoner and Armalite did not have the AR-3 ready in time for the competition, and so never went beyond a few prototypes. However, design elements from the AR-3 would later appear Stoner and Armalite designs.

The AR-11 is the same rifle, scaled down to fire a smaller caliber. It was designed for evaluation by the Infantry General Staff, who were evaluating small-caliber rounds that had high power. It was designed to fire a modified version of the .222 Remington, hot-loaded and designed for high-performance. Note that the AR-11 is not a Stoner design, though it is based on a Stoner design, The AR-11 is sometimes called the Stopette, for reasons I have not been able to discover in my research. It was also called the SCHV, for Small Caliber High Velocity. The AR-11 used the direct gas impingement operation as the AR-10, instead of the system that the AR-3 does. Being a scaled-down AR-3, the form is virtually the same, with plenty of light alloy and fiberglass.

Weapon	Ammunition	Weight	Magazines	Price
AR-3	7.62mm NATO	3.77 kg	20	\$1047
AR-11	5.56mm SCHV	3.01 kg	20	\$600

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-3	SA	4	2-3-Nil	8	4	Nil	72
AR-11	SA	3	1-Nil	7	3	Nil	66

Armalite AR-10: The Prototypes

Country of Origin: US

Appears in: Competition for new service rifle in mid-1950s

Notes: The AR-10 that everyone knows today was the result of several prototypes and modifications. The basic design was still similar to the AR-10 familiar today, but was the result of several prototypes. Stoner began work on the AR-10 before he joined Armalite, and several features that would become familiar later, such as the carrying handle, the straight-in-line design, and the direct gas impingement system. The AR-10, unfortunately did not win the competition, despite many testers having judged it the best rifle in the competition. The AR-10, however, has come back, in the guise of the SR-25 SASS.

The first AR-10 prototype fired .30-06 Springfield (it appeared that the new rifle would fire .30-06 at the time). The barrel, bolt, and recoiling mass were straight-in-line, reducing felt recoil. The stock, however, did have a bit of a drop in it, behind the recoiling mass. Despite the AR-10 prototype's cutting edge design, some features of earlier rifles were used, such as the use of BAR magazines, and the sights and bolt locking mechanism of the Johnson Light Machinegun. The second prototype was made when the competition was changed to what would become the 7.62mm NATO cartridge. It was very similar to the First Prototype, but used a completely straight-in-line stock. The front sight remained a post on a triangular riser, but the rear sight used was a ZF-41 optical sight as used on the some versions of the Kar-98k. In both prototypes, there was a carrying handle incorporating the rear sight and enclosing the charging handle. Barrels were 20.8 inches; this would remain the same throughout the prototyping process. Magazines were subcontracted out, but proprietary at the time. The barrels for these two prototypes were light alloy, lined with stainless steel. Another feature which would remain constant (though the parts differ between the prototypes) are the large-scale use of polymer and light alloy.

The third prototype, the AR-10 A (not to be confused with the modern-production AR-10A), can be immediately spotted by its front sight assembly mounted on a pepperpot-type muzzle brake, similar to the mounting on a Johnson LMG. The handguards are short,

leaving a long length of exposed barrel; this was an immediate no-go among the testers. The pistol grip was less sharply raked, and rather un-ergonomic. The charging handle was attached to the exposed bolt on the right side. The AR-10A used a lot of polymer, fiberglass, and light alloy, of course.

The AR-10 B (again, not to be confused with the modern-production AR-10B) incorporated a number of changes desired or suggested by the military testers. Minor changes included the gas block moved to the top of the barrel, and a linking stainless steel gas tube leading to the gas port in the lower receiver. The charging handle was placed at the rear of the frame, a feature familiar to AR-15 and M-16 users. The forward side had a narrow riser, and was positioned between the handguards and the muzzle device (which was a more beefy muzzle brake than that of the AR-10 A). The barrel was, again, light alloy with a bore liner of stainless steel, but it had more stainless steel thickness than previous AR-10 design. New handguards were designed; they looked very FAL-like, and increased the rate of cooling. The light alloy receiver and some internal parts were made of steel or reinforced with steel frames; the barrel also used a steel armature to bed the barrel. The butt and pistol grip were made of molded plastic strengthened with fiberglass; the stock, for example, was hardened fiberglass and filled with glass fiber. The US Army also found deficiencies in the AR-10 B; their primary concern was the temperature the barrel reached, up to 600 degrees on occasion. Armalite chose not to attempt another entry in the competition. Stoner and Armalite decided instead to sell semiautomatic version to civilians, and let it be license-produced in small numbers in the Netherlands. Series production of the AR-10 only resulted in slightly over 9000 copies. The version built by the Dutch differed from the AR-10 B in having a long, open, birdcage-type flash suppressor, and in being much lighter due to heavier use of advanced (for the time) light alloys and lighter fiberglass in the stock.

Weapon	Ammunition	Weight	Magazines	Price
AR-10 (1st Prototype)	.30-06 Springfield	4.05 kg	20	\$1235
AR-10 (2nd Prototype)	7.62mm NATO	3.76 kg	20	\$1046
AR-10 A	7.62mm NATO	3.87 kg	20	\$1084
AR-10 B	7.62mm NATO	5.42 kg	20	\$1234
AR-10 (Dutch)	7.62mm NATO	3.29 kg	20	\$1046

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-10 (1st Prototype)	5	4	2-3-Nil	8	4	9	57
AR-10 (2nd Prototype)	5	4	2-3-Nil	8	4	9	66
AR-10 A	5	4	2-3-Nil	7	3	8	66
AR-10 B	5	4	2-3-Nil	7	2	6	66
AR-10 (Dutch)	5	4	2-3-Nil	8	4	10	66

Armalite AR-16

Country of Origin: US

Appears in: Gene Stoner's attempt to produce a heavier-caliber rifle to compliment the AR-15.

Notes: The resemblance between this rifle and the AR-18 is more than passing; the AR-16, in fact, appears to be an AR-18 chambered for a larger caliber. It was designed in the hopes of producing a rifle for nations (especially NATO) who were currently using 7.62mm NATO weapons they weren't happy about, and to supplement the M-16 series with an official issue heavier-caliber rifle. In the end, it turned into another "also-ran." It could not go against the political winds, especially in countries that didn't appreciate being saddled with the 7.62mm NATO cartridge in the first place.

And that's too bad, because the AR-16 was an advanced, lightweight, well-balanced rifle that was relatively easy to strip and maintain. Starting up a production line would have a real-life cost one-quarter most other NATO 7.62mm rifles. The rifles themselves, in real-life terms, would be three-quarters to one-half most NATO 7.62mm weapons of the period. (Of course, that's Armalite-supplied data, who were trying to sell their rifle to skeptical prospective customers...)

The AR-16 comes in rifle and carbine versions; both have match-quality floating barrels (20 inches for the rifle, and 16 inches for the carbine) giving them sniper-rifle like accuracy (though most of the time through iron sights). The design was unusual for Gene Stoner – it was a gas piston system, devoid of small parts and with parts hardened to dramatically increase endurance and reduce wear, as well as an increase in reliability. The rear sight is a flipping peep sight, similar to that of the M-16A2 and adjustable for windage and elevation (using dials); the front sight is a post. In addition, the receiver is grooved and tapped for a variety of scope mounts. In both cases, this is done by dials. The magazine has been moved in front and above the trigger guard on the right side, and actuated by depressing with the trigger finger. Construction is largely from steel and aluminum stampings and pressings. The stock, pistol grip, and handguards are of wood, however.

The AR-12 is the direct antecedent of the AR-16. The primary difference is the use of a gas piston system instead of direct gas impingement.

Weapon	Ammunition	Weight	Magazines	Price
AR-16 Rifle	7.62mm NATO	3.97 kg	5, 10, 20	\$1018

AR-16 Carbine	7.62mm NATO	3.56 kg	5, 10, 20	\$1006
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Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-16 Rifle	5	4	2-3-Nil	7	4	9	67
AR-16 Carbine	5	4	2-3-Nil	5/6	4	9	48

B-20

Country of Origin: Czechoslovakia (and later Czech Republic).

Appears in: Literature of the mid-1990s to early 2000s (and it is still being offered for sale, with no takers).

Notes: This Czech battle rifle looks like a reworked AK, but in fact uses a form of delayed blowback instead of the gas operation of the AK series. It also uses a larger caliber. The B-20 is the variant of the B-10/20/30/40 series that seems to be the least in demand, though sales of the entire series is very low.

Twilight 2000 Notes: The B-20 was often used in the Twilight War by Czech special forces operating behind enemy lines, since it could use captured enemy ammunition. In the Twilight 2000 World, a version of the B-20 was also designed to use 7.62mm Nagant ammunition. It was otherwise in very limited issue.

Weapon	Ammunition	Weight	Magazines	Price
B-20	7.62mm NATO	3.9 kg	10, 20	\$1018
B-20	7.62mm Nagant	3.9 kg	10, 20	\$1068

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
B-20 (7.62mm NATO)	5	4	2-3-Nil	5/6	4	9	46
B-20 (7.62mm Nagant)	5	4	2-3-Nil	5/6	4	9	46

Birdman Weapon Systems M-82B1K-PDW

Country of Origin: US (Sort-of)

Appears in: This weapon is an internet hoax, but I have included it as a "what-if." The site for "Birdman Weapon Systems" used to could be seen at <http://www.birdman.org>.

Notes: The M-82B1K-PDW is a drastically chopped version of the Barrett M-82 heavy sniper rifle, with a barrel about 1/10th the length of the standard Barrett M-82A1, a shortened, sliding stock, an M-16A2-style pistol grip front and back, and a different muzzle brake. It received some acceptance from special operations communities, who value it for its ability as a close assault weapon able to shoot through walls, doors, and armor, but most buyers were exotic weapons collectors and heavy-caliber firearm enthusiasts.

Weapon	Ammunition	Weight	Magazines	Price
M-82B1K-PDW	.50 Browning Machinegun	9.73 kg	5,10	\$8657

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-82B1K-PDW	SA	7	2-3-4	5/6	4	Nil	15

Charlton Machinegun

Country of Origin: New Zealand

Appears in: A perceived need for large amounts for automatic weapons rather than bolt-action rifles.

Notes: This odd weapon was the result of a need to arm New Zealand's World War 2 Home Guard with automatic weapons in a hurry, while allowing more modern weapons to be put into the hands of the actual New Zealander troops. After the Japanese takeover of Singapore and the attack on Pearl Harbor, it was felt that it was only a matter of time before the Japanese went after Australia and New Zealand, and New Zealand had an acute shortage of small arms of all kinds.

Philip Charlton actually began his work before World War 2; he had seen the engineering drawings of the work of GT Buckham and AT Dawson in England for their conversion of Lee-Enfield-type rifles to semiautomatic, and decided to improve on their work and come up with semiautomatic conversion of his own. Then he took it one step further, converting the Lee-Enfield into a selective-fire weapon. The resulting Charlton Machinegun was actually an incredible piece of engineering; the even more incredible part was that the conversion not only worked, it worked quite well. The Lee-Enfield was converted from a bolt-action rifle to a gas-operated selective fire weapon (with an extremely low automatic cyclic rate of only 250 rpm), though it took until 1941 before Charlton was ready for full-scale conversion work. He expected to be able to convert 200 Lee-Enfields per month; the actual rate of conversion was considerably lower, however. Only 1500 such conversions were actually accomplished by the end of World War 2; this was mostly because Charlton was also tasked with the production of the higher-priority Owen submachinegun.

Other changes went into the stock, which was given a pistol grip as well as a foregrip, in addition, the buttstock was modified slightly (the stock had to be lowered to clear the modified action), the rear third of the barrel was given cooling fins, sights were modified, and the magazine well was changed to take a modified Bren magazine as well as being still able to use a Lee-Enfield magazine. The fore-end was also shortened to allow more cooling of the barrel and fit the gas operation, with the foregrip being attached to the gas tube shroud. Barrel length was also slightly modified, and the barrel was also tipped with a muzzle brake. The

Charlton Machinegun could not take a bayonet, but a clip-on bipod could be added.

After World War 2, the Charlton Machineguns were stored in a New Zealand military armory, without any of them having seen any actual combat. In the late 1940s, that armory burned to the ground, with less than 200 of the Charlton Machineguns surviving the fire. These were used for some years for training purposes, and then most of them were destroyed. Today, very few of them are still around, and most of those are in museums.

Twilight 2000 Notes (sort of): The Charlton Machinegun illustrates what sort of expedient weapons could be made during the Twilight War; it also shows that virtually any sort of small arm can be made over into an automatic or selective-fire weapon, given enough work. This is the sort of "Frankenweapon" I would imagine would crop up all over the world in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
Charlton Machinegun	.303 British	7.03 kg	10, 30	\$2090

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Charlton Machinegun	3	4	2-3-Nil	8	3	4	86

Garand T-31

Country of Origin: US

Appears in: Experiments to replace standard military rifle after World War II.

Notes: John Browning's entry into the US Battle Rifle competition as well as his last attempt at full weapons design was the T-28, a bullpup rifle that most rejected out of hand as being "too weird." It is sort of a mix between an M-14 and a British EM-2, in its ideas of functioning. The rifle, other than its "weirdness," suffered from a problematic gas piston system that took much time and effort to troubleshoot (not before some spectacular gas block and barrel burstings, unfortunately). The design was well done out, with a straight in line recoil line between the muzzle and shoulder. The weapon also looked delicate, though it was surprisingly strong. The 24-inch barrel was tipped by a muzzle brake (the bursting problems genesis were the interacting between the muzzle brake and gas block). The T-31 also had a problem all early bullpups faced -- the ejection port was close to the shooter's face and the rifle was very much right-handed only. However, center of gravity and therefore balance were excellent.

Weapon	Ammunition	Weight	Magazines	Price
T-31	7.62mm NATO	3.95 kg	10, 20	\$1089

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
T-31	5	4	2-3-Nil	6	3	8	73

ISA Rail Gun Rifle

Country or Origin: US (originally a private venture).

Appears in: Several of the later Dale Brown books, including *Warrior Class*.

Fictional Notes: This weapon, probably developed by Dr. Jon Masters' company of Sky Masters, is a radical departure and advance over present-day firearms. Those who are familiar with the original *Traveller* RPG will recognize it immediately as an early version of the Gauss Rifle, a firearm that does not use chemical propellants to fire its rounds, but instead uses a charge of electromagnetism, similar to the manner in which a mag-lev train moves. This causes the round to move at extremely high velocity, and be very destructive. This also means that the entire round can be fired out of the barrel, with no cases remaining and allowing for a larger bullet. And the bullets fired by the rail gun rifle are huge -- about as large as a modest-sized cigar. The rail gun rifle is large (over six feet long) and heavy, and one really needs the augmentation of a BERP suit (more on this, one of these days...) to handle it in a fluid combat situation, but it also makes a really good antimaterial rifle or sniper's weapon. The magazines themselves weigh 2.45 kilograms, and include a battery pack to power the rifle's electromagnets; a single round weighs 26.5 grams. The weapon normally uses the sensors in the helmet of the BERP suit, but a special electronic sight may also be added, similar to that on an OICW.

These guns were originally designed for use by the US ISA (Intelligence Support Agency) for use in their support of the CIA and military's operations. There are probably less than 20 in the world, total.

Weapon	Ammunition	Weight	Magazines	Price
Rail Gun Rifle	15x75mm ISA-Masters	38.2 kg	10	\$39,460

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Rail Gun Rifle	SA	21	2-2-2*	14	4	Nil	507
Rail Gun Rifle (Bipod)	SA	21	2-2-2*	14	2	Nil	658

*Penetration against vehicles (armored or otherwise) or other structures is 10/9/7/5.

Madsen LAR m/62

Country of Origin: Denmark

Appears in: An attempt by Madsen to produce a battle/assault rifle for domestic use and export, in the late 1950s.

Notes: After World War 2, the firm of Madsen tried to enter the NATO rifle competition with the m/62 (also known as the LAR, Light

Automatic Rifle, or Madsen A-Carbine). The m/62 was a very high-quality weapon with gas operation similar to that of the FN FAL (though developed independently) and a rotating bolt. The original versions had no muzzle device except for being shaped to allow the use of the rifle grenades of the period. The receiver was of advanced construction for the period, being made from high-strength aluminum alloy. The bore, chamber, and part of the gas system were chrome-plated. The 20.6-inch barrel was free-floating, something quite unusual in a rifle meant for general use. The pistol grip handguard were made from wood, while the barrel shroud was of ventilated sheet steel. The m/62 was originally designed with a folding steel-strut stock with a folding buttplate which folded to the side; versions were also designed with fixed wood stocks, sliding steel stocks, and fixed tubular metal stocks. The m/62 could accept standard Danish bayonets of the period as well as a new bayonet designed for it, and also had a detachable bayonet which clipped to the bayonet scabbard when not in use. Sights are simple aperture and post sights, with the rear aperture sight being adjustable and able to be flipped up or down. The front sight post was protected by a ring. The m/62 had a straight-line configuration, which made high-mounted sights necessary, but reduced felt recoil. A muzzle brake was also designed for the m/62 for testing purposes, but Madsen decided it wouldn't be used on future production weapons since the brake made it impossible to use the rifle grenades of the period.

The m/62 was originally designed to fire the new (at the time) 7.62mm NATO round, using a proprietary 20-round magazine. However, in an effort to attract Finnish customers (who were looking for a new infantry weapon at the time), they designed a version firing 7.62mm Kalashnikov ammunition and able to accept standard AK-47, AKM and RPK-type magazines. The muzzle was re-designed to accept the types of rifle grenades the Finns used at the time. (None were supplied with muzzle brakes.) The Finns actually seriously considered adopting the m/62, and a version with the side-folding stock went through operational testing in small numbers in Finland in 1960. In the end, however, they elected to go with their own version of the AKM.

Unfortunately, the m/62 was essentially a victim of the market forces of its time – first prototypes appeared in 1957, and Madsen did not consider the m/62 market-ready until 1962. By this time, it faced fierce competition from other NATO 7.62mm weapons – especially from the FAL, G-3, and CETME all of which had already been on the international market for several years. Madsen realized the m/62 was never going to turn a profit. Despite rumors of its use by some special operations and mercenary units, it was never officially used anywhere. Despite this, reports of its use surfaced here and there in the world for several decades, always in very small numbers. Despite the high quality, uncomplicated design, and reliability of the m/62, it never got a toehold in the international marketplace, and Madsen abandoned sales attempts in 1965.

Note that on the combat portion of the tables below, the 7.62mm NATO versions with folding and sliding stocks are identical for game purposes, and the versions with fixed wooden and metal stocks are identical for game purposes.

Weapon	Ammunition	Weight	Magazines	Price
m/62 (Folding Stock)	7.62mm NATO	4.64 kg	20	\$1555
m/62 (Folding Stock, w/Brake)	7.62mm NATO7	4.84 kg	20	\$1605
m/62 (Sliding Stock)	7.62mm NATO	4.54 kg	20	\$1539
m/62 (Sliding Stock, w/Brake)	7.62mm NATO	4.74 kg	20	\$1589
m/62 (Fixed Wooden Stock)	7.62mm NATO	4.83 kg	20	\$1530
m/62 (Fixed Wooden Stock, w/Brake)	7.62mm NATO	5.03 kg	20	\$1580
m/62 (Fixed Metal Stock)	7.62mm NATO	4.74 kg	20	\$1543
m/62 (Fixed Metal Stock, w/Brake)	7.62mm NATO	4.94 kg	20	\$1593
m/62	7.62mm Kalashnikov	4.33 kg	30, 75 Drum	\$1373

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
m/62 (Folding)	5	4	2-3-Nil	5/7	3	9	67
With Bipod	5	4	2-3-Nil	5/7	2	4	88
m/62 (Folding, Brake)	5	4	2-3-Nil	6/7	3	8	67
With Bipod	5	4	2-3-Nil	6/7	2	4	88
m/62 (Fixed)	5	4	2-3-Nil	7	3	9	67
With Bipod	5	4	2-3-Nil	7	2	4	88
m/62 (Fixed, Brake)	5	4	2-3-Nil	7	3	8	67
With Bipod	5	4	2-3-Nil	7	2	4	88
m/62 (7.62mm Kalashnikov)	5	4	2-3-Nil	5/7	4	9	64
With Bipod	5	4	2-3-Nil	5/7	2	4	83

Rukavishnikov SVR-38

Country of Origin: Soviet Union

Appears in: Attempts by the Soviet Union to increase their troops' firepower by producing a semiautomatic or automatic battle rifle.

Notes: This was a competitor to rifles like the AVS-36 and SVT-38/40. The rifle developed by Rukavishnikov was well-made, with machined steel parts, a pistol grip stock, a wooden handguard, and sheet-steel protectors over the gas system. The testing authorities criticized the SVR-38 as unwieldy and cumbersome; however, the real strike against the rifle seems to have been the cost and time it took to manufacture, despite the quality of the weapon. As a result, the SVR-38 was rejected after only 5 rifles were built. It remains an interesting rifle, though.

Weapon	Ammunition	Weight	Magazines	Price
SVR-38	7.62mm Nagant	4.45 kg	15, 20	\$1098

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SVR-38	SA	4	2-3-Nil	7	4	Nil	79

Springfield T-20E2 Garand

Country of Origin: US (But see below).

Appears in: Experiment by Springfield to produce a shorter M-1 Garand (but see below).

Notes: The T-20E2 was to be a selective-fire variant of the M-1 Garand battle rifle. The genesis of the T-20E2 began in September of 1944; at that time, preparations were being made for an invasion of Japan (and the Manhattan Project was still a well-kept secret). Springfield Armory first responded with the T-20 (with the modifications designed by John Garand himself), but it was essentially a technical mess that had mechanical problems as well as excessive recoil, extreme heating of the barrel (which was uncomfortable for the shooter during sustained fire even through the wooden handguard), and later, a muzzle brake which prevented the use of a bayonet or rifle grenade launcher attachment. Needless to say, it was not accepted by the War Department, but it did serve to teach Springfield some valuable lessons of how *not* to go about the conversion.

Remington was also asked by the War Department to submit its own modified M-1 Garand, which was designated the T-22, T-23, and T-24. The T-23 and T-24 were essentially meant to prove that the idea of converting the M-1 to selective fire was possible; the T-22 was the version that Remington actually carried to (nearly) full development. Like the T-20, it was fed by a modified BAR magazine, and it also encountered the same feed problems as the T-20 (later traced to the modifications made to the BAR magazines). The T-22 was actually a reasonably-viable design; with a little more work, it could have been the needed selective-fire version of the M-1. Remington's biggest problem was actually with the War Department; they essentially wanted an unrealistically light weapon with unrealistically low felt recoil and unrealistically few modifications of the standard M-1 (to make production easier and allow rebuilding of existing M-1s); the War Department's expectations essentially made Remington's task impossible. (Ironically, a few months later, with the projected invasion of Japan looming ever larger, the T-22 would probably have been accepted.)

Springfield's work on the T-20, along with shared experience from Remington gained from their T-22, led them to the T-20E1. The operating system was vastly simplified, yet still quite similar to that of the standard M-1 Garand. Springfield also solved (for the most part) the barrel heat problem with a pair of simple heat flow arresting grooves cut into the barrel at the chamber, allowing heat to disperse far more evenly. Though at first the T-20E1 used the same modified BAR magazine, new purpose-designed magazines were eventually used instead, once the feed problems had been traced to the modified BAR magazine. A folding bipod (not designed for removal in the field) was added at the gas cylinder. The T-20E1 was almost right; Aberdeen Proving Grounds and Springfield suggested several changes, which would lead to the definitive T-20E2 version.

The T-20E2 version differed primarily in the use of a slightly-modified receiver, an improved feeding and extraction mechanism, a muzzle brake which also allowed the attachment of a rifle grenade launcher and a bayonet, drilling and tapping for a telescopic sight, a modified bipod (still not field-detachable), a more ergonomic magazine release, and a few other small changes. The only problem the War Department had with the T-20E2 had was the weight of a fully-loaded T-20E2, and they decided to ignore that. The T-20E2 was therefore deemed ready for limited production in May 1945.

Unfortunately, by the time tooling-up was completed, it was literally days before the atomic bombing Hiroshima. Suddenly, the T-20E2 was no longer considered such a priority, and funds to produce the T-20E2 basically dried up and blew away. Almost no T-20E2s were built in their final form, and apart from about 5 of those and the prototypes, no other T-20E2s were built.

All that work proved not to be in vain, however. Springfield continued tinkering with the T-20E2, even developing a prototype chambered for the 7.62mm T-65 cartridge (which later became the 7.62mm NATO cartridge). Most of this work helped or directly led to the M-14 battle rifle, which the US military adopted in 1957.

Weapon	Ammunition	Weight	Magazines	Price
T-20E2	.30-06 Springfield	4.37 kg	20	\$1842

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
T-20E2	5	4	2-3-Nil	8	3	8	70
With Bipod	5	4	2-3-Nil	8	2	4	90

Springfield T-26 "Tanker" Garand

Notes: The first thing I want to say in this entry is **there is no such thing as a Tanker Garand**.

Now that I've probably confused you, considering the title of this section, let's get to the meat. The T-26 was in fact never called the "Tanker" Garand, and was never intended to arm tank crews or any sort of vehicle crews. The "Tanker" appellation was a marketing ploy that was used much later (more on that below). I used the name in the title of this entry simply because it is the name that this variation of the Garand is best known by, even though it is inaccurate.

The T-26 was originally the result of two ideas that gelled together: a smaller, carbine version of the M-1 Garand for use by airborne troops, and a shorter, easier to handle Garand for use by US Marines and Army troops in the thick jungles of the Pacific. The test rifles were modified from existing M-1 Garands, and most sources say that only three such conversions were made. One is in the

Springfield Armory's museum, one was re-made into a standard M-1 Garand and issued back out to some unknown soldier, and the other was reportedly destroyed during testing at Aberdeen Proving Grounds. The modified rifles had shortened 18-inch barrels and a gas system modified for the shorter barrel length. The results were unsatisfactory: a muzzle that spouted a blinding gout flame two feet long, markedly greater recoil, and of course, less accuracy.

That said, it is relatively easy to find a "Tanker Garand" for sale these days. And they're *all* fakes. (The "Tanker" name was coined in the 1950s by some arms dealer that thought it would improve sales – and it did.) Some are stocked, some have pistol grips, some have folding stocks – but they're all fake, every one of them. If you've ever bought a "genuine Tanker Garand" or something like that, you've been taken, and you go to the gun dealer who sold it to you and give him a solid butt stroke to the chin with butt of that fake Tanker Garand. The only genuine T-26 is in Springfield's museum, it's priceless, and they're not giving it up.

A related version of the T-26 is the M-1E5; this one almost made to production. This is a standard-length Garand, but the stock behind the receiver is replaced by a simple tubular metal folding stock. This was designed for use by paratroopers and vehicle crews in anticipation of the Operation Overload landings. The mechanism, as is virtually the entire forward version of the rifle, is basically a T-26. After testing at Aberdeen Proving ground it was deemed unnecessary, something protested by the Airborne and Glider units. Again, there are only a few, and they have never been sold to anyone.

Weapon	Ammunition	Weight	Magazines	Price
T-26	.30-06 Springfield	4.13 kg	8 Clip	\$1182
M-1E5	.30-06 Springfield	3.63 kg	8 Clip	\$1207

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
T-26	SA	4	2-3-Nil	7	5	Nil	46
M-1E5	SA	4	2-3-Nil	5/7	5	Nil	46

Winchester Machine Rifle

Country of Origin: US

Appears in: An experimental World War 1-era weapon.

Notes: This weapon, at first designed for use by aircraft crews to destroy the hydrogen-filled balloons of the First World War, has been described by some as the "first true assault rifle" and the "BAR before the BAR." It was developed in 1917 by Frank Burton, who went on to develop the BAR automatic rifle with John Browning. A ground version was quickly designed to accompany the aircraft version.

The aircraft and ground versions differed little from each other, with the primary difference being that the aircraft version fired and was optimized for incendiary ammunition. The design was innovative, with a wooden stock virtually in a straight line from the shoulder, a pistol grip trigger group with an enlarged trigger guard for use with a gloved hand. The magazine is above the receiver and angled off from the receiver at 60 degrees; the magazine well actually allowed for two magazines, with one feeding at a time – after the first is empty, it slides out of place and the second one feeds the weapon. The safety switch is a simple "second trigger" below the trigger guard. This second trigger must be pulled at the same time as the trigger within the trigger guard. Operation was also novel for the time, being by straight blowback and from an open bolt. The charging handle is below the receiver. The recoil spring is long and extends all the way into the stock. The fore-end has finger grooves and a ring to mount on an airplane; the 25-inch barrel is finned for half its length for cooling. Ejection is downwards. To top off the innovative features of the Winchester Machine Rifle, the weapon fires the .345 Winchester Self-Loading Rifle cartridge – a true intermediate cartridge made by necking down and shortening the .351 Winchester Self-Loading Rifle cartridge. The Winchester Machine Rifle was apparently extensively tested at the Springfield Armory but records of the testing have been lost and the reasons for its not being adopted are not known.

Weapon	Ammunition	Weight	Magazines	Price
Winchester Machine Rifle	.345 Winchester Self-Loading Rifle	4.54 kg	40 (x2)	

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Winchester Machine Rifle	5	4	2-3-Nil	8	3	8	73

3-Barrel 40mm Grenade Launcher

Country of Origin: United States

Appears in: This weapon was developed for SEAL use in Vietnam, but was not adopted.

Notes: During 1966-67, the SEALs and other US special operations forces tried several designs in an attempt to increase the firepower of their grenade launching systems over the M-79. One of these systems, which never received any official designation, was a triple-barreled grenade launcher designed to be carried under the M-16 and CAR-15. This design used a slide-forward loading design in a similar manner to the then-experimental underbarrel grenade launcher, the XM-148, but improved to prevent dirt from entering the mechanism and eliminating the guide bar system of the XM-148. The trigger mount is similar to that of the XM-148, however. The barrels are shorter than that of the XM-148 or M-79, being only 6 inches, to allow it to fit under the CAR-15 without projecting beyond the barrel. At least three and as many as five of these launchers were built; one was known to have been sent for combat testing to Marine Force Recon in Vietnam, while the rest were sent with the SEALs. The firepower was well thought of, but that was the only thing they liked about the design. The launcher was unwieldy, unbalanced the rifle it was mated to, and the complex firing mechanism did not stand up to the dirt and mud common in Vietnam. In fact, when the trigger was pulled, there was about a 50/50 chance that the round would not fire. The design remains an interesting, though flawed and failed, attempt to increase firepower.

Weapon	Ammunition	Weight	Magazine	Price
3-Barrel 40mm	40-46mm Low-Velocity	2.04 kg	3 Internal	\$456

Weapon	ROF	Round	SS	Burst	Range	IFR
3-Barrel 40mm	SA	APERS	2	Nil	43	Nil
	SA	CHEM	2	Nil	85	357
	SA	Ferret	2	Nil	85	357
	SA	Flash-Bang	2	Nil	85	357
	SA	Flechette	2	Nil	77	Nil
	SA	HE	2	Nil	85	357
	SA	HEAT	2	Nil	85	357
	SA	HEDP	2	Nil	85	357
	SA	HE Airburst	2	Nil	85	357
	SA	ILLUM	2	Nil	85	357
	SA	WP	2	Nil	85	357

Alliant Techsystems XM-25 Airburst Assault Weapon

Country of Origin: United States

Appears In: Current US weapons development programs

Notes: Though the XM-25 might be called a "weapon that isn't – yet," I have included here, for the time, since due to budget pressures, the XM-25 may never make into service. The XM-25 is a child of the XM-29 OICW – it is the grenade launcher component, upsized into a weapon using 25mm grenades that are related (but not the same) as those of the XM-307 OCSW. As such, the XM-25 is an advanced, "next-generation" support weapon – and one whose real-life price is quite high. Field testing and deployment dates

have repeatedly slipped and are continuing to do so; currently, no one is really sure when (or if) the XM-25 will become an operational weapon.

The XM-25 uses an external design similar in appearance to that of the also ill-fated XM-8 assault rifle; it is a smooth, sleek, lightweight polymer shell. The XM-25 uses a bullpup design instead of the XM-8's sliding-stock design, with a recoil pad on the buttplate. Feed is by a polymer 8-round magazine; case ejection may be set up for left or right-handed shooters. Many of the metal parts are of the XM-25 also made from light alloys, with heavy steel being kept to a minimum (such as the barrel and other high-wear parts).

Atop the receiver is an advanced target acquisition/fire control sight, incorporating a thermal imager/optical sight (with 2x magnification for both), powered direct-view optics (called under the *Twilight 2000 v2.2* rules an image intensifier), a laser rangefinder, and a compass. The data that the sight provides is tied together by a ballistic computer; this computer computes a fire solution, sets the fuzes of the rounds about to be fired, and then presents the information to the shooter on a unified display inside the sight. The shooter can accept the provided fire solution or modify some or all of it as necessary.

The XM-25 might be simply an advanced, rather small-caliber grenade launcher, were it not for the equally-advanced ammunition fired by the XM-25. Initially, the XM-25 was to use the same ammunition as the XM-307 OCSW, but due to the higher power of the XM-307's ammunition, infighting between Alliant and General Dynamics (working on the XM-307), and repeated delays in the XM-307 itself, a compromise was made. The fuzes of the XM-25 and XM-307 are identical, and the warheads are *almost* identical (though the warheads of the XM-25's ammunition are a little smaller). The case and propelling charge, however, is quite a bit smaller than that of the XM-307, with a 40mm-long case being used. This drops the velocity (and range) of the XM-25's ammunition quite a bit (it's considered a low-velocity round), but it makes the recoil manageable and still provides the XM-25 about double the effective range of the M-203.

The fire control system of the XM-25 not only sets the fuze of the grenade's warhead to explode at the proper range, but also (depending on the target and warhead) the proper *height* above the target (in the case of the HEAB or Thermobaric rounds). This gives the XM-25 the "Airburst" portion of its designation – the grenades are meant to be primarily used to explode above the heads of their targets, causing the maximum damage to entrenched or exposed troops, soft-skinned troops and materiel. (This is actually *still* an ongoing problem with the XM-25 and its ammunition – getting the fire control computer to properly set the fuzes.) The airburst abilities of the ammunition means that the small 25mm grenade is able to cause damage equal to or greater than the 40x46mm round currently used by most of the world's 40mm grenade launchers. The ammunition can also be set for point detonation (on contact with the target) or point detonation delay (delaying the detonation a few milliseconds, in order to go through a window or doorway) if desired or if the computer has a glitch or damage and cannot be used. The rounds shown below are those currently being tested; in addition, two training rounds have also been designed. A flechette round is also possible in the future, though as far as is known, none have yet actually been built; likewise, a tactical CS round is also possible for the future.

Twilight 2000 Notes: Needless to say, the XM-25 is not a weapon that exists in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazine	Price
XM-25	25x40mm Low-Velocity	6.35 kg	8	\$3410

Weapon	ROF	Round	SS	Burst	Range	IFR
XM-25	SA	HEAB	1	Nil	124	496
	SA	AP	1	Nil	124	496
	SA	Thermobaric	1	Nil	124	496
	SA	Flechette	1	Nil	50	Nil
	SA	CS	1	Nil	124	496

XM-25 Grenade Launcher Ammunition

Round	Round Weight	Round Price	Damage	Penetration

HEAB (Airburst)	0.13 kg	\$16	C2 B9	Nil
HEAB (Point Detonation)			C2 B14	Nil
AP	0.17 kg	\$18	C0 B2	23/17/12/6
Thermobaric (Airburst)	0.14 kg	\$24	C5 B5	9C
Thermobaric (Point Detonation)			C8 B5	9C
Flechette	0.08 kg	\$11	11	1-Nil
CS	0.12 kg	\$6	C2 (B2)	Nil

B-40

Country of Origin: Czech Republic

Appears in: Czech weapons catalogs of the 1990s and early 2000s.

Notes: This Czech grenade launcher is part of a family of weapons, including the B-10 assault rifle, B-20 battle rifle, and B-30 sniper rifle. Many of the components of this weapon are interchangeable with the B-30, and it is claimed that the weapons may be interchanged by simply changing the barrel and magazine.

The B-40 and its brethren seem to have been confined largely to arms shows where the designers hoped for sales which pretty much never happened, and by 2006 it was no longer being offered.

Weapon	Ammunition	Weight	Magazine	Price
B-40	30mm Russian Medium-Velocity	15.3 kg	5	\$810

Weapon	ROF	Round	SS	Burst	Range	IFR
B-40	5	HE	1	3	140	860
	5	HEDP	1	3	140	860

Explosive Scatter Gun

Country of Origin: United States (for *Traveller* purposes, Aslan)

Appears in: *Space Gamer* Magazine, in an article by William A. Barton (though I have changed the story considerably).

Fictional Notes: The original article for the Explosive Scatter Gun is a weapon for the original *Traveller* game, a Tech level 10 weapon designed by the Aslan for use against armored transports and personnel dressed in heavy battlesuits. However, this weapon can easily be imagined as something that was come up with by the likes of DARPA or China Lake, for use as a heavy grenade launcher to attack light armored vehicles, unarmored vehicles, and troops in the open. I have devised special ammunition for it, since the original weapon is described by Mr. Barton as using Tech level 10-11 RAM grenades; these are essentially higher-tech versions of NATO 40mm HV ammunition.

The XM-192 Explosive Scatter Gun exists only in the Merc 2000 timeline, and not in the Twilight 2000 timeline. It was designed for use by special operations, airborne, air assault, and Marine units for use as a heavy support weapon; fully-loaded, it is quite a handful, and while due to its advanced construction materials it is not too heavy, it is a very bulky weapon. It resembles a short rocket launcher, some 850 millimeters in length, and the barrel cluster some 105 millimeters wide. The XM-192 has a bipod near the muzzle, a forward handgrip for hip firing (which is a practice that is not recommended when burst firing), and a curved, padded shoulder stock that allows the weapon to be supported on the shoulder easily. The XM-192 uses 30mm grenades which are rocket-assisted to increase range and velocity. The weapon is fed by 10-round cassettes; the XM-192 breaks open like a shotgun at the breech of the barrel cluster. Due to the size of the cassettes, reloading the XM-192 takes 3 combat phases. (A cassette weighs 1 kilogram, plus the weight of the

ammunition within; it costs \$10) The "receiver" of the weapon is topped with a MIL-STD-1913 rail; the normal sight, included in the cost of the weapon, is an electronic sight similar to that used on the OICW.

The weapon may be fired in one of three ways: semiautomatically, in "half bursts" where half the ammunition in the cassette is fired at the same time with one pull of the trigger; and a "full burst", in which all the ammunition in the cassette is fired simultaneously with one pull of the trigger. Though the rocket-assisted ammunition takes up part of the recoil (the rocket fires within a few milliseconds after leaving the barrel, with a small launching charge actually firing within the barrel), the simple fact is that the recoil is brutal when half bursts or full bursts are fired. However, the half and full bursts can do something a single shot cannot do – open up an armored vehicle like a can opener. Due to special enhancements to the sight and ammunition, the rounds in a half or full burst will all hit in roughly the same spot if desired by the gunner; this mode is set by the gunner by flicking a switch before firing the burst. If the gunner scores a hit, the user of a burst in this precise mode may multiply the penetration what would be a single round by 3 for a half burst, or 6 for a full burst. If a miss is made in this precise mode, *all* the rounds fired in the burst miss, and eventually hit the ground at their maximum effective range, scattering normally. Of course, such precise burst may also be fired at targets other than vehicles; if fired at troops in the open in this mode, scatter is rolled normally, but the maximum amount of scatter is only 1 meter. Without the precision mode, shots at troops in the open scatter normally, and shots against armored vehicles and suchlike hit as normal (enhanced by the electronic sight).

The XM-192, due to the way it fires and its effectiveness, is generally known to troops who use it as the "Splat Gun" or "Can Opener."

Weapon	Ammunition	Weight	Magazine	Price
XM-192	30x68mm RAM Grenades	5 kg	10 Cassette	\$2670

Weapon	ROF	Round	SS*	Burst*	Range	IFR
XM-192	1/5/10	APERS	3	6/12	30	Nil
	1/5/10	CHEM	3	6/12	230	730
	1/5/10	Flash-Bang	3	6/12	230	730
	1/5/10	Flechette	3	6/12	40	Nil
	1/5/10	HE	3	6/12	230	730
	1/5/10	HEAT	3	6/12	230	730
	1/5/10	HEDP	3	6/12	230	730
	1/5/10	HE Airburst	3	6/12	230	730
	1/5/10	ILLUM	3	6/12	230	730
	1/5/10	Thermobaric	3	6/12	230	730
	1/5/10	WP	3	6/12	230	730

*Halve recoil (rounded up) and add 20% to the range when used from the bipod.

XM-192 Grenade Launcher Ammunition

Round	Round Weight	Round Price	Damage	Penetration
APERS	0.12 kg	\$3	1d6x8	Nil

CHEM	0.23 kg	\$3/\$6/\$9	C2 (B1)	Nil
Flash-Bang	0.18 kg	\$5	(C4)	Nil
Flechette	0.12 kg	\$6	1d6x8	1-2-Nil
HE	0.24 kg	\$5	C2 B11	Nil
HEAT	0.24 kg	\$9	C1 B9	29C
HEDP	0.24 kg	\$6	C2 B11	4C
HE Airburst	0.26 kg	\$9	C3 B14	Nil
ILLUM	0.23 kg	\$3	(B145)	Nil
Thermobaric	0.27 kg	\$15	C6 B6	14C
WP	0.23 kg	\$8	C2 B6	Nil

Sarmac Falconet

Appears in: Various weapons literature of the early-to-mid-1980s.

Country of Origin: Switzerland

Notes: The Falconet was conceived in the late 1970s as a special assault and defensive weapon for infantrymen. Designed by the likes of Francois Brandt (son of Edgar Brandt, that genius of mortar design), the Falconet appears to not have achieved any sales beyond demonstrators, nor employment in even small numbers (or possibly any numbers whatsoever).

Relatively light in weight, the Falconet employed small-caliber grenades of only 24mm in diameter, two types of grenades were contemplated, an offensive grenade with an HEDP warhead and a defensive grenade packed with 12 heavy tungsten flechettes. The grenades were to have been stabilized by fins and by the distribution of weight in the grenade. Operation was by blowback, employing a reciprocating barrel to help absorb recoil as well as a multi-baffle muzzle brake. (Its straight-line profile also helped in this respect.) For carry purposes, the barrel can also be telescoped back to the muzzle brake to provide a more compact package (though it cannot be fired in this configuration). Magazines were to be of light alloy, and coincidentally appeared similar to those of the later Barrett M-82 series. Leaf-type iron sights were to be standard, though a mount for optical sights was provided; the Falconet was intended to be a relatively direct-fire weapon.

Twilight 2000 Notes: The Falconet was employed in small numbers by Swiss and Austrian units; some captured examples were also deployed by other countries, the reports say that NATO special operations units were using them as far away as the Middle East.

Merc 2000 Notes: The Falconet suffered the same fate as it did in real life.

Weapon	Ammunition	Weight	Magazine	Price
Falconet	24mm Medium-Velocity	6 kg	5	\$1682

Weapon	ROF	Round	SS	Burst	Range	IFR
Falconet	SA	HEDP	1	Nil	140	840
	SA	Flechette	1	Nil	80	Nil

*A Falconet normally has a Bulk of 7. In its folded configuration, it has a bulk of 6, but it *cannot* be fired when folded.

Falconet Grenade Launcher Ammunition

Round	Round Weight	Round Price	Damage	Penetration
HEDP	0.15 kg	\$2	C1 B6	17C
Flechette	0.07 kg	\$3	2D6x12	1-1-Nil*

*Penetration of the flechettes against vehicles is 1/1/0/0.

AWS 1911 Machine Pistol

Appears in: Abortive (so far) attempt to produce a PDW in the late 1980s and early 1990s.

Country of Origin: Philippines

Notes: The Elisco Tool Company was started in 1980 to produce the M-16 assault rifle under license from Colt. In 1988, several Filipino agencies (mostly police units) who had read the book *Rimfire Battle Guns* by JM Ramos approached Elisco to produce something even more ambitious – a fully automatic version of the M-1911A1. Wheels turned slowly, but eventually AWS (Automatic Weapon Systems) bought out Elisco and in 1992, Gene Cordero of AWS finally began the design work with help from Ramos, which resulted in functioning prototypes in 1994.

There were several stumbling blocks in the prototypes' design. Perhaps the worst was the massive recoil of the .45 ACP cartridge coupled with the request for the absence of the usual remedy for this problem, a large muzzle brake. (Eventually, a compensated barrel was used.) An additional problem was the lack of magazine capacity of the M-1911A1; even with modified double-stack magazines, and along with the initial prototypes' cyclic rate of 1000 RPM, meant that magazines would be emptied in a split second. Design started over (partially) using Para-Ordnance frame kits, with their higher magazine capacities. A rate reducer along with a special trigger module was tried, with unsatisfactory results; then a burst limiting mechanism was decided upon. A forward-folding foregrip was added. (The locking mechanism for the foregrip is essentially like a miniature bicycle kickstand). Ramos and Cordero had a viable machine pistol, and decided to chamber it in three calibers, though a .40 Smith & Wesson version was designed that never made it off the drawing board.

Then AWS started to go belly up, and then failed entirely. The project ended at that point, unfortunately. That is too bad, because the weapon sounds interesting, and has some merit as a small, concealable PDW. Ramos is still reportedly trying to get the project going again with different companies, shopping the design around.

It should be noted that the weight and barrel length (5 inches) I based these stats on are conjecture. I have not been able to find solid information on these points.

Weapon	Ammunition	Weight	Magazines	Price
AWS 1911	.45 ACP	1.1 kg	14	\$458
AWS-1911	.40 Smith & Wesson	1.1 kg	16	\$361
AWS 1911	.38 Super	1.1 kg	19	\$335
AWS-1911	9mm Parabellum	1.1 kg	19	\$299

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AWS 1911 (.45)	3	2	Nil	1	2	3	14
AWS 1911 (.40)	3	2	1-Nil	1	2	3	16
AWS 1911 (.38)	3	2	1-Nil	1	2	3	14
AWS 1911 (9mm)	3	1	Nil	1	2	3	13

Birdman Weapon Systems BWS M-82B1-P

Appears in: This weapon is an internet hoax, but I have included it as a "what-if." The site for "Birdman Weapon Systems" could be seen at <http://www.birdman.org>, but this site is now defunct.

Country of Origin: US

Fictional Notes: This weapon began life as a Barrett M-82 heavy sniper rifle, but has been drastically modified into a heavy pistol, for use as a close assault weapon. In this version, the stock is removed, and the barrel chopped to little over 1/10th its normal length, with a different style muzzle brake added, along with a pistol grip modified from the M-16A2 assault rifle. The result is a pistol unlike any other, firing a massive cartridge for excellent short-range firepower. This pistol was tested by US Special Forces, and by several police departments, but found most acceptance only with survivalists and exotic weapon collectors.

Weapon	Ammunition	Weight	Magazines	Price
BWS M-82B1-P	.50 Browning Machinegun	7.35 kg	10	\$8595

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-82B1-P	SA	7	2-3-4	4	3	Nil	9

Colt M-1911A1 in 7.62mm Tokarev

Appears in: A rare war trophy from the Vietnam War

Country of Origin: Vietnam

Notes: This weird war trophy was brought back by an unnamed US GI from the Vietnam War. Whether it is unique or not is not known; it is, however, the only one captured and brought back from Vietnam. This interesting M-1911A1 variant was captured from a dead Viet Cong guerilla; it was probably converted to 7.62mm Tokarev because that round was the most common pistol cartridge in Viet Cong and North Vietnamese forces, and .45 ACP could be difficult for them to get. The North Vietnamese were well known for converting a number of weapons chambered for other pistol rounds to fire the 7.62mm Tokarev round. This pistol was eventually donated to a museum in the late 1970s.

The caliber conversion is not the best work in the world, but was obviously not done in the usual crude manner of most Viet Cong caliber conversions, and may have actually been done for them by the North Vietnamese. The work appears to have been done in a well-supplied machine shop, and was done with metric tools. Conversion required a lot of work; the barrel was given a permanent barrel sleeve to accommodate the smaller caliber and a smaller bolt face was machined into the slide after a block of metal was welded to the slide face. The ejection port was enlarged to allow proper ejection of the longer 7.62mm Tokarev round; this meant that part of engagement surface for the rear locking lug was removed, leaving that rear locking lug nothing to lock against. This does reduce the safety margin of firing the pistol, though the pistol does seem to fire without a problem. The grip was modified to take a TT-33 Tokarev magazine, primarily by filing away the front of the magazine well; this makes the front of the grip frame quite thin.

Exactly what the story of this strange conversion is unknown; it seems like a lot of work was done to convert this M-1911A1 to 7.62mm Tokarev, and whether the Viet Cong guerilla thought it was worth it is also unknown. Why the North Vietnamese would do this much work to convert a weapon is another mystery, as is whether or not they converted any other M-1911A1s in the same manner.

Twilight 2000 Notes: I can imagine that this sort of thing might happen a lot in the Twilight 2000 timeline, due to lack of proper ammunition or some other screwy reason. I personally think such "Frankenweapons" would be fairly common in the Twilight 2000 world.

Weapon	Ammunition	Weight	Magazines	Price
Modified M-1911A1	7.62mm Tokarev	1 kg	8	\$241

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Modified M-1911A1	SA	1	Nil	1	3	Nil	9

Colt OHWS

Appears In: US SOCOM OHWS competition, which started in the late-1980s; this was just one of the finalists.

Country of Origin: US

Notes: The Colt OHWS (Offensive Handgun Weapons System) was designed to compete for US SOCOM's need for a new handgun to fulfill both a defensive and offensive role. Though this competition was eventually won by Heckler & Koch's Mk 23, the Colt entry remains an interesting look at H&K's primary competition in that arena.

The Colt OHWS was designed from the start to fire .45 ACP ammunition; moreover, it was capable of firing virtually any sort of .45 ACP ammunition ever designed, from sub-loaded heavy-bullet designs to extremely hot-loaded wildcat versions of the .45 ACP. (In fact, SOCOM indicated at the time that they intended the primary round for the OHWS to be a then-new version of a .45 ACP +P round, with standard .45 ACP ball to be used when a silencer was attached.)

Since none of Colt's pistols (including the M-1911A1) were capable of handling a steady diet of +P ammunition, and it was felt that modifying the M-1911A1 to meet SOCOM's needs would be more expensive than to design a new pistol from scratch, that's what Colt did. Essentially, the Colt OHWS became a melding of the Colt M-1911A1, All-American 2000, Double Eagle, and many entirely new ideas. (Most of SOCOM's requirements were already present in at least one of those three designs, and they just needed to be blended together.)

Instead of using the Browning locking system, Colt used a variant of the All-American 2000's Stoner-designed rotating barrel locking system. The rotating barrel locking system is perhaps the strongest locking system ever designed for a handgun; it does however require a wider slide and much tighter tolerances (making the pistol less tolerant to dirt) than any other handgun locking system. In addition to its strength, it also has the side benefit of reducing recoil somewhat; in addition, recoil becomes more of a "push" than a "thump." The heavy steel frame was modified from that of the M-1911A1, and is mostly machined instead of stamped. The slide of the Colt OHWS was also made of heavy steel (stainless steel in this case), and was designed from scratch. The firing mechanism was a modified M-1911A1 Series 80 mechanism, though the trigger was adjustable for weight of pull, length of pull, and length of reach. Controls were also made ambidextrous. Operation was double-action (with a decocker), and the hammer was of the Commander-type, both modified from the Double Eagle. A slide lock was also added, to stop cycling of the slide and mechanism in cases where this would be too loud.

Since a single-column magazine (at the time) was more reliable in a handgun than a double-column magazine, Colt decided to use a single-column 10-round magazine. (Standard M-1911A1 magazines will not fit in a Colt OHWS, though a Colt OHWS magazine will fit into an M-1911A1, with the end projecting from the pistol grip.) Another problem Colt faced was putting a detachable silencer and a detachable muzzle brake onto the rotating barrel. Therefore, they designed both a silencer and a muzzle brake which attach to the frame rather than the barrel itself, using an extension rail and a toggle switch. The silencer actually fits over the muzzle brake, and cannot be attached without the muzzle brake in place. Various other modifications were made to improve the reliability and smooth operation of the Colt OHWS, plus touches like a rail under the dust cover for accessories, micrometer-adjustable rear sights, and some other things that SOCOM asked for.

In testing by SOCOM, a number of problems were found that would eventually lead to the rejection of the Colt OHWS. The Colt OHWS was felt to be too heavy, as well as being too tall due to its single-column magazine. The rail under the dust cover was too proprietary, allowing only certain accessories to be used without a special interface. The barrel (though not the locking system itself) turned out to be not durable enough when firing a lot of +P ammunition. In addition, the entire pistol's design was very complicated and difficult to strip and care for.

Just to add the icing to the whole rotten cake, Colt was in great financial chaos at the time; the Colt OHWS was one product that

was extremely expensive. Though modifications were made to correct the barrel failure problem and some other issues, it caused Colt even more unneeded expense, and SOCOM was leery of a company in such dire financial straits. The H&K entry was also, unfortunately, a superior weapon in almost all areas. The Colt OHWS was doomed, and became another interesting failed weapon.

Weapon	Ammunition	Weight	Magazines	Price
Colt OHWS	.45 ACP and .45 ACP +P	1.59 kg	10	\$411
Colt OHWS (w/Brake)	.45 ACP and .45 ACP +P	1.69 kg	10	\$461
Colt OHWS (w/Silencer)	.45 ACP	2 kg	10	\$588

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Colt OHWS (.45 ACP)	SA	2	Nil	1	2	Nil	14
Colt OHWS (.45 ACP +P)	SA	2	1-Nil	1	2	Nil	17
Colt OHWS (.45 ACP, Brake)	SA	2	Nil	1	1	Nil	14
Colt OHWS (.45 ACP +P, Brake)	SA	2	1-Nil	1	1	Nil	17
Colt OHWS (.45 ACP, Silencer)	SA	2	Nil	3	2	Nil	12

Colt SCAMP

Appears in: Experiments to increase the firepower of the pistol in the late 1960s.

Country of Origin: US

Notes: At the end of the 1960s, a lot of rumors were going around the firearms industry that the US Army was looking for a replacement for the M-1911A1. (I'm not sure if they were simply rumors at this time, or these were the first inklings of the idea that led to the M-9.) Since Colt had been supplying the US military's standard sidearm for what was then about 50 years, it was natural for Colt to feel that the US Army would come to them first – and that the Army might be open to replace some of the M-1911A1s with something completely different. In addition, such a pistol would be ideal as a defensive weapon for aircrews, and as an offensive handgun for special operations and other covert personnel. At about the same time period, the concept of a PDW (Personal Defense Weapon) was emerging. The result was the SCAMP (Small CALiber Machine Pistol).

The SCAMP was a burst-firing machine pistol firing a high-powered .22-caliber round (similar in concept to the M-16 series). The round used was a heavily-modified .22 Hornet, with a rather large propellant load. The SCAMP was built largely of stainless steel, though the receiver and some other parts (such as the grip panels) were made of high-impact plastic reinforced with glass fiber. The SCAMP was a bit large and heavy, but not much more than the M-1911A1, and could easily put rounds of reasonable power (for a pistol) downrange far quicker than the M-1911A1, making it useful for suppressive fire as well as aimed fire. The 7-inch barrel was tipped with compensating slots to help mitigate recoil. The cyclic rate of fire was extremely high at 1500 rpm, so Colt engineers used a 3-round burst mechanism to prevent wasteful (and inaccurate) automatic fire. In both semiautomatic and automatic modes, the trigger pull was light and smooth, and the SCAMP is said to have been easy to fire accurately.

The SCAMP, however, was a victim of bad timing. Colt was ready for production in 1972; though the military was reportedly quite impressed by the SCAMP, the long and expensive war in Vietnam meant that there wasn't any funding for the SCAMP or any other large acquisitions of new small arms. In addition, the round the SCAMP fired was proprietary, something that would cause all sorts of supply chain headaches and require even more expense. These factors meant that the promising SCAMP never went far beyond the prototype phase, and only 12 SCAMPs were ever built.

Twilight 2000 Notes: Production was picked up again in 1993 after clamoring by US pilots for a more lethal weapon after they were shot down. It was then picked by special operations aircrews as a sidearm, and by CIA and DIA personnel as concealable automatic weapon.

Merc 2000 Notes: 11 of the prototypes are accounted for, but one is missing and was last used in a bank robbery in December of 2002.

Weapon	Ammunition	Weight	Magazines	Price
SCAMP	.22 SCAMP	1.38 kg	27	\$628

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SCAMP	3	2	1-1-Nil	2	2	3	17

Dardick

Appears in: An experimental/limited production weapon designed in the late 1950s by David Dardick.

Country of Origin: US

Notes: This unusual revolver design featured an open cylinder (i.e., the chambers are open to the outside of the cylinder) and a modified type of round known as a "Tround" (triangular round). The name of Tround was applied because while the bullet and the stub casing containing the primer are made of conventional metals, the rest of the "casing" is a short polycarbonate rod with a triangular cross-section. Though using a revolving cylinder, the Dardick is in fact a type of semiautomatic pistol, being fed from a magazine and the cylinder only a device to feed the rounds into the firing mechanism.

While the standard ammunition for Dardick pistols was its special Trounds, it quickly became apparent that the manufacture of the Trounds could not keep up with supply. Therefore, reusable "Tround Adapters" were devised; using these, the Dardick was capable of

firing standard .38 Special, .38 Smith & Wesson, .38 Super, and 9mm Parabellum rounds. The user simply pushed the rounds into the adapters (it's a tight fit), and after firing, takes a rod and pushes the spent casings back out of the adapters (also a tough job). In addition, a special Tround Adapter was made to enable the firing of .22 Short, .22 Long, and .22 Long Rifle rounds with the Model 1100; however, this also requires a barrel change (quite easily done). The grip magazine is not detachable; the Dardick is loaded by opening the feed door on the left side of the grip and either inserting loose Trounds or using a special stripper clip.

Construction of the grip and frame is in two halves, made from cast aluminum. While this was not difficult once the manufacturing equipment was set up, making the molds for those grip/frame halves was tedious and exacting work and was expensive and time-consuming. The cylinder and trigger unit was sort of a Rube Goldberg-type nightmare, requiring over 50 parts and requiring much precision machining and hand fitting; in addition, many of the parts were quite small (even tiny in some cases). The grip/frame/cylinder/trigger combination was reportedly quite fragile. The barrels were made from steel, and were basically conventional; sights were basically notch-and-blade types, though they were unusually high. Three models of the Dardick were built, each with different magazine sizes; those magazine capacities were fairly high for the time, as it turned out that Trounds stack quite well in a magazine. A carbine conversion kit was also available for use with the Model 1500 (when used with .22 Rimfire ammunition); the Dardick's barrel was removed and the rest of the pistol put into the CCU. (Though described as a carbine conversion unit, the barrel length of 23.5-inch barrel is more rifle-length.) This unit is also extremely rare.

All this meant that the Dardick was an expensive weapon to produce and buy. Add to that the unusual ammunition, and the result is that less than 100 were built (mostly Model 1500s). The Model 1100 is extremely rare, and the Model 2000 is rarely seen and may have only existed in prototype form. The lack of sales led David Dardick to end production in 1960, and in 1962 he sold the design to Numrich Arms. Numrich Arms attempted to modify the Trounds to be based upon 9mm Parabellum bullets and stub cases, but the results were unsatisfying, and the bosses at Numrich were reticent to fire many Trounds through the remaining Dardicks due to their high collector value. Numrich later sold the design to the Gun Parts Corporation; while they have not done anything with the design, they still have a large number of parts for the Dardick in their inventory, as well as Tround Adapters and even some actual Tround ammunition.

Weapon	Ammunition	Weight	Magazines	Price
Dardick M-1100 (3" Barrel)	.38 Dardick, 9mm Parabellum, .38 Smith & Wesson, .38 Special, .38 Special	0.91 kg	11 Clip	\$314
Dardick M-1100 (3" Barrel)	.22 Short, .22 Long, .22 Long Rifle	0.84 kg	11 Clip	\$289
Dardick M-1100 (6" Barrel)	.38 Dardick, 9mm Parabellum, .38 Smith & Wesson, .38 Special, .38 Special	0.96 kg	11 Clip	\$344
Dardick M-1100 (6" Barrel)	.22 Short, .22 Long, .22 Long Rifle	0.85 kg	11 Clip	\$317
Dardick M-1500 (3" Barrel)	.38 Dardick, 9mm Parabellum, .38 Smith & Wesson, .38 Special, .38 Special	0.93 kg	15 Clip	\$318
Dardick M-1500 (3" Barrel)	.22 Short, .22 Long, .22 Long Rifle	0.86 kg	15 Clip	\$293
Dardick M-1500 (6" Barrel)	.38 Dardick, 9mm Parabellum, .38 Smith & Wesson, .38 Special, .38 Special	0.98 kg	15 Clip	\$348
Dardick M-1500 (6" Barrel)	.22 Short, .22 Long, .22 Long Rifle	0.91 kg	15 Clip	\$321
Dardick M-2000 (3" Barrel)	.38 Dardick, 9mm Parabellum, .38 Smith & Wesson, .38 Special, .38 Special	1.09 kg	20 Clip	\$371
Dardick M-2000 (6" Barrel)	.38 Dardick, 9mm Parabellum, .38 Smith & Wesson, .38 Special, .38 Special	1.14 kg	20 Clip	\$406
Dardick M-1500 w/CCU	.22 Short, .22 Long, .22 Long Rifle	1.97 kg	15 Clip	\$420

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Dardick M-1100 (3", .38 Dardick)	SA	2	Nil	1	3	Nil	5
Dardick M-1100 (3", 9mm)	SA	1	Nil	1	3	Nil	6
Dardick M-1100 (3", .38 S&W)	SA	1	Nil	1	3	Nil	6
Dardick M-1100 (3", .38 Special)	SA	1	Nil	1	3	Nil	4
Dardick M-1100 (3", .38 Super)	SA	2	Nil	1	3	Nil	7
Dardick M-1100 (3", .22 Short)	SA	-2	Nil	1	2	Nil	4

Dardick M-1100 (3", .22 Long)	SA	-2	Nil	1	2	Nil	5
Dardick M-1100 (3", .22 Long Rifle)	SA	-1	Nil	1	2	Nil	5
Dardick M-1100 (6", .38 Dardick)	SA	3	1-2-Nil	1	3	Nil	14
Dardick M-1100 (6", 9mm)	SA	1	Nil	1	3	Nil	15
Dardick M-1100 (6", .38 S&W)	SA	2	Nil	1	3	Nil	15
Dardick M-1100 (6", .38 Special)	SA	2	Nil	1	3	Nil	12
Dardick M-1100 (6", .38 Super)	SA	3	1-Nil	1	3	Nil	16
Dardick M-1100 (6", .22 Short)	SA	-2	Nil	1	2	Nil	8
Dardick M-1100 (6", .22 Long)	SA	-1	Nil	1	2	Nil	10
Dardick M-1100 (6", .22 Long Rifle)	SA	-1	Nil	1	2	Nil	11
Dardick M-1500 (3", .38 Dardick)	SA	2	Nil	1	3	Nil	5
Dardick M-1500 (3", 9mm)	SA	1	Nil	1	2	Nil	6
Dardick M-1500 (3", .38 S&W)	SA	1	Nil	1	3	Nil	6
Dardick M-1500 (3", .38 Special)	SA	1	Nil	1	3	Nil	4
Dardick M-1500 (3", .38 Super)	SA	2	Nil	1	3	Nil	7
Dardick M-1500 (3", .22 Short)	SA	-2	Nil	1	2	Nil	4
Dardick M-1500 (3", .22 Long)	SA	-2	Nil	1	2	Nil	5
Dardick M-1500 (3", .22 Long Rifle)	SA	-1	Nil	1	2	Nil	5
Dardick M-1500 (6", .38 Dardick)	SA	3	1-2-Nil	1	3	Nil	14
Dardick M-1500 (6", 9mm)	SA	1	Nil	1	3	Nil	15
Dardick M-1500 (6", .38 S&W)	SA	2	Nil	1	3	Nil	15
Dardick M-1500 (6", .38 Special)	SA	2	Nil	1	3	Nil	12
Dardick M-1500 (6", .38 Super)	SA	3	1-Nil	1	3	Nil	16
Dardick M-1500 (6", .22 Short)	SA	-2	Nil	1	2	Nil	8
Dardick M-1500 (6", .22 Long)	SA	-1	Nil	1	2	Nil	10
Dardick M-1500 (6", .22 Long Rifle)	SA	-1	Nil	1	2	Nil	11
Dardick M-2000 (3", .38 Dardick)	SA	2	Nil	1	2	Nil	5
Dardick M-2000 (3", 9mm)	SA	1	Nil	1	2	Nil	6
Dardick M-2000 (3", .38 S&W)	SA	1	Nil	1	2	Nil	6
Dardick M-2000 (3", .38 Special)	SA	1	Nil	1	2	Nil	4
Dardick M-2000 (3", .38 Super)	SA	2	Nil	1	2	Nil	7
Dardick M-2000 (6", .38 Dardick)	SA	3	1-2-Nil	1	2	Nil	14
Dardick M-2000 (6", 9mm)	SA	1	Nil	1	2	Nil	15
Dardick M-2000 (6", .38 S&W)	SA	2	Nil	1	2	Nil	15
Dardick M-2000 (6", .38 Special)	SA	2	Nil	1	2	Nil	12
Dardick M-2000 (6", .38 Super)	SA	3	1-Nil	1	2	Nil	16
Dardick M-1500/CCU (.22 Short)	SA	-2	Nil	6	1	Nil	39
Dardick M-1500/CCU (.22 Long)	SA	-1	Nil	6	1	Nil	43
Dardick M-1500/CCU (.22 Long Rifle)	SA	1	Nil	6	1	Nil	47

Fletcher Safestop Pistol

Appears In: Custom Modification produced by R "Fuzzy" Fletcher, a noted gun experimenter

Country or Origin: US

Notes: R "Fuzzy" Fletcher designed this pistol when experimenting with .38 Magnum rounds in a 1911-type pistol. As far as I know, it is a one-off.

Fuzzy wanted to "scratch an itch" that had existed with him for some time: produce a .45 pistol, preferably a 1911, that could reproduce the ballistics and stopping power of a .357 Magnum round. After much experimenting and luck, Mr Fletcher arrived at a .45 ACP case necked down to accept a .357 Golden Saber wadcutter bullet. He used a standard-length 5-inch barrel (suitably down-sized), and used a 20-pound mainspring and a shock buffer. Mr Fletcher found that the flat-nosed bullet is more likely to dump its energy into a soft target and unlikely to spin or ricochet. He also benefitted from the experiences of police acquaintances, and a few FBI acquaintances as well. He also used wadcutters into which he had cut an "X" shape into the flat head. The barrel is a modified .38 Super barrel of the same length.

Weapon	Ammunition	Weight	Magazines	Price
Safestop	.38/45 Safestop	1.11 kg	6	\$283

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Safestop	SA	3	1-Nil	1	3	Nil	13

Gallagher Custom Revolvers

Appears in: Custom modification produced by John Gallagher, master weaponsmith

Country of Origin: US

Notes: John Gallagher runs a small custom gunsmithing shop dedicated to making unusual and custom versions of contemporary firearms, usually based on older designs because in his mind, they are more strongly-built and better able to take custom conversions.

One of these is a modification of the Ruger Single Six (Old Model) in .22 caliber with a 5.5-inch barrel into a .41 Magnum-firing version with a shorter and handier 4.625-inch barrel. Mr. Gallagher feels that the .41 Magnum is an under-used round which gets little respect, and therefore is interested in guns which fire this caliber. The Old Model Single Six is required for this conversion, as the New Model has a transfer bar safety which does afford the room to open up the loading port enough for the much bigger .41 Magnum round. The firing pin is changed to centerfire, and the cylinder, though it remains the same size, now holds only five rounds. The flattop frame is left as it is, as is the rear dovetailed sight, while the front sight is changed to a post-type slanting forward and serrated. Other modifications include a Belt Mountain locking base pin, a trigger tuned to 2.5 pounds of pull, a polished blue finish, and grips of exotic wood.

Another Gallagher modification is a light pocket pistol based on the New Model Ruger Single Six, and with the caliber changed to .38 Special. The barrel is shortened to 3.75 inches and tapered, the ejector rod, housing, and receptacle have all been removed and replaced by a smaller unshrouded ejector rod, and the front of the frame has been stepped down to further save weight along with the recoil shield and loading gate. The hammer is replaced by a Bisley-type hammer, the grips are rounded, smoothed, and re-finished. The front sight is a small serrated blade, and one of the few parts that project from the weapon.

John Gallagher also rechambered a Smith & Wesson 28-2 Highway Patrolman from .357 Magnum to .45 Long Colt. The barrel for this modification is cut to 5 inches, bored out to .45 caliber and tapered, refitted with a post-type front sight ramp, and the trigger tuned to 3 pounds. This was done at the request of noted revolver guru John Taffin, who wanted a weapon like the Smith & Wesson 1950 target, but in .45 Long Colt. This modification is designed specifically for semi-wadcutter bullets, but can shoot most other bullets equally well.

One of John Gallagher's favorite conversions is Ruger Old Model Blackhawk in .357 Magnum, re-chambered for .44 Special. The cylinder is replaced by a larger one (and a larger frame window), a 4-inch barrel, and a cut-down ejector rod housing and ejector rod. The rear sight is a Bowen adjustable sight, while the front sight is a sloping serrated blade. The hammer is taken from an Old Model Super Blackhawk. The trigger pull is set at 2.5 pounds.

At one time, Ruger offered the Ruger Maximum Blackhawk, a revolver chambered for the rare .357 Maximum round. It was quickly dropped from production due to lack of public interest, but John Gallagher has made a modified form of it, firing the equally-exotic .445 SuperMag round. The original revolver was rechambered for the new round, and a Bisley-type grip frame was fitted, along with a Bisley-type hammer, trigger, and exotic wood grips. The barrel is a full 10 inches. The rear sight is an adjustable Bowen sight, while the front is a blade fitted onto a rifle ramp. The revolver is finished in polished blue, and the trigger is set to 3.625 pounds. Though the revolver is designed specifically for .445 SuperMag, it will also fire .44 Magnum and .44 Special.

Another Ruger Maximum Blackhawk modification is for .500 Smith & Wesson Magnum. The cylinder is changed to a 5-shot, and the revolver has a 5.5-inch octagonal heavy barrel with an integral ramp front sight with a post blade. The rear sight is a Bowen adjustable sight. The grip frame, hammer, and trigger are of the Bisley-type. The finish is matte blue with a nickel hammer.

Using a New Model Ruger Blackhawk as a base, John Gallagher designed a pistol for varmint hunting. This is rechambered for .32-20, has an 8-shot cylinder, and one of several barrel lengths. The finished for the frame is color case-hardened, the grips are Gallagher custom grips, the rear sight is a Bowen adjustable sight, and the front sight is a post. The combination of a heavy frame and a light caliber make for a revolver which is very pleasant to shoot.

Twilight 2000 Notes: John Gallagher does most of his work reworking and repairing standard revolvers, but also makes several custom guns upon request.

Weapon	Ammunition	Weight	Magazines	Price
Gallagher Single Six	.41 Magnum	1.11 kg	5 Cylinder	\$218
Gallagher Single Six	.38 Special	0.74 kg	6 Cylinder	\$163
Gallagher S&W 28-2	.45 Long Colt	1.23 kg	6 Cylinder	\$257
Gallagher Blackhawk	.44 Special	1.02 kg	6 Cylinder	\$210
Gallagher Blackhawk (4.5" Barrel)	.32-20 Winchester	1.11 kg	6 Cylinder	\$158
Gallagher Blackhawk (6.5" Barrel)	.32-20 Winchester	1.17 kg	6 Cylinder	\$178
Gallagher Blackhawk (7.5" Barrel)	.32-20 Winchester	1.19 kg	6 Cylinder	\$188
Gallagher Maximum Blackhawk	.445 SuperMag, .44 Magnum, and .44 Special	1.41 kg	6 Cylinder	\$329
Gallagher Maximum Blackhawk	.500 S&W Magnum	1.32 kg	5 Cylinder	\$357

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Gallagher Single Six (.41)	SAR	3	1-Nil	1	4	Nil	10
Gallagher Single Six (.38)	SAR	2	Nil	1	4	Nil	6
Gallagher S&W 28-2	DAR	2	1-Nil	1	5	Nil	11
Gallagher Blackhawk (.44 Special)	SAR	2	1-Nil	1	4	Nil	8
Gallagher Blackhawk (4.5", .32-20)	SAR	1	Nil	1	3	Nil	6

Gallagher Blackhawk (6.5", .32-20)	SAR	2	Nil	1	3	Nil	10
Gallagher Blackhawk (7.5", .32-20)	SAR	2	1-Nil	1	3	Nil	12
Gallagher Maximum Blackhawk (.445)	SAR	5	1-2-Nil	2	5	Nil	25
Gallagher Maximum Blackhawk (.44 Magnum)	SAR	4	1-Nil	2	5	Nil	28
Gallagher Maximum Blackhawk (.44 Special)	SAR	2	1-Nil	2	5	Nil	25
Gallagher Maximum Blackhawk (.500)	SAR	5	1-2-Nil	2	5	Nil	13

Gerasmenko VAG-72/73

Country of Origin: Soviet Union

Appears in: Experiment by Vladimir Gerasmenko in the 1970s

Notes: Vladimir Gerasmenko was a Soviet industrialist supervisor who oversaw several projects at industrial plants throughout Kiev. In his spare time, he designed small arms and improved existing Soviet small arms; some of his improvements actually made it into current Soviet weapons or into their manufacturing methods. Gerasmenko invented, amongst other small arms, the VAG-72 and VAG-73 pistols, which were innovative for the ammunition they used and, in the case of the VAG-73, the feed method. The two pistols fired semi-caseless ammunition, similar to the later 9mm AUPO rounds designed for the Italian AUPO submachinegun. The round had most of the propellant charge in a hollow cavity in the rear of the bullet, and the rest in the small brass case, which contained a small part of the charge and the primer. When the round is assembled, the base is screwed into the base of the bullet. This small case is the only part that exits the pistols as a "spent shell." The bullets were steel, and had armor-piercing qualities. The barrel was 4.8 inches long and heavy; this would become important in the VAG-73, but was also present on the VAG-72. Both pistols also had a large recoil spring under the barrel in a cylinder, in lieu of a dust cover. The slide has several cooling holes at the front and continuing to the middle of the slide, cooling almost the entire barrel. Grip for the VAG-72 was wood, wrap-around, and made to fit the frame; this proved too expensive and difficult to make, so the VAG-72 had plastic grip plates. Both were smooth. The ejection port is quite large for the small case to be ejected, in case a jam needed to be cleared. Fire controls are above the trigger under the slide, and within reach of the firing finger. The operation is DA/SA, and there is no slide lock or hold-open feature, or manual safety.

The VAG-72 is essentially a standard semiautomatic pistol, except for the ammunition. It holds a single-stack magazine, with a rather long grip to hold the capacious magazine. The VAG-73 is a machine pistol, with no burst controller, but with a pneumatic device to hold down the cyclic rate. The magazine is dual-stack, but with one stack in front of the other; it is essentially two VAG-72 magazines joined together. (The grip is rather wide because of this.) The magazine feeds from the top of front of the magazine, with rounds from the rear compartment moving into the front of the magazine.

Ironically, the pistols themselves were good designs and not the problem with the weapons; the innovative ammunition, on the other hand, presented lots of problems. The ammunition offered no advantages over conventional ammunition except taking up less room; it was more difficult and time-consuming to manufacture and cost more to produce. The difficulties with producing the ammunition included obturation, maintaining the proper headspace between the case and bullet, and excessive fouling of the barrel. Special equipment was also necessary to produce it, also expensive.

The military never had more than a passing interest in these pistols, except that they did test them; they were quickly rejected, with no chance for improvement to the design. Only one of each pistol was produced, they are currently in the Artillery Museum in St Petersburg, along with some of the ammunition for the pistols.

Weapon	Ammunition	Weight	Magazines	Price
VAG-72	7.62mm Semi-Caseless	1.1 kg	24	\$314
VAG-73	7.62mm Semi-Caseless	1.2 kg	48	\$389

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
VAG-72	SA	2	1-Nil	1	2	Nil	7
VAG-73	10	2	1-Nil	1	1	7	7

Hecker & Koch G-11 PDW

Appears in: Heckler Koch literature of the early 1980s

Country of Origin: Germany

Notes: This is a machine pistol designed to use caseless ammunition. It is not really related to the G-11 assault rifle, other than the name and its use of caseless ammunition. The G-11 PDW uses a shortened form of the ammunition used by the G-11 (4.7x25mm Caseless), and is rather a large pistol. The magazines consist of a 20-round magazine that would sit flush with the grip, and an extended 40-round magazine. The G-11 PDW was never developed beyond the ammunition and a wooden model, but shows how a family of weapons evolves. The G-11 PDW was designed to be the machine pistol/PDW version of the G-11 family, used to arm rear-area troops.

Weapon	Ammunition	Weight	Magazines	Price
G-11 PDW	4.7mm Caseless Short	1.5 kg	20, 40	\$168

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
G-11 PDW	3	1	Nil	1	2	2	13

Heckler & Koch HK-45

Appears in: Unofficial Heckler & Koch company literature

Country of Origin: Germany

Notes: Unlike most of the weapons shown here, the HK-45 actually has a chance of existing in production form – possibly in the near future. The HK-45 is essentially a highly-modified mix of the USP-45 and P-2000, tailored for the needs of the US military. Its origin is a brainstorming session between two gunsmiths, Ken Hackathorn and Larry Vickers, both noteworthy custom pistolsmiths. (Larry Vickers is in fact retired from the US Army Special Forces – and rumored to have been a member of Delta Force, though of course the Army will *never* confirm this.) Since Larry Vickers now works for the US arm of Heckler & Koch Defense, he was in a unique position to pitch their development to the company.

The USP-45 and P-2000 both have problems from the military standpoint – the grip angle is bad, balance is a bit off, controls can be a bit difficult to use from the shooting hand, and the magazine springs of both of them are a bit weak and tend to get weaker when carried or stored loaded for long periods, leading to feed failures. Tailoring pistols to the individual mission and/or shooter can easily correct these problems, but is not practical for a general-issue military weapon. And it is a poorly-kept secret that the US military is unhappy with the lack of stopping power of the 9mm Parabellum round fired by the M-9, and that it is looking for something firing the .45 ACP round.

Enter the HK-45. So far, only five advanced prototypes and several less-refined prototypes have been built for evaluation purposes, but it does look quite promising, both to the US military and to several other countries who are looking for a better pistol for their special operations units. The grip angle is more ergonomic than the USP-45 or P-2000, and it also comes with interchangeable backstraps to allow it to fit different-sized hands. Though designed to use a *very* light coating of lubricant, it will shoot for a long time with no lubrication whatsoever, and can even use dry or “wet” lubricant with equal efficiency. The trigger unit is light, yet not too light, and yields quick, accurate pulls. The trigger unit can also be exchanged with ones allowing for lighter or heavier pull weights. (It is essentially a better-tuned version of the USP’s trigger unit, with some features from the P-2000.) Magazine capacity is larger than those of the M-1911, but not too large, allowing for more firepower yet less spring fatigue, and improved springs help this greatly. The frame is polymer; prototypes are colored OD green or desert tan, but other colors can be easily made. Controls are ambidextrous and also ergonomic, even for small hands. They are also done “American style” instead of “European style.” The HK-45 uses the LEM trigger system, which eliminates the need for a decocker. On the dust cover, molded into the frame, is a MIL-STD-1913 rail. The trigger guard is large to allow use with a gloved hand, and the front of the trigger guard is somewhat squared to allow those who like to put a finger of the nonfiring hand on the trigger guard to do so. Sights are dehorned 3-dot types; all dots are in white, but the sights can be interchanged for ones with tritium inlays. The barrels extend slightly from the slide and frame; they are also threaded and have an O-ring-type attachment point, allowing for the attachment of virtually any sort of silencer.

Two versions of the HK-45 have thusfar been developed: the full-sized HK-45, with a 4.4-inch barrel, and the HK-45C, with a 3.8-inch barrel. The HK-45 uses a 10-round magazine as standard, while the HK-45C has a shorter grip and uses an 8-round magazine as standard; however, both versions can use each others’ magazines. (When the HK-45C uses the 10-round magazine, a special adapter can be attached to the bottom of the magazine to cover the bottom of the magazine, which protrudes when used with the HK-45C.)

Whether or not the HK-45 is picked up by the US military (and what its eventual designation will be) is unknown, nor is it known at this point whether the HK-45 will even be put into production. I personally hope so, even though I will never get a chance to fire one. I’ve used both the M-1911A1 and M-9, and I greatly prefer the M-1911A1 to the M-9.

It should be noted that the stats below are provisional; since experimentation with the HK-45 is still ongoing, the eventual size and weights of the pistols has still not be finalized.

Twilight 2000 Notes: Whether or not the HK-45 is ever mass-produced, it would not be available in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
HK-45	.45 ACP	0.79 kg	8, 10	\$403
HK-45C	.45 ACP	0.68 kg	8, 10	\$396

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
HK-45	SA	2	Nil	1	4	Nil	12
HK-45C	SA	2	Nil	1	4	Nil	10

Heckler & Koch P-46 UCP

Appears in: Though company literature lists it, it does not appear to be for sale yet

Country of Origin: Germany

Notes: Like the HK-45, the P-46 UCP (Ultimate Combat Pistol) probably falls into the category of “weapons that may yet be.” Rumors say it is being tested by the Bundeswehr and certain German police units, and may even have been combat tested in Bosnia and possibly Afghanistan, though results of field testing and possible combat testing have not been released to the public at the time of this writing (early April 2007). The earliest prototypes of the P-46 apparently appeared in 2002 shortly after the advent of the MP-7 PDW, though it is still officially considered by Heckler & Koch and the Bundeswehr as being in advanced prototype form which is in limited production for testing purposes, and the design, as it exists now, is still not finalized. Though most of these prototypes are full-sized versions, though it is possible that a compact version also exists. (I have included stats for a possible compact version below,

though it is purely conjecture on my part. For that matter, a lot of this is conjecture at this point...) Another version is also planned, which has a barrel extension in order to accept a suppressor which is being designed by Brügger and Thomet.

The P-46 appears to be at least partly based on the P-2000; externally, the two pistols look similar, including the exchangeable backstraps to fit different-sized hands. Operation delayed blowback, though exact internal workings are still unknown. The magazine release, manual safety, and slide lock lever are all ambidextrous. Below the dust cover is a MIL-STD-1913 rail for the mounting of accessories. The P-46 is said to be equipped with a modular trigger system which allows the use of several different trigger units, from a standard non-adjustable military trigger unit to one which allows for great adjustment of the trigger and hammer. Currently, the prototypes are being used with a 20-round magazine, but future plans include the use of magazines of the MP-7. And of course there is the ammunition – the P-46 uses the same round as the MP-7 PDW.

Weapon	Ammunition	Weight	Magazines	Price
P-46	4.6mm HK PDW	0.85 kg	20	\$400
P-46 Compact	4.6mm HK PDW	0.82 kg	20	\$387
P-46 (Silenced)	4.6mm HK PDW Subsonic	1.06 kg	20	\$506

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
P-46	SA	2	1-Nil	1	3	Nil	11
P-46 Compact	SA	2	Nil	1	3	Nil	8
P-46 (Silenced)	SA	2	Nil	2	2	Nil	9

Hower 12-Shot LeMat

Appears In: A project by Kenneth Hower to produce a modern version of the LeMat revolver. It is a one-off, made just for fun.

Country of Origin: US

Notes: Clint Thompson of *American Handgunner* magazine went out to his father's place in Oklahoma in late 2016 for an afternoon of visiting and shooting. While he was there, he took Clint over to a friend's house to see his 12-shot revolver. It was the biggest revolver Clint had seen in his life! (See the weight figure below, and be amazed.) Though it follows most of the planform of the LeMat, it is much bigger, because Kenneth had always thought the LeMat was not built heavy enough for its ammunition, especially the central smoothbore barrel. The massive cylinder also makes it much larger and heavier, along with the ammunition it fires. The barrels (both of them), are roughly 6.5 inches long and heavy. The basic cylinder ammunition it fires is powerful. For the central bore, Kenneth did not want to run afoul of the BATFE and have his LeMat classified as a destructive device or short-barreled shotgun, so he cheated a little bit and developed a new round, the .50-28 Hower, naming after the bore of the barrel and the original caliber of the LeMat's central smoothbore barrel. Kenneth's central barrel, however, is rifled, so it is classed as a handgun by the BATFE. The .50-28 Hower round can fire a solid lead projectile or a load of shot, as the .50-28 Hower is basically a brass 28-gauge shell.

Mr Hower built his revolver with amazing craftsmanship, fit, and finish. It is a single-action weapon, like the original, and cocking back the hammer exposes the cylinder/central barrel selector. The finish is mostly color case-hardened.

After an ample amount of firing the beast for fun, Kenneth Howell donated his new revolver to NRA Museum in Raton, New Mexico.

Weapon	Ammunition	Weight	Magazines	Price
Hower LeMat	.357 Maximum and .50-28 Hower	4.99 kg	12 Cylinder and 1 Internal	\$316

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Hower LeMat (.357)	SAR	3	1-1-Nil	2	1	Nil	18
Hower LeMat (.50-28, Shot)	SAR	1d6x16 or 2d6x4	Nil or 1-Nil	2	3	Nil	12
P-46 (Silenced)	SAR	4	1-2-Nil	2	3	Nil	14

MBA Gyrojet Pistol

Appears in: Weapon experiments conducted in the US in the early 1960s, and later Vietnam

Country of Origin: US

Notes: The idea of a firearm with rocket-powered ammunition is nothing new; it dates back to the Chinese in roughly 1200. More contemporary experiments with rocket rounds include weapons based on flintlock muskets dating from 1810, the 1834 Danish Voss "rocket ball" shoulder launcher, and a Walther-designed pistol designed during World War 2 in an attempt to save valuable brass (but never attained production status). The US Navy is said to have copied this Walther design after World War 2 for experimentation of their own, but results of these tests have never been published, and records of Walther's experimentation are likewise almost nonexistent. MBA's Gyrojet Pistol attempted to bring the concept up to date, but fell flat on its face in the process. Many firearms experts still believe the concept was sound, but way ahead of its time.

In 1960, Dr. Robert Mainhardt and Dr. Arthur T Biehl of the US began to develop a rocket-firing pistol of their own. Their idea was to produce a handgun with virtually no recoil, and would also be inexpensive (as such a handgun could be made with almost no moving parts), easy to use, produced no expended brass, and would have a unique psychological effect on an attacker, as the sound

and visual effects of a rocket-powered round would be very different from conventional rounds. Interestingly, at the time of development, Mainhardt and Biehl had no military or civilian sales in mind; their target was civilian sales.

Mainhardt and Biehl came up with a pistol called the Gyrojet (named for the spin stabilization produced by rocket vents and the rocket propulsion of the round). The pistol itself was made from a light aluminum alloy called Zamac, made from 93% light aluminum alloy and 7% silicone. The pistol could be made of such a lightweight alloy since the firing of the Gyrojet rounds produced virtually no internal stresses on the weapon, and the silicone part of Zamac made cleaning easy and meant that lubrication was not necessary for a Gyrojet pistol. The only steel components are the few parts of the Gyrojet pistol that do encounter high repeated stresses, such as the mechanism that loads rounds from the magazine (consisting of one moving part and two springs) and the hammer.

Though early in experimentation, MBA used a 12mm round, they quickly changed the caliber to 13mm since there were ready sources of 13mm-wide steel tubes. (More on the effects of this costly decision later.) The Gyrojet Mk 1 was a pistol that was rather large in size (10.88 inches long), it is was still very light in weight. The smoothbore barrel was 5 inches in length, with porting on the sides along almost its entire length; these ports directed the exhaust of rockets out and slightly forward. The grip plate on the right side had a small cut-away section at the top front, allowing the shooter to see whether or not he was low on ammunition. Sights were fixed, with a simple V-notch at the rear and blade at the front. The exhaust of the rounds also drove the magazine loading mechanism. The Gyrojet pistol had no removable magazine; rounds were inserted through the bottom of the grip. The “hammer” is actually in front of the round when it is chambered; the “hammer” (more of a rammer) slams the round against the fixed firing pin at the rear. As the round travels down the barrel, it cocks the hammer. The entire effect was to balance what little recoil forces the round produced with the small movements of the firing mechanism, producing recoil only 1/5 of what could be expected of a similar-caliber conventional handgun. The launch of the Gyrojet round itself produced only a soft *whoosh* – the round itself, still accelerating as it left the barrel, did not break the sound barrier until it had traveled a little over 15 meters, at which point one heard the normal *crack* of a supersonic firearm projectile.

That said, the Gyrojet Pistol had a *lot* of problems, almost entirely the result of its ammunition. The muzzle velocity of the Gyrojet round was only 30-40 mps, though it increased dramatically to nearly 400 mps at 15 meters, and then tapered off slowly from that point (the propellant ran out by the time the round had traveled 15 meters). What this meant was that the Gyrojet Pistol had extremely screwy performance – below 15 meters, the Gyrojet round was unable to penetrate a thin sheet of cloth mounted on cardboard. (In one experiment, one of the testers held a piece of cardboard *against* the muzzle – and stopped the Gyrojet round from even *leaving* the barrel when it was fired). At 15 meters, the Gyrojet round could fully penetrate a 25mm-thick steel plate. Below 15 meters range, the shooter didn't really have to aim the Gyrojet pistol to hit exactly what he wanted – but at 50 meters (the maximum effective range of the M-1911A1 control weapon in military testing), one would be very lucky to get carefully-aimed groups that were less than 100 cm across.

Combat testing of the 13mm version was reportedly conducted in Vietnam by the SEALs (who were interested in the ability of the Gyrojet to be fired normally underwater) – but the SEALs were incredibly disappointed, and stopped using the Gyrojet pistol *very* quickly. (The SEALs also experimented with a version of the Gyrojet Pistol that fired a rocket-powered dart for underwater use, called the Lancejet – and it had equally disappointing results.) Civilian 13mm versions ran afoul of the then-new 1968 Gun Control act, which classified the 13mm Gyrojet Pistol as a destructive device due to its caliber. This led MBA to produce the 12mm Mk II Mod C – but the new round did nothing to improve the odd ballistics or performance of the weapon. Changes in the design of the ammunition to ease mass production just made things worse. Though the Gyrojet Pistols themselves were inexpensive, the rounds were horribly expensive – the Gyrojet Pistol itself was affordable to civilians, but the price of ammo meant the average owner would almost never get to fire it; the ballistics meant he wouldn't be happy with the results when he did fire it.

Weapon	Ammunition	Weight	Magazines	Price
Gyrojet	12mm Gyrojet	0.4 kg	7 Internal	\$721
Gyrojet	13mm Gyrojet	0.42 kg	6 Internal	\$824

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Gyrojet (12mm)	SA	3*	*-1-2	2	2	Nil	10**
Gyrojet (13mm)	SA	4*	*-1-2	2	2	Nil	11**

*The damage and penetration listed apply at medium range or longer. At short range, penetration is Nil and damage is 1.

**Hitting a target at short range is one level easier than the standard *Twilight 2000 v2.2* rules. At medium range, hitting a target follows standard *Twilight 2000 v2.2* rules. At long range, hitting a target is one level harder than normal, and at extreme range, hitting a target is two levels harder than normal. (And I'm actually being generous with this special rule!)

Metzger Arms Spectre-15

Appears in: *Twilight 2000 First Edition Small Arms Guide*, though I have embellished the story considerably.

Country of Origin: US

Fictional Notes: In the late 1980s, the US CIA and DIA and the British MI-5 and MI-6, as well as the Mossad and intelligence agencies of certain other countries, were looking for a firearm with decent firepower and was yet invisible to X-Rays, CAT Scans, and MRI scanners, and could also shield the metal and gunpowder of its ammunition from detection from known methods (including dogs and electronic explosive or gunpowder sniffers). The program was handed to a company known as “Metzger Arms,” which was actually a CIA front company for black weapon research. The result, after four years, was the Spectre-15. The Spectre-15 is constructed entirely of exotic synthetic polymers (even the barrel and firing pin) that are harder than steel and extremely durable. The

materials are also virtually invisible to most known detection methods; disassembled, the Spectre-15 is unlikely to be spotted inside a bag or distributed over a person. The magazine well includes gaskets that prevent odors from exiting the weapon (though the chamber and barrel do not). In addition, special bags and cases were issued with the weapon that enhanced those features; these bags and cases were manufactured to resemble various objects that an average person might carry on an airplane, ship, or other secured facility. A no-wipe silencer was also made of the same materials for use with the Spectre-15. A laser spot device is included with the weapon; some of the parts of the laser are the few parts of the Spectre-15 not composed of the exotic polymer (known as Abiliplex in CIA records). The laser spot device can be removed for this reason.

Weapon	Ammunition	Weight	Magazines	Price
Spectre-15	9mm Parabellum	0.59 kg	15	\$599
Spectre-15	.40 Smith & Wesson	0.71 kg	15	\$672
Spectre-15	10mm Colt	0.78 kg	15	\$713
Spectre-15	.45 ACP	0.85 kg	15	\$755
Spectre-15	.50 Action Express	1.27 kg	14	\$1007

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Spectre-15 (9mm)	SA	1	Nil	1	3	Nil	12
Spectre-15 (.40)	SA	2	2-Nil	1	3	Nil	13
Spectre-15 (10mm)	SA	2	1-Nil	1	3	Nil	12
Spectre-15 (.45)	SA	2	2-Nil	1	3	Nil	14
Spectre-15 (.50)	SA	4	1-1-Nil	1	3	Nil	14

Miculek Modified Smith & Wesson 627

Appears in: Custom modification by master gunsmith Jerry Miculek

Country of Origin: US

Notes: This revolver is a one-off – it is a Smith & Wesson 627 revolver modified by Jerry Miculek for use certain competitions, particularly the International Revolver Championships (IRC). It started out as a standard Smith & Wesson 627, but has been extensively modified, with a mount on the top strap for a Bushnell Holographic optical sight, four anti-recoil ports in the 6.5-inch barrel, a cylinder modified to use 8-round full-moon clips, an unfinished stainless steel barrel (normally, Model 627 barrels are fully sculptured by the Smith & Wesson Performance Center), a double-action trigger pull of 8 pounds (Jerry Miculek does not use the single-action feature of the weapon), and Hogue Monogrip wooden grips that were custom made for his hand and the way he holds a revolver.

Twilight 2000 Notes: Jerry Miculek has had this particular revolver since 1997 – he might or might not have this revolver, or something similar to it, after the November Nuclear Strikes.

Weapon	Ammunition	Weight	Magazines	Price
Miculek S&W 627	.357 Magnum	1.59 kg	8 Cylinder	\$404

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Miculek S&W 627	DAR	3	1-Nil	1	2	Nil	15

Omnicon Auto-9

Appears in: *Robocop* series of movies, as the sidearm of Robocop

Country of Origin: US

Fictional Notes: This is the sidearm of Robocop. The Auto-9 is a selective-fire machine pistol based on Beretta's M-93R machine pistol, but fires a proprietary cartridge developed for it with considerably more power than the standard 9mm Parabellum round of the M-93R. Recoil is surprisingly light, despite the power of the rounds. The weapon is also much larger than the M-93R with a longer barrel, and an enlarged pistol grip; standard magazine is 16 rounds, but a 30-round extended magazine is available. Note that the pistol will not fit inside Robocop's integral leg holster with an extended magazine fitted. This pistol is also available to US and NATO special operations troops, and to rear area troops as sort of a PDW.

Weapon	Ammunition	Weight	Magazines	Price
Auto-9	9mm OCP Magnum	2.24 kg	16, 30	\$528

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Auto-9	3/5	3	1-1-Nil	2	1	2/3	28

Podsenkowsky MCEM-2

Appears in: Weapon experiment in the early-1950s

Country of Origin: Britain

Notes: This was an experimental machine pistol designed by a Polish expatriate, Lt. Podsenkowsky, as an entry weapon that was smaller than the then-common (1950) Sten submachinegun. Podsenkowsky placed the magazine in the grip, and removed

the stock, and used the then-new idea of a telescoping bolt to further reduce the size of the weapon. There was no charging handle, instead, the user put a finger inside a slot above the muzzle and drew it back. Unfortunately, the MCEM-2 is a very light weapon and the rate of fire high, so the weapon could be virtually uncontrollable in automatic fire. A butt was then designed made out of rigid canvas, but the idea was dropped by the British MoD.

Weapon	Ammunition	Weight	Magazines	Price
MCEM-2	9mm Parabellum	2.49 kg	18	\$288
MCEM-2 Stock	N/A	0.7 kg	N/A	\$20

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MCEM-2	10	2	Nil	2	1	7	19
MCEM-2 (With Butt)	10	2	Nil	3	1	6	24

Stechkin Patparine

Appears in: The beginning of the movie *Red Heat*, in the hands of Russian KGB agent Ivan Danko (played by Arnold Schwarzenegger)

Country of Origin: Soviet Union

Fictional Notes: During *Red Heat*, KGB agent Ivan Danko claims that this is the most powerful handgun in existence, to which his Chicago police partner Art Ridzik replies that the Smith & Wesson .44 Magnum is the world's most powerful handgun. (Of course, neither were or are, and the charts don't bear it out for the Patparine.) The Patparine wielded by Danko in the opening sequences is a dressed-up Desert Eagle, modified to give it a more "Soviet" look and even though the Desert Eagle used appears to have a six-inch barrel, an extension is used to make the barrel look more like about 7.5 inches. We'll make this a match-quality barrel.

So I postulate that the Patparine is a heavy, long-barreled pistol firing a heavy, hot-loaded magnum cartridge. The movie gives the caliber as 9.2mm; it also uses a fairly-long case. The ammunition is specially-designed for the pistol. The Patparine is a custom-made pistol; most are virtually hand-made and used only by certain KGB agents, especially those able to handle the muzzle blast and weight (though recoil is mitigated by the sheer weight of the Patparine). Rear sights are micrometer-adjustable; the front is a blade. Compared to most Soviet weapons, the Patparine is a masterpiece. The long cartridges require that the shooter have fairly large hands to control the pistol properly. No muzzle brake or porting is employed. Though some military use was supposedly made of the Patparine, it is most likely a status symbol in the military rather than a combat weapon, as its characteristics, like the Desert Eagle, would limit its effectiveness in sustained combat, though it would certainly being an opponent down quickly.

Note: Most of this entry is based on internet guesses.

Weapon	Ammunition	Weight	Magazines	Price
Patparine	9.2x40mm Patparine	2.22 kg	11	\$476

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Patparine	SA	3	1-1-Nil	2	2	Nil	17

Webley Mars

Appears in: An attempt to capture the British pistol contract in the early 1900s.

Country of Origin: Britain

Notes: The Mars – well, it was a monster of a pistol, with an 11.25-inch barrel and a weight to match. Webley responded to the British MoD call for a pistol to replace their revolvers with what was at the time the most powerful handgun in the world, that monster Mars pistol, firing an equally monster cartridge, the .45 Mars Long. Most of the complaints about the Mars centered around its weight, its huge muzzle blast, and the heavy weight of its recoiling parts, which led to heavy recoil in general. It didn't help matters much that the mechanism of the Mars ejected the spent shells directly to the rear. The long recoil system was also quite a complex mechanism – it was necessary at the time for the powerful rounds it fired, but too complex for a service pistol. The testing soldiers roundly rejected the Mars; the captain in charge of testing the Mars at the British Naval Gunnery School said that "No one who fired once with the pistol wished to shoot it again." Another testing soldier described shooting the Mars as "singularly unpleasant and alarming." Webley then tried to sell the Mars on the civilian market, where it found little sales. Today, ironically, the Mars has become a much sought-after collectors' item, bringing thousands of real-life dollars when sold, and the ammunition is even rarer. The designers of the modern-day Desert Eagle are said to have taken inspiration from the Mars. Only about 80 Mars pistols were made.

Weapon	Ammunition	Weight	Magazines	Price
Mars	.45 Mars Long	2.43 kg	10	\$833
Mars	.45 Mars Short	1.65 kg	10	\$431
Mars	9mm Mars	1.65 kg	10	\$432
Mars	8.5mm Mars	1.47 kg	10	\$347

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Mars (.45 Long)	SA	5	1-1-Nil	3	5	Nil	26
Mars (.45 Short)	SA	4	1-1-Nil	2	4	Nil	32

Mars (9mm)	SA	3	1-1-Nil	2	4	Nil	27
Mars (8.5mm)	SA	3	1-1-Nil	2	3	Nil	29

AAI GPHMG

Country or Origin: United States

Appears In: Company and other literature as early as the mid-1980s (as far as I know).

Notes: This weapon was designed as a private venture for a replacement for the M2HB. It aimed to fix a number of perceived problems with the M2HB, such as the variable headspace and timing, the slow loading times, the lack of dual-belt ability, and other small details. The AAI GPHMG can be fired from a tripod (NHT) or vehicle mount. The weapon has a dual-feed mechanism and is normally loaded within both BMG and SLAP belts. It also has a mount for sighting or ranging gear, a quick-change barrel, and does not require the tedious headspace and timing adjustments of the M2HB. The AAI GPHMG fell victim to budgetary problems in the US government, and did not sell anywhere else. It remains an interesting "what if."

Twilight 2000 Notes: The AAI GPHMG appeared too late for widespread distribution, but was acquired by the US military at the advice of the Chairman of the JCS. It was popular and much sought-after.

Merc 2000 Notes: This is a weapon that sold better overseas than to the US military, most notably to the South Koreans. Nonetheless, it was never a big seller.

Weapon	Ammunition	Weight	Magazines	Price
AAI GPHMG	.50 BMG	21.32 kg	110 Belt (x2)	\$10104

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AAI GPHMG (Normal Ammo)	5	10	2-2-3	12	1	3	450
AAI GPHMG (SLAP Ammo)	5	10	1-1-1	12	1	3	541

Empty Shell XM556

Country of Origin: United States

Appears in: Empty Shell's web site, and several reviews by gun experts on magazine web sites.

Notes: Currently an experimental project by Empty Shell, the XM556 is much smaller and lighter than the XM214 Microgun, particularly with the short-barreled configuration. The total configuration in its short-barreled version is a mere 56 centimeters long. The XM556 is even lighter than some 5.56mm support weapons. Currently, no orders are being taken for the XM556, as it is still a work in progress, and details may change as time goes by.

The XM556 may run off external power (it takes 24 Volts DC) or by a battery, which is enough to fire 6000 rounds. Recharging the battery takes 15 minutes. The gun is held by a yoke in the left hand, and fired from a trigger at the rear with the right hand (or vice versa for lefties). The XM556 was designed from scratch, and not in imitation of the M134 or XM214. Parts were designed with wear and tear in mind, and do not need to be replaced or fixed as often as an M134, though full testing is still in progress. The XM556 may be fired by hand or mounted on basically any mount that may be used for the M134, including RWSs.

Extra Notes: I have a SS recoil figure below, but by current design, SS fire is basically impossible.

Twilight 2000 Notes: The XM556 does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
XM556 (10" Barrels)	5.56mm NATO	7.26 kg	500 Belt, 2000 Belt, 4000 Belt	\$3730
XM556 (16" Barrels)	5.56mm NATO	9.16 kg	500 Belt, 2000 Belt, 4000 Belt	\$4698

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XM556 (10" Barrels)	20/40	2	1-Nil	4	1	7/21	19
XM214 (10" Barrels, Tripod)	20/40	2	1-Nil	4	1	1/6	37
XM556 (16" Barrels)	20/40	3	1-Nil	5	1	7/21	40
XM214 (16" Barrels, Tripod)	20/40	3	1-Nil	5	1	1/6	79

FN BRG-15

Country of Origin: Belgium

Appears in: I first heard of this weapon in the *RDF Sourcebook*, and later confirmed it in mid-1980s issues of *Jane's Infantry Weapons*.

Notes: This is a Belgian-made heavy machinegun designed to fill the gap between the .50 machinegun and the 20mm cannon. It was also conceptually influenced by the Russian KPV heavy machinegun and the British 15mm Besa. Though it looks very much like an M2HB, the BRG-15 is gas-operated instead of recoil-operated with a rotating bolt. This is similar to an enlarged FN-FAL operation, and most of the operation takes place above the barrel, again like a FAL. It has a dual-feed system that gives the gunner a choice of ammunition. The BRG-15 can also be used on helicopter mounts. It cannot be fired without a vehicle or tripod mount. The BRG-15

uses the NHT and was given a hard look by US, NATO, Israeli, and other countries' militaries, but eventually found no takers.

Twilight 2000 Notes: The BRG-15 partially replaced the M2HB in the USMC, Belgian, French, and Israeli Defense Forces.

Merc 2000 Notes: There is isolated special operations use of this weapon, but it is mostly unknown.

Weapon	Ammunition	Weight	Magazines	Price
BRG-15	15.5mm BRG	60 kg	100 Belt (x2)	\$14552

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
BRG-15 (Normal Ammo)	5	12	2-2-3	14	1	2	479
BRG-15 (SLAP Ammo)	5	12	1-1-1	14	1	2	575

GE XM214 Microgun

Country or Origin: United States

Appears in: The Microgun idea has been kicked around for while; it appears in literature as early as 1982 (as far as I've been able to find out).

Notes: Also known as the Six-Pack or the Mini-Minigun, the XM214 is a smaller version of the M134 Minigun designed for use by ground or light vehicle-mounted troops to deliver massive amounts of small-caliber fire for defensive purposes. It is basically similar to the Minigun, except that it fires 5.56mm NATO ammunition and have various differences in layout to adapt it to tripod and vehicle use. Though rumors persist of its testing in various hot spots around the world, it is unknown whether the Microgun has seen any real combat use, and it remains officially an experimental weapon as of 2003. The Microgun has two rates of fire, and can actually be hip-fired (though it is unwieldy). Rumors say that this weapon gave the makers of the movie *Predator* the idea for their then-fictional man-packed minigun.

The Microgun is fed by a pair of 500-round belts contained in "cassettes," roughly square containers of belts which are then connected to the gun by a feed chute. When the cassette is running dry, a flag is tripped telling the crew that they must soon switch the feed chute to the other cassette. This takes one phase. The Microgun may be run off of external power (it takes 24 Volts DC) or by a battery, which enough to fire 3000 rounds. Recharging the battery takes 15 minutes.

Twilight 2000 Notes: This weapon was type-standardized M214 in 1992, though it was still not produced in great quantities. In an odd sort of competition, it became sort of a badge of rank for command vehicles of infantry units to be armed with the Microgun whenever possible.

Weapon	Ammunition	Weight	Magazines	Price
XM214	5.56mm NATO	18.06 kg	2x500 Belt	\$5639

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
XM214	10/60	3	1-Nil	7	1	2/6	58
XM214 (Tripod)	10/60	3	1-Nil	7	1	1/1	116

Melanika Uirapuru

Country of Origin: Brazil

Appears in: *Jane's* and company literature up to the late 1990s.

Notes: Designed to be the standard Brazilian machinegun, the Uirapuru fell victim to budget cuts and competition from cheaper imports before it could be widely produced and distributed. Built by Mekanika Industries, the Uirapuru is named after a rain forest bird and has proven to be an excellent and reliable machinegun, though a bit expensive. The weapon is simple but ergonomically built, and has a very efficient muzzle brake.

Twilight 2000 Notes: Unlike in the real world, the Uirapuru was widely built and distributed in the Twilight 2000 World.

Merc 2000 Notes: The Uirapuru enjoyed lots of sales to mercenaries and clandestine units.

Weapon	Ammunition	Weight	Magazines	Price
Uirapuru	7.62mm NATO	13 kg	100 Belt	\$2589

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Uirapuru	10	4	2-3-Nil	8	2	8	79
Uirapuru (Bipod)	10	4	2-3-Nil	8	1	4	103
Uirapuru (Tripod)	10	4	2-3-Nil	8	1	2	159

Stange MG-39 Rh

Appears in: Competition to replace the MG-34 just prior and during early World War 2.

Notes: This Czech light machinegun dates back to the German request for a lighter, simplified, improved machinegun to replace the MG-34, which was eventually won by the MG-42. The original requirements were a higher rate of fire, more reliability, better suited to mass production through the use of modern production methods such as stamped metal and spot-welding, and production which cut down time and the need for skilled labor. The design was to use as many of the MG-34's accessories as possible, such as the bipod, tripod, and non-disintegrating link belts as well as disintegrating-link belts. As the design process at the stage at which the

MG-39 Rh appeared, the designs to be submitted were still considered experiments and not required to be completely finalized. The design proved to be superior in almost all ways to the other two prototypes, including the Grossfuss prototype design which eventually evolved into the MG-42. However, Germany decided to go with the Grossfuss design anyway; but Stange decided to keep developing his gun, figuring that if the Grossfuss team couldn't work out the bugs in their design, they would be waiting in the wings with a perfected design.

The MG-39 Rh owes much to Vaclav Holec's ZB-26, the gun that went on to become Britain's Bren gun. The MG-39 Rh has the tilting bolt locking method, the bolt carrier has bolt unlocking ramps, and the firing pin is contained within the bolt and the gun fires by striking a separate projection on the bolt carrier, therefore actuating the firing pin indirectly. However, there were plenty of operating differences, including only having the front part of the bolt tilting upward for locking, the bolt meeting the barrel and stopping, but the bolt carrier continuing to move forward (which is what tilts the bolt). The ZB-26 was largely machined, but the MG-39 Rh was largely made of stamped metal, with spot-welding and riveting. The only machined part is the core of the barrel mounting block. The design of the locking lugs required that turn-bolt locked – some say this was an unnecessary complication. Instead of simple recoil operation, the MG-39 Rh used gas operation, which brings up the specter of fouling. Belt pull also uses a complicated operation, with the feed not gripping the rim of the cartridge, requiring a spring-loaded rim stabilizer, and the belt-feed mechanism contained entirely within the feed cover, with many small parts. The MG-26 Rh's extractor was also unusual, being an oscillating spur suspended from pivot pins and a projecting ejector plunger. The bolt was surprisingly light, despite its complication, filling the requirement for a high rate of fire. The firing pin is a three-pronged star shape to make it stronger, but requiring more skill on the part of laborers. (A conventional firing pin would be snapped by the violent action of the extractor system.) The quick-change barrel was threaded, and had a handle on it, but required that a nut at the base of the barrel be tightened, negating much of the advantage of the handle. This also resulted in a chronically leaky gas chamber. Rotating off a hot, swollen, tight barrel often required banging the nut with a hammer.

In the end, the design of the MG-39 Rh was simply too complicated and far more quirky than the MG-42 turned out to be. However, some of its best design features would show up in later designs, such as on the PK and PKM and the Vz-59. It was turned down by the German military. It was a marvelously lightweight design, but simply too complicated for a country in the middle of a major war that needed machineguns fast and built by largely unskilled labor.

Weapon	Ammunition	Weight	Magazines	Price
MG-39 Rh	8mm Mauser	6.55 kg	50 Belt, 100 Belt	\$2758

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MG-39 Rh	10	4	2-3-Nil	9	3	14	80
MG-39 Rh (Bipod)	10	4	2-3-Nil	9	1	7	104
MG-39 Rh (Tripod)	10	4	2-3-Nil	9	1	3	159

McDonnell Douglas Scorpion UFW

Notes: The Scorpion UFW (Urban Fighting Weapon) was originally designed in response to a US Military request for designs for the MPIM (MultiPurpose Individual Munition), a mid-1980s experimental program to test and possibly adopt a lightweight weapon for short-range combat, particularly for urban warfare. The Scorpion was eventually rejected (along with almost everything that came out of the MPIM program), but reportedly the Scorpion is being given a new look by the US military. The “winner” of the MPIM competition was the Predator short-range ATGM, though the Predator itself ended up being dropped from the budget shortly later.

The Scorpion was a sort of disposable rocket launcher like the M72 KAW, but with a twist – the Scorpion was launched from a reinforced fiberglass tube that would be mounted under an assault rifle like an M203 or other underbarrel grenade launcher. The Scorpion attaches to the bayonet lug at front of the host rifle, and by a ring-type adapter and/or a clip to the magazine well at the rear. Attaching or detaching the Scorpion to the host weapon takes less than 30 seconds and no special training or tools. The Scorpion has its own firing mechanism, consisting of a simple bar at the rear end of the module (in front of the magazine well for most rifles, and particularly the M16 for which the Scorpion was designed). Though designed specifically for mounting underneath the M16, M16A1, and M16A2, the Scorpion could also be attached to most western-type assault rifles, battle rifles, and even some submachineguns; in game terms, one needs host rifle with a magazine well that projects below the rifle for a short length, and a bulk of at least 5 (or more precisely, about 4.65). Adapters were planned that would take the place of a bayonet lug as well as allow more flexibility in installation. The Scorpion launcher itself is 77.47 cm long; it did project a considerable distance beyond the end of the M16's barrel. In its container, the Scorpion is 81.3 cm long, and the container has a sling as well as rings to allow the Scorpion container to be carried more easily over the shoulder, or attached to other gear.

The shooter of a Scorpion would use the sights of his own rifle; to further enhance accuracy, it was envisioned that the shooter could employ tracers fired from his rifle to increase his chances of a first-round hit. (If this method is employed, every tracer [fired in semiautomatic mode] that hits before the shooter fires the Scorpion allows the shooter a +1 on his die roll when he actually fires the Scorpion, to a maximum of +3.)

The lightweight reinforced fiberglass tube of the Scorpion included slots on the sides, venting the rocket's firing charge exhaust without harming the shooter. Though the Scorpion is not a totally recoilless weapon, it is very close to being so (enough to have no recoil in *Twilight 2000* v2.2 terms). Shortly after the rocket clears the launcher, the main rocket charge ignites. The Scorpion rocket's exhaust ports are angled, further decreasing the danger to the shooter from the rocket exhaust. After the rocket clears the launcher, spring-loaded fins pop out, and the Scorpion is at that point like any other short-range rocket. The design of the launcher and rocket meant the Scorpion presented virtually no backblast danger to the shooter and his fellow troops, and the Scorpion could be fired inside tight enclosures without a problem. The original design of the Scorpion called for a 52mm rocket. This was later increased to 66mm, giving the warhead a greater punch, and allowing the Scorpion to use modified forms of existing 66mm warhead designs. I have included the 52mm and 66mm versions below for comparison and, well, “just because.”

Twilight 2000 Notes: Though the eventual MPIM competition winner was a variant of the Predator Light ATGM, the Scorpion was adopted in limited quantities by special operations forces of the US and some Western European nations, and the regular military forces of the Israelis, South Koreans, and Taiwanese.

Weapon	Caliber	Weight	Length	Price
Scorpion UFW (HEAT)	52mm	3.18 kg	77.47cm (81.3cm in container)	\$135
Scorpion UFW (HEAT-T)	52mm	3.54 kg	77.47cm (81.3cm in container)	\$282
Scorpion UFW (HE)	52mm	3.18 kg	77.47cm (81.3cm in container)	\$131
Scorpion UFW (HEDP)	52mm	3.18 kg	77.47cm (81.3cm in container)	\$139
Scorpion UFW (HESH)	52mm	3.18 kg	77.47cm (81.3cm in container)	\$152
Scorpion UFW (FRAG)	52mm	3.22 kg	77.47cm (81.3cm in container)	\$119
Scorpion UFW (Thermobaric)	52mm	3.54 kg	77.47cm (81.3cm in container)	\$360
Scorpion UFW (HEAT)	66mm	4.08 kg	77.47cm (81.3cm in container)	\$160
Scorpion UFW (HEAT-T)	66mm	4.54 kg	77.47cm (81.3cm in container)	\$320
Scorpion UFW (HE)	66mm	4.08 kg	77.47cm (81.3cm in container)	\$156
Scorpion UFW (HEDP)	66mm	4.08 kg	77.47cm (81.3cm in container)	\$165
Scorpion UFW (HESH)	66mm	4.08 kg	77.47cm (81.3cm in container)	\$182
Scorpion UFW (FRAG)	66mm	4.45 kg	77.47cm (81.3cm in container)	\$142
Scorpion UFW (Thermobaric)	66mm	4.54 kg	77.47cm (81.3cm in container)	\$427

Weapon	Reload	Range	IFR	Round	Damage	Pen
Scorpion (52mm)	SS	167	Nil	HEAT	C3 B12	45C
	SS	167	Nil	HEAT-T	C4 B12	36C/45C
	SS	167	Nil	HE	C5 B20	Nil
	SS	167	Nil	HEDP	C4 B16	22C
	SS	167	Nil	HESH	C3 B14	36C
	SS	167	Nil	FRAG	C3 B25	Nil
	SS	167	Nil	Thermobaric	C10 B12	22C

Scorpion (66mm)	SS	172	Nil	HEAT	C5 B20	59C
	SS	172	Nil	HEAT-T	C4 B20	47C/59C
	SS	172	Nil	HE	C8 B30	3C
	SS	172	Nil	HEDP	C6 B26	31C
	SS	172	Nil	HESH	C5 B24	47C
	SS	172	Nil	FRAG	C6 B38	0C
	SS	172	Nil	Thermobaric	C16 B18	31C

European Theater Board M25

Notes: In 1944, the Americans found itself fighting increasingly powerful German tanks. Though this led in 1945 to the M20 Super Bazooka, The Generals wanted more, as at the end of World War 2, it looked like a war against the Russians was inevitable. At the War's end, the US Army and Marines were using two calibers of Bazookas, as well as a 75mm recoilless rifle for infantry use. The Board had the bright idea to replace these three weapons with one: a double M20 Bazooka. However, despite being an innovative concept, testing (both on test ranges and general infantry use, and combat use in the Korean War), the M25 was proven too heavy to tote around and to carry enough ammunition for it.

The M25 was loaded like an M20. The launcher used the front end of an M20; the rear section contained the loading chamber and, when loaded, the round itself. Within two flips of a cocking lever, the firing chamber rotated to a loaded chamber. A good gunnery team could keep up a high rate of fire, with the loader continually keeping the magazine loaded and the gunner firing at targets. In addition, a full five-round magazine could be loaded onto the M25.

The M25 was fed by a five-round chamber atop the weapon, with the loader keeping the chamber topped off. Unfortunately, the M25 was quite a hefty weapon, weighing 22.68 kilograms even if unloaded. The assembly therefore required a light tripod, made for the M25, to keep the M25 stable while he fired and the loader kept the magazine topped off. And the M20's warhead was no better than those of the M25 (being the same warhead), and the M2 and M20 were proving increasingly ineffective against Chinese armor. No matter what the rate of fire was, the M20 warheads could inflict only so much damage on the Chinese armor (though the M25 was quite effective against personnel in the open, light armored vehicle, and soft-skinned vehicles).

The front sight, trigger, and front of the barrels were identical to the M20.

Though seeing some action in Korea, mostly near the end of the War, the M25 in the end got bad reviews from the troops using them (though they liked the firepower, they hated the weight of the weapon and the ammunition). The M25 disappeared quickly after the Korean War. (The nomenclature was re-used some sixty-odd years later for the M25 Punisher grenade launcher.) Some 1500 M25 rocket launchers were made.

The M25 had a length of 152.4 centimeters, and as said above it had a weight of 22.68 kilograms unloaded. This not include the 7-kilogram tripod, adapted from an AAA mount. At it's time of inception, only the M28 HEAT and M29 HEDP rockets were available, as well as models of those rockets which are modified primarily in the area of tail fins and other accuracy measures. The M35 HEAT rocket was later available, which had improved accuracy and 30% more velocity. It was also designed with Korea's miserable winter weather in mind.

Weapon	Caliber	Weight	Length	Price
M25	89mm	29.68 kg	1.52 meters	\$775

Ammunition	Caliber	Weight	Price
M28 HEAT	89mm	4.05 kg	\$109
M29 HEDP	89mm	4 kg	\$90
M35 HEAT	89mm	5 kg	\$135

Weapon	ROF	Range	IFR	Round	Damage	Pen
M25	SA	115	Nil	M28 HEAT	C9 B30	82C
	SA	55	Nil	M29 HEDP	C2 (B10)	Nil
	SA	144	Nil	M35 HEAT	C9 B30	103C

Armalite AR-17 Golden Gun

Notes: Gene Stoner designed a semiautomatic hunting shotgun in the mid-1950s, using some of his work designing the then-to-becoming AR-10 and AR-15. It was then an excellent design, gas-operated, and used since then in the workings of lots of semiautomatic shotguns. At the time though, it was complicated though innovative, and unfortunately expensive (IRL), thus deterring a lot of sales; the fact that it was primarily meant for sale to civilians didn't help, as they typically didn't have unlimited funds. Add to this that many parts, including the barrel, were made from special (and expensive) steel and aluminum alloys, just made the situation (and cost) worse, especially in the 24-inch barrel and its compensator. Armalite did manage to sell a few between 1956 and 1962, but in the end, not enough to justify keeping even a small production line open. One of the innovative features was the AR-17's ability to break apart into two sections just to the rear of this barrel, halving the bulk rating for transport, another is a compensator designed for use with shot. Metalwork finish is largely blued, but the stock and fore-end are from polymer designed to look and feel like wood.

The most common version had a 2-round tubular magazine, but four and 6-round tubular magazines could be had back in the day. These were by special order only at the time; IRL, they would cost a mint.

Not many people know of the AR-17's predecessor, the AR-9. The AR-9 was stressed for magnum cartridges, and this made the recoil a real bear as the AR-9 was made to be light. The 18-inch barrel was primarily light alloy, with a stainless steel bore. The AR-9 was semiautomatic, but its magazine capacity was only two rounds, giving the shooter a maximum of three shots before he had to reload. He offered the design to the US military citing it as a good military police firearm, but they were not interested. The nation's police departments were also not interested. The AR-9's heavy use of light alloy and polymers made the real-world cost high, and only one prototype was produced.

Weapon	Ammunition	Weight	Magazines	Price
AR-17 (2-Round Magazine)	12 Gauge 2 3/4"	2.54 kg	2 Tubular	\$737
AR-17 (4-Round Magazine)	12 Gauge 2 3/4"	2.61 kg	4 Tubular	\$739
AR-17 (6-Round Magazine)	12 Gauge 2 3/4"	2.68 kg	6 Tubular	\$741
AR-9	12 Gauge 3"	1.13 kg	2	\$620

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-17 (2-Round Magazine)	SA	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	8	4	Nil	52
AR-17 (4-Round Magazine)	SA	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	8	4	Nil	52
AR-17 (6-Round Magazine)	SA	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	8	4	Nil	52
AR-9	SA	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	6	8	Nil	43

Colt Defender

Notes: When Winchester gave up on the Liberator project (US Shotguns W-Z), Colt took up the weapon and developed it some more into the Defender. The Defender is made largely of light castings, and has reduced caliber in a vain attempt to help control the massive recoil if all barrels are fired at once. Since the gauge was reduced, the amount of barrels was increased. In addition, a central tube was added to fire a spring-loaded canister-type grenade (usually tear gas); this barrel is fired by a trigger in a forward pistol grip that doubles to steady the weapon. The eight shotgun barrels may be fired all at once, or in sequence; if fired all at once, the recoil is added together! Assuming the proper coordination, the user may even fire the central canister grenade at the same time as the shotgun. The damage per shell type below is per barrel; add them all together if all barrels are fired at once.

Despite the many supporters of the weapon (including US President Richard Nixon himself), it was regarded as unwieldy and rejected by the law-enforcement community at which it was targeted. The military was likewise uninterested. Only one prototype was ever produced, but it is presented here as an interesting "what-if."

Weapon	Ammunition	Weight	Magazines	Price
Colt Defender	20 Gauge (all types)	4.35 kg	8 Internal + 1 Internal (Grenade)	\$156

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Defender (2.5" Shells)	SA	3/1d6x12 or 2d6x4	2-Nil/Nil or Nil	3/4	2	Nil	20
Defender (2.6" Shells)	SA	3/1d6x12 or 2d6x4	2-Nil/Nil or Nil	3/4	2	Nil	19
Defender (2.75" Shells)	SA	3/1d6x12 or 2d6x4	2-Nil/Nil or Nil	3/4	3	Nil	22
Defender (3" Shells)	SA	3/1d6x16 or 2d6x4	2-Nil/Nil or Nil	3/4	3	Nil	20
Defender (Grenade)	SS	Grenade	Grenade	3/4	2	Nil	11

Hillberg Model J

Notes: Though Robert Hillberg is better known for his work on semiautomatic shotguns and such exotic projects as the Colt Defender and Winchester Liberator, he also worked on several pump-action shotguns, such as the Model J. Like most of his projects, it has several unusual features; it is a box-magazine-fed pump-action shotgun with an ejection port on both sides of the gun. A switch determines which way the spent shells are ejected. This allow the Model J to be used with equal utility by left and right-handed shooters, and the box magazine allows for large ammunition capacity with quick reloading. The Model J was also one of the first shotguns to be equipped with a folding stock. The Model J was experimented with by the US Military in Vietnam, but never adopted by any branch.

Weapon	Ammunition	Weight	Magazines	Price
Model J	12 Gauge 2 3/4"	3.18 kg	8	\$823

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Model J	PA	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	5/6	4	Nil	38

Ramos M-412 TAPP

Notes: The TAPP (Tactical Perimeter Powerhouse) is a project that JM Ramos and a few other gunsmiths dreamed up for an article in the March 2009 issue of *Small Arms Review* magazine. Using a Remington 870 as a base, Ramos and his team came up with something...unique – a tactical shotgun that can be used (with rifled slugs) as a sharpshooting weapon as well as a conventional shotgun and close assault weapon.

The modifications done to the Remington 870 base are nothing short of astounding. The shotgun has its stock replaced with an M-4-style sliding stock (the CAA RS870 6-position stock), which includes a compartment for batteries to power optics and other accessories; a pistol grip is also mounted. The receiver is beefed up a bit, and topped with a MIL-STD-1913 rail. This rail has BUIS flip-up iron sights, and a short MIL-STD-1913 rail near the muzzle mounts a similar front sight. The rail is topped by a low-power red-dot optical sight; alternatively, other optics or laser pointers can be mounted, or a carrying handle. (The price below includes a 1.5-6x scope.) The slide is replaced with a slide that has three MIL-STD-1913 rails (the Wilson Tactical Picatinny Rail Forend); the bottom rail normally mounts a vertical foregrip (CAA's VG1) for faster cycling, as well as a lightweight folding bipod (the CAA BPOS Short Bipod) adjustable for height and cant. On the right side is laser pointing device. A CAA-made OPS one point tactical sling is also used. A ventilated aluminum guard is found above the barrel; the upper MIL-STD-1913 rail extends about a third of the way down this guard. The barrel is abbreviated to 14 inches; the magazine is extended almost flush with the muzzle.

So, is the M-412 a shotgun? Certainly. It is a short-barreled rifle? It can function as such. Close assault weapon? Definitely. Perimeter defense weapon. It can function as such. It may also be a weapon that has been over-accessorized. But it's definitely interesting!

Weapon	Ammunition	Weight	Magazines	Price
M-412 TAPP	12 Gauge 2.75" and 3"	3.7 kg	6 Tubular	\$1475

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-412 TAPP	PA	4	1d6x20 or 2d6x4	4/5	4	Nil	28
With Bipod	PA	4	1d6x20 or 2d6x4	4/5	2	Nil	37

Smith & Wesson AS-3

Notes: This was one of the candidates for the CAWS competition that the US conducted in the late 1970s and early 1980s. Originally, three versions were envisioned: the AS-1, a semiautomatic-only version for police and civilians; the AS-2, which had a three-round-burst feature; and the AS-3, which fired in full-automatic as well as 3-round burst. The AS-1 was dropped as Smith & Wesson felt they would not find a market for it, and the AS-2 was dropped as being redundant, leaving the AS-3. (The automatic and 3-round burst feature, in *Twilight 2000 v2.2* game terms, are identical, since the full automatic cyclic rate is only 375 rpm.)

The AS-3 is a shotgun constructed more like an assault rifle, with rifle sights, straight-line configuration, box ammunition feed, and a muzzle brake (something which took a lot of research, since most muzzle brakes are destroyed by buckshot or flechette ammunition). The barrel is unusual, being constructed of light, high-strength alloy instead of steel, as is the receiver. The barrel is actually of the quick change type, and is 18.75 inches long (though early prototypes used a 18.25-inch barrel). The stock, pistol grip, and fore-end are of high-impact plastic/synthetic material, with the stock having a rubber recoil pad. The furniture and upper and lower receivers are based loosely on the AR-15/M-16 series, and field stripping begins the same way, with the upper and lower receivers being separated by the use of push pins. (In fact, some 30% of the parts of the AS-3 are identical to those of the M-16/AR-15.) Operation is a locked-breech, short-recoil system instead of a gas system, however. The top of the receiver has a raised ventilated sighting rib which extends about a third of the length of the weapon; this rib also has modified M-16A1-type rear sights (calibrated for the 12-gauge ammunition, of course) which are adjustable for elevation and windage, and a simple post front sight. It could also mount the same types of optics which could be mounted on an M-16A1 carrying handle. The first prototype AS-3s had a short fore-end, but later prototypes used a somewhat longer fore-end. Like other CAWS competitors, special ammunition was developed to take advantage of some of the AS's unique properties; the AS-3 could also use conventional plastic-cased and

cardboard-cased 12-gauge ammunition, in addition to most antiriot-type 12-gauge rounds if the AS-3 is set for semiautomatic. (The AS-3 would jam easily if beanbag or baton-type rounds were used on automatic.) In addition, it was recommended that the AS-3 be fed with only standard loadings of conventional 12-gauge ammunition its own special ammunition, or that designed for the Olin/HK CAWS. (These specially-designed rounds were 3 inches long.)

Like other CAWS competitors, the AS-3 was dropped when the CAWS program was terminated.

Weapon	Ammunition	Weight	Magazines	Price
AS-3 (Early)	12 Gauge 2.75" or 3"	4.42 kg	10	\$746
AS-3 (Late)	12 Gauge 2.75" or 3"	4.59 kg	10	\$748

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AS-3 (Early, 12 GA 2.75")	3	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	6	2	3	39
AS-3 (Early, 12 GA 3")	3	4/1d6x28 or 2d6x4	2-3-Nil/Nil or 1-Nil	6	2	3	44
AS-3 (Early, Flechette)	3	2d6x8	1-Nil	6	2	3	28
AS-3 (Early, AP)	3	4	1-2-3	6	2	3	44
AS-3 (Early, HE)	3	C1 B3	Nil	6	2	3	28
AS-3 (Early, Gas)	3	(B2)	Nil	6	2	3	28
AS-3 (Early, RAP AP)	3	5	1-1-2	6	3	4	59
AS-3 (Late, 12 GA 2.75")	3	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	7	2	3	40
AS-3 (Late, 12 GA 3")	3	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	7	2	3	46
AS-3 (Late, Flechette)	3	2d6x8	1-Nil	7	2	3	29
AS-3 (Late, AP)	3	4	1-2-3	7	2	3	46
AS-3 (Late, HE)	3	C1 B3	Nil	7	2	3	29
AS-3 (Late, Gas)	3	(B2)	Nil	7	2	3	29
AS-3 (Late, RAP AP)	3	5	1-1-2	7	3	4	60

USAC FAS-173

Notes: This was one of the first shotguns in the research that would eventually culminate in the H&K CAWS. The FAS-173 is a fully automatic shotgun, and as the H&K CAWS had not yet appeared on the scene, it was designed primarily to compete with the Atchisson Assault 12 (the weapon that eventually became the AA-12).

The FAS-173 was designed by John Foote, who based it on an assault rifle he had built based on the AK series; it therefore in many ways resembles a cross between the AA-12 (Maxwell Atchisson once worked for USAC) and the Russian Saiga series of shotguns. The operation is, in fact, quite similar to that of the AK-47's gas system, with the exception of extraction and that the FAS-173 was designed to fire from an open bolt. 12-gauge models are built almost entirely of steel; 20-gauge versions (which existed only in early prototype form) use a steel-lined aluminum barrel. Stocks are primarily wood (though some plastic-stocked versions were tried), with a recoil pad on the butt; versions with folding stocks were also built.

The FAS-173 was meant to be part of a family of weapons, to include an assault rifle and light machinegun (which existed only on paper), but with the world glutted with M-16s and AKs, and no one realizing the utility of a combat shotgun, the FAS-173, went the way of most of the CAWS program, into the dustbin of history.

Weapon	Ammunition	Weight	Magazines	Price
FAS-173 (Fixed Stock)	12 Gauge 2.75" or 3"	4.31 kg	10	\$1125
FAS-173 (Folding Stock)	12 Gauge 2.75" or 3"	4.31 kg	10	\$1145
FAS-173 (Fixed Stock)	20 Gauge 2.75" or 3"	3.04 kg	10	\$840
FAS-173 (Folding Stock)	20 Gauge 2.75" or 3"	3.04 kg	10	\$860

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
FAS-173 (Fixed, 12GA, 2.75")	5	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	6	4	9	43
FAS-173 (Fixed, 12GA, 3")	5	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	6	4	9	49
FAS-173 (Folding, 12GA, 2.75")	5	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	5/6	4	9	43
FAS-173 (Folding, 12GA, 3")	5	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	5/6	4	9	49
FAS-173 (Fixed, 20GA, 2.75")	5	4/1d6x20 or 2d6x4	2-Nil/Nil or 1-Nil	6	4	10	36
FAS-173 (Fixed, 20GA, 3")	5	4/1d6x20 or 2d6x4	2-3-Nil/Nil or 1-Nil	6	4	10	41
FAS-173 (Folding, 20GA, 2.75")	5	4/1d6x20 or 2d6x4	2-Nil/Nil or 1-Nil	5/6	4	10	36
FAS-173 (Folding, 20GA, 3")	5	4/1d6x20 or 2d6x4	2-3-Nil/Nil or 1-Nil	5/6	4	10	41

Winchester Liberator Mk III

Notes: This weapon had its genesis in the early 1960s when the Bay of Pigs invasion was being put together. The planners were looking for weapons to drop to anti-Castro partisans so they could help the invasion. The idea was something cheap and disposable in the same vein as the World War 2 Liberator pistol, but more effective. This led to a simple multibarrel shotgun made from aluminum

and magnesium castings to keep costs and weight down. It wasn't a bad idea, but then people started getting more ideas; a removable stock that could also be telescoped was added, and gauge was increased from the original 16 Gauge all the way up to 12 Gauge. This made the weapon heavier than it was supposed to be, and gave it nearly unmanageable recoil, especially since all barrels fire at once! (This feature meant that the trigger pull was nearly 18 pounds.) The idea for the weapon was dropped at this point; it was cheaper and more effective to airdrop World War 2 surplus M-1 Carbines (something that was never actually done, at least not officially, in Cuba). Since the four barrels may only be fired simultaneously, this is the figure shown below. Standard choke for the Liberator is Full.

Weapon	Ammunition	Weight	Magazines	Price
Winchester Liberator	12 Gauge (all types)	3.63 kg	4 Internal	\$195

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Liberator (2.5")	4*	4/1d6x20 or 2d6x4	2-3-Nil/Nil or 1-Nil	3/5	16	Nil	28
Liberator (2.6")	4*	4/1d6x20 or 2d6x4	2-3-Nil/Nil or 1-Nil	3/5	16	Nil	27
Liberator (2.75")	4*	4/1d6x20 or 2d6x4	2-3-Nil/Nil or 1-Nil	3/5	16	Nil	31
Liberator (2.88")	4*	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	3/5	16	Nil	30
Liberator (3")	4*	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	3/5	16	Nil	28
Liberator (3.5")	4*	4/1d6x24 or 2d6x4	2-3-Nil/Nil or 1-Nil	3/5	16	Nil	24

Winter Swatriplex-18

Notes: Designed in the late 1970s specifically as a combat shotgun by John W Winter, the Swatriplex-18 had a number of unusual features, some of which appeared in later shotguns. Unfortunately, the company which was supposed to manufacture the weapon (Consortium W), pulled out after only a few prototypes were built and Winter was never able to attract anyone else to manufacture, let alone buy his unusual shotgun.

The Swatriplex-18 used a semi-bullpup design using twin tubular magazines under a single barrel. Feed could be from one magazine at a time, or alternately between the right and left magazines. Operation was semiautomatic, using gas operation and something quite unusual in a shotgun, a telescoping bolt. Construction was with a combination of light alloys and steel (for the barrel and where strength was critical). The 22-inch barrel was surrounded by a shroud/handguard which was ventilated for cooling. The Swatriplex-18 has ejection ports on both sides of the weapon; each could be sealed, and this allowed use of the weapon by both left and right-handed shooters by simply reversing the ejection direction, charging handle, and cheek rest (something most designers of bullpup weapons seem to overlook). The Swatriplex-18 used rifle-type sights on raised stands; both were adjustable for elevation and windage by knobs. (The raised sights were thought of as a potential problem, and Winter reputedly was considering either removable sights or moving the sights down to the receiver itself.) The stock was of light alloy, but the butt was synthetic with a rubber recoil pad. The top of the receiver had a carrying handle which could be folded flat against the receiver if desired.

The Swatriplex-18 was most likely a design which was way ahead of its time; many companies thought it was simply too weird-looking to sell, despite its reliability and advanced features. This may have killed the Swatriplex-18 more than anything else. Unfortunately, even the prototypes seem to have disappeared, and examples of the weapon now exist only on paper.

Weapon	Ammunition	Weight	Magazines	Price
Swatriplex-18	12 Gauge 2.75"	4.1 kg	9 Tubular (x2)	\$661

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Swatriplex-18	SA	4/1d6x28 or 2d6x8	2-3-Nil/Nil or Nil	5	3	Nil	43

Winchester Wabbit Hunter

Fictional Notes: I am sure that my fellow Americans watched Porky Pig cartoons when they were a kid. I'll also say it's a fair bet that my Canadian, Mexican, and Western European readers have seen Porky Pig too, and those cartoons were probably shown in still more countries.

Notes: A lot Porky's appearances had something to do with the "wabbit" he was chasing. (Of course, since that "wabbit" turned out be Bugs Bunny, Porky stood no chance whatsoever of causing Bugs so much as a split end on one of his hairs.)

Most of the time, he has a "cartoon generic" version of a blunderbuss, double-barreled shotgun, or very rarely, a rifle. And then there came about a week ago, a Porky Pig/Bugs Bunny cartoon I happened to see when channel surfing and decided to watch the whole of. Porky had a firearm that I never saw him with before.

It was based on some double-barreled shotgun he carried so many times. My guess is about 26-inch barrels; it appears to have only one trigger, and with most double-barreled shotguns with only one trigger, I will have the first pull fire the upper barrel first, then the lower. Porky had to remove spent shells manually, so we'll equip his shotgun with automatic extractors instead of ejectors. I didn't see a rear sight, but I did see a front sight -- it projected far enough above the front end that in real life, it would have caught on everything and eventually it would have broken off. And it looked like no firearm iron sight I've ever seen -- like a miniature version of the crosshairs in a ring that were seen on so many early AAA guns. The barrels had no support of any kind, and I have no idea of how the barrel cluster is constructed. My guess is that they're welded together; there appeared to have no rib between the barrels or method of adjusting the aim point of the barrels individually. There was no safety apparent, nor did the shotgun have externally-

exposed hammers. The stock appears to be a simple wooden stock; how the barrels/mechanism and stock were joined is that they were just sort of glued together or something. We'll call it a boxlock with no side plates. No recoil pad -- ouch.

The shells did look huge -- we'll make the ammunition 8-gauge 4" magnum shells. I don't know the age of the cartoon, but the shells were red, so we'll call them plastic shells. The recoil of one of these shells just had to be massive -- Porky is either made of very dense flesh or, as is true in so many of those old cartoons, Porky doesn't have to follow the Laws of Physics. However, I put the recoil numbers that my spreadsheet came up with.

And of course, this shotgun was just as useless against Bugs as anything else that anyone has tried in an attempt to hurt Bugs.

Of course, because I'm trying to turn a cartoon into "reality," this entry is composed basically of free thinking, fudging, and guesses. I'm just having a little fun here. Please indulge me.

Weapon	Ammunition	Weight	Magazines	Price
Woinchester Wabbit Hunter	8 Gauge 4"	7.42 kg	2 Internal	\$2878

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Woinchester Wabbit Hunter	SA	7/1d6x72 or 2d6x20 or 3d6x4	2-3-4/Nil or Nil or 2- Nil	7	6	Nil	91

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Armalite AR-1 Parasniper

Appears In: Rifle experiment in 1954 by Eugene Stoner

Notes: The genesis of the AR-1 was an idea for a very lightweight sniper rifle. The mechanism is based on a Mauser-style action, placed into a variant of the Remington 722 rifle, and had a standard 20-inch sniper-quality barrel. By looks, it was unremarkable, but it used the latest in parts fabrication as well as an unusual aluminum alloy barrel with a steel liner and a compact muzzle brake. The stock had a thin layer of sheet fiberglass on the outside, and was filled with glass fiber. The stock is on the shortish side, but had a Monte Carlo adjustable cheekpiece, a recoil pad, and was adjustable for length. The stock used a pistol grip configuration instead of the semi-pistol grip of most sniper rifles of the period. The AR-1 was bolt-action, with a sturdy interior using mostly aluminum alloy parts. The scope used in the tests was a commercial 4x Bushnell, again chosen for its light weight and mounted with aluminum alloy rings. The US test rifles were chambered in the then-new 7.62mm NATO, while the Dutch chose .30-06.

Unfortunately, Stoner was never able to interest anyone, including military and police, in the AR-1. Only 10 prototypes and 15 production rifles were built. Many cited the light weight as producing too much felt recoil. Though Stoner did not necessarily have the Airborne in mind when he designed the AR-1, it still got associated with airborne forces and acquired the name of Parasniper. While the US and Dutch Armies tested the AR-1 in 1955 at the Aberdeen Proving ground and found it effective, in the end they did not choose the novel rifle for service (though in 20 years or so, such experiments were again carried out by other companies, and some were adopted in small numbers around the world. The US and Dutch armies found them to have too many extraction failures (where have we also heard that?) and excessive barrel jump, even with the muzzle brake. (Some testing by the Dutch Gendarmeries produced good results, however.) Accuracy was another consideration; the short barrels were simply not effective at long range.

Four of the unusual rifles have been preserved and are in the Springfield Armory Museum.

Weapon	Ammunition	Weight	Magazines	Price
AR-1	7.62mm NATO	2.72 kg	5	\$1668
AR-1	.30-06 Springfield	2.72 kg	5	\$1950

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-1 (7.62mm)	BA	4	2-3-Nil	7	4	Nil	64
AR-1 (.30-06)	BA	4	2-3-Nil	7	4	Nil	74

Heckler & Koch WSG-2000

Appears in: Heckler & Koch literature of the early 1990s.

Weapon Type: Sniper Rifle

This weapon was designed by Heckler and Koch as their answer to the heavy-caliber sniping rifles beginning to emerge at the time. H&K's research indicated that the best antimateriel rifle would be one firing a moderate-caliber round at a high velocity, and be of moderate size to reduce shooter fatigue. To this end, they developed a 340-grain 9x90mm ammunition fired by a large powder load, to produce a muzzle velocity of over 1100 meters per second. This was coupled with a computerized sight that is equivalent to a 12x sight with an additional bonus of +3 to hit at all ranges, and also has night vision equal to an image intensifier. This weapon was to be issued to various Special Operations communities, but was unfortunately never developed beyond one working prototype due to lack of interest and high cost of development (the RL unit price was far in excess than the T2K price).

Weapon	Ammunition	Weight	Magazines	Price
WSG-2000	9x90mm MEN	7.98 kg	5	\$6685

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
WSG-2000	SA	8	1-3-5	7	4	Nil	61
WSG-2000 (Bipod)	SA	8	1-3-5	7	2	Nil	81

Armalite AR-5/MA-1

Country of Origin: US

Found in: USAF requirement for a new aircrew survival rifle

Notes: In 1955, the Air Force was still searching for a better survival rifle to equip aircrews who had to bail out. The Air Force heard of someone named Eugene Stoner, "who could do wonderful things with light rifle designs." The Armalite company designation was the AR-5; the Air Force designation for the then-prototype rifle was the MA-1.

The AR-5 had a number of features that would turn up again in later designs. The entire weapon could be stripped and put into a compartment in the stock; the result was watertight and would float. Even if it were thrown into the water fully assembled, the stock would cause the end to bob to the surface. (Sound familiar?) It was a bolt-action locking breech weapon. The stock was fiberglass, and most of the rest was made of aluminum alloy, including the barrel. On the second prototype, Armalite put a small button compass on the toe of the stock. No 2 was the only AR-5 that had this feature. The barrel had a stainless steel liner and was 9 inches long. The stock could be removed from the rifle, and the AR-5 used as a long-barreled pistol. The .22 Hornet, though an unusual choice for military use, was compact, powerful for its size, could take down small game or a perhaps even a man, and even make a bear think twice.

12 prototypes were built, and it seemed that the reviews from the Air Force were good. Production could start at any time. Then word came from the top -- there were already enough M-4 (not to be confused with the M-4 Carbine) and M-6 survival rifles in the inventory, and the Pentagon didn't want to spend a bunch more money for new survival rifles, even if the AR-5 was superior to the M-4 and M-6. The Air Force, Navy, and Marine pilots didn't like the whole idea of a survival rifle in the first place -- it took a lot of room in their bail-out pack that would be better used carrying survival food or water. The AR-5 went the way of the dodo, but most of its features surfaced again in the AR-7.

Weapon	Ammunition	Weight	Magazines	Price
AR-5	.22 Hornet	1.8 kg	4	\$574

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
AR-5 (Carbine Configuration)	BA	2	1-1-Nil	2/4*	4	Nil	24
AR-5 (Pistol Configuration)	BA	2	1-1-Nil	2	4	Nil	12

*The bulk listed here is fully assembled/pieces disassembled and in stock. It cannot be fired in its disassembled state.

Barsness-Sisk Remington 700BDL

Country of Origin: US

Found In: Wildcat action of a Remington 700 BDL

Notes: John Barsness and Charlie Sisk used a Remington 700BDL action with a 24-inch barrel to hand-make a rifle firing a new wildcat cartridge they were working on, the 9.3mm Barsness-Sisk. Essentially a 9.3x62mm Mauser bullet in a .350 Remington Case, the 9.3mm Barsness-Sisk offers a flat trajectory and good hitting power at long distances. For now, the project is a one-off.

Weapon	Ammunition	Weight	Magazines	Price
Barsness-Sisk Remington 700BDL	9.3mm Barsness-Sisk	5.44 kg	4 Internal	\$2849

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Barsness-Sisk Remington 700BDL	BA	6	1-3-Nil	8	4	Nil	112

Carl Stolzer 2-Bore Rifle

Country of Origin: US

Found in: A Limited-Production Weapon by Carl Stolzer and his mad imagination.

Notes: This massive rifle was at first designed by custom gunsmith Carl Stolzer as a whim; soon, however, several select buyers expressed an interest in it. It is essentially a wooden-stocked rifle, with a Monte Carlo comb, a checkered pistol grip wrist, and a checkered fore-end. It has a color-case hardened finish receiver, and a rust blued upper receiver, trigger guard, hammer, and barrel. The receiver is engraved in a pattern of broad acanthus leaves. The stock is of sugar maple, finished in oil and wax, with the aforementioned checkering very fine at 20 lpi. The rear sight is a folding leaf on a quarter-rib; the front sight is a silver bead on a ramp. Rick Straker, the first customer of the rifle, is a lefty, so the action is designed for left-handed shooters, but Mr Stolzer intends to make the weapon for certain exclusive buyers and will make it in a right-hand version. The rifle is, at its base, a premium single-shot rifle.

OK, so it is a standard single-shot rifle so far, right? That's where the similarity ends. The rifle is chambered for 2-Bore (33.68mm) ammunition, which is also custom made by handloaders working for Carl Stolzer. The round fires a lead round ball; the entire round weighs almost half a kilogram. The 2-Bore Rifle is designed for blackpowder, and is not stressed for modern propellants. The barrel is 28 inches, and has a rather lazy twist for its rifling, perfect for stabilizing balls or short conical bullets. There is no muzzle brake or

flash suppressor; the muzzle is bare. Stolzer's 2-Bore includes a Pachmayr Decelerator recoil pad and three mercury recoil reducers. Recoil is a slow (but not gentle) push instead of a sudden sharp kick.

Note that the cost below is for *Twilight 2000*. The real cost could probably buy you a new luxury car.

Twilight 2000 Notes: These rifles are not available in the Twilight 2000 timeline. Pity.

Weapon	Ammunition	Weight	Magazines	Price
Carl Stolzer 2-Bore	S&H Super Precision 2-Bore	10.04 kg	1 Internal	\$1642

Weapon	ROF	Damage*	Pen	Bulk	SS	Burst	Range
Carl Stolzer 2-Bore	SS	13	1-1-1	9	7	Nil	123

*Damage against vehicles is 3/3/2/1.

LeMAG MAG-1

Seen in: Weapon experiment done by Tim LeGendre in the late 1990s, with a few being built for himself and a few unnamed friends and (it is rumored) certain US Special Ops units.

Country of Origin: US

Notes: A custom modification by Tim LeGendre of the M-1 Carbine, the MAG-1 was produced in two calibers, first on a whim, then in limited numbers for US Special Operations forces and for big game hunters. The MAG-1 has all the balance and lightness of the original weapon, and has reputedly very controllable recoil despite their greatly increased calibers. The stocks have been replaced with a synthetic stock, since the original wooden stocks crack under the pressure of the higher calibers.

Weapon	Ammunition	Weight	Magazines	Price
MAG-1	.45 Winchester Magnum	3.5 kg	6, 12	\$434
MAG-1	.50 Action Express	3.5 kg	5, 10	\$504

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MAG-1 (.45)	SA	4	1-1-Nil	6	2	Nil	49
MAG-1 (.50)	SA	5	1-2-Nil	6	3	Nil	50

LeMAG MAG-14

Seen in: Weapon experiment done by Tim LeGendre in the late 1990s, with a few being built for himself and a few unnamed friends and (it is rumored) certain US Special Ops units.

Country of Origin: US

Notes: Another custom modification by Tim LeGendre, this time of the M-14, the MAG-14 is modified for the .338WM round. Again, the stock has been replaced with a synthetic one, and the sights have been replaced with new ones appropriate for the new caliber. The rifle is fed from a modified M-1 Garand clip or a modified BAR magazine.

Weapon	Ammunition	Weight	Magazines	Price
MAG-14	.338 Winchester Magnum	4.8 kg	5 Clip, 8	\$1894

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MAG-14	SA	6	2-3-Nil	7	4	Nil	82

LeMAG MAG-15

Seen in: Weapon experiment done by Tim LeGendre in the late 1990s, with a few being built for himself and a few unnamed friends and (it is rumored) certain US Special Ops units.

Country of Origin: US

Notes: Another custom modification by Tim LeGendre, this time of the AR-15 in a custom caliber called .45 Professional. The new round has nearly the ballistics of the .338WM while reliably feeding into a modified AR-15. Though accuracy is not its strong suit, damaging potential is. The magazines are modified AR-15/M-16 magazines, but the 90MWG and 100-round C-Mags cannot be used with this weapon. It is notable that Eugene Stoner, inventor of the AR-15 series, insisted that this modification could not be accomplished.

Weapon	Ammunition	Weight	Magazines	Price
MAG-15	.45 Professional	4 kg	8, 12	\$2142

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MAG-15	SA	6	2-4-Nil	6	5	Nil	74

208 Research Institute SMG

Country of Origin: China

Appears in: This is an actual weapon developed for the Chinese PDW/SMG competition, but not approved.

Notes: The PLA is currently conducting a competition for a new submachinegun/personal defense weapon to be issued across the board from rear area troops to certain special operations forces. One of the competitors was in the competition for so short a time that it never had an official name, but is normally called simply the "208," for the company that designed it, the 208 Research Institute. The 208 is mostly a conventional-design SMG (in fact, it looks vaguely like an MP-5, and the external design was in fact influenced by the German SMG; it can even use steel MP-5 magazines). The guts of the 208 are, however, very different from the MP-5; it uses a telescoping bolt, blowback operation, and fires from an open bolt. The upper receiver is of stamped steel, while the lower receiver and collapsing stock are of aluminum alloy (virtually identical to the metal used in the AR-15/M-16 series' lower receiver). Handguard, pistol grip, and the buttstock insert are of light-but-strong polymer. The charging handle is on top of the receiver (below the sight line of the front and rear sights), and if the 208 jams it may be rotated 90 degrees (locking it to the bolt) and used as a forward assist. Though the sights are not of unusual design (they are a simple hooded front post and an aperture rear); they are made of an unusual material: titanium alloy. The rear sight is removable and mounted on a short optics mounting rail. The selector lever is also unusual; in addition to conventional safe, semiautomatic, 3-round burst, and automatic settings, it also slides out, allowing the weapon to be broken open for cleaning in the same manner as an AR-15/M-16-series weapon. (This strikes me as slightly dangerous, but anyway...) A variety of accessories were designed for the 208, ranging from non-magnifying holographic reflex sights to laser pointers to a lightweight silencer.

Unfortunately, the 208 was dropped from the competition very early in the process; most sources cite the exotic construction materials and that unusual selector lever/breakdown pin. The 208 Research Institute tried to market the weapon elsewhere, but found no buyers. It remains an interesting "what-if" weapon.

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

Merc 2000 Notes: There is some limited use of the 208 (known in the Merc 2000 timeline as the Type 08 submachinegun) by a couple of Chinese warlords' forces, but the primary users of the 208 are the troops of the Myanmar Army.

Weapon	Ammunition	Weight	Magazines	Price
208 SMG	9mm Parabellum	1.7 kg	30	\$411

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
208 SMG	3/5	2	Nil	2/3	2	3/4	26

AAI 18.5mm Submachinegun Feasibility Model ("Rocket Submachinegun")

Country of Origin: US

Appears In: DARPA weapons research in the early 1970s.

Notes: More commonly called the 18.5mm Rocket Submachinegun, this unusual weapon was the result of a DARPA-sponsored effort in the early 1970s to develop a short-barreled automatic weapon based on the rocket-powered projectile idea of the Gyrojet Pistol. Though the Rocket Submachinegun is thought by some as more of a short-barreled assault shotgun firing exotic ammunition, AAI always referred to the weapon as a submachinegun; and as its primary round does use a single projectile, I will keep it in this section of the site. The final design proved to be quite feasible, and AAI also felt that the Rocket Submachinegun could also be easily converted into submachineguns firing more conventional ammunition (though this was never actually done, except on paper). The military was reportedly very interested in the Rocket Submachinegun as a lightweight support weapon, but the post-Vietnam War drawdown and its sharp budget cutbacks killed the Rocket Submachinegun's DARPA sponsorship, killing the development program after only a few prototypes had been built.

The Rocket Submachinegun looked basically like a typical compact submachinegun of the time, albeit with a huge-sized barrel and magazine. Due to the nature of the weapon and its ammunition, operation is a rather strange mix of gas and delayed blowback. The round itself is ignited by a standard percussion-type primer and using a firing pin. The Rocket Submachinegun fired from a closed bolt, with a retarding wedge holding the bolt closed until just after the round has left the barrel (roughly 25 milliseconds). This allows the gas pressure from the launching charge of the round to fall low enough so that the blowback part of the operation (which uses some of the gas from the launching charge as well as the slight kick from the primer) does not produce an excessive amount of recoil nor undue stress on the lightweight receiver. The entire round, including the casing, was fired from the Rocket Submachinegun, which made the use of any sort of extraction mechanism unnecessary unless there was a dud round or the weapon needed to be cleared for safety while a round was chambered. The firing mechanism, despite its unusual nature, was actually quite simple and required few moving parts. The receiver of the Rocket Submachinegun was of lightweight aluminum alloy, with steel used for the operating parts, barrel, and a few other parts that might be otherwise easily damaged. Sights consisted of an adjustable rear notch and a front blade. The 11.5-inch barrel was rifled, due to the intended operation of the rocket rounds. Though the prototypes had no stocks, they did have attachment points for both fixed and folding stocks, which would have been added later in the development.

The ammunition, designed specifically for the Rocket Submachinegun, was about the size of a 12-gauge 3-inch magnum shell – but that is where the similarity ended. The rounds were rimless, with canted exhaust ports around the base to spin-stabilize the round after main propelling charge fires (except for the HE-FRAG round, which is spin-stabilized only by the rifling in the barrel). The rocket rounds used a large case of light steel alloy with a standard percussion-type primer, but the entire round left the weapon when fired.

The rocket rounds had three charges in them. The first, the launching charge, fires in a near-instantaneous spurt to fire the round from the barrel before the main propelling charge fires. The main propelling charge fires after the round has traveled about 6 meters (about 48 milliseconds after the launching charge fires), which keeps the exhaust from the rocket motor from harming the shooter. The third charge depends upon the round that was fired, and is either a small sabot separation charge (for the Multi-Scimitar), a pellet ejection charge (for the buckshot round), or a conventional RDX filler (for the HE-FRAG round).

The intended primary round for the Rocket Submachinegun was the Multi-Scimitar. The Multi-Scimitar used a four-piece sabot that contains two stacks of seven Scimitar sub-projectiles; the Scimitar sub-projectile itself was an advanced-design flechette made from simple stamped sheet steel and weighing 0.81 grams (12.5 grains). The Scimitar was flat in shape, with a pointed nose that was sharpened to provide greater penetration as well as improve aerodynamics and stability in flight. The rear of the Scimitar has a pair of slightly-twisted fins to further improve flight stability by providing a slow rate of spin. A thicker cross-section at the nose also improved stability, ensures that the Scimitar flies nose-first, and somewhat improves striking power. The sub-projectile package was designed to diverge quickly so that it can effectively attack large groupings of enemy troops at close and medium range – the Scimitars give a grouping of about a 50mm at 15 meters range, increasing to about 400mm at about 30 meters range. The Scimitar projectiles were known to produce large, nasty wounds out of proportion to their size and weight. (In game terms, shots at short and medium ranges follow standard *Twilight 2000* v2.2 buckshot/flechette rules – but at long range, Scimitar hits are only half as likely, and extreme range fire is effectively not possible with the Multi-Scimitar round.) The Scimitar projectiles would later show up again in the CAWS program, though ultimately they were rejected for use in the CAWS ammunition.

The second round designed for the Rocket Submachinegun is an HE-FRAG round, essentially a small grenade. The design of the HE-FRAG round was more or less conventional, and used a modified form of the rocket shell used for the Multi-Scimitar round. The fragments were produced by a thickened steel case wall, internally scored and producing 415 cubical steel fragments.

The third round is a rumored buckshot-type round that was essentially a rocket-powered shotgun shell; it may have been a planned type of rocket round that was never actually produced. The buckshot round was similar to the Multi-Scimitar round in design, but discharged 14 cubical tungsten pellets approximately 2.5mm in size, with the heavy, cubical tungsten pellets providing increased penetration and tissue damage.

Weapon	Ammunition	Weight	Magazines	Price
Rocket Submachinegun (Stockless)	18.5mm AAI Rocket Round	2.4 kg	20	\$1875
Rocket Submachinegun (Fixed Stock)	18.5mm AAI Rocket Round	2.9 kg	20	\$1905
Rocket Submachinegun (Folding Stock)	18.5mm AAI Rocket Round	2.7 kg	20	\$1925

Weapon	ROF	Damage*	Pen	Bulk	SS	Burst	Range
Rocket Submachinegun (Stockless, Multi-Scimitar)	5	2d6x14	1-3-Nil	4	1	3	20**
Rocket Submachinegun (Stockless, HE-FRAG)	5	C1 B8	Nil	4	1	3	60
Rocket Submachinegun (Stockless, Buckshot)	5	2d6x14	1-Nil	4	1	3	20
Rocket Submachinegun (Fixed, Multi-Scimitar)	5	2d6x14	1-3-Nil	6	1	2	20**
Rocket Submachinegun (Fixed, HE-FRAG)	5	C1 B8	Nil	6	1	2	60
Rocket Submachinegun (Fixed, Buckshot)	5	2d6x14	1-Nil	6	1	2	20
Rocket Submachinegun (Folding, Multi-Scimitar)	5	2d6x14	1-3-Nil	4/6	1	2	20**
Rocket Submachinegun (Folding, HE-FRAG)	5	C1 B8	Nil	4/6	1	2	60
Rocket Submachinegun (Folding, Buckshot)	5	2d6x14	1-Nil	4/6	1	2	20

*As the main propellant charge does not ignite until a Rocket Submachinegun round has traveled 6 meters, the velocity of the rounds are relatively low until this point. If **any** of these rounds are fired at a target 6.5 meters or less in range, the round will hit as a single, low-velocity round; rounds like the Multi-Scimitar or buckshot will not have time for the sub-projectiles or pellets to separate, and the HE-FRAG's contact fuze will not have time to arm, and will not explode. Damage rating in this case is only 2, and penetration is Nil.

The Scimitar sub-projectile is essentially treated as a buckshot/flechette round for game purposes at greater than short range – except that it has a long range in addition to a medium range, the individual Scimitars have a damage rating of 2, and Penetration rating is 1.

**See the paragraph on the Multi-Scimitar round above for further information on range effects.

AMAC Delta-786

Country of Origin: United States

Appears in: Company literature of the late 1980s and early 1990s.

Notes: The Delta-786 was designed by AMAC primarily for military use, and secondarily for police SRT and SWAT use, with another possible role as a bodyguard's weapon. The Delta-786 is essentially a very small submachinegun, perhaps more a PDW or machine pistol. As it's primarily design impetus was to function as a PDW in military use by rear-area troops, vehicle troops, or a sidearm for helicopter crews, it contains features that are primarily military in appeal. The Delta-786 is light and compact yet durable and hard to break. An optional "stock" is very unusual; it consists of a curved chinpiece to brace the weapon against (yes, that sounds rough to me as well). The chinpiece could also be used trapped against the forearm as a vestigial stock. Of course, in the testing phases, this was supplemented by a snap-on conventional stock, but it was not retractable. Operation is by open belt and direct blowback. Though there was only one manual safety, the Delta-786 also had a plethora of internal passive safeties. The trigger

guard folds down for use with heavy gloves. A special holster, strapping to the thigh, was designed for the Delta-786. Field stripping is fast and easy, and a partial breakdown can also be done which exposes the most commonly-dirtied parts for cleaning and lubrication. Sights are heavy-duty, with the rear sight fully adjustable.

Proprietary magazines were designed, but Uzi magazines can also be used. AMAC says that the US Military never looked at their SMG seriously, and no country seems to have been interested as well.

Weapon	Ammunition	Weight	Magazines	Price
Delta-786	9mm Parabellum	2.7 kg	20, 25, 32	\$273

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Delta-786	5	1	Nil	1/3	1	2	16

Anthony Smith M-11/Suomi

Country of Origin: United States

Appears in: Many such weapons are regularly designed here and there in the world -- particularly in the US -- mostly for use in specialist submachinegun competitions by licensed individuals, or simply as experiments.

Notes: The M-11/Suomi is a "frankenweapon" -- a new weapon made by combining the parts of one or more weapons into a new whole, in this case the Ingram M-11 in 9mm (the SWD version) and part of the upper receiver of a Finnish Suomi submachinegun. The result looks sort of like a long-barreled M-11, with the magazine feed moved well forward of the grip, and now using Suomi-type magazines (including the 71-round drums). The rate of fire is drastically lowered by addition of a weight to the bolt, to 527 rpm. Due to the forward position of the magazine feed, the barrel is not actually as long as it might appear; it is in fact only 137 millimeters long. The primary advantage of Anthony Smith's conversion is to decrease the wasteful rate of fire of the M-11, grant the ability to use the much better-made Finnish magazines (which are also common on the War Surplus market), and simply produce an interesting weapon. It is not known at this time whether Mr. Smith plans on any sort of production of the M-11/Suomi, though he does sell the plans for the weapon.

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

Weapon	Ammunition	Weight	Magazines	Price
M-11/Suomi	9mm Parabellum	3.61 kg	50, 71 Drum	\$277

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-11/Suomi	5	2	Nil	3/5	1	2	17

Ares Folding SMG

Country of Origin: United States

Appears in: Weapon experiments of the late 1960s to late 1980s, when several such weapons were designed in the US.

Notes: The ARES Folding SMG is an ARES patent of the Warin SMG. It is a novel concept in weapons, capable of being folded to the size of a cigarette carton. One phase is required to ready the weapon when folded (or vice-versa). The magazines used are Uzi or MP-28 magazines. The cyclic rate of fire is adjustable between 650 and 950 rpm; this is more a continuous adjustment, rather than a selector lever (though only ROFs of 5 and 10 are shown below). There is also a 3-round burst setting. In reality, only two of these weapons were ever built, and they were withdrawn from sale without any buyers; it however makes an interesting "what-if."

Twilight 2000 Notes: Over 100 of these weapons were built for CIA and DIA agents.

Merc 2000 Notes: As Twilight 2000 Notes, except that the number was closer to 200.

Weapon	Ammunition	Weight	Magazines	Price
ARES Folding SMG	9mm Parabellum	1.81 kg	20, 32	\$416

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
ARES Folding SMG	3/5/10	2	Nil	3	1	2/3/7	19

Benelli CB-M2

Country of Origin: Italy

Appears in: This submachinegun was actually ready for full-scale production, but unfortunately Benelli had no buyers for whom to manufacture it.

Notes: This SMG fired a purpose-designed "semi-caseless" cartridge based on the 9mm Parabellum round. The round is semi-caseless in that the primer section is made of a combustible compound inside a ring made of a brass compound. However, there is nothing to be ejected when the weapon cycles, since the "semi-case" is also ejected with the round down the barrel. Several countries evaluated the weapon and liked it very much; however, the prospect of incorporating totally new ammunition into their supply chain

was a stumbling block, and none were officially accepted into military service. It therefore went into the dustbin of history.

Twilight 2000 Notes: The only people using the CB-M2 in the Twilight 2000 World are a few special ops personnel, and government agencies.

Weapon	Ammunition	Weight	Magazines	Price
CB-M2	9mm AUPO	3.15 kg	20, 30, 40	\$344

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Benelli CB-M2	10	2	1-Nil	3/4	1	5	23

Colt MARS

Country of Origin: US

Appears In: A government request to Colt Firearms in 1997

Notes: The MARS (Mini Assault Rifle System) was designed at the behest of the Special Analytical Services in 1997, who felt that there was a place in the military as well as the police for a PDW-type weapon that would also be useful to police SRT teams as well as military special operations. The MARS had a different design philosophy than other PDWs like Heckler & Koch's MP-7 and FN's P-90 – most PDW's focused on lightweight rounds with enhanced penetration, while Colt's approach was on damage and range, with penetration a secondary requirement and minimum re-tooling necessary for production of the MARS as well as its ammunition a third.

The MARS prototype was, in fact, a heavily-modified M-4 carbine – literally. The M-4 used in the tests was taken apart, had metal machined out of the lower and upper receivers, a modification to the magazine well, a new bolt put in – even the magazines were M-16/M-4 magazines that had been cut apart and reduced in width, with a new follower and spring added. Nonetheless, these jury-rigged weapons produced outstanding test results. Three prototypes were made; two were chambered for the 5.56x30mm MARS cartridge, while one was chambered for the 9x30mm MARS cartridge. The 5.56mm MARS cartridges were made with cut-down 5.56mm NATO brass and loaded with an M-193 bullet; the 9mm MARS round was made from a necked-down 10mm Colt round loaded with a lengthened 9mm Parabellum bullet. The M-4s used for the prototypes were flat-top weapons, and thus the tops of the receivers had a length of MIL-STD-1913 rail. The sliding stock was modified to allow it to be collapsed shorter than that of a standard M-4; they could be collapsed almost to the receiver. The sights designed for the MARS were a lower-profile M-4-type front sight and a rear sight unit with a 1.5x optical sight, with a folding iron sight similar to that of the M-4 as a backup.

In hindsight, it is believed that what killed the MARS program was its proprietary cartridges. As the 5.56mm MARS has the ballistics of a hotloaded .221 Fireball round, many have said that Colt should have chambered the MARS for this round instead. At any rate, military and police forces to whom it was demonstrated thought it was a great weapon, but funds for development never came Colt's way.

Twilight 2000 Notes: The MARS does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
MARS	5.56mm MARS	2.45 kg	30	\$549
MARS	9mm MARS	2.92 kg	30	\$932

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
MARS (5.56mm)	5	2	1-Nil	3/4	3	6	16
MARS (9mm)	5	3	2-Nil	3/4	4	9	16

Connor M-21 Folding SMG

Country of Origin: United States

Appears in: Weapon experiments of the late 1960s to late 1980s, when several such weapons were designed in the US.

Notes: During the movie *Robocop II*, the public saw for the first (and only time) a folding submachinegun in the hands of the juvenile villain called the UC-9. This weapon was designed by Utah Connor for use by undercover police and clandestine forces. It never reached production (and the one in the movie was the only one made), but the design was later refined into the M-21. The UC-9 was a rather fragile weapon; the M-21 is far less so. An accidental discharge while folded was possible with the UC-9; the M-21 cannot be folded if the weapon is cocked or a round is in the chamber. The folded dimensions of the M-21 are 267x114x38mm.

Twilight 2000 Notes: Some 500 of these weapons were produced for MilGov after the split.

Merc 2000 Notes: Though reports of these weapons show up from time to time, no one is sure how many have been produced or who they were originally made for.

Weapon	Ammunition	Weight	Magazines	Price
M-21	9mm Parabellum	2.84 kg	32	\$258

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
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Heckler & Koch HK-54A1

Country of Origin: Germany

Appears in: Candidates for Project 6.2 of the US JSSAP in the 1980s.

Notes: The US JSSAP (Joint Services Small Arms Program) in the 1980s was a large military small arms research project used to research and (if possible) procure new small arms for the US military. Some parts of the JSSAP included the well-known ACR program and the pistol project that eventually led to the adoption of the M-9 pistol. One of the lesser-known parts of JSSAP was Project 6.2, meant to produce a new submachinegun for US military special operations. As it was a small part of JSSAP, Project 6.2 was to use, as much as possible, off-the-shelf components or modified versions of them. US military special operations were already using several Heckler & Koch weapons, so they were contracted to work with several US military research agencies to work on Project 6.2, with the MP-5 submachinegun being the base weapon.

The first weapon produced by JSSAP 6.2 was the HK-54A1. The HK-54A1 was a highly-modified version of the MP-5, with numerous new features to make the HK-54A1 a more versatile submachinegun than the MP-5. The HK-54A1 has been dehorned to a large extent from its MP-5 base – without the silencer attached, it's shorter than an MP-5, and most sharp contours have been rounded off or covered with a polymer shell. The sights, however are much more complex than those of the MP-5; the rear sight was a large drum-type diopter sight which can be adjusted to a finer point than typical submachinegun sights. The front sight was basically the same as found on the MP-5. Though the HK-54A1 could feed from standard MP-5 magazines, Heckler & Koch also designed a drum magazine made of polymer and light alloy, with a capacity of 50 rounds. (Despite the lightweight materials used in the drum magazine, the drum still weighed 0.68 kg empty, and it was rather clumsy.) The selector mechanism allowed for five settings – safe, semiautomatic, 3-round burst, automatic, and locked breech (explained in the next paragraph). The sliding stock was designed to be lighter and more streamlined, and the buttplate was much smaller in size. (Future development was to give the HK-54A1 an ability to mount a wide variety of attachments, but development of the HK-54A1 never got that far.)

Perhaps the largest amount of modification to the MP-5 design was made for silenced operation. The HK-54A1 was designed from the start to use a silencer better than any on the market, and yet still be completely effective without a silencer attached. Heckler & Koch used part of the MP-5SD design to do this – the HK-54A1 has gas ports near the breech similar to those on the MP-5SD. Unlike the MP-5SD, the 7.06-inch barrel of the HK-54A1 is strong enough for use without the silencer attached, and the ports can be closed with using a switch under the fore-end of the weapon in front of the magazine well. The silencer is of the screw-on type, and more than doubles the length of the HK-54A1; with no silencer attached, the HK-54A1's barrel does not extend beyond the handgrip and barrel shroud. The HK-54A1's silencer, like that of the MP-5SD, demands the use of full-power 9mm Parabellum ammunition of standard military weight and propellant charge; without the silencer, the HK-54A1's shooter has a much wider choice of 9mm Parabellum ammunition types. Silent operation could be further enhanced by a selector lever setting that locks the bolt back after each shot, eliminating bolt clatter. (In game terms, the HK-54A1 has better than Class 3 noise suppression when fired on the locked breech setting, but also has a BA fire rate.) Used with a locked bolt and silencer, the HK-54A1 was at the time possibly the quietest silenced weapon yet designed.

The HK-54A1 was given a lot of testing by the US military, including range, field, and some combat testing in unspecified places. The troops that used the HK-54A1 felt that it was a very effective weapon and an improvement over both the MP-5 and MP-5SD – but not a big enough improvement to merit large-scale procurement. The mechanism of the HK-54A1, particularly with the barrel porting system, often caused problems, as they could be jammed, even when closed, by dirt – in a closed, open or partially-open position. Unit armorers sometimes felt that maintenance was a real pain in the butt due to the complex mechanism. The large 50-round drum designed by Heckler & Koch turned the HK-54A1 into a relatively clumsy weapon. When the silencer was attached to the HK-54A1, the length of the weapon suddenly became 7.2 inches longer, and the HK-54A1 became very front-heavy with the silencer attached. Add the drum magazine *and* the silencer to the HK-54A1, and the user ended up with a *very* clumsy weapon. The special operations troops that used the HK-54A1 didn't think the HK-54A1 was necessarily a bad weapon, but they did feel there was considerable room for improvement; therefore, they couldn't recommend any large-scale buys to their superiors. Heckler & Koch did more work with the HK-54A1 design, producing the submachineguns commonly known as the SMG I and SMG II. These are detailed later in this section of this site.

Weapon	Ammunition	Weight	Magazines	Price
HK-54A1	9mm Parabellum	2.98 kg	10, 20, 30, 50 Drum	\$384
HK-54A1 Silencer	N/A	0.42 kg	N/A	\$123

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
HK-54A1	3/5	2	Nil	3/4	1	2/3	19
With Silencer	3/5	2	Nil	4/5	1	1/2	16

Heckler & Koch SMG I/SMG II/MP-2000

Country of Origin: Germany

Appears in: Candidates for Project 6.3A of the US JSSAP in the 1980s.

Notes: Though the HK-54A1 was rejected by the US military, US special operations units (especially the Navy's SEALs) still felt that the HK-54A1 was a promising design; it just needed more work. The Pentagon therefore authorized the JSSAP 6.3A

submachinegun project, and asked Heckler & Koch to further develop the HK-54A1 with input from the US special operations community as well as selected US firearms designers. The aim was to produce a submachinegun that could be placed in service by the mid-1990s, and possibly also usable by other troops as a PDW.

Though commonly called the SMG I, the first weapon produced under JSSAP 6.3A was referred to by the military as the JSSAP 6.3A SMG; Heckler & Koch gave it the unusual developmental designation of HK-94054. The SMG I was a lightweight, short-barreled submachinegun, barely larger than an MP-5K, but much more streamlined in appearance and in most ways more versatile. The lower receiver, magazine well, pistol grip, a non-folding foregrip, handguard, trigger guard, and trigger group housing were a single unit, made from strong and lightweight polymer/plastic. The upper receiver was of stamped steel; in addition, steel or light alloy reinforcement was used for the operating parts as well as to provide reinforcement in some areas of the lower receiver. The sliding stock was even more streamlined than that of the HK-54A1, and when completely collapsed, it was almost completely flush with the receiver and barely visible. The stock could also be completely removed. The 30-round magazine, modified from the standard MP-5 design, was a bit more curved than that of the standard MP-5 magazine to improve feed characteristics when loaded with unusual ammunition types; it was also made from the same lightweight polymer/plastic as the SMG I's lower receiver. (This magazine will not fit into other MP-5-based designs, though the SMG I can also use standard MP-5 magazines.) The SMG I was tested with the HK-54A1's 50-round drum as well as several variations on that theme, but the drum magazine idea was quickly rejected since the drum did make the SMG I into a clumsy weapon.

Perhaps the most dramatic change in the SMG I was to the internal operating system. The roller-locking delayed-blowback operation of the MP-5 was totally replaced; the SMG I used simple blowback operation and fired from a closed bolt. The blowback operation was only slightly modified, using an integral safety lock that delayed the release of the firing pin for a few milliseconds; this prevented most cook-offs from happening in the first place. The simplified operation also allowed for a much wider choice of 9mm Parabellum ammunition types, weights, and propellant charges. The SMG I was designed and presented to the US military with the capability for only semiautomatic and automatic fire, though Heckler & Koch could easily have added in burst capability if desired. The SMG I also included a bolt hold-open device at the request of the JSSAP committee, with the release being a button above trigger guard. The selector group and magazine release were also ambidextrous. The drum-type diopter rear sight was more complex than those of the HK-54A1 (it was derived from the rear sight of the HK-21 machinegun), and included a feature allowing the shooter to easily switch between standard and suppressed fire while keeping the same zero. Both the front and rear sights could be raised in height, making them easier to use when the shooter was wearing a protective mask. Unusually, the SMG I was equipped with a forward assist; though it could be used to fully seat the bolt in a dirty weapon (which is really not a good practice in the first place), its primary use was to quietly close the bolt after loading and charging the SMG I.

The 5.63-inch barrel did not have the complicated barrel porting system of the HK-54A1, but the silencer designed for use with the SMG I was far better than the typical removable silencer. The silencer was not only useable with both full-power and subsonic ammunition, it could be used with a much wider variety of bullets and propellant charges (though not as large a selection as when the SMG I was used without its silencer). The silencer is secured by latches instead of threads, and can be quickly and easily removed and mounted by the user. A gas adjustment valve was included to allow for more efficient use of rounds with larger-than-normal propellant loads as well as subsonic propellant loads. In addition, the bolt lock of the HK-54A1 was retained, further quieting the SMG I if desired. The silenced SMG I wasn't as quiet as the HK-54A1 or MP-5SD, but it was still one of the quietest submachineguns ever devised.

In the end, the Pentagon decided against the SMG I. This had nothing to do with the design of the SMG I – the troops were almost completely satisfied with it. The JSSAP committee simply decided that while the SMG I was a great submachinegun, it just wasn't really a necessary acquisition at the time, given that the SMG I would be produced only in small batches – the SMG I would be an expensive weapon due to the limited production alone, and the US defense budget was also experiencing a drawdown. The MP-5-series weapons that US special operations units were already using were deemed adequate. Nonetheless, some 60 SMG I's were built, and they have largely been retained (stored in an operating condition) by the US military; in addition, the Pentagon elected to retain complete copies of the specifications and associated engineering package – supposedly for possible future use, though as far as is known, the SMG I has not seen the light of day since 1985.

Heckler & Koch, however, felt that they had a winner in the SMG I (and US special operations troops agreed), and that sales to other countries were a real possibility. Heckler & Koch tweaked the SMG I a bit more, combining some of the best features of the SMG I and SMG II (see below) with those of the MP-5 series. This led to the MP-2000. The MP-2000 was very similar to the SMG I in appearance and operation, though a pair of slots are cut into both sides of the fore-end on either side of the barrel. A pair of cooling slots are cut on either side of the handguards. The trigger guard was about twice the length of that on the SMG I; at the front of the MP-2000's trigger guard is a lever, which is the magazine release. Below the handguard was a mount for a foregrip similar in shape to that of the MP-5K; this foregrip was not only removable, but could be adjusted in position along the handguard and (to a limited extent) adjusted for length. The MP-2000 had charging handles on both sides of the receiver, further enhancing its ambidextrous features. The barrel was a bit longer at 5.87 inches. The MP-2000 was reportedly tested in and out of combat by a number of special operations units worldwide, but not officially adopted by anyone; it's uncertain how many MP-2000s were actually built. It is possible that the MP-2000's biggest marketing problem was that it was competing against its own father – the MP-5 series – and a new (and more expensive, in real-life terms) version of the MP-5 series couldn't compete against the already-existing versions of the MP-5 series and the greater availability of parts, weapons, and support.

In between the SMG I and the attempted marketing of the SMG II, Heckler & Koch designed the SMG II. Designed in 1984, the SMG II is sort of a product-improved SMG I. The SMG II was designed for a still-unknown customer that liked the SMG I, but wanted

a few more changes to the design of the SMG I. The customer for the SMG II is still undisclosed, but the SEALs are believed to have at least tested the SMG II. Most sources say that at least 60 examples of the SMG II were built, but as many as 200 may have been made. The SMG II was, however, close to handmade; no special production line, machinery, or tools were set up at Heckler & Koch for the SMG II.

The HK-21-derived sights used on the SMG I were exchanged for something in-between those of the SMG I and MP-2000 – derived from those of the standard MP-5, they were smaller and less complicated, but had the ability to switch between settings for full-power ammunition and subsonic ammunition. The sights also had brighter tritium inlays. A minor change was made to the trigger group; the normal H&K selector lever position markings (designed to be easily-understood whether the shooter uses the Latin alphabet or not – or even whether or not he can even read) were replaced by numerical markings instead. The major change to the trigger group was that a four-position selector was used, allowing for safe, semiautomatic, 3-round burst, and automatic fire; bolt-locking was also retained from the SMG I, though it is done with a separate switch. The MP-2000-type cooling slots are mounted a bit further forward on the SMG II. The charging handle of the SMG I was replaced with a knob above the barrel, similar to that on the Uzi. The folding stock design was further refined; the buttplate is even smaller than that of the SMG I, and when folded, is indistinguishable from the rest of the receiver at first glance. Some internal changes to the SMG II also led to an ejection port positioned a bit higher than that of the SMG I, and the rails of the sliding stock have a slight cutout on the right side so that the ejection port is not blocked by the stock rails when the stock is folded. Atop the receiver are a pair of brackets for the mounting of various optics or mounting devices. The hollow pistol grip has a hinged endcap, which can store various small items (usually batteries or a small cleaning kit).

Twilight 2000 Notes: In the Twilight 2000 timeline, the MP-2000 was put into limited production starting in 1995; it was used by the US Navy SEALs, US Army Special Forces, German Fernspah troops and the German GSG-9, among others. The SMG I itself saw far more limited production and use, primarily by US Navy SEALs; less than 200 were built in the Twilight 2000 timeline. In the Twilight 2000 timeline, the “unknown customer” for the SMG II turned out to be the ISA (Intelligence Support Activity), a little-known composite CIA/military special operations unit. As the Twilight War went on, spare parts for those SMG IIs got progressively more difficult to get (despite the ISA having several alternate sources for parts), and their SMG IIs had largely fallen into disuse after 1999.

Weapon	Ammunition	Weight	Magazines	Price
SMG I	9mm Parabellum	2.78 kg	10, 15, 30	\$284
MP-2000	9mm Parabellum	3 kg	10, 15, 30	\$373
SMG II	9mm Parabellum	2.81 kg	10, 15, 30	\$374
SMG I/SMG II/MP-2000 Silencer	N/A	0.82 kg	N/A	\$105

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SMG I	5	2	Nil	2/4	1	3	17
With Silencer	5	2	Nil	4/5	1	2	14
With Silencer, Subsonic	5	1	Nil	4/5	1	2	12
MP-2000	3/5	2	Nil	2/4	1	1/2	17
With Silencer	3/5	2	Nil	4/5	1	1/2	14
With Silencer, Subsonic	3/5	1	Nil	4/5	1	1/2	12
SMG II	3/5	2	Nil	2/4	1	2/3	17
With Silencer	3/5	2	Nil	4/5	1	1/2	15
With Silencer, Subsonic	3/5	1	Nil	4/5	1	1/2	12

Hill H-15

Country of Origin: United States

Appears in: Experiments conducted in the 1960s.

Notes: John L. Hill began thinking about the H-15 design in 1948; however, it wasn't until the early 1960's when, caught in a snowstorm in Denver in a machine shop with nowhere to go and nothing to do that the first H-15 was made. It is a shot-barreled submachinegun designed to be used in one hand or fired two-handed like a large pistol, though a folding wire stock may also be attached to the weapon. The most striking aspect of the H-15 is the magazine; it is a large clear plastic box that sits atop the weapon with the rounds contained sideways within it, in exactly the same manner that the FN P-90 PDW would use some 30 years later! It is sort of a “semi-bullpup” design, with the magazine behind and above the pistol grip, and with a barrel which, though short, is longer than one might expect from looking at the weapon. The experimental weapons he produced had no manual safeties of any sort, though there were some automatic safeties. Unfortunately, the rather draconian gun regulations present in the US at the time prevented Mr. Hill from making many fully-automatic versions of the H-15, and he could not interest any police or military agencies in the rather novel weapon. He was basically ahead of his time. Perhaps 90-100 of these weapons were built, mostly semiautomatic, and only 10 or 11 examples remain in existence today. (The status of Frankford Arsenal's H-15 is unknown at this time.) Most of these were made to fire 9mm Parabellum, but some .380 ACP versions were also built. The H-15 remains a great example of how ingenious a private arms manufacturer can be.

Weapon	Ammunition	Weight	Magazines	Price
H-15	9mm Parabellum	2.27 kg	35	\$303
H-15	.380 ACP	1.81 kg	35	\$287

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
H-15 (9mm)	5	2	Nil	2/3	1	3	21
H-15 (.380)	5	2	Nil	2/3	2	4	20

Howlett JE-1 SMG

Country of Origin: United States

Appears in: Tests for new submachinegun to use the .30 Carbine round conducted in the mid-1940s.

Notes: The JE-1 (with "JE" standing for "Japeradicator") was a submachinegun designed by a worker at Douglas Aircraft named C.C. Howlett. While his weapon would now be regarded more as a PDW (Personal Defense Weapon), at the time of its inception it was meant to be a small stockless submachinegun to use the then-new .30 Carbine cartridge, which the US Army hoped would be a round which was lighter and more effective than the .45 ACP when fired from longer-barreled weapons. The JE-1 was a selective fire weapon based on short blowback operation, with a barrel that recoiled slightly much like that of a pistol, but not as far. The upper receiver of the weapon was fashioned largely of stamped steel, with a lower receiver of aircraft aluminum. And a wooden pistol grip and fore-end/heat shield. A simple thumb lever controlled the operation of the weapon, and the barrel was a short 12-inches, finned on the rear third of the barrel for cooling. As stated before, the barrel had a lower wooden foregrip/heat shield, with a steel, ventilated shield on top of the barrel; the barrel protruded only a fraction of an inch from this affair. External steel parts were blued, the aluminum was left in natural metal, and the wood laminated. No tools were required for stripping. The weapon was designed to be used with two hands, but could be fired with one hand. For a prototype, the JE-1 was exceptionally well-made, but it was a bit on the heavy side.

Unfortunately, though the Army took a long, hard look at the JE-1, and even extensively tested it, they requested several changes – something Mr. Howlett had little money to do. It was later determined that the JE-1 offered no significant advantages over the M-1 Carbine, and furthermore could not have a grenade launcher or bayonet mounted. Though the OSS was reportedly quite interested in the JE-1, the Army dropped interest in the weapon, and the end of World War 2 effectively killed the JE-1 completely.

Weapon	Ammunition	Weight	Magazines	Price
Howlett JE-1	.30 Carbine	2.72 kg	15, 30	

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Howlett JE-1	5	2	1-Nil	2	1	3	21

Colt IMP/Bushmaster Rifle/Submachinegun

Country of Origin: United States

Appears in: A request by the US Air Force in an attempt to produce better armament for downed pilots.

Notes: This weapon was originally designed by the Frankfort Arsenal for use by downed aircrews. The idea was to give them the equivalent of an assault rifle in a package small enough to be put in their survival kits. To this end, they developed what they first called the "Arm Gun" (called that because the proper firing position was to hold the bullpup stock against the bicep of the firing arm with the off hand; the original name was the IMP, for Individual Multi-Purpose, so-called because it was originally envisioned for a wider role). They first experimented with a new cartridge, the .17 caliber Frankfort Arsenal round; this did not give the proper punch, so they switched to .221 Fireball (approximately the same ballistics as the 5.56mm NATO, but lighter). The military then asked for a switch to the standard 5.56mm NATO round. The entire program was then scrapped, because the Air Force simply couldn't figure out how to fit it in the tiny survival packs of fighter pilots. The three prototypes were all that were built. They are presented here as an interesting "what-if."

While the Bushmaster Arm Gun was unsuccessful, Bushmaster later sold the weapon as a sort of large pistol, and sales of this weapon took off. The barrel is slightly longer, the weapon is lighter, and the Bushmaster Pistol is designed to be semiautomatic-only, but it is otherwise the same as the 5.56mm NATO version of the Bushmaster Arms Gun. This weapon was one of the first targets of the Brady Gun Ban, and it is unknown whether Bushmaster plans to pick up production again in the future.

Twilight 2000 Notes: CivGov acquired Frankfort Arsenal during the confusion in the US after the November Nuclear Strikes. They took the plans for the Bushmaster and began manufacturing them in 5.56mm NATO for issue to levied militia, particularly horse-mounted troops, vehicle crews, and teenagers. They built approximately 4000 of them.

Weapon	Ammunition	Weight	Magazines	Price
IMP	.17 Frankfort Arsenal	2.1 kg	20, 30	\$543
IMP	.221 Fireball	2.68 kg	20, 30	\$837
IMP	5.56mm NATO	2.8 kg	20, 30	\$863
Bushmaster Pistol	5.56mm NATO	2.38 kg	10, 20, 30	\$850

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
IMP (.17)	5	2	1-Nil	3	2	4	12
IMP (.221)	5	2	1-Nil	3	2	5	14
IMP (5.56mm)	5	2	1-Nil	3	3	6	13

Bushmaster Pistol	SA	2	1-Nil	3	3	Nil	14
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Ingram Lightning M-5

Country of Origin: United States

Appears in: Literature of the Lightning Arms Corporation of Post-World War 2.

Notes: The Model 5 was one of Gordon B Ingram's first submachinegun designs (Ingram would later become famous for the invention of the M-10 and M-11 submachineguns). Though the Lightning Arms Corporation fully intended to mass-produce the Model 5, and in fact had what they thought was a firm order from Nicaragua in 1946, ultimately only one prototype was produced.

Though somewhat superficially resembling the Thompson M-2 submachinegun from the outside, internally the M-5 is a quite different weapon; it is not nearly as complicated a weapon as the Thompson (nor would its real-life price been anywhere as expensive), built primarily from steel stampings and having an internal firing mechanism with only 3 moving parts. The furniture was of simple hardwood, and the weight of the M-5 was far less than that of the Thompson. The M-5 also employed a fairly efficient (and advanced, for its time) buffer system which reduced felt recoil despite the lack of any sort of muzzle device. (In fact, Lightning's representatives in Nicaragua demonstrated the simplicity and low recoil of the M-5 by having the daughter of a high-ranking political figure fire the weapon on full automatic, which she did quite well!) Perhaps one of the smallest submachineguns of its time, the M-5 was a mere 25 inches long, yet had a 10-inch barrel, with the barrel being covered by a ventilated barrel shroud. Feed was from Reising-type magazines, though Lightning advertised (but never made) a 25-round magazine. The prototype had no provision for semiautomatic fire, though production examples were to have selective-fire capability.

Ultimately, it appears that the M-5 was a victim of the post-World War 2 – as happens after any large war, the world suddenly gets flooded with large amounts of cheap surplus firearms, and Nicaragua found its firearms elsewhere instead of buying the M-5.

Weapon	Ammunition	Weight	Magazines	Price
Lightning M-5	.45 ACP	2.72 kg	12, 20, 25	\$342

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Lightning	5	2	Nil	4	2	5	31

Ingram M-7/M-8/M-9

Country of Origin: United States

Appears in: Various Ingram designs of the early 1950s.

Notes: Though the Ingram M-6 enjoyed moderate success in 9mm Parabellum, Gordon always preferred the .38 Super cartridge, believing it to be superior 9mm Parabellum and approaching the .45 ACP's power without having quite the recoil of that cartridge. He therefore developed an improved version of the M-6, chambered exclusively for the .38 Super cartridge; this submachinegun was known as the M-7. The M-7 was similar in configuration to the M-6, but had a number of differences internal and external that made it a new gun. The M-7 fired from a closed instead of an open bolt, and had a receiver made from an aluminum alloy, which was quite unusual at the time. (Internally, there were steel strengthening spars.) The M-7 had a slightly higher cyclic rate than the M-6, even in the M-6's rare .38 Super version (though not high enough to count for game purposes). The barrel was heavy and finned for cooling and to stiffen the barrel; underneath the barrel was a wooden foregrip, and the stock and pistol grip were made from a single piece of wood. Unfortunately, POC found no buyers for Ingram's creation, and only one prototype M-7 was ever built.

Ingram then slightly modified and improved the M-7, producing the M-8. The M-8 was again chambered for 9mm Parabellum as well as .45 ACP, and the entire weapon was far easier to field-strip and resistant to dirt. The charging handle slot had a dust cover added, and the safety would work whether the bolt was forward or back. By this time (1955), Ingram had left POC, and could not find another US manufacturer to make the M-8. For a while, it looked like Thailand's state arms manufacturer was willing to produce the M-8 for both Thai and export purposes, but this deal fell through. Again, only one prototype was built.

Ingram returned to the US, where he modified the M-8 to use the sliding stock of the M-3 submachinegun, calling it the M-9. Again, Ingram was not able to attract any manufacturers, and again only one prototype was built.

Weapon	Ammunition	Weight	Magazines	Price
M-7	.38 Super	3.38 kg	30	\$328
M-8	9mm Parabellum	3.27 kg	30	\$292
M-8	.38 Super	3.38 kg	30	\$338
M-8	.45 ACP	3.79 kg	30	\$452
M-9	9mm Parabellum	3.1 kg	30	\$317
M-9	.38 Super	3.2 kg	30	\$353
M-9	.45 ACP	3.59 kg	30	\$477

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-7	5	2	1-Nil	5	1	3	26
M-8 (9mm)	5	2	Nil	5	1	3	24
M-8 (.38)	5	2	1-Nil	5	1	3	26
M-8 (.45)	5	2	Nil	5	2	5	28

M-9 (9mm)	5	2	Nil	3/5	1	3	24
M-9 (.38)	5	2	1-Nil	3/5	1	3	26
M-9 (.45)	5	2	Nil	3/5	2	5	28

LAPA SM M-02

Country of Origin: Brazil

Appears in: A weapon designed to replace Brazilian submachineguns in the early 1980s.

Notes: This Brazilian-made SMG was designed as a companion weapon to the LAPA FA M-03 assault rifle. It is a modern design, perhaps ahead of its time, with the entire body made of high-impact plastic with smooth surfaces. It is short, light, and easy to use. However, Brazilian troops found it, like the FA M-03, a bit strange looking and the Army found training troops to use a radically different sort of weapon costly. It was thus never adopted, and now is firmly in the prevue of exotic weapons collectors and museums. Twilight 2000 Notes: An initial production batch of about 275 of these weapons was placed into the hands of Brazilian special operations forces, who liked their resistance to dirt and damage. Factories could not be geared up quickly enough to produce this weapon in large quantities, and after the November Nuclear Strikes, the materials to produce it were almost unobtainable. However, the troops who did use the LAPA loved it, since it was virtually indestructible and idiot-proof.

Merc 2000 Notes: This is a Brazilian submachinegun that was adopted for a short time by Brazilian armed forces, and also had some success with foreign sales.

Weapon	Ammunition	Weight	Magazines	Price
SM M-02	9mm Parabellum	2.8 kg	20, 30, 32	\$284

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
SM M-02	5	2	Nil	4	1	3	21

LEL-1

Appears in: Experiments began by DM ("Carbine" Williams in the 1930s and continued by LE Lisk in the early 1970s.

Weapon Type: Submachinegun

Notes: David Marshall "Carbine" Williams (the nickname is from his greatest invention – the M-1 Carbine) began designing a .22 Long Rifle submachinegun soon after selling the M-1 Carbine to the US government. The idea was to use the weapon as a testbed for a weapon firing a larger caliber. The weapon, known as the Model 7, had a design which was jealously-guarded by Williams, as he believed it was so innovative that it would be immediately stolen if its plans were known. Unfortunately, Williams died in 1975 before he was able to make a working prototype of the Model 7 – but not before writing a document giving Williams' widow permission to allow LE Lisk (and only LE Lisk) to copy or improve upon the design.

Lisk did improve upon the design, and the eventual prototype produced was called the LEL-1. It is, essentially, a belt-fed rimfire submachinegun. Crude and rather lumpish in appearance, it looks like what it is – a first prototype – in software terms, an "alpha" version. The operation is very similar to that of the M-1919A4, firing from a closed bolt, pulling the belt in from the right side, and ejecting brass from the bottom of the receiver. The charging sequence is unusual in that the bolt must be cycled twice before the weapon is ready for operation. Unlike the M-1919A4, however, the barrel does not move during operation; instead, the LEL-1 has a "floating chamber" which moves by itself instead of taking the barrel with it. The belts themselves are made from cloth, and since no loading machine (Williams designed one, but neither Williams nor Lisk ever built it) was ever made for them, loading the belts is quite a bear of a job that tends to put blisters on one's fingers. There are no sights of any kind; they were to be designed and placed on later models. The LEL-1 has a sliding wire stock, but no sort of safety mechanism (again, this was to be added later). Most of the weapon is made from aluminum. Like alpha software, the LEL-1 has a number of features which don't actually work, but were meant to be working in the final examples of the weapon. The LEL-1 has a cocking knob, but it was left disconnected; instead, one must open the top cover, pull the bolt back with a finger (like the M-3A1 Grease Gun), then do it again. The LEL-1 also has a knob-like protrusion at the rear of the receiver. In later examples, this would have adjusted the cyclic rate, but the actual feature is not present in the LEL-1.

LE Lisk demonstrated the weapon to the US Army at the Aberdeen Proving Grounds. The Army was not really as interested in the weapon as they were to see how it works; however, Lisk would not permit an internal inspection of it, fearing the Army would steal the design before any contracts were signed. Lisk went as far as taking the LEL-1 with him to lunch, keeping his foot on it the entire time. (This secrecy continues to this day.) The Army refused to even consider any sort of contracts before they made a full, disassembled inspection of the LEL-1. Thus there was a classic standoff, with the Army and Lisk parting ways rather quickly, and no one ever manufacturing the LEL-1. Lisk also never continued work on the design (as far as is known). Lisk seems to have lost interest in firearms design after the death of his wife in 2002. Thus the LEL-1 remains an interesting design seemingly with much unrealized potential.

Weapon	Ammunition	Weight	Magazines	Price

LEL-1	.22 Long Rifle	5.44 kg	100 Belt, 250 Belt, 1000 Belt			\$221
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Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
LEL-1	25	1	Nil	2/4	1	3	21

Len Savage Calico/MAC

Country of Origin: United States

Appears in: An experimental weapon made by Len Savage.

Notes: This “Frankenweapon” is the result of one of those “what the hell” moments of inspiration that often lead to something strange and/or innovative. The Calico/MAC is pretty much what it sounds like – a combination of the Calico M-900 pistol and the M-10 submachinegun in 9mm Parabellum. Though the result does look primarily like a modified M-10 with a Calico magazine atop the receiver, looking closely will reveal many other Calico elements. The M-10’s upper receiver is heavily modified to feed from the Calico’s helical magazine, and internally a number of Calico parts are also used. His original version used a fixed wooden stock, but later he removed the wooden stock and replaced with a folding Calico stock. In addition, the foregrip and protector of an MP-5K was also used. Behind that is a short MIL-STD-1913 rail. The M-10’s bolt is essentially flipped upside down, and mated with elements of the Calico, particularly the magazine “well” and feed chute. The barrel is a mere 5.4 inches. Though Mr. Savage hopes for sales to the military and police, he is not necessarily optimistic in this regard, and the Calico/MAC may remain simply a “one-off.”

Weapon	Ammunition	Weight	Magazines	Price
Calico/MAC	9mm Parabellum	4.35 kg	50 Helical	\$280

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Calico/MAC	10	2	Nil	1/3	1	3	18

Morgan M-101C

Country of Origin: United States

Appears in: Special operations weapon experiment in the early 1970s.

Notes: Though I have placed this weapon in the submachinegun category, this is more because of the caliber than anything else; the M-101C is actually more a carbine than a submachinegun, with several unusual features to boot. Jim Morgan introduced the M-101C in 1974 as a demonstrator in 1974 to the US military; almost all of the military officers and NCOs who tested it agreed that it was an excellent design which would be extremely useful to the US military (the special ops troops of the time were especially interested in it), but the shortsighted brass at the Pentagon thought of it as merely another submachinegun, and they decided that the US military did not need any submachineguns. (Ironically, the M-101C was a demonstrator, and Morgan could easily have modified it for other barrel lengths, chamberings, etc.) Therefore, the testers were pissed, the Pentagon ignored it, and the M-101C died a sad, quiet death, with Morgan going on to other projects.

The M-101C demonstrator was chambered for 9mm Parabellum and used a 16.4-inch barrel tipped with a conical flash hider. It was astonishingly easy to field strip, breaking down into only 7 parts. Armorer maintenance was not much more difficult. The M-101C was very resistant to the extremes of nature. Despite its blowback operation, the M-101C used what was essentially a reciprocal recoil mass movement (perhaps the first use of such a principal in a small arm) to greatly reduce recoil. In addition, the M-101C had essentially a straight-line configuration, which also reduced barrel climb (and was, incidentally, all the rage at the time). Morgan himself admitted that the barrel was not made of steel which was of military specifications – it was, in fact, much *stronger* than military-grade barrel steel. (For one demonstration, Morgan plugged the barrel and fired live ammunition through it. The inside of the barrel was ruined, but that’s all that happened. You wouldn’t want to try that with your average military small arm!) The M-101C also had innovative features to allow dozens of magazines to be fired without any significant barrel or chamber heating problems. Morgan designed a special coating to reduce the need for lubricants and cleaning (though he wasn’t dumb enough to think the M-101C didn’t require lubricants or cleaning of any sort...)

In addition, Morgan designed two other features which were ahead of the times. One was a collimator-type sight with a slight magnification and an illuminated red dot, designed specifically for quick aiming – something which is now in common use by military forces worldwide. The second is even more interesting – the TAR-1.

The TAR-1 (Tactical Assault Rocket) was a 127mm rocket-assisted explosive shell – essentially, a RAW-type weapon, but predating the RAW by over a decade. Like the RAW, the TAR-1 was fired from an adapter attached to the muzzle of the M-101C, and actuated by a standard round being fired through the M-101C. The adapter was reusable, and the rocket charge gave it a range which was astounding when used in direct fire – and even more astounding in indirect fire. Like the M-101C itself, the TAR-1 was a demonstrator weapon – Morgan had a plethora of ideas for variants of the TAR-1, though only an HE-Blast-type version was ever actually made.

In my mind, the M-101C is another one of those “too bad” weapons – as in too bad it wasn’t further developed and adopted for the US military. The Pentagon really missed the boat on this one, primarily due to ignorance and prejudice against what they believed was “just another submachinegun.”

Weapon	Ammunition	Weight	Magazines	Price
M-101C	9mm Parabellum	3.36 kg	40	\$510

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
M-101C	5	2	2-Nil	5	1	2	36

Weapon	Ammunition	Weight*	Price*
TAR-1	127mm RAM Grenade	0.84/5 kg	\$120/200

Weapon	ROF	SS	Damage	Pen	Range	IFR
TAR-1	1/2	2	C24 B34	12C	250	3750

*Weight and price are for the adapter/grenade.

PLJ

Country of Origin: Unknown (Possibly Italy or the former Yugoslavia)

Appears In: Immediate post-World War 2, but probably existed *during* World War 2.

Notes: The PLJ is a stockless submachinegun whose origin is a mystery. Even the name of the weapon is a mystery; "PLJ" is derived from some weapon markings that seem to indicate the designation of the weapon, but may not be. The PLJ is a rare weapon, and was a rare weapon even immediately post-World War 2. Specimens have recently turned up in Slovenia, but these are in bad shape. The weapons appears that, even when new, construction quality was not the best; it may have been built as an *ad hoc* weapon by resistance forces in whatever machine shops were available. One might even argue whether the PLJ is in fact a true submachinegun or simply a large machine pistol. The PLJ is largely made from a single iron casting, with some parts of the receiver being zinc; steel appears to have been reserved for the working parts and the barrel. The grip is of checkered wood, and the entire weapon appears to be crudely made. The receiver is mostly made of an iron tube, with the end secured by a screw-on cap. The 7.87-inch barrel is tapered and has a post-type front sight with a large hood around it. The rear sight is a simple notch. The cocking knock is large, and also functions as a safety, with the knob and lever moved into a position that locks the bolt. The weapon is selective fire, but in a strange way – normal pressure on the trigger gives automatic fire, but if the bottom of the trigger is pulled instead of the middle of the trigger, semiautomatic fire will result. The PLJ would be difficult to control on automatic fire, being light, having no stock, and no foregrip. What magazines were used with the PLJ have been lost; I have used an estimate below. Likewise, examples existing today are not in firing condition and the cyclic rate is unknown, and I have used an estimate for this. Even the intended ammunition is a bit of a mystery; the chamber seems to fit both the 9mm Parabellum round and the 9mm Glisenti round.

Twilight 2000 Notes: This weapon is noteworthy in Twilight 2000 because it represents the kind of weapon that might be made in various machine shops in the aftermath of the Twilight War.

Weapon	Ammunition	Weight	Magazines	Price
PLJ	9mm Parabellum or 9mm Glisenti	2.2 kg	25, 30, 32	\$252

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
PLJ (9mm Parabellum)	5	2	Nil	2	1	5	20
PLJ (9mm Glisenti)	5	2	Nil	2	1	5	20

Policarpa 22-2

Country of Origin: International

Appears in: Built by different companies on and off for several decades, never in large numbers.

Notes: The origins of the Policarpa 22-2 are not entirely certain; a similar weapon was possibly invented in Austria by Heinrich Von Wimmersperg in 1925, but he may have based his work on the design of one or more other people. Von Wimmersperg's design seems to have sort of disappeared, but a similar weapon again cropped up in the late 1960s in the US, where the Venus Corporation of Michigan has acquired the rights for manufacture. It appears that only a few prototypes were built by Venus, but for a short time, it was manufactured in small numbers by a Columbian company named Policarpa. Just to make things stranger, it appears that the US government bought a few of these weapons for covert operations, and it is possible that Mitch WerBell devised a special T-shaped suppressor for the Policarpa 22-2. Rumors of its use in US covert operations persist here and there, but it is known that Policarpa never sold many, and today the Policarpa 22-2 is essentially a curiosity item owned primarily by a few lucky collectors.

A little large to be a machine pistol and a little small to be a submachinegun (it's almost a foot long, but the barrels are just a little over 4 inches each), the Policarpa 22-2 is a twin-barreled .22 Long-Rifle-firing automatic weapon able to fire most .22 Long Rifle rounds on the market today and at the time of its inception. (The US government is believed to have used the Policarpa with subsonic ammunition.) It is fed by what are essentially a pair of 22-round magazines joined together, each side of the magazine feeding one barrel. The Policarpa is well-balanced enough for one-handed use, and it does not have any sort of shoulder stock. Construction is largely of cast or machined steel, with a hollow grip that is meant to contain a small cleaning kit. There are ejection ports on either side of the receiver. Semiautomatic fire occurs in an alternating manner from both barrels (first the left barrel, then the right), automatic fire is basically the same, except for the automatic fire. The trigger is two stage, with a short pull firing the Policarpa on

semiautomatic, and a long pull firing it on fully automatic. A safety lever is located on the right side of the receiver, and simply allows the Policarpa to fire or be safed. The magazine release is located just above the magazine well. It is not possible to fire the Policarpa with only one side of the magazine loaded or though only one barrel; it's both or nothing. The mechanism, with its extending and retracting firing pins, makes runaway fire almost impossible and allows for clearing a jam much quicker and easier.

In the end, the Policarpa sold poorly, probably due to the low-power ammunition it fires and the limited range of applications. Though there have been persistent rumors of its use throughout the years here and there, particularly by the US, it is has never been confirmed that that any major government, army, or police force has used the Policarpa 22-2, and it is unknown how many were actually built and sold.

Weapon	Ammunition	Weight	Magazines	Price
Policarpa 22-2	.22 Long Rifle	1.3 kg	44	\$216
(With Silencer)	.22 Long Rifle	1.6 kg	44	\$246

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Policarpa 22-2	20	1	Nil	1	1	10	14
(With Silencer)	20	1	Nil	2	1	9	11

S&S SS-1 Sidewinder

Country of Origin: United States

Appears in: Literature of the 1980s.

Notes: The origins of this weapon are interesting. Delta was looking for weapons that would help them during Operation Eagle Claw, the abortive rescue of the hostages from the Iranian Embassy in 1980. One thing that Delta was looking for was a weapon that their operators could fire while roping down from helicopters (fast roping had not yet been developed). Two weapon designers, Sid McQueen and Donald Packingham, had been developing just such a weapon for some time, but the design proceeded slowly, primarily due lack of government interest – until the preparation for Eagle Claw began. Suddenly, Delta was very interested in the Sidewinder.

By 1980, S&S had four advanced Sidewinder prototypes (EX-002 in 9mm Parabellum, and EX-004 in 45 ACP). All were designed to be fired with one hand or two, were bullpup designs, and extremely well-balanced. The receiver and magazine could be rotated 180 degrees, without taking apart the weapon – one simply depressed a lever on the pistol grip while holding it vertically. (A later version, the EX-020 does not have this feature, for reasons which will become apparent in a moment.) This allowed it to be used by both right and left-handed shooters with equal ease, and could also allow shooters to shoot around left or right-hand corners quite easily. Construction was largely of a simple steel tube, with a steel barrel. The top of the receiver had a mount for a variety of collimator, laser aiming, or night vision sights. Fire selection was done by trigger depression – a short pull gave semiautomatic fire, while a full trigger pull gave automatic fire. The stock was simply a padded crescent-shaped steel piece – this was at the end of the main tube on EX-002 and EX-004, while on EX-003 and EX-020, a sliding stock and a shortened main tube were used. Caliber conversion was quite easy, consisting merely of changing the barrel, reversing the bolt, and changing the magazine. The magazine well had a projection which could be used as a speedloader for the magazines; the magazines used were Sten magazines for the 9mm Parabellum chambering, and M-3 Grease Gun magazines for the .45 ACP chambering. All but the EX-020 prototype were fed from the side of the receiver; EX-020 used traditional feed (from the underside of the receiver). The trigger guard swings downwards for use with heavy gloves. Fire controls are ambidextrous, as is the magazine release.

A peculiarity of all Sidewinders is the cocking knob. It is located at the center of the rear portion of the rear of the main tube, offset to one side. On all but the EX-020, the cocking knob reciprocates with the mechanism – which could lead to the knob hitting the shooter in the face if fired from the shoulder. As a result, S&S recommended that those versions should have the receiver rotated to the left if the shooter is right-handed and to the right if the shooter is left-handed. (The ejection port is far enough forward was to not present a problem in this regard. The EX-020 prototype has a non-reciprocating knob and therefore this is not a problem.

Though it is all very hush-hush, and to this day nothing official has come out, it is believed that Delta took two Sidewinders to Eagle Claw – the EX-003 prototype (an EX-002 with a caliber conversion capability, a Weaver sight base with backup iron sights, an extra fire selection setting (3-round burst), and a sliding stock); and the EX-005 prototype (an EX-004 with similar modifications except for the 3-round burst selector). Delta's evaluations of the Sidewinder are still classified, but they apparently did not accept it for use after Eagle Claw. The EX-005 prototype in .45 ACP is identical to the EX-020 for game purposes; the EX-005 prototype in 9mm Parabellum is identical to the EX-020 prototype in 9mm except for the magazine it uses.

The final variation of the Sidewinder, the EX-020 prototype, did not appear until after Eagle Claw. Most of the differences are noted above, but it also had something the other prototypes did not have – a manual safety. The EX-020 also is much easier to field-strip and for armorers to work on, and in its 9mm iteration uses Uzi magazines instead of Sten magazines.

Unfortunately, no country's military or police forces accepted the Sidewinder, and it became another footnote in history.

Weapon	Ammunition	Weight	Magazines	Price
EX-002 Prototype	9mm Parabellum	2.04 kg	32	\$282
EX-003 Prototype	9mm Parabellum	2.13 kg	32	\$413
EX-003 Prototype	.45 ACP	2.24 kg	30	\$665
EX-004 Prototype	.45 ACP	2.15 kg	30	\$449
EX-005 Prototype	9mm Parabellum	2.13 kg	32	\$324

EX-020 Prototype	9mm Parabellum	2.13 kg	20, 25, 32	\$324
EX-005/020 Prototype	.45 ACP	2.24 kg	30	\$467

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
EX-002	10	2	Nil	3/4	2	8	22
EX-003 (9mm)	3/10	2	Nil	3/4	1	2/6	22
EX-003 (.45 ACP)	3/10	2	2-Nil	3/4	2	3/11	23
EX-004	10	2	2-Nil	3	2	12	23
EX-005/020 (9mm)	10	2	Nil	3/4	1	6	22
EX-005/020 (.45)	10	2	2-Nil	3/4	2	11	23

TSNIITOCHMASH Baksan

Country of Origin: Russia

Appears in: Pretty much nothing anymore, though there was a lot of buzz about the Baksan in the early 1990s.

Notes: The Baksan (called by many in the West the Busksun) is somewhat of an enigma; though the manufacturer insists they have several prototypes of the weapon, and even that the Russian military and police has tested it as a PDW, only literature and drawings (including CAD-based plans) have been seen in public, with no actual hardware having been produced for examination by the public. It is therefore understandable (at least to myself) why there have been no takers of the Baksan, and why the Russians say they don't even use it. In fact, the attempted marketing of the Baksan appears to have stopped in 1995; no one has seen or heard anything about the Baksan since that time, and it is uncertain whether it will ever appear again.

As far as can be told, the Baksan appears to be a Russian attempt at a PDW. It is, according to the information that was released, an extremely compact weapon, short-barreled weapon with a folding wire stock; its configuration, with the magazine in its pistol grip, lends itself to firing as a large pistol as well as a conventional submachinegun/PDW. Of course, the light weight, as with all such weapons, does not really lend itself to accurate automatic fire, even with the stock extended. The operation is by delayed blowback, possibly making recoil even worse, though TSNIITOCHMASH hints at internal mechanisms to reduce the recoil. In addition, the 8-inch barrel is tipped with a rudimentary muzzle brake, though the design of this brake would seem to indicate that it would not only be rather ineffective, but that it would produce a lot of muzzle blast as well. The wire stock folds forward almost to the end of the muzzle brake. Construction is also a bit of a mystery, though it appears that the Baksan might have a light alloy lower, a steel upper, and a polymer pistol grip and handguard. Sights appear to be simple fixed notch-and-blade. Feed is from a 20-round magazine (again, composition unknown) which fits entirely within the pistol grip and has a slightly-extended floor plate to make the pistol grip flat-bottomed. The trigger mechanism is also unknown, but appears to have a rather short pull length. There is an optional foregrip under the handguard.

Of course, due to the relative dearth of information, there have been many guesses made, both by myself and analysts in general.

Twilight 2000 Notes: Limited use of the Baksan was made by the Russians in the Twilight War, primarily by airborne and air assault command personnel and some vehicle drivers. Russian special ops apparently either didn't like the Baksan or preferred heavier weapons. Many Russian troops found the firing signature caused by the muzzle blast to be quite a detriment at night, easily giving away their position and spoiling their night vision (or even blinding them for a few precious seconds when wearing older night vision goggles). The 9mm Parabellum version does not exist in the Twilight 2000 timeline.

Weapon	Ammunition	Weight	Magazines	Price
Baksan	9mm Makarov or Makarov Hi-Impulse	1.8 kg	20	\$327
Baksan	9mm Parabellum	1.81 kg	20	\$329
Baksan	9mm Gurza	1.87 kg	20	\$343

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
Baksan (9mm Makarov)	5	2	2-Nil	2/3	2	4	20
With Stock	5	2	2-Nil	2/3	1	3	23
Baksan (9mm Hi-Impulse)	5	2	1-1-Nil	2/3	2	5	24
With Stock	5	2	1-1-Nil	2/3	1	4	28
Baksan (9mm Parabellum)	5	2	2-Nil	2/3	2	4	21
With Stock	5	2	2-Nil	2/3	1	3	25
Baksan (9mm Gurza)	5	2	1-1-Nil	2/3	2	4	24
With Stock	5	2	1-1-Nil	2/3	1	3	29

Vesely V-42

Country of Origin: Britain

Appears In: An experimental submachinegun designed for the British Army in World War 2.

Notes: Labeled a "Machine Carbine," as the British called submachineguns at the time, the V-42 was one of three related weapons designed to be lightweight, easy to produce (though it could not match later models of the Sten in that respect), and provide superior firepower. The V-42 series was designed by an escapee from Czechoslovakia named Josef Vesely, who wanted to give back to his

country of refuge. It was a typical submachinegun of the period, something we might call a carbine today due to its size. (The barrel alone is 10 inches.) It was also much like the submachineguns of the period in that it used straight blowback operation. The V-42 used a wooden stock, normally of beech and varnished; the V-41 appears to be a prototype of the V-42, and it's construction is almost identical to the V-42. The V-43 was designed for paratroopers; the stock is user-removable. In both cases, the weapons can take a spike-type bayonet which fits over the barrel and forward barrel jacket. The selector lever is split into two mechanisms; the first selected between semiautomatic and automatic, and the second put the weapon on safe.

The most unusual feature of the V-42 is its feed system and the associated magazines. The magazines held 60 rounds in a double stack configuration, but not a double stack as we think of one today. The rounds sat in the magazine in two columns (29 in the front and 31 in the rear), one column in front of the other. The feed mechanism holds the rear column of rounds depressed below the path of the bolt until the front stack is empty. At this point, a switch is used to allow rounds to feed from the rear stack. This allowed for more ammunition, with less magazine changes, but it's not like having a normal 60-round magazine.

Weapon	Ammunition	Weight	Magazines	Price
V-42	9mm Parabellum	3.25 kg	29/31 (60)	\$298

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
V-42	10	2	1-Nil	4	1	5	26

W/99 Submachinegun

Notes: This weapon is not a real weapon; it appeared in an article in *Challenge* magazine, and I have added to the back story. It is, however, illustrative of the type of weapons that would probably appear in the wake of World War 3.

Twilight 2000 Notes: Produced by the Wojchiechowicz armaments factory in Krakow, the W/99 is almost an exact copy of the Soviet W.W.II submachinegun the PPS-42/43. The weapon is entirely stamped from steel except for the barrel and bolt, and spot-welded together. The only non-metal parts are the wooden grips and a small piece of leather acting as a buffer for the bolt. The perforated barrel jacket extends beyond the muzzle to act as a muzzle brake and compensator, a curved 35 round box magazine is used; and the skeleton steel butt folds across the top of the gun body. A simple safety catch is fitted in the front edge of the trigger guard, and there is no provision for single shots. Finish on the W/99 is non-existent, rough welds and grinding marks being apparent all over the weapon.

Merc 2000 Notes: This weapon is not available in the Merc 2000 World.

Weapon	Ammunition	Weight	Magazines	Price
W/99	7.62mm Tokarev	3.9 kg	35	\$306

Weapon	ROF	Damage	Pen	Bulk	SS	Burst	Range
W/99	5	2	Nil	4/5	Nil	2	17