

AUTOCANNONS



M21 Armament Subsystem with M134 minigun and M158 Rocket Launcher

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ADI Modernized 40/60

Notes: This is a modernization of the standard Bofors L/60 anti-aircraft gun. It is designed for low cost and to be an easy upgrade. The biggest upgrades are not in the guns themselves, but in the hydraulic and electrical systems controlling the firing, traverse, and elevation. The result is a weapon that can elevate, traverse, and follow targets much faster than a standard L/60 AAG. It also replaces worn components with newer ones able to better withstand use and abuse. As of 2000, only the Australian Navy is using this version of the L/60, but it is also for sale on the open market.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
ADI Modernized 40/60	40mm Bofors L/60	3	3 Minutes	1520 kg	\$144031

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Bofors L/60	3	20	420	APFSDS-T	9	17/14/12/8
	3	20	320	APHC-T	C2 B5	25C
	3	20	420	AP	9	7/6/5/3
	3	20	320	HE	C2 B10	-1C
	3	20	320	MP	C2 B10	25C
	3	20	320	PFHE	C2 B15	-2C

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30mm L21A2 Rarden

Notes: The Rarden (Royal Armament, Research and Development establishment and Enfield) is fitted to the British FV-510 Warrior IFV, FV-107 Scimitar reconnaissance vehicle, Sabre reconnaissance vehicle, and FV-721 Fox armored car. It was designed in the early 1960s to defeat known and projected armored personnel carriers of the time. Requirements at the time included penetration, accuracy, low weight, and ease of operation. This partially why the ROF was kept so low (90 rounds per minute); another reason was to prevent wasteful ammunition usage. The low rate of fire is primarily because while the Rarden is a dual-feed weapon, it is hand-fed by 3-round clips into either side of the weapon; the 90-round per minute rate of fire is the maximum practical rate of fire by a well-trained crew. The lack of a belt feed also allows the dimensions of the gun to be kept smaller, and allows it to be used in turrets and on vehicles with limited space. The low rate of fire also contributes to a low rate of wear and tear, and reduces maintenance. The Rarden has the advantage of having no firing gasses that escape into the vehicle from a vehicular mount. Operation is by long recoil, but the barrel is the primary part that recoils instead of the gun mechanism itself. The recoil mechanism means that the Rarden does not need to be externally-powered and can remain in operation even if the vehicle's power is put out. Spent casings and dud rounds are ejected forwards out of the turret.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
L21A2 Rarden	30mm Rarden or KCB	1	NA	139.8 kg	\$20015

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
L21A2 Rarden	3	100B	520	Rarden APDS	7	10/9/7/5
	3	100B	520	Rarden APFSDS	7	14/12/10/7
	3	100B	435	Rarden APSE	7	7/7/6/4
	3	100B	390	Rarden HE	C2 B10	-3C
	3	100B	390	KCB HEI	C2 B10	-3C
	3	100B	435	KCB SAPHEI	C2 B10	7/7/6/4

FAM-2M

Notes: This is a twin autocannon system used by the Chileans to protect its airfields. There are no known exports to date. Very early versions used HS-820 cannons cannibalized from Vampire T.11 aircraft, but these guns are now out of service and have been replaced by versions using twin KAD autocannons. One of the best features of the system is the degree of protection it gives the gunner; he is almost totally enclosed in thick steel plating. On the right side of the mounting is a small gasoline-powered generator sufficient to supply power to the weapon's elevation and traverse mechanisms. The generator also has a battery backup. The FAM-2M uses an optical sight that is about as advanced as one can get without going to computerized sights. In addition, up to four of these guns can be hooked to one radar for centralized remote control.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
FAM-2M	20mm KAD	3	4 Minutes	1700 kg	\$60845

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
FAM-2M	20	200 Belt (x2)	590	APDS	4	4/3/3/2
	20	200 Belt (x2)	590	API	4	2/2/2/1
	20	200 Belt (x2)	440	HE	C1 B5	-4C
	20	200 Belt (x2)	440	SHRAP	C1 B8	-5C

23mm Type 80

Notes: This appears to be a reverse-engineered version of the Russian ZU-23-2. The differences between it and the Russian weapon are few and mostly to suit local manufacturing methods and materials. The sight is 3.5x instead of the 2.5x of the ZU-23-2.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 80	23mm ZU-23	3	2 Minutes	950 kg	\$86209

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Type 80	20	50 Belt (x2)	550	API	5	3/3/3/2
	20	50 Belt (x2)	410	HE	C1 B5	-4C
	20	50 Belt (x2)	660	HVAPI	5	4/4/3/2
	20	50 Belt (x2)	550	HVHE	C1 B5	-4C

25mm Type 85

Notes: This is basically a ZU-23-2 with the 23mm autocannons replaced with 25mm autocannons of local manufacture. The Type 85 is externally very similar to the Type 80 23mm AAA gun and can be easily mistaken for it at first glance. This was originally an export-only weapon, but in the 2000s, the Chinese decided to start replacing their 23mm guns with 25mm guns, including those of new-design SP anti-aircraft guns, such as the Type 95 and Type 04 series.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 85	25mm KBA	3	3 Minutes	1500 kg	\$91329

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Type 85	10	50 Belt (x2)	420	AA	C1 B8	-4C
	10	50 Belt (x2)	560	APFSDSDU	6	14/12/10/7
	10	50 Belt (x2)	560	API	6	5/4/3/2
	10	50 Belt (x2)	420	HE	C1 B5	-3C

25mm Type PGB87

25mmx183mm is the standard AAA base gun caliber that the PLA is changing to; Norinco is also eyeing export sales. The basic gun is a twin-barreled design borrowed from the Australian Oerlikon KBA, and actually differs little from that design other than manufacturing and materiel particulars. This includes the long 2.173-meter barrels, but in the Chinese version, they are tipped with long, slotted flash suppressors. The barrels normally feed from separate 150-round drums containing belted ammunition, but a 300-round drum is available, and it can also feed from loose belts if alert loaders are available to keep the belt from hanging up on a part of the gun platform. A telescopic optical sight of 4x, an IR viewer for the telescopic sight, and an image intensifier are standard for this setup. The guns and their electro-optical sights are mounted on a sturdy four-wheeled towed mount in which the four trails are spread from the corners before firing, and the gun is traversed and elevated electrically using a small 0.5kW APU under the gunner's seat and fed from a 50-gallon fuel tank.

The PGB87 fires all Western KBA-compatible ammunition, and a couple of others designed specifically for this gun.

One and three-barreled versions of this gun exist; adjust the stats accordingly.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
PGB87	25mm KBA	4	4 Minutes	1.27 tons	\$158399

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
PGB87	10	2x150B	410	AA	C1 B8	-4C
	10	2x150B	550	APDS	6	10/9/7/5
	10	2x150B	550	APFSDS	6	14/12/10/7
	10	2x150B	550	APFSDSDU	6	17/16/13/8
	10	2x150B	550	API	6	5/4/3/2
	10	2x150B	550	FAPDS	C1 B3	7/6/5/4
	10	2x150B	410	HEI	C1 B5	-3C
	10	2x150B	410	PFPF	C2 B8	8/7/5/4
	10	2x150B	410	SAPHEI	C1 B3	7/6/4/2

30mm Type 730B

Notes: Originally a shipboard CIWS missile defense system like the same sort of systems on US and several Western Navies, the Type 730 has morphed into a ground-based and vehicle-based system, primarily for use against low-flying UAVs and attack helicopters, as well as some ground targets (and it is certainly devastating against infantry in the open). The ground-based system differs from the shipboard system in having a FLIR viewer instead of the advanced electro-optical secondary guidance system of the shipboard model. (Vehicle-based systems have their own tracking systems, as detailed in their entries on the Chinese SP anti-aircraft

pages.) Known land-based uses for the Type 730 include the BK-1070 and LD-2000, but there is also a wheeled mount, and that is what is covered here (though the figures on the gun are the same for both systems). The system generally uses its surveillance/tracking radar and FLIR together, using the FLIR to track the first target designated, and the radar to track the second most immediate target, to the radar can immediately hand off the target it is tracking to the FLIR after the most immediate target has been destroyed. The gun then swivels automatically to the new target, with the gunner providing fine tuning and the actual fire switch. Once the gun is fine-tuned by the gunner, the gun system keeps aimed on the target automatically, making adjustments to elevation and traverse as necessary. The surveillance radar is capable of keeping track of 48 targets; the most immediate threat is automatically handed off to the radar, and the surveillance radar picks up another target. The tracking radar has a range of 6 kilometers; the surveillance radar has a tracking range of 15 kilometers. The Type 730B has a special fire control computer that gives the gunner a +2 bonus when firing, and has an AV3 gun shield. Power is provided by an onboard 12 kW APU, power by diesel fuel. The gun used appears to be based on the US GAU-8/A cannon mounted on the A-10, though it is much more compact and has less range and power. Though the set-up time is listed as 10 minutes, this is with both the crew and a 5-man secondary crew working. (after they set up the gun, they become ammo bearers, with ammo and the secondary crew carried on an accompanying medium or heavy truck). Though the maximum ROF is 70, this wears out the gun and barrels quickly; ROF is normally limited to 40.

A variant of the Type 730B, the Type 730C, is being tested; this has boxes on the side of the guns carrying three FL-2000N SAMs on each side, to engage longer-ranged targets. When these are used, the radar and FLIR are slaved to the missiles via a special fire control computer.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 730B	30mm Type 730	4	10 minutes	3.79 tons	\$510211
Type 730C	30mm Type 730	4	12 minutes	4.45 tons	\$683260

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Type 730	70	500 Belt (x2)	390	AA	C1 B13	-4C
	70	500 Belt (x2)	520	APDS	7	10/9/7/5
	70	500 Belt (x2)	520	FAPDS	C2 B6	8/7/5/3
	70	500 Belt (x2)	390	HEI	C2 B10	-3C
	70	500 Belt (x2)	390	PFPF	C2 B12	8/7/5/3

35mm PG99

A development of unnamed autocannon designs (but probably some iteration of an Oerlikon autocannon), the PG99 uses twin 35mm L/90 autocannons which can fire at up to 110 rpm. The Chinese have developed several types of ammunition specifically for the PG99, though several of these merely duplicate Western rounds. The autocannons feed from two 112-round autocannons, with another 126 rounds on the gun for replenishment of the guns; it only takes 7.5 seconds to reload a full drum on a gun, using two loaders. The PG-99 is usually towed by a medium truck that also carries further ammunition. The gun barrels are tipped by long slotted flash suppressors similar to those of the PGB87 above. The gun is mounted on a four-wheeled cradle/carriage that minimizes vibration and rocking when the guns are fired and men are climbing on it, and the carriage uses electrical actuators to fold the wheels, drive spikes into the ground, and set the flat-bottomed carriage on the ground. Rotation and elevation are also handled electrically, and the entire affair is powered by a 0.5kW APU under the gunner's seat. The gunner has an AV2 gun shield ahead of him. He aims by using a telescopic optical sight of 4x, an IR viewer for the telescopic sight, and an image intensifier. The gun also has a small targeting computer and laser rangefinder which does the precision aiming for the gun once it is laid on target, giving the gunner a bonus of +2 to hit.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
PG99	35mm PG99	5	5 minutes	6.8 tons	\$214693

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
PG99	20	112 Belt (x2)	570	APDS	8	12/10/9/6
	20	112 Belt (x2)	430	HEI	C2 B10	-2C
	20	112 Belt (x2)	420	HEI-T	C2 B8	-3C
	20	112 Belt (x2)	430	PFPF	C3 B13	9/7/5/4
	20	112 Belt (x2)	570	SAPHEI	C1 B4	8/6/5/4

35mm PG-99-1

Notes: This gun was specifically designed for the BK-1060, and so far has seen no other use, such as a ground mount. It fires the same ammunition as the PG99, and electro/optical systems and radar is provided by the BK-1060 upon which it mounted, as is mechanisms to lay on target and track targets. The PG99-1 has somewhat longer barrels than the PG99, but is otherwise the same as the PG99.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
PG99-1	35mm PG99	3	N/A	355 kg	\$95975

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
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PG99-1	10	600 Belt	590	APDS	8	12/10/9/6
	10	600 Belt	440	HEI	C2 B10	-2C
	10	600 Belt	430	HEI-T	C2 B8	-3C
	10	600 Belt	440	PFPF	C3 B13	9/7/5/4
	10	600 Belt	590	SAPHEI	C1 B4	8/6/5/4

37mm Type 55/65/74/74SD/P793

Notes: The genesis of these designs is the Russian M-1939 37mm anti-aircraft gun. The Type 55 is, in fact, little more than a Chinese copy of the single-barreled M-1939, while the Type 65 is a copy of the twin 37mm version of the M-1939. Type 74 has the ability to be hooked into an existing anti-aircraft system and placed under its radar control, has a slightly higher rate of fire (no effect in game terms), and a telescopic sight. The Type 74SD replaces hydraulic manual controls with electrical servos. The P793 can be equipped with standard or long barrels; the rate of fire is further increased; the unit has its own 5.22 kW generator; the telescopic sight's magnification is increased to 5x; and an image intensifier is supplied.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 55	37mm M-1939	3	3 Minutes	2100 kg	\$131299
Type 65	37mm M-1939	5	4 Minutes	2699 kg	\$241929
Type 74	37mm M-1939	5	4 Minutes	2835 kg	\$240817
Type 74SD	37mm M-1939	4	4 Minutes	2693 kg	\$246837
Type P793 (Standard)	37mm M-1939	4	3 Minutes	3100 kg	\$247137
Type P793 (Long Guns)	37mm M-1939	4	3 Minutes	3300 kg	\$263449

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Type 55	3	5 Clip	490	API	8	6/5/4/3
	3	5 Clip	370	FRAG-HE	C2 B15	-1C
	3	5 Clip	490	HVAP	8	7/7/6/4
Type 65/74/74SD	6	5 Clip (x2)	490	API	8	7/6/5/3
	6	5 Clip (x2)	370	FRAG-HE	C2 B15	-1C
	6	5 Clip (x2)	490	HVAP	8	9/8/7/4
Type P793 (Standard Guns)	10	5 Clip (x2)	490	API	8	7/6/5/3
	10	5 Clip (x2)	370	FRAG-HE	C2 B15	-1C
	10	5 Clip (x2)	490	HVAP	8	9/8/7/4
Type P793 (Long Guns)	10	5 Clip (x2)	510	API	8	7/6/5/3
	10	5 Clip (x2)	380	FRAG-HE	C2 B15	-1C
	10	5 Clip (x2)	510	HVAP	8	9/8/7/4

57mm Type 59

Notes: This weapon is a close copy of the Russian S-60 and differs from that weapon in only minor respects. Most of these differences are concessions to local manufacturing methods. However, the ammunition used by the Type 59 normally uses steel cases instead of the copper cases used by the Russians. The Type 59 is normally radar-directed by rotating bar-type radar known as the GW-03.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 59	57mm S-60	8	2 Minutes	4780 kg	\$428765

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Type 59	3	4 Clip	510	APFSDS	13	41/36/31/20
	3	4 Clip	510	APHE	C3 B10	17/15/13/8
	3	4 Clip	390	HE	C5 B15	2C

Norinco Giant Bow AAA System

Notes: While this may seem like a simple ZU-23-2 with power movement and computer control, you need to zoom out and see the big picture. The ace up the sleeve of the Giant Bow is that truck (could be one of several models) parked up to 50 meters away is the Battery Optoelectronic Commander's Vehicle. Up to six Giant Bows may be wired in to the BOCV, and the BOCV can be used to detect and to an extent, help the gunners aim the guns and feed computer coordinates of aircraft to the Giant Bow's computer. In of itself, the Giant Bow has a fire control computer an image intensifier, and an optronic rangefinder; the BOCV adds a FLIR, 2nd generation image intensifier, advanced computers that can track, aim, and predict target tracks. A laser rangefinder and a TV camera with 6x magnification complete the sensors. The BOCV has a crew of four. The images from the BOCV's FLIR and image intensifier can be fed to the Giant Bow's viewfinder, and fire coordinates fed to the gun's computer.

Of course, while the BOCV is a nice perk of the system, the Giant Bow does not have any need for the BOCV to be an effective weapon. The BOCV simply allows for more accurate, coordinated fire. The Giant Bow is basically a ZU-23-2, with a widened crew

platform to allow for a gunner and observer/computer operator, and techy enhancements are added that gives it accuracy and abilities that a standard ZU-23-2 doesn't have. It otherwise is a two-wheeled trailer with a folding undercarriage and a heavy-duty articulated tow bar.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Giant Bow	23mm ZU-23	2	4 Minutes	1.25 tons	\$51581

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
ZU-23	20	2x50B	550	APDS-T	5	8/7/6/4
	20	2x50B	550	API	5	5/4/3/2
	20	2x50B	410	HE	C1 B5	-4C
	20	2x50B	550	HVAPI	5	6/5/4/3
	20	2x50B	550	HVHE	C1 B5	-4C

M-53

Notes: Like many such things, the Czechs developed their own light antiaircraft gun system during their Warsaw Pact days. In this case, the twin 30mm autocannon M-53 is used to replace the ZU-23-2 in Czech and Slovak service. It is heavier compared to the ZU-23-2, and has a lower rate of fire, but the range and punch are greater. There is no provision for radar control, but a telescopic periscope is provided.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-53	30mm M-53	4	4 Minutes	2100 kg	\$205530

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-53	10	10 Clip (x2)	520	API	7	5/4/3/2
	10	10 Clip (x2)	520	APFSDS	7	11/10/8/5
	10	10 Clip (x2)	390	HE/HEI	C1 B5	-3C

20mm Giat 53T1

Notes: This elderly antiaircraft gun is still in use by French Foreign Legion units, usually in a ground support role, and by the forces of Chad. It is preferred by the Legion due to its light weight and low recoil forces, which made it suitable for employment from relatively light vehicles. It uses the same M 693 autocannon used by the Cerbere 76T2, Tarasque 53T2, and the 53T4. Sighting equipment includes a reticule sight for antiaircraft use and a 5.2x telescopic sight for use against ground targets.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
53T1	20mm KAD	2	2 Minutes	635 kg	\$30712

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
53T1	10	100B (x2)	630	APDS	4	4/3/3/2
	10	100B (x2)	630	API	4	2/2/2/1
	10	100B (x2)	470	HEI	C1 B5	-4C

20mm Giat Tarasque 53T2

Notes: This is an older French antiaircraft gun, using the same autocannon (M 693(F2)) that the Cerbere 76T2 twin 20mm gun uses. It is a low-weight weapon that can be easily mounted on light trucks or towed behind smaller vehicles. The traverse and elevation mechanisms are driven by a hydraulic motor. As with the 53T1, the sights are a basic reticule sight for antiaircraft use and 5.2x telescopic sight for use against ground targets.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
53T2	20mm KAD	3	3 Minutes	840 kg	\$30651

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Tarasque 53T2	10	100B (x2)	630	APDS	4	6/5/4/3
	10	100B (x2)	630	API	4	3/3/3/2
	10	100B (x2)	470	HEI	C1 B5	-4C

20mm Giat 53T4

Notes: This is a double autocannon version of the Giat 53T2 antiaircraft gun above. It is otherwise the same as the 53T2, except for a more beefy, stable mounting and hydraulic recocking of the guns when loading them. In addition, the guns have automatic electric cutout to stop a gun from firing if it cooks off, and the gun can be set to not fired if pointed within certain arcs (to prevent firing at friendly targets or at useless fields of fire such as targets the ammunition cannot penetrate). As with most French antiaircraft autocannons, the gun includes a 1x reticule gunsight for antiaircraft use and a 5.2x telescopic sight for ground targets.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
53T4	20mm KAD	5	3 Minutes	2000 kg	\$61049

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
53T4	20	150B (x2)	630	APDS	4	6/5/4/3
	20	150B (x2)	630	API	4	3/3/3/2
	20	150B (x2)	470	HEI	C1 B5	-4C

20mm Cerbere 76T2

Notes: This is basically the German Rheinmetall Twin 20mm System with the Rh-202 autocannon replaced with M-693(F2) autocannons like those mounted on the 53T2 and 53T4. The 76T2 is designed to work in concert with the Crotale SAM missile system, and can use the same radar as the Crotale. It is also designed to be used with a helmet-pointing system (where the gunner directs the guns by looking at a target through a visor in a specially-equipped helmet). This helmet system, known as the DALDO, had not been bought by any country as of 2000, but is for sale.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
76T2	20mm KAD	3	3 Minutes	2150 kg	\$63297

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
53T4	20	270B (x2)	630	APDS	4	6/5/4/3
	20	270B (x2)	630	API	4	3/3/3/2
	20	270B (x2)	470	HEI	C1 B5	-4C

20mm Giat Type 20 M621

Notes: The Giat Type 20 M621 is an electrically controlled 20mm autocannon designed for use on light vehicles and helicopters. It is capable of semiautomatic and automatic fire. An attached electrical box controls the selective fire aspects and burst length. It is

mounted on light vehicles such as the Land Rover as well as helicopters such as the Puma, Gazelle, and boats. Turrets have also been devised with this gun. It can accept most sights and night vision equipment designed for use with automatic weapons.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 20 M621	20mm HS-804	1	1 Minute	49 kg	\$5644

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Giat Type 20 M621	10	100B	490	API	4	2/2/2/1
	10	100B	370	HE	C1 B5	-4C

25mm Giat 53T4

Notes: This is a Giat 53T4 antiaircraft gun (detailed in the *Heavy Weapons Handbook*) with the twin 20mm autocannons replaced with a single 25mm Giat M811 autocannon. The mount is substantially the same with small changes to handle the new autocannon, and the ammunition box is somewhat larger, but also mostly the same.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
53T4 25mm	25mm KBA	3	4 Minutes	1900 kg	\$45649

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
53T4 25mm	5	300B (x2)	370	AA	C1 B8	-4C
	5	300B (x2)	500	APFSDSDU	6	14/12/10/7
	5	300B (x2)	500	API	6	5/4/3/2
	5	300B (x2)	370	HE	C1 B5	-3C

25mm Giat Type 25 M 811

Notes: This is an externally powered autocannon with a dual-feed mechanism. The feed direction is selected before firing a burst by flicking a switch. It can be placed on any mount that can normally accept a French 20mm autocannon, and turret mountings also exist.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 25 M811	25mm KBA	1	4 Minutes	105 kg	\$11413

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Giat Type 25 M811	5	100B (x2)	370	AA	C1 B8	-4C
	5	100B (x2)	500	APFSDSDU	6	14/12/10/7
	5	100B (x2)	500	API	6	5/4/3/2
	5	100B (x2)	370	HE	C1 B5	-3C

30mm Giat Type 30 M 781

Notes: This autocannon uses a mechanism similar to the 25mm Chaingun. The cannon comes with an electronic control and power unit, and has a rate of fire up to 1-750 rounds per minute. The Type 30 M 781 is a dual-feed weapon. It was designed principally as helicopter armament, but a ground/vehicle mount does exist. Weight given is with the mount.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Type 30 M781	30mm DEFA	1	3 Minutes	65 kg	\$17369

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Giat Type 30 M781	5	100B (x2)	340	APHEI	C1 B5	3/3/3/2
	5	100B (x2)	340	API	7	3/3/3/2
	5	100B (x2)	250	HEI	C2 B10	-3C
	5	100B (x2)	340	SAPHEI	C1 B5	4/4/3/2

20mm MK-20 Rh-202

Notes: The MK20 Rh-202 has a high rate of fire, yet low recoil forces, and can thus be mounted in a variety of vehicles and mounts. It is a dual-feed weapon that feeds from the top, and the type of round fired may be selected by a simple switch. The Rh-202 can keep firing even in extremes of temperature, water, and contamination.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
MK20 Rh-202	20mm KAD	1	3 Minutes	75 kg	\$7418

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
MK20 Rh-202	10	100 Belt (x2)	570	APDS	4	4/3/3/2
	10	100 Belt (x2)	570	API	4	2/2/2/1
	10	100 Belt (x2)	430	HE	C1 B5	-4C
	10	100 Belt (x2)	430	SHRAP	C1 B8	-5C

20mm Rheinmetall AA Twin Gun System

Notes: This is a light AAA gun system using two Rh-202 autocannons. The Rh-202 cannon is a fairly common one in European service. The Rheinmetall AA System is remarkable in that it can be almost completely field stripped without the use of any tools. Each gun is belt fed from an ammunition box containing two belts with 140 rounds per belt. The gunsight has a magnification of x5, or 1x for a wider field of view (normally used against low-flying aircraft). A computer is incorporated in the sight for calculating the proper lead for moving targets.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Rheinmetall 20mm AA	20mm KAD	4	4 Minutes	2160 kg	\$62585

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Rheinmetall 20mm AA	20	140 Belt (x4)	570	APDS	4	4/3/3/2
	20	140 Belt (x4)	570	API	4	2/2/2/1
	20	140 Belt (x4)	430	HE	C1 B5	-4C
	20	140 Belt (x4)	430	SHRAP	C1 B8	-5C

25mm Mauser MK-25

Notes: This German autocannon was first developed as a replacement for the autocannon on the Marder, then an Rh-202. Some ASCOD IFVs are also fitted with this weapon. 75% of the parts on this weapon are interchangeable with those on the MK-30. The MK-25 is a dual feed weapon.

Twilight 2000 Notes: Replacements with this autocannon began with the Marder in 1994, with some 250 vehicles modified before the start of the Twilight War.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
MK-25	25mm KBA	1	NA	112 kg	\$11446

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Mauser MK-25	10	100B (x2)	400	AA	C1 B8	-4C
	10	100B (x2)	530	APFSDSDU	6	14/12/10/7
	10	100B (x2)	530	API	6	5/4/3/2
	10	100B (x2)	400	HE	C1 B5	-3C

30mm Mauser MK-30

Notes: This autocannon is used on the Greek Artemis LAAG, the Breda Sentinel ADA, and is used by itself on a ground and vehicle mounts by the Italian Guardia di Finanza and French Navy (with varying barrel lengths in each case). It has a high rate of fire and has a dual feed mechanism that may feed from the sides or top. The MK-30 is gas-operated and is known for its reliability. The MK-30 is easy to maintain and can be assembled and disassembled without tools.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
MK-30	30mm KCA	1	3 Minutes	155.7 kg	\$20399

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Mauser MK-30	5	100B (x2)	520	APDS	7	10/9/7/5
	5	100B (x2)	520	APFSDS	7	14/12/10/7
	5	100B (x2)	520	APHE	C1 B5	6/5/4/3
	5	100B (x2)	520	API	7	6/5/4/3
	5	100B (x2)	390	HE	C2 B10	-3C

30mm Mauser/KUKA Arrow

Notes: This anti-aircraft gun is similar in appearance to the Greek Artemis gun, but has a computerized fire control system that allows shots at +2. This fire control computer may also be slaved to an external radar unit to allow shots at +3. The gun mechanisms are powered by a 1.5kW generator. Gun leveling and lowering onto jacks is done mechanically, and setup time is fast for a gun of its size. Besides Germany, this gun is used by Thailand. The autocannons used are MK-30s.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Arrow	30mm KCA	4	5 Minutes	6800 kg	\$164750

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Arrow	20	125B (x4)	520	APDS	7	10/9/7/5
	20	125B (x4)	520	APFSDS	7	14/12/10/7
	20	125B (x4)	520	APHE	C1 B5	6/5/4/3
	20	125B (x4)	520	API	7	6/5/4/3
	20	125B (x2)	390	HE	C2 B10	-3C

20mm TCM-20

Notes: This light AAA gun is basically an old US M-55 trailer-mounted AA machinegun system with the four M-2HB replaced by two HS-404 20mm autocannons that have been modified to fire more powerful HS-804 ammunition. The resulting gun can be used from a trailer, fixed position, or most light armored vehicles. Each autocannon is fed from 60-round drum magazine, but the guns must be cocked manually when reloaded.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price	
TCM-20	20mm HS-804	3	40 Seconds	1350 kg	\$49459	
Weapon	ROF	Magazine	Range	Round	Damage	Penetration
TCM-20	10	60 Drum (x2)	540	APT	4	2/2/2/1
	10	60 Drum (x2)	400	HEI	C1 B5	-4C
	10	60 Drum (x2)	400	HEITSD	B5	9C

23mm TCM Mk 3

Notes: Using captured 23mm autocannons, the Israelis also produced a version of the TCM-20 with ZU-23 autocannons. This system was used for a short time by the Israelis, but they later took them out of service, replacing them with more TCM-20s. Rumors point to Chile and South Africa as possible recipients of some of the cast-off TCM Mk 3s, but this is not confirmed.

Twilight 2000 Notes: The Israelis kept some 75 TCM Mk 3s, using them for home defense. South Africa and Chile also received some.

Merc 2000 Notes: As Twilight 2000 Notes, but the Israelis did not keep any.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price	
TCM Mk 3	23mm ZU-23	3	40 Seconds	1532 kg	\$85772	
Weapon	ROF	Magazine	Range	Round	Damage	Penetration
ZU-23	10	100B	550	API	5	3/3/3/2
	10	100B	410	HE	C1 B5	-4C
	10	100B	550	HVAPI	5	4/4/3/2
	10	100B	550	HVHE	C1 B5	-4C

60mm HVMS

Notes: The HVMS (HyperVelocity Medium Support) is a high-velocity autocannon mounted on some Israeli vehicles, such as the M-119A1 and Sherman/60mm. It is a long-barreled system, magazine-fed system with a high rate of fire.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price	
HVMS	60mm HVMS	1	NA	Vehicular Mount	\$134173	
Weapon	ROF	Magazine	Range	Round	Damage	Penetration
HVMS	10	40	480	APFSDS-T	13	79/69/49/38

Israeli Autocannons

	10	40	360	HE	C7 B20	2C
	10	40	360	HEAT	C5 B10	65C
	10	40	360	WP	C2 B10	Nil

30mm OTOBreda Sentinel

Notes: The Sentinel is a twin 30mm autocannon system using Mauser Model F guns on a mobile field mounting. The trailer includes its own 40 kW generator, sufficient to power the unit. The unit also includes a laser rangefinder with ballistic computer and a passive IR night vision device.

Twilight 2000 Notes: This system is rare in the extreme, and usually not found outside of Italian units.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Sentinel	30mm KCB	4	3 Minutes	5000 kg	\$164048

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Sentinel	10	250 Belt (x2)	520	APDS	7	10/9/7/5
	10	250 Belt (x2)	520	APFSDS	7	14/12/10/7
	10	250 Belt (x2)	520	APHE	C1 B5	6/5/4/3
	10	250 Belt (x2)	520	API	7	6/5/4/3
	10	250 Belt (x2)	390	HE	C2 B10	-3C

40mm OTOBreda 40mm Antiaircraft Gun

Notes: This is basically a Bofors L/70 antiaircraft gun carriage license-produced by OTOBreda in Italy and given a few improvements. The improvements include increasing the ROF from 240 rounds per minute to 300 (this has no practical game effect); the ability to fire newer forms of ammunition such as PFHE and 3P rounds; a larger magazine; and the ability to use batteries when a generator is not available. The 40mm AAG can also be attached to a remote control mechanism to place large numbers of guns under the control of a single gunner.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
40mm AAG	40mm Bofors L/70	3	3 Minutes	5300 kg	\$174159

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
40mm AAG	3	144	350	3P (AIREX)	C2 B15	-3C
	3	144	350	3P (HE)	C3 B10	-1C
	3	144	350	3P (HEAT)	C2 B10	41C
	3	144	470	APFSDS-T	9	24/21/18/12
	3	144	470	API	9	8/7/6/4
	3	144	350	HET	C3 B10	-1C
	3	144	350	PFHE	C2 B15	-2C

40mm OTOBreda Twin 40L70

Notes: This is a field mounting of a popular Italian naval antiaircraft mounting using twin Bofors L/70 autocannons. The guns are linked together so that they recoil and fire at the same time; this increases the recoiling mass and thus lowers the recoil forces on the mount. The system can be linked to a Flycatcher air defense radar to form a system known as the Guardian. It can be further integrated into existing surface-to-air missile defenses. Each gun can be fed from 4-round clips through hatches in the sides of the cupola; the ammunition is held in magazines under the gun. The gun holds a total of 111 clips of ammunition. The entire cupola has an armor value of 2.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Twin 40L70	40mm Bofors L/70	4	5 minutes	10400 kg	\$343431

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Twin 40L70	6	222 (x2)	350	3P (AIREX)	C2 B15	-3C
	6	222 (x2)	350	3P (HE)	C3 B10	-1C
	6	222 (x2)	350	3P (HEAT)	C2 B10	41C
	6	222 (x2)	470	APFSDS-T	9	24/21/18/12
	6	222 (x2)	470	API	9	8/7/6/4
	6	222 (x2)	350	HET	C3 B10	-1C
	6	222 (x2)	350	PFHE	C2 B15	-2C

40mm OTOBreda Twin Fast Forty

Notes: This is a modernized version of the Twin 40L70 above. The biggest combat modifications are improvements that allow the ROF of each gun to be quickened to nearly 500 rounds per minute each. Other improvements include computer-aided aiming, reduction in recoil length, larger side hatches, and a widespread use of titanium to increase strength of the gun components.

Twilight 2000 Notes: This weapon system does not exist.

Merc 2000 Notes: The Twin Fast Forty development is complete, awaiting orders that have not yet been placed.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Twin Fast Forty	40mm Bofors L/70	4	5 minutes	12150kg	\$347082

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Twin Fast Forty	10	222 (x2)	350	3P (AIREX)	C2 B15	-3C
	10	222 (x2)	350	3P (HE)	C3 B10	-1C
	10	222 (x2)	350	3P (HEAT)	C2 B10	41C
	10	222 (x2)	470	APFSDS-T	9	24/21/18/12
	10	222 (x2)	470	API	9	8/7/6/4
	10	222 (x2)	350	HET	C3 B10	-1C
	10	222 (x2)	350	PFHE	C2 B15	-2C

76mm OTOMATIC

Notes: This is an Italian autocannon designed for shipboard antiaircraft use, but made with ammunition to give it some antiarmor capability. The gun barrel is a long L/62. The antiarmor ammunition development was primarily motivated by the design of the OTOMATIC self-propelled antiaircraft gun and land-based antiaircraft guns which could be pressed into service against light armor. For the most part, these guns never materialized, but the ammunition was kept as being possibly useful in some circumstances. Two versions exist: the standard Compact version, which has a cyclic rate of fire of 85 RPM and is smaller in size, and the Super Rapid version, which is larger and has a cyclic rate of 120 RPM. (For game purposes, the ROF is the same for both versions.) The OTOMATIC gun is also able to fire NATO 76mm M32 ammunition

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
OTOMATIC	76mm OTO	1	NA	Vehicle Mount	\$30712

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
OTOMATIC	3	12R, 20B, 29D, 45B, 90B	450	APFSDS	17	99/86/73/48
	3	12R, 20B, 29D, 45B, 90B	625	DART (Each Projectile)	6	33/29/24/16
	3	12R, 20B, 29D, 45B, 90B	340	HE	C12 B25	4C
	3	12R, 20B, 29D, 45B, 90B	340	HE-FRAG	C8 B32	3C
	3	12R, 20B, 29D, 45B, 90B	340	MOM	C10 B40	42C
	3	12R, 20B, 29D, 45B, 90B	340	PFF	C10 B36	3C
	3	12R, 20B, 29D, 45B, 90B	340	SAPOM	C12 B25	63C
	3	12R, 20B, 29D, 45B, 90B	425	SAPOMER	C12 B25	63C
	3	12R, 20B, 29D, 45B, 90B	40 km (Max Range)	Vulcano	C8 B32	40C
	3	12R, 20B, 29D, 45B, 90B	440	M32 APBC	17	40/35/30/19
	3	12R, 20B, 29D, 45B, 90B	440	M32 APFSDS	17	97/84/71/46
	3	12R, 20B, 29D, 45B, 90B	165	M32 Canister	35x65D	1-Nil
	3	12R, 20B, 29D, 45B, 90B	330	M32 HE	C12 B25	4C
	3	12R, 20B, 29D, 45B, 90B	330	M32 HEAT	C8 B16	84C
	3	12R, 20B, 29D, 45B, 90B	440	M32 HVAP	17	45/39/34/21
	3	12R, 20B, 29D, 45B, 90B	440	M32 HVAPDS	17	68/60/51/33
	3	12R, 20B, 29D, 45B, 90B	330	M32 WP	C2 B15	Nil

20mm FK 20-2

Notes: This Norwegian autocannon is a German Rh-202 fitted out for the ground support/air defense role. In this role, the autocannon is fitted with a sight that allows shots at +1, a flexible tripod mount that can be used from prone or seated positions, and is fed by two magazines. It is normally towed by a truck, but may be broken into 8 loads for carry over short distances. The mount includes a frontal gun shield that protects the gunner (AV 2). Besides Norway, the FK 20-2 was used by Germany.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
FK-20-2	20mm HS-820	3	3 Minutes	620 kg	\$7508

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
FK-20-2	10	75 (x2)	570	APDS	4	4/3/3/2
	10	75 (x2)	570	API	4	2/2/2/1
	10	75 (x2)	430	HE	C1 B5	-4C
	10	75 (x2)	430	SHRAP	C1 B8	-5C

23mm ZUR-23-2S Jod

Notes: This is a Polish modification of the ZU-23-2 anti-aircraft gun. In this model, the base ZU-23-2 is fitted with tubes and sights for a twin SA-7 Grail mount. The new sight is electrically powered from a battery, and allows shots with either the guns or the missiles at +1. The gun includes seats for two gunners, one for the autocannons and one for the missiles.

Weapon	Ammunition		Crew	Set Up Time	Weight	Price	
ZUR-23-2 Jod	23mm ZU-23 + SA-7 Missiles		4	4 Minutes	1120 kg	\$47595	
Weapon	ROF	Magazine	Range	Round	Damage	Penetration	
ZUR-23-2S Jod (Guns)	20	100B (x2)	550	API	5	3/3/3/2	
	20	100B (x2)	410	HE	C1 B5	-4C	
	20	100B (x2)	550	HVAPI	5	4/4/3/2	
	20	100B (x2)	550	HVHE	C1 B5	-4C	
Weapon	Magazine	Accuracy	Guidance	Sensing			
SA-7A	2	Formidable	IR	Rear Aspect			
SA-7B	2	Difficult	IR	Rear Aspect			
Weapon	Reload	Speed	Min Rng	Max Rng	Damage	Pen	Type
SA-7A	1	2150	800	3600	C5 B30	4C	FRAG-HE
SA-7B	1	2900	800	4200	C6 B38	4C	FRAG-HE

23mm ZU-23

Notes: This cannon is found on a variety of vehicular and ground mounts, including the ZSU-23-4, BMP-23, and ZU-23-2 and ZU-23-4, as well as some Russian-invented aircraft. It was invented just after the Second World War, and very few changes have been made to the design or ammunition since then.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
ZU-23	23mm ZU-23	1	NA	102.2 kg	\$10764

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
ZU-23	10	100B	550	APDS-T	5	8/7/6/4
	10	100B	550	API	5	5/4/3/2
	10	100B	410	HE	C1 B5	-4C
	10	100B	550	HVAPI	5	6/5/4/3
	10	100B	550	HVHE	C1 B5	-4C

ZU-23-2

Notes: This is a towed mounting of two ZU-23 autocannons. It was designed initially to replace the ZPU-2 double KPV machinegun mounting, but ended up merely supplementing that weapon at best. In the Russian military and that of most former Warsaw Pact countries, the ZU-23-2 ended up being mostly replaced in turn by the SA-9 Gaskin surface to air missile. The ZU-23-2 is, however, very common in the world, particularly in former Russian and Chinese client states and in Israel and South Africa (where captured examples were put to use). In many of those countries, the towed systems have had their wheels removed and they are mounted on the backs of trucks or light armored vehicles.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
ZU-23-2	23mm ZU-23	3	2 Minutes	950 kg	\$86209

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
ZU-23-2	20	100B (x2)	550	APDS-T	5	8/7/6/4
	20	100B (x2)	550	API	5	5/4/3/2
	20	100B (x2)	410	HE	C1 B5	-4C
	20	100B (x2)	550	HVAPI	5	6/5/4/3
	20	100B (x2)	550	HVHE	C1 B5	-4C

30mm 2A42

Notes: This Russian autocannon is mounted on several Russian and former Warsaw Pact vehicles, including the BMP-2 and BMP-3. It is a long-barreled, gas operated, dual-feed weapon that may be fired at a ROF of 3 or 5. Some newer vehicles use the 2A72 30mm autocannon; this differs primarily in reliability issues and may, for game purposes, be considered identical to the 2A42.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
2A42	30mm 2A42	1	NA	153.5	\$19174

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
2A42	5	100B (x2)	525	APBC	6	9/8/7/4
	5	100B (x2)	500	APDS	7	10/9/7/5
	5	100B (x2)	620	APFSDS	7	14/12/10/7
	5	100B (x2)	500	API	7	6/5/4/3
	5	100B (x2)	460	HE-FRAG	C3 B14	-5C
	5	100B (x2)	460	HE	C2 B10	-3C

37mm M-1939

Notes: This is a very old weapon developed before World War 2 and never upgraded in any significant manner over the years. Despite this fact, and that it is of very limited usefulness against modern aircraft, it is widely used throughout the world. The basic gun includes an AV2 gun shield, but it is removed by most countries since it severely limits the depression of the gun, and the M-1939's best use today is as an antipersonnel and anti-light-vehicle weapon. (It also reduces the weight of the gun by about 100 kilograms.) There are one and two-gun mounts of this weapon. The M-1939 is known to be in service with at least 43 countries today, but Russia is not one of them.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-1939/70-K	37mm M-1939	4	4 Minutes	2100 kg	\$131299
M-1939/V-11M	37mm M-1939	6	5 Minutes	2699 kg	\$241929

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
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M-1939/70-K	3	5 Clip	490	APFSDS-T	8	17/14/12/8
	3	5 Clip	490	API	8	6/5/4/3
	3	5 Clip	490	APHE	C2 B6	5/4/3/1
	3	5 Clip	370	FRAG-HE	C2 B15	-1C
	3	5 Clip	490	HVAP	8	9/8/7/4
M-1939/V-11M	6	5 Clip (x2)	490	APFSDS-T	8	17/14/12/8
	6	5 Clip (x2)	490	API	8	6/5/4/3
	6	5 Clip (x2)	490	APHE	C2 B6	5/4/3/1
	6	5 Clip (x2)	370	FRAG-HE	C2 B15	-1C
	6	5 Clip (x2)	490	HVAP	8	9/8/7/4

57mm AZP S-60

Notes: A magazine fed autocannon, this is a towed version of the gun found on the ZSU-57-2. The gun is also found on the fictional PT-57 light combat vehicle (see Best Light combat Vehicles That Never Were). The weapon is fed from a 4-round magazine when in a ground mount, and can be kept continually firing by a diligent crew feeding clips into it. On the ZSU-57-2, the S-60 feeds from a 50-round belt (per gun). (The fictional PT-57, however, feeds from a 24-round dual-feed belt.) The S-60 is designed to be hooked into fire control radars used by various SAM missile systems, to be used in conjunction with the missiles for an integrated air defense network. The S-60 was originally designed just after World War 2, and was meant to replace the 37mm M-1939 and other 37mm antiaircraft guns; however, with the advent of SAMs, plans for production of antiaircraft guns were scaled back, and the S-60 ended up supplementing the M-1939 rather than supplanting it.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
S-60	57mm S-60	8	4 Minutes	4660 kg	\$428765

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
S-60	3	4 Clip	510	AP	13	23/20/17/11
	3	4 Clip	510	APCBC	13	27/23/20/13
	3	4 Clip	510	APFSDS	13	55/48/41/26
	3	4 Clip	510	APHE	C2 B10	17/15/13/8
	3	4 Clip	390	HE	C5 B15	2C

20mm Vektor GA1

Notes: This is the 20mm autocannon most commonly found on South African vehicles, boats, and aircraft, such as the Casspir, RG-32 Scout/Weapons Carrier, and Rooivalk helicopter. It may be mechanically or electrically fired, and ground and pintle mounted versions include the Armson Occluded Eye Gunsight, a 3.5x sight designed for the extreme vibration of heavy weapons such as heavy machineguns, grenade launchers, and autocannons. The GA1 may be mounted on an NHT for ground use, or in equivalent mounts for pintle use.

Weapon	Ammunition			Crew	Set Up Time	Weight	Price
Vektor GA1	20mm MG-151			1	2 Minutes	39 kg	\$9018

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Vektor GA1	10	100B	390	AP	4	2/2/2/1
	10	100B	390	API	4	2/2/2/1
	10	100B	290	HEI	C1 B5	-4C

20mm Vektor GAMA

Notes: The GAMA (Gun Automatic Multiple Ammunition) is a variant of the GA1 that employs a series of interchangeable barrels and feed mechanisms to fire a large amount of ammunition types. The weapon is issued as a kit containing the barrels and receiver groups. It was first developed to allow the user to train with cheaper smaller caliber ammunition, but was then further developed to give the user greater utility with the weapon.

Weapon	Ammunition	Crew	Set Up Time	Weight		Price
Vektor GAMA	.50 Browning Machinegun, 12.7mm DShK, 14.5mm KPV, 20mm MG-151, 20mm M-39, 20mm Oerlikon S	1	2 Minutes	(Receiver) 38 kg; (.50 Caliber or 12.7mm Barrels) 9 kg; (14.5mm Barrel) 12 kg; (20mm MG-151 Barrel) 10 kg, (20mm M-39 Short Barrel) 12 kg, (20mm M-39 Long Barrel) 17 kg; (20mm Oerlikon Barrel) 15 kg)		(Receiver) \$5586, (20mm M-39 Short Barrel) \$301; (Other Barrels) \$331 Each

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Vektor GAMA (.50)	10	105B	178	Ball	9	2-3-4
Vektor GAMA (12.7mm)	10	100B	169	Ball	10	2-2-3
Vektor GAMA (14.5mm)	10	100B	177	Ball	11	2-2-3
Vektor GAMA (20mm MG-151)	10	100B	390	AP	4	2/2/2/1
	10	100B	390	API	4	2/2/2/1
	10	100B	290	HEI	C1 B5	-4C
Vektor GAMA (20mm M-39 Short)	10	100B	410	APC	4	3/3/2/1
	10	100B	410	API	4	2/2/2/1
	10	100B	310	HEI	C1 B5	-4C

Vektor GAMA (20mm M-39 Long)	10	100B	440	APC	4	3/3/2/1
	10	100B	440	API	4	2/2/2/1
	10	100B	330	HEI	C1 B5	-4C
Vektor GAMA (20mm Oerlikon)	10	100B	410	AP	4	2/2/2/1
	10	100B	310	HEI	C1 B5	-4C
	10	100B	410	SAPI	4	3/3/2/1

20mm Vektor GI2

Notes: This South African autocannon is based on the French M-693. It is a smaller autocannon, useable on NHT or pintle mounts as well as being the main armament on the Ratel 20 APC. It is electrically fired by a battery, generator, or vehicle power. It can be installed upright, upside down, or on its side without affecting its performance. It is a dual feed weapon, in which two belts of ammunition may be loaded into the weapon, and the belt fired being selected by a flip of a switch.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Vektor GI2	20mm HS-820	1	2 Minutes	73.5 kg	\$7626

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Vektor GI2	10	100B (x2)	570	AP	4	3/3/3/2
	10	100B (x2)	570	APC	4	4/4/3/2
	10	100B (x2)	570	APDS	4	6/5/4/3
	10	100B (x2)	570	API	4	3/3/3/2
	10	100B (x2)	430	HEI	C1 B5	-4C
	10	100B (x2)	430	SAPHEI	C1 B3	3/3/3/2
	10	100B (x2)	430	SHRAP	C1 B8	-5C

35mm eGLaS 35

Notes: This is towed anti-aircraft gun system based around the GA-35 autocannon. It is a surprisingly lightweight system for its size, and computer studies suggest that three of these guns are more effective than two double-barreled 35mm Oerlikon GDF systems (now standard in South Africa). The fire control system includes a periscopic sight with a magnification of 5.2x, a laser rangefinder with a ballistic computer, and a Doppler muzzle-velocity measuring system. The gun is fed by two 55-round belts contained in magazines on either side of the receiver. Unfortunately, with the end of arms sanctions to South Africa, the South Africans were able to obtain cheaper anti-aircraft weapons from foreign sources and development of the eGLaS 35 stopped; the system is for sale, however.

Twilight 2000 Notes: About 50 of these weapons were deployed during the Twilight War.

Merc 2000 Notes: This weapon is a pretty good seller.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
eGLaS 35	35mm KDB	3	4 Minutes	6600 kg	\$292346

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
eGLaS 35	5	55 Belt (x2)	480	AHEAD	C2 B10	15C
	5	55 Belt (x2)	640	APCI	7	9/8/7/4
	5	55 Belt (x2)	640	APDS	7	12/10/9/6
	5	55 Belt (x2)	640	APFSDS	7	17/14/12/8
	5	55 Belt (x2)	640	FAPDS	C1 B5	12/10/9/6
	5	55 Belt (x2)	480	HEI	C2 B10	-2C
	5	55 Belt (x2)	480	HEIBF	C2 B12	-3C
	5	55 Belt (x2)	480	HEINF	C3 B15	-4C
	5	55 Belt (x2)	640	SAPHEI	C1 B5	7/6/5/3

40mm Bofors L/60 AAG

Notes: The design of this weapon dates back to 1928; prototypes appeared by 1931, and it was type-standardized in 1936. Within a few years, over 20 countries adopted it, and most of them still use it to this day. The gun is well-liked due to its simplicity and reliability, as well as flexibility.

In the early 1990s, Bofors developed an upgrade kit for the L/60. This includes an increase in ROF from 120 rpm to 200 rpm, a new 20-round magazine above the guns, and the fitting of a laser rangefinder with ballistic computer.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
L/60	40mm Bofors L/60	3	3 Minutes	2400 kg	\$151454
L/60 (Modernized)	40mm Bofors L/60	3	4 Minutes	2750 kg	\$161454

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Bofors L/60	2 (3 for Modernized)	4 Clip (20 for Modernized)	420	APFSDS-T	9	19/17/14/9
	2 (3 for Modernized)	4 Clip (20 for Modernized)	320	APHC-T	C2 B10	41C
	2 (3 for Modernized)	4 Clip (20 for Modernized)	420	AP	9	8/7/6/4
	2 (3 for Modernized)	4 Clip (20 for Modernized)	320	HE	C3 B10	-1C
	2 (3 for Modernized)	4 Clip (20 for Modernized)	320	MP	C3 B10	21C
	2 (3 for Modernized)	4 Clip (20 for Modernized)	320	PFHE	C2 B15	-2C

40mm Bofors L/70

Notes: This is a magazine fed autocannon used on the Breda L70 ADA, Breda Twin L70 ADA, Bofors L70 ADA, and the CV-9040 Infantry Fighting Vehicle. It is a long-barreled weapon with considerable hitting power.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
L/70	40mm Bofors L/70	1	NA	Vehicle Mount	\$43124

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Bofors L70	3	24, 48, 144, 480	350	3P (AIREX)	C2 B15	-3C
	3	24, 48, 144, 480	350	3P (HE)	C3 B10	-1C
	3	24, 48, 144, 480	350	3P (HEAT)	C2 B10	41C
	3	24, 48, 144, 480	470	APFSDS-T	9	24/21/18/12
	3	24, 48, 144, 480	470	API	9	8/7/6/4
	3	24, 48, 144, 480	350	HET	C3 B10	-1C
	3	24, 48, 144, 480	350	PFHE	C2 B15	-2C

40mm Bofors L/70 Antiaircraft Guns

Notes: There are 5 types of Bofors L/70-based antiaircraft guns of Swedish manufacture. The basic model is the Bofors L/70 Type A antiaircraft gun; this is a basic mounting using an external power source. The Type B adds a 2 kW APU for independent use. The L/70 BOFI (Bofors Optronic Fire-control Instrument) fair weather system adds to this laser rangefinder, ballistic computer, and image intensifier. The L/70 BOFI all-weather system adds a J-band pulse Doppler radar. The fifth model is the L/70 modernization package, also known as the REMO (REnovation and MODernization); this is a Type B gun with the APU upgraded to 5 kW, batteries for use if the APU goes down, a sight system similar to that of the CV-9040 IFV, and a kit that improves the rate of fire by 40 rounds per minute. (This has no practical effect in game terms.)

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
L/70 Type A	40mm Bofors L/70	3	4 Minutes	4800 kg	\$172867
L/70 Type B	40mm Bofors L/70	3	4 Minutes	5150 kg	\$173134
L/70 BOFI FW	40mm Bofors L/70	3	4 Minutes	5500 kg	\$183134
L/70 BOFI AW	40mm Bofors L/70	3	4 Minutes	5700 kg	\$223134
L/70 REMO	40mm Bofors L/70	3	4 Minutes	5250 kg	\$173584

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
L/70 AAG (All)	3	20	350	3P (AIREX)	C2 B15	-3C
	3	20	350	3P (HE)	C3 B10	-1C
	3	20	350	3P (HEAT)	C2 B10	41C
	3	20	470	APFSDS-T	9	24/21/18/12
	3	20	470	API	9	8/7/6/4
	3	20	350	HET	C3 B10	-1C
	3	20	350	PFHE	C2 B15	-2C

20mm Oerlikon KAA

Notes: The KAA is found on a variety of vehicular and ground mounts, including the GAI-D01, GAI-C01, and GAI C04 anti-aircraft guns. It is also known as the Hispano-Suiza Type 204 GK. It is gas-operated. Based on the World War 2 Hispano-Suiza Type S autocannon (primarily an AAA gun), the KAA was designed in the 1950s, but did not really take off until after the Falklands war after the Royal Navy found their GAM-B01 autocannons were inadequate as close-in AAA guns. Before this, some naval vessels and light AFVs used the KAA, though it is primarily designed for use as a AAA gun. The KAA is electrically-fired and requires a power source, though the Spanish Meroka variant uses a percussion-primed recoil system requiring no power source. The KAA is light and handy.

The KAB is a gas-operated version suitable for anti-aircraft and ground target applications. The gun may be fed from one of several magazines or drums. It is fitted with a very efficient muzzle brake, with a longer barrel. The KAB may be field-stripped without tools.

The GAI-B01 variant is one of the smallest, lightest, and simplest mounted anti-aircraft cannons in existence. This is in no small order related to its being built around the KAB autocannon. It is normally towed on a light trailer by a vehicle, but can be mounted in its entirety on a heavier vehicle, or even man-packed in up to 10 loads plus ammunition. The elevation is done with a handwheel, and traverse with pumping pedals. The mount includes a 1x sight for anti-aircraft use, and a 3.7x sight for ground targets.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
KAA	20mm KAA	1	NA	87 kg	\$7000
KAB	20mm KAA	1	3 Minutes	109 kg	\$7210
GAI-B01	20mm KAA	2	20 Seconds	547 kg	\$29401

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Oerlikon KAA	10	100B	540	API	4	3/3/3/2
	10	100B	400	HE	C1 B5	-4C
Oerlikon KAB	10	8, 20, 50	710	API	4	3/3/3/2
	10	8, 20, 50	530	HE	C1 B5	-4C
GAI-B01	10	8, 20, 50	710	API	4	3/3/3/2
	10	8, 20, 50	530	HE	C1 B5	-4C

20mm Oerlikon GAI-C01/GAI-C04

Notes: These weapons are both based around Oerlikon KAD autocannons (also known as HS-820 autocannons). The GAI-C01 uses one belt of ammunition that feeds from the right side, while the GAI-C04 uses a slightly different version that uses a dual feed mechanism. They can be used against aircraft and ground targets. The elevation and traverse are manual with a handcrank and pumping pedals. The sights are x1 for anti-aircraft use and 2.5x for ground targets. Each ammunition box contains 75 rounds of belted ammunition. The KAD suffers from a high rate of fire and in some applications struggles against the limitations of small magazines and belts; it was primarily designed as an aircraft cannon and not a ground-mounted cannon.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
GAI-C01	20mm KAD	3	2 Minutes	512 kg	\$30531
GAI-C04	20mm KAD	4	2 Minutes	535 kg	\$30610

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
GAI-C01	10	75 Belt	590	APDS	4	6/5/4/3
	10	75 Belt	590	API	4	3/3/3/2
	10	75 Belt	440	APHEI	C1 B5	17C
	10	75 Belt	440	HEI	C1 B5	-4C
	10	75 Belt	440	SHRAP	C1 B8	-5C
GAI-C04	10	75 Belt (x2)	590	APDS	4	6/5/4/3
	10	75 Belt (x2)	590	API	4	3/3/3/2
	10	75 Belt	440	APHEI	C1 B5	17C
	10	75 Belt (x2)	440	HEI	C1 B5	-4C
	10	75 Belt (x2)	440	SHRAP	C1 B8	-5C

20mm GAI-C03

Notes: This is basically a GAI-C01 that uses a variant of the KAD known as the KAD-A01. The biggest difference between the standard KAD and the KAD-A01, apart from the barrel length, is that the KAD-A01 is fed from drum magazines similar to those of KAB. The GAI-C03 uses the same carriage, mount, and sight of the GAI-C01.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
GAI-C03	20mm KAD	3	2 Minutes	495 kg	\$31061

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
GAI-C01	10	8, 20, 50	670	APDS	4	6/5/4/3

10	8, 20, 50	670	API	4	3/3/3/2
10	8, 20, 50	500	HE	C1 B5	-4C
10	8, 20, 50	500	SHRAP	C1 B8	-5C

20mm GAI-D01

Notes: This weapon was designed to fill the gap between simple single-barreled 20mm anti-aircraft guns and heavy, sophisticated weapons such as the 35mm GDF series. It has twin barrels that are longer than the standard KAA or KAB barrels. It is also meant to be economical enough to be used routinely against ground targets, especially personnel in the open. The GAI-D01 is a fairly simple weapon, but has powerful 6x telescopic sights and a small 1.5 kW generator under the gunner's seat for the gun training and rotation mechanism.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
GAI-D01	20mm KAA	5	1 Minutes	1800 kg	\$56472

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
GAI-D01	20	120 Belt (x2)	590	API	4	3/3/3/2
	20	120 Belt (x2)	440	HE	C1 B5	-4C

25mm Oerlikon KBA

Notes: The design of the KBA dates back to the 1960s and the competition for what would become the autocannon on the US MICV (later the M-2 Bradley). The KBA was actually designed by famed small arms maven Eugene Stoner, but the design was bought out by Oerlikon after the MICV autocannon competition was won by the M-242 Bushmaster. The KBA is used in a large amount of vehicles, including the AIFV, MOWAG Piranha, Diana ADA, and Oerlikon GBI-A01, as well as the GBD-AOA and GBD-COA turrets. It is a gas-operated, dual-feed weapon; the KBA-A fires on automatic only; the KBA-B is selective fire, with semiautomatic, programmable rapid semiautomatic with a cyclic rate of 200 RPM, and fully automatic. The standard automatic cyclic rate of fire is 570 RPM, but the KBA-C01 version uses a recoiling barrel and has a slightly higher rate of fire at 600 RPM (this has no effect in game terms). The operation of the autocannon is primarily electrical, though as backups hand cranks and a trigger pedal are available (the electrical firing mechanism actually "pulls the trigger" instead of electrically firing the ammunition).

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
KBA	25mm KBA	1	NA	112 kg	\$11468

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Oerlikon KBA	5	100 Belt (x2)	380	AA	C1 B8	-4C
	5	100 Belt (x2)	510	APDS	6	8/7/6/4
	5	100 Belt (x2)	510	APFSDS	6	11/10/8/5
	5	100 Belt (x2)	510	APFSDSDU	6	14/12/10/7
	5	100 Belt (x2)	510	API	6	5/4/3/2
	5	100 Belt (x2)	510	FAPDS	C1 B3	7/6/5/4
	5	100 Belt (x2)	380	HEI	C1 B5	-3C
	5	100 Belt (x2)	380	SAPHEI	C1 B3	4/3/2/1

25mm Oerlikon GBI-A01

Notes: This is a relatively simple single-barreled 25mm anti-aircraft mount using a KBA autocannon. The weapon requires virtually no set-up time; in a pinch, the GBI-A01 may be fired only partially set up, while still hooked to its towing vehicle (though this limits traverse to 45 degrees in either direction). Elevation and traverse are manual, using handwheels. The gunsight is equivalent to a 4x set of binoculars. The Cannon is fed from two ammunition boxes, one on each side of the gun.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
GBI-A01	25mm KBA	2	30 seconds	600 kg	\$46084

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
GBI-A01	5	40 Belt (x2)	380	AA	C1 B8	-4C
	5	40 Belt (x2)	510	APFSDSDU	6	14/12/10/7
	5	40 Belt (x2)	510	API	6	5/4/3/2
	5	40 Belt (x2)	380	HE	C1 B5	-3C

35mm Oerlikon GDF-001/002/003/005

Notes: This twin 35mm autocannon began development in the late 1950s. The first model was known as the GDF-001, and had a low-power telescopic sight, but was otherwise a basic anti-aircraft gun. In 1980s, the GDF-002 was introduced, using a higher-power sight and digital data transmission; it can also be used in conjunction with radar systems. The GDF-003 increases the integration possibilities to include vehicle equipped with the Marksman turret or Skyguard radar system. The GDF-005 adds an autonomous

gunsighting system so that several guns may be remote-controlled; an automatic reloader with ammunition storage on the gun, a laser rangefinder with ballistic computer, and better cannons. The cannons used in the GDF-001, 002, and 003 are KDBs; the 005 uses KDC autocannons.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
GDF-001	35mm KDB	4	4 Minutes	6300 kg	\$290535
GDF-002	35mm KDB	4	4 Minutes	6300 kg	\$297795
GDF-003	35mm KDB	4	4 Minutes	6700 kg	\$305243
GDF-005	35mm KDC	4	4 Minutes	7250 kg	\$325243

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
GDF-001/2/3	10	56 Belt (x2)	430	AHEAD	C2 B12	17C
	10	56 Belt (x2)	570	APCI	8	8/7/6/4
	10	56 Belt (x2)	570	APDS	8	12/10/9/6
	10	56 Belt (x2)	570	APFSDS	8	17/14/12/8
	10	56 Belt (x2)	570	FAPDS	C1 B5	15/12/11/7
	10	56 Belt (x2)	430	HEI	C2 B10	-2C
	10	56 Belt (x2)	430	HEIBF	C1 B12	-3C
	10	56 Belt (x2)	430	HEINF	C3 B15	-4C
	10	56 Belt (x2)	570	SAPHEI	C1 B5	7/6/5/3
	GDF-005	10	65 Belt (x2)	430	AHEAD	C2 B12
10		65 Belt (x2)	570	APCI	8	8/7/6/4
10		65 Belt (x2)	570	APDS	8	12/10/9/6
10		65 Belt (x2)	570	APFSDS	8	17/14/12/8
10		65 Belt (x2)	570	FAPDS	C1 B5	15/12/11/7
10		65 Belt (x2)	430	HEI	C2 B10	-2C
10		65 Belt (x2)	430	HEIBF	C1 B12	-3C
10		65 Belt (x2)	430	HEINF	C3 B15	-4C
10		65 Belt (x2)	570	SAPHEI	C1 B5	7/6/5/3

20mm Vulcan

Notes: The Vulcan, and its upgraded version, the PIVAD, is one of the most common air defense guns in the world, whether in trailer-mounted versions, fixed mountings, naval mountings, and vehicular use. A modified form is a very common aircraft gun. The Vulcan is a six-barreled rotary cannon that fires at an extremely rapid rate of fire, projecting a virtual wall of metal at targets.

The Vulcan has also been used as armament for most US military and US-made military aircraft since the 1950s; in fact, the Vulcan was first designed for use on the F-104 Shooting Star interceptor. In this guise, the Vulcan has the designation M61. The initial design, the M61, was fed by linked ammunition, and sent out for testing in the then-new F-104. The M61, which had been plagued by misfeeds and jams up to this point, ejected its expended links overboard through a slot under the fighter. The test pilot, firing while in a turn at about Mach 2, found that the expended links were ingested into its air intake on the right side and also hit the wing, which was a carefully-shaped special airfoil, and the links hitting the wing munged up the aerodynamics. The test pilot, therefore, got to be the first pilot to find out what it's like to eject from an aircraft at Mach 2 speeds. (He spent months in the hospital, and months more before he was fit enough for flying status.)

The M61A1 did away with the linked ammunition feed in favor of linkless feed. This essentially worked miracles, making jams rare and doing away with any problems caused by spent links being ejected overboard. In addition, expended cases are retained inside the aircraft to keep them from doing the same thing the M61's expended links did. The M61A1 became the standard aircraft cannon for almost all US and US-made aircraft for 50-odd years, and it is still in widespread use. It inspired virtually all rotary cannons and machineguns which were designed after the Vulcan. The nominal rate of fire for the M61A1 is 6000 rounds per minute (though not even the AC-130s that carry the Vulcan have that much ammunition); pilots normally fire in one-second or half-second burst, firing 100 or 50 rounds at an attack. Some M61A1s (such as on the Brazilian/Italian AMX and the F-106 Delta Dart) have their rate of fire throttled to 4000 rounds per minute, and some attack aircraft (like the A-7 Corsair II) can have a rate of fire selected by the pilot at either 4000 or 6000 rounds per minute.

The M61A1 can also be mounted under an aircraft (on the wings or centerline; in practice, the pods are not mounted on the wing except in those rare instances that a pod is carried under each wing); this pod is known as the GAU-4. Early versions of this pod were powered by ram air provided by the forward motion of the aircraft; however, it was quickly discovered in Vietnam that the GAU-4 became unreliable when the aircraft carrying it was traveling at less than 400 kmh. The GAU-4 was modified into the GAU-4/A, which is powered by electricity from a small generator inside the pod..

There is a new version of the M61, the M61A2; this version is made of lighter materials, including a lot of titanium and even ceramics and composites. In addition, the designers literally removed any metal that did not directly contribute to the operation of the gun, and the electrical power unit was able to be made lighter due to new technology. The M61A2 was originally designed for the F-22 Raptor, but it is now also found on the F/A-18E/F Super Hornet and F-15EX Eagle II.

Aircraft equipped with the Vulcan normally use API ammunition.

The US Army calls the M61A1 the M130; its primary use in the Army is on the M167 VADS towed SPAAG, and the M163 VADS. The M163 is mounted on a modified M113 APC chassis; the M167 is on a towed mount and is normally towed by a medium truck which also carries more 20mm Vulcan ammunition. The M167 trailer also carries a 10kW generator to power the M130. Initially, the generator was powered by a large diesel fuel tank, but the fuel used was later changed in US Army service to JP8. The generator and the fuel tank essentially form the gunner's platform, and the rest of the VADS is on top of this.

The M130 gun is also mounted on the Israeli Machbet, a variant of the M163, and the original Phalanx CIWS naval weapons. It is also mounted on an Army AAA version of the Phalanx; this mount is still in advanced development, but combat testing in Iraq and Saudi Arabia have yielded good results against cruise missiles, rockets, and UAV. Sudan and Yemen use M167 Vulcans mounted on top of BTR-152s, and a modified M167 mount has been seen mounted in the back of a Toyota Land Cruiser in Yemen in the hands of the Houthi.

The standard VADS system, whether an M167 or M163, has a range-only radar and an optical lead-calculating sight. The M167A2 PIVAD adds a new digital optical sight and a ballistic computer, and is much more accurate than the VADS system on the M167 VADS. (These improvements were also made to the M163.) The M130 gun on the VADS and PIVAD may be programmed by the gunner to fire in 10, 30, 60, or 100-round bursts, though the nominal rate of fire is 3000 rounds per minute. The size of bursts is programmed by the gunner. VADS and PIVAD systems normally use HEI-T rounds (an HEI round with a tracer base). A use not often mentioned for the M167 and M163 is its ability to depress the gun enough to be used against ground targets; they can decimate infantry, shred light vehicles, and even take out some light armored vehicles.

Though the M167, and in some cases, the M163, are still used worldwide, the VADS and PIVAD systems were phased out in the US in favor of the M1097 Avenger SAM system and will also be replaced by the truck-mounted Phalanx CIWS. The M6 Bradley Linebacker was also to be a replacement for the M163, though the M6 itself was phased out by the Army after a few years. (I don't know what brilliant General or Congressional Committee made that decision, or what they were thinking when he decided to shelve the Linebacker...)

A third model, the Basic Vulcan, is an M167 designed for export to poorer countries; it deletes the radar, digital sight, and power controls for elevation and traverse.

The Basic Vulcan, VADS, and PIVAD are grouped in the second table below by the gun used (the M130 Vulcan). Note that the range of the M130 Vulcan differs from the M61; this is because the M130 uses longer barrels.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M61A1	20mm Vulcan	Depends	N/A	112 kg	\$55421

M61A2	20mm Vulcan	on Aircraft Depends on Aircraft	N/A	92 kg	\$60964
Basic Vulcan	20mm Vulcan	3	4 Minutes	1565 kg	\$32769
Vulcan ADA	20mm Vulcan	4	4 Minutes	1588 kg	\$43692
PIVAD	20mm Vulcan	4	4 Minutes	1732 kg	\$53692

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M61A1 Vulcan	500	Depends on Aircraft Capacity	420	AP	4	2/2/2/1
	500	Depends on Aircraft Capacity	420	APDS	4	4/3/3/2
	500	Depends on Aircraft Capacity	420	API	4	3/3/2/1
	500	Depends on Aircraft Capacity	300	HEI	C1 B5	-4C
	500	Depends on Aircraft Capacity	420	MPT-SD	4	4/3/3/2
	500	Depends on Aircraft Capacity	300	SAPHEI	C1 B3	2/2/2/1
M61A1 Vulcan (4000 RPM)	333	Depends on Aircraft Capacity	420	AP	4	2/2/2/1
	333	Depends on Aircraft Capacity	420	APDS	4	4/3/3/2
	333	Depends on Aircraft Capacity	420	API	4	3/3/2/1
	333	Depends on Aircraft Capacity	300	HEI	C1 B5	-4C
	333	Depends on Aircraft Capacity	420	MPT-SD	4	4/3/3/2
	333	Depends on Aircraft Capacity	300	SAPHEI	C1 B3	2/2/2/1
M61A2 Vulcan	550	Depends on Aircraft Capacity	420	AP	4	2/2/2/1
	550	Depends on Aircraft Capacity	420	APDS	4	4/3/3/2
	550	Depends on Aircraft Capacity	420	API	4	3/3/2/1
	550	Depends on Aircraft Capacity	300	HEI	C1 B5	-4C
	550	Depends on Aircraft Capacity	420	MPT-SD	4	4/3/3/2
	550	Depends on Aircraft Capacity	300	SAPHEI	C1 B3	2/2/2/1
M130 Vulcan	250	300 Chute, 500 Chute	490	AP	4	2/2/2/1
	250	300 Chute, 500 Chute	490	APDS	4	4/3/3/2
	250	300 Chute, 500 Chute	490	API	4	3/3/2/1
	250	300 Chute, 500 Chute	370	HEI	C1 B5	-4C
	250	300 Chute, 500 Chute	490	MPT-SD	4	4/3/3/2
	250	300 Chute, 500 Chute	370	SAPHEI	C1 B3	2/2/2/1

25mm M-242 Chain Gun

Notes: Also known as the Bushmaster, this autocannon is fitted to the M-2 and M-3 Bradley Fighting Vehicles and the LAV-25, as well as US Navy deck mountings. It is also employed on MOWAG Piranhas used by the Saudis. Rounds may be fired on semiautomatic, ROF 2, ROF3, or ROF5. This weapon fires both US-made and European ammunition. The mechanism is actuated by a chain drive, hence the name. It is noteworthy that before Operation Iraqi Freedom, the US Army was heavily considering replacing the Bradley's 25mm M-242 with a heavier-caliber autocannon; however, the 25mm M-242 has outperformed expectations and its replacement is no longer being considered.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-242	25mm KBA	1	NA	153.5 kg	\$11270

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-242 ChainGun	5	100B (x2)	390	AA	C1 B8	-4C
	5	100B (x2)	520	APFSDSDU	6	14/12/10/7
	5	100B (x2)	520	API	6	5/4/3/2
	5	100B (x2)	390	HE	C1 B5	-3C

25mm Objective Crew-Served Weapon

Notes: This weapon was designed to partially replace the Mark 19, ASP, and M-2HB. The OCSW's rounds, like the OICW's grenade launcher rounds, can be set to airburst over a target's heads or strike the target directly. The OCSW fires a special 25mm round with a computerized proximity fuse, either HE or HEDP. The OCSW is fired from a lightweight tripod developed especially for this weapon, or it may be fired from a NHT mount. The OCSW uses a computerized laser sight, a slightly improved version of the IR imaging sight on the OICW. The OCSW is fed from special cassettes of 22 or 74 rounds.

Twilight 2000 Notes: The Objective Crew-Served Weapon (OCSW) was rushed into service several years ahead of its target date,

however, few were available by the Twilight War.

Merc 2000 Notes: Budget cuts largely ended deployment of this weapon.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
OCSW	25mm OCSW	1	1 Minute	16.5 kg (With Tripod)	\$15152

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
OCSW	5	22, 74	190	HE	C4 B20	-3C
	5	22, 74	190	HEDP	C2 B10	23C
	5	22, 74	190	HEAB	C6 B24	-3C
	5	22, 74	190	HEDP-AB	C4 B15	23C

30mm ASP

Notes: The ASP-30 (Automatic, Self-Powered) is a gas-operated version of the 30mm ChainGun designed as an infantry support weapon. It fits on an NHT or any other mount that is equivalent to an NHT. It is fed from a 50-round belt. Recoil is manageable when on a tripod or vehicle mount.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
ASP	30mm KCB	1	3 Minutes	48 kg	\$20179

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
ASP	5	50B	340	APFSDSDU	7	14/12/10/7
	5	50B	340	API	7	5/4/3/2
	5	50B	250	HE	C2 B10	-3C
	5	50B	250	HEAT	C1 B5	29C
	5	50B	250	HEDP	C2 B10	13C

30mm Bushmaster II

Notes: This weapon is an upgraded M-242 Chain Gun, and retains 70% commonality of parts with that weapon. The Bushmaster II can use the same ammunition as the GAU-8, and can also fire 30mm Rarden and KCB ammunition. It is used on US Navy deck mounts, and on the Swedish CV-30, and on some versions of the cancelled AAV. It is rumored as an interim upgrade for the Bradley Fighting Vehicle. And the US Marine AAPV-7A1.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Bushmaster II	30mm KCB, GAU-8, and Rarden	1	NA	147.4 kg	\$20180

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Bushmaster II	5	100B (x2)	625	GAU-8 APIDU	7	17/15/13/8
	5	100B (x2)	390	GAU-8 HEI	C2 B10	-3C
	5	100B (x2)	520	KCB APFSDSDU	7	17/15/13/8
	5	100B (x2)	520	KCB API	7	6/5/4/3
	5	100B (x2)	390	KCB HE	C2 B10	-3C
	5	100B (x2)	390	KCB HEAT	C1 B5	29C
	5	100B (x2)	390	KCB HEDP	C2 B10	13C
	5	100B (x2)	625	Rarden APDS	7	10/9/7/5
	5	100B (x2)	625	Rarden APFSDS	7	14/12/10/7
	5	100B (x2)	520	Rarden APSE	7	6/5/4/3
	5	100B (x2)	390	Rarden HE	C2 B10	-3C

30mm GAU-8/A Avenger

Notes: The A-10 Warthog CAS aircraft was literally built around the massive GAU-8/A and it's huge ammo drum. Since then, it has been used on the Goalkeeper CIWS shipboard defense system, better to bring down low-flying missiles at short-range. As noted above, the 20mm Bushmaster II can also use the GAU-8/A's rounds. Warthogs normally carry only APIDU rounds; the Goalkeeper normally uses only HEI rounds. GAU-8/A rounds are about the size of a milk bottle or, for those youngns who don't remember milk delivery, a 2-liter Pepsi).

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
GAU-8/A Avenger	30mm GAU-8	1 (3 Loaders on Ground Crew)	6 Minutes (To Reload)	1.584 tons	\$46,100

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
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GAU-8/A Avenger	35	1274 Linkless	2125	APIDU	8	17/15/13/8
	35	1274 Linkless	1326	HEI	C2 B10	-2C

35mm Bushmaster III

Notes: This is a belt-fed autocannon which is just beginning to be mounted on AFVs; anti-aircraft and naval use is still more common. The Norwegian variant of the CV-9040, for example, uses the Bushmaster III. 70% of the parts of this weapon are compatible with the Bushmaster I and II. It fires ammunition identical to that of the 35mm Oerlikon autocannon, though some new warhead types were developed along with the Bushmaster III. The Bushmaster III has been designed to, after the replacement of the barrel and some minor parts, to be able to fire 50mm Supershot ammunition, effectively becoming a 50mm autocannon. As of yet, this has not been done on an operational basis, but the concept has been thoroughly tested and is ready for deployment upon request.

Twilight 2000 Notes: This weapon has been mounted some versions of the M-2 and M-3 Bradley.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
Bushmaster III	35mm Oerlikon KDA	1	NA	181.5 kg	\$35841

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
Bushmaster III	5	100B (x2)	390	AHEAD	C2 B12	17C
	5	100B (x2)	520	APCI	8	8/7/6/4
	5	100B (x2)	520	APDS	8	12/10/9/6
	5	100B (x2)	520	APFSDS	8	17/14/12/8
	5	100B (x2)	520	APFSDS-T	8	20/17/14/9
	5	100B (x2)	520	APFSDSDU	8	21/18/14/10
	5	100B (x2)	520	API	8	7/6/5/3
	5	100B (x2)	520	FAPDS	C1 B5	15/12/11/7
	5	100B (x2)	390	HE/HEI	C2 B10	-2C
	5	100B (x2)	390	HEAT	C2 B5	35C
	5	100B (x2)	390	HEDP	C2 B10	17C
	5	100B (x2)	390	HEIBF	C1 B12	-3C
	5	100B (x2)	390	HEINF	C3 B15	-4C
	5	100B (x2)	520	SAPHEI	C1 B5	7/6/5/3

75mm ARES XM-274

Notes: Initial development of this heavy autocannon began in 1973 as part of the US Army's HSTV-L and HIMAG programs; the development was sponsored by the US DoD's ARRADCOM Large Caliber Weapons Laboratory, and though the design work was done by ARES personnel, most of the work was done at this facility and ARRADCOM provided partial funding. The XM-274 was originally going to be used in both a light armored gun system as well as in a self-propelled anti-aircraft gun system, but the HSTV-L and HIMAG programs came to naught. However, in 1981, ARES received renewed interest in the XM-274 from the Army, as possible armament for its RDF/LT program vehicle, the supposed replacement for the M-551 Sheridan at the time. In conjunction with AAI, a light armored gun system which could be airdropped was designed, using a low-profile turret and a special feed system for the gun. However, this program too eventually came to naught. ARES and MOWAG got together and produced a test version of the Piranha II armed with this gun, but no one seemed interested. Test vehicles with the XM-274 as armament were also made on a LAV-25 chassis, again with no takers. Eventually, the gun was shelved, though ARES still retains the design in their inventory and is willing to put it into production if someone is interested.

The XM-274 is a heavy autocannon firing revolutionary (for the time) case-telescoped ammunition. In vehicular applications, the gun is fed from a 36-round carousel in the floor of the vehicle under the low-profile turret, though ARES is willing to consider and has proposed other feed designs. The CTA ammunition reduces its volume and its weight, as well as making feed more reliable. The XM-274's design called electrical priming of the rounds and a recoil/hydropneumatic system for operation. Spent cases are ejected upwards and outside of the vehicle. The XM-274 is designed to function optimally firing in short bursts of 1-5 rounds, with a cyclic rate of one round per second. The barrel is fairly long at L/75.48 (5.661 meters), giving it good accuracy and power despite the relatively small caliber of its rounds.

At the time of the cancellation of ARES's entry in the RDF/LT program, ARES was working on a 90mm version of the XM-274, but the rate of research was slow as ARES concentrated on the 75mm version, and only two such prototypes were made.

Twilight 2000 Notes: In the Twilight 2000 timeline, this autocannon is mounted on the LAV-75 light armored gun system.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
XM-274	75mm ARES CTA	1	NA	1144 kg	\$65,410

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
XM-274	5	36 Carousel	670	APFSDS	17	97/84/71/46
	5	36 Carousel	500	HE	C10 B20	4C

	5	36 Carousel	500	HEAT	C6 B15	68C
	5	36 Carousel	500	WP	C2 B15	Nil

90mm ARES "XM-275"

Notes: This grew out of the XM-274 project in the early 1980s, when the Army expressed a wish for an ARES/AAI RDF/LT with greater firepower (and they were asking for the same from RDF/LT prototypes in general. The gun was never mounted on a vehicle or even in a mockup or turret; however, the basic gun system was built to the same standards as the XM-274 and AAI drew up plans for a carrier vehicle. In the end, though, the gun barrel was simply too long and the vehicle itself unable to be airdropped from the C-130 or the C-141 (it was meant to equip the 82n's Airborne in addition to light formations). The two working prototypes reportedly still exist, but are mothballed.

The ARES 90mm gun would have required a bigger vehicle with a bigger turret to make room for the gun and it's ammunition. It too is fed by a 36-round carousel on the floor of the vehicle. The barrel of the ARES 90mm is not as long relative to its caliber, being 56.61 calibers long. Optimal fire is still a burst of 1-5 rounds, though ARES recommended 3-round bursts to conserve ammunition and because the rounds themselves are capable of more damage potential than the 75mm ARES rounds. Operation is identical to the XM-274.

"XM-275" is the Twilight 2000 designation, or more likely, "M-275."

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
XM-274	90mm ARES CTA	1	NA	1373 kg	\$86,443

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
XM-274	5	36 Carousel	430	APFSDSDU	20	152/132/112/73
	5	36 Carousel	320	HE	C16 B30	7C
	5	36 Carousel	320	HEAT	C11 B20	101C
	5	36 Carousel	320	WP	C2 B20	Nil
	5	36 Carousel	160	Flechette	D 30x65; 2d6 Each	1-Nil
	5	36 Carousel	320	HESH	C11 B20	121C

20mm Zastava M-55 A2

Notes: This weapon is one of three similar anti-aircraft guns. The guns used are license-produced HS-804 guns, three on one mount. The guns are placed close together to allow quicker reloading. It is otherwise a very simple weapon.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-55 A2	20mm HS-404	3	2 Minutes	970 kg	\$49128

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-55 A2	15	60 Drum (x3)	460	AP	4	1/1/1/1
	15	60 Drum (x3)	460	API	4	1/1/1/1
	15	60 Drum (x3)	350	HE	C1 B5	-4C
	15	60 Drum (x3)	350	HEI	C1 B5	-4C
	15	60 Drum (x3)	350	MPHC	B5	5C
	15	60 Drum (x3)	460	SAPI	4	2/2/1/1

20mm Zastava M-55 A3 B1

Notes: This is an improved version of the M-55 A2. The main difference is the small gasoline engine to the right of the gunner's seat to provide power and relieve the gunner of having to manually control the traverse and elevation. This engine provides 5.22 kW.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-55 A3 B1	20mm HS-404	3	3 Minutes	1150 kg	\$49859

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-55 A3 B1	15	60 Drum (x3)	460	AP	4	1/1/1/1
	15	60 Drum (x3)	460	API	4	1/1/1/1
	15	60 Drum (x3)	350	HE	C1 B5	-4C
	15	60 Drum (x3)	350	HEI	C1 B5	-4C
	15	60 Drum (x3)	350	MPHC	B5	5C
	15	60 Drum (x3)	460	SAPI	4	2/2/1/1

20mm Zastava M-55 A4 B1

Notes: This is an M-55 gun system on the mount of the Swiss GAI-D01 anti-aircraft gun. In addition, an engine of the same type as the M-55 A3 B1 has been placed under the gunner seat, and a ballistic computer has been added.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-55 A4 B1	20mm HS-404	3	3 Minutes	1350 kg	\$54859

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-55 A4 B1	15	60 Drum (x3)	460	AP	4	1/1/1/1
	15	60 Drum (x3)	460	API	4	1/1/1/1
	15	60 Drum (x3)	350	HE	C1 B5	-4C
	15	60 Drum (x3)	350	HEI	C1 B5	-4C
	15	60 Drum (x3)	350	MPHC	B5	5C
	15	60 Drum (x3)	460	SAPI	4	2/2/1/1

20mm M-75

Notes: This is basically a single-weapon mount of the same M-1955 autocannon as on the M-55 series of anti-aircraft guns. It can be broken into smaller loads, the largest of which is 55 kilograms in weight. It is a very simple, basic weapon.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-75	20mm HS-404	2	2 Minutes	260 kg	\$24664

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-75	5	10 Drum, 60 Drum	460	AP	4	1/1/1/1
	5	10 Drum, 60 Drum	460	API	4	1/1/1/1
	5	10 Drum, 60 Drum	350	HE	C1 B5	-4C
	5	10 Drum, 60 Drum	350	HEI	C1 B5	-4C
	5	10 Drum, 60 Drum	350	MPHC	B5	5C
	5	10 Drum, 60 Drum	460	SAPI	4	2/2/1/1

20mm Zastava M-1955

Notes: This autocannon is suspiciously similar to the Hispano-Suiza (later Oerlikon) HS-804. The primary use is on the M-55 3-

gun anti-aircraft mount, but it has also been seen on a single-gun wheeled mount.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-1955	20mm HS-404	1	NA	115 kg	\$5999

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-1955	5	60 Drum	460	AP	4	1/1/1/1
	5	60 Drum	460	API	4	1/1/1/1
	5	60 Drum	350	HE	C1 B5	-4C
	5	60 Drum	350	HEI	C1 B5	-4C
	5	60 Drum	350	MPHC	B5	5C
	5	60 Drum	460	SAPI	4	2/2/1/1

30mm Zastava M-86

Notes: This Yugoslavian design is intended for mounting on armored vehicles or anti-aircraft mounts. The M-68 can feed from either side, but is not a dual-feed weapon; only one belt may be loaded in the weapon at a time. It is designed for low-recoil operation, but its belt-pulling power is not great, limiting the potential belt length. Firing is electrical.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-86	30mm M-53	1	NA	200 kg	\$5999

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-86	5	40 Belt	470	API	7	5/4/3/2
	5	40 Belt	470	APFSDS	7	11/10/8/5
	5	40 Belt	350	HE	C1 B5	-3C
	5	40 Belt	350	HEI	C1 B5	-3C

30mm Zastava M-89

Notes: This is a dual-feed version of the M-86 above. Except for that feature and the weight and price, it is identical to the M-86.

Weapon	Ammunition	Crew	Set Up Time	Weight	Price
M-89	30mm M-53	1	NA	215 kg	\$6220

Weapon	ROF	Magazine	Range	Round	Damage	Penetration
M-89	5	40 Belt (x2)	470	API	7	5/4/3/2
	5	40 Belt (x2)	470	APFSDS	7	11/10/8/5
	5	40 Belt (x2)	350	HE	C1 B5	-3C
	5	40 Belt (x2)	350	HEI	C1 B5	-3C