

Tracked Light Combat Vehicles



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TAMSE TAM

Notes: This is a light tank designed in the mid-1970s for the Argentine Army as a companion to the VCTP armored personnel carrier. Prototypes appeared in 1977, with full production beginning in 1979. The TAM was developed primarily German engineers, but there was considerable design input by Argentine engineers, who advised on what they needed in a medium tank, the threats from other countries, and most of all, what could be accomplished with the available budget. Most TAMs were, in fact built in Argentina, with knock-down kits being supplied to the TAMSE plant in Argentina to allow them to study design before undertaking production. Economic difficulties ended production prematurely in 1983, but manufacturing began in 1994, after which the Army's request for 200 TAMs was finally fulfilled. Budgetary difficulties cut short the sales to Argentine Army, but then some of the surplus was sold to Malaysia Ecuador, and Thailand after upgrading, and production was ramped up again. (These vehicles are known as TH-301s.) The TAM is in fact part of family of vehicles based on the same chassis.

TAM

Based on a lengthened Marder chassis, the TAM (Tanque Argentino Mediano, the Argentine name for the vehicle) is topped with a turret mounting a 105mm Rheinmetall Rh-105-30 smoothbore gun. The gun is stabilized in only one plane. The coaxial machinegun is an Argentine-built version of the FN MAG. There is a driver's hatch on the front left of the deck; the turret is mounted in the rear of the vehicle with a commander and loader's hatches on the turret deck. In the rear of the hull is a door that is normally used for resupply, but can be used as a quick exit for the crew if the vehicle is taken out of action.

Optics have been criticized by defense experts as being inadequate, especially in the light of what optics were available at the time. Fire control consists of a ballistic computer and a laser rangefinder with a range of 9900 meters, far outranging the main gun, but useful for determining distances to terrain features.

The engine is a MTU MB-883 Ka500 diesel engine. It has a basic turbocharger, and uses an automatic transmission. The engine, combined with the light weight, gives the TAM lots of agility. The TAM carries a pair of two 200-liter armored drums of extra fuel, to extend range. Though these are in fact vulnerable enemy fire, the tanks do have an AV of 6 from all angles and are self-sealing. The tanks are carried above the level of the deck, allowing fuel to easily flow out of them. (Argentine Army policy is to use the extra fuel first.) The TAM is NBC-Sealed and NBC-filtered fans to help increase comfort; it is not, however, an air conditioner.

The TAM's armor is primarily of all-welded steel. Most defense experts consider the TAM's armor to be inadequate for its role, but the Argentines were willing to sacrifice protection for lighter weight, and therefore, speed and agility. Perhaps the most obvious feature of the TAM is its low-profile turret, with most working space being inside the turret basket. The gun has 20 rounds in a compartment in the turret bustle, but 30 rounds are stored in non-protected storage in the turret, protected only the hull floor armor, which is, to its credit, somewhat thicker than one might expect from its class of vehicle. The TAM is capable of fording up to four meters of water. Suspension is by torsion bars

TH-301

The Argentines were, to a large extent, hamstrung by their own economy when they built the TAM. The Germans were not nearly so restricted, and they saw a market for an improved version of the TAM. The TH-301 version of the TAM was the version that the Thais bought; beyond that, no sales were made, and the Germans eventually took the TH-301 off the market. Most countries were, unfortunately, interested in Main Battle Tanks and not medium tanks.

The TH-301 has an all-round retrofit for its vision system, from adjustable telescopic optical sights to thermal imaging to four-way day/night CCD cameras. It also has improved fire control and stabilization. The engine is a new design, a 750-horsepower turbocharged diesel with a mighty output of 750 horsepower, coupled to a fully-automatic transmission, power steering, and power brakes. Externally, the TH-301 looks almost like a TAM, with the lengthened Marder chassis and the low-profile turret and the 105mm ordnance. However, the TH-301 has slightly improved armor with higher-quality steel, and has side skirts. The suspension is mostly by torsion bar, but the Germans learned from the TAM and put a shock absorber on the front and rear roadwheels. The TH-301 is NBC-Sealed and has NBC filters for its air conditioner. Major attention has been given to the maintenance and servicing of the vehicle; for example, the TH-301 has a unitary power pack and it may be removed in one piece.

TAM 2C

The TAM 2C is a heavily-upgraded version of the TAM. In the early 2000s, the Argentines felt they needed a tank that was more survivable on the battlefield. They looked at the Leopard 2A4, the Leclerc, the Merkava, the T-80. It was decided, however, that these vehicles were too expensive to buy, use, and maintain, and that a cheaper upgrade to the TAM would be more in line with the Argentine budget. The Argentines contacted a variety of firms to design and do the upgrades, including Elbit in Israel and several Argentine firms. Yet some defense analysts criticize the TAM 2C as not enough of an upgrade, considering its likely opponents in South America, and that the Argentines passed on deals for far better main battle tanks. As medium tanks go, the TAM 2C is a reasonably up-to-date vehicle, however.

A large bustle rack has been added to the rear of the turret. Side skirts have also been added. Below the bustle rack, mounted on the back of the hull, is a 10kW APU for silent running. (The APU is at the back of the vehicle and seems to lack any armor.) Turret operation was changed from a hydraulic system to an all-electric system. Despite the increase in armor, new armor composition technology means that the TAM 2C is actually lighter than the TAM. Some TAM 2Cs sport a large rack that stretch across the entire rear deck and is about a meter wide and high.

The TAM 2C has a thermal imager as well as a backup camera for the driver. The gunner and commander were given a thermal imager as well as a day/night CCD camera. The commander also has as part of his cupola a laser rangefinder and laser designator. The commander's sight head gives the TAM 2C a hunter/killer capability. An onboard computer was added, both as a vehicle state computer and as a mapping computer; the TAM 2C has inertial navigation. The computer system also provides a ballistic computer program to the gun and coaxial, as well as providing LCD interfaces for the gunner, commander, and driver.

The gun is more properly stabilized, due to strategically-placed counterweights as well as the addition of a thermal sleeve. The current gun is a 105mm Rheinmetall Rh-105-30 smoothbore gun, but a possible future upgrade is the 120mm smoothbore gun used by most NATO and Western tanks. The gun is also more effective due to the capability of firing more, different types of ammunition, including the Israeli LAHAT and a new long-rod tungsten APFSDS-T round. The gun has 20 rounds in a compartment in the turret bustle which is similar in concept to that of the M1 series, but 30 rounds are stored in non-protected storage in the turret floor.

The chassis is essentially an up-armored version of the German Marder, with the same MTU MB-883 Ka500 diesel engine. An improved turbocharger has been added, however, and this increases output to 740 horsepower., This is linked to a fully automatic transmission, along with power brakes and power steering. Armor has been improved in general, particularly on the glacis, turret front, and turret sides., this armor is generally all-welded steel. But also incorporates some advanced armor in strategic places. The armor is said to be a version of the Israeli Iron Wall armor. The suspension base is the same as the standard TAM, but there are also shock absorbers on the front two and the rear roadwheels. The TAM 2C has an ability to detect a laser designation beam and automatically launch smoke.

The commander has an electrically-powered cupola with an Argentine-built version of the MAG on a pintle. The TAM 2C retains the bank of four smoke grenade launchers on either side of the rear of the turret. The crew benefits from air conditioning and NBC Overpressure protection.

Some TAM 2Cs have been seen with the TAM's extra fuel tanks at the rear. This appears to have been discontinued after the addition of the APU. The TAM 2C, however, retains the ability to mount those extra fuel tanks as the rear.

Twilight 2000 Notes: When the Twilight War intervened, production and the undelivered vehicles were shifted to domestic use.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
TAM	\$678,494	D, A	508 kg	31.6 tons	4	29	Passive IR, Image Intensification	Shielded
TH-301	\$909,066	D, A	521 kg	31.6 tons	4	21	Passive IR, Image Intensification, Day/Night CCD Camera (G, C), Day/Night CCD Camera (Backup)	Shielded
TAM 2C	\$1,251,883	D, A	507 kg	30.5 tons	4	24	Thermal Imaging (D, G, C), Day/Night CCD Camera (G, C), Day/Night CCD Camera (Backup) (D)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
TAM	158/111	44/31	650+400	268	Trtd	T4	TF26 TS8 TR8 HF32 HS6 HR6*
TH-301	164/114	45/32	650+400	279	Trtd	T5	TF28Sp TS10Sp TR8 HF34Sp HS8Sp HR6*
TAM 2C	167/117	46/32	650+400	275	Trtd	T5	TF31Cp TS10Sp TR8 HF38Cp HS7Sp HS6**

Vehicle	Fire Control	Stabilization	Armament	Ammunition
TAM	+2	Fair	105mm Rheinmetall Gun, MG3, MG-3 (C)	50x105mm, 3000x7.62mm
TH-301	+3	Fair	105mm Rheinmetall Gun, MG3, MG3 (C)	50x105mm, 3000x7.62mm
TAM 2C	+4	Good	105mm Rheinmetall Gun, MAG, MAG (C)	50x105mm, 3000x7.62mm

*Turret Roof Armor is AV6. Hull Roof Armor is AV5, Hull Floor armor is AV6, except for the front third of the floor, which is AV7.

** Roof AV is 7, Floor Armor is 8Sp.

4K 7FA FSCV 90

Notes: This is a fire support variant of the Steyr 4K 7FA-KSPz armored personnel carrier. The basic chassis is topped with a turret mounting a 90mm French or NATO gun, and ammunition is carried instead of most passengers. Two passengers are retained as scouts so the vehicle can be used for reconnaissance. The top hatch is replaced by the turret, but all other hatches are retained, and two hatches are in the turret for the commander and gunner. This vehicle is used in small numbers by Switzerland and Greece.

The FSCV 90 has the engine and transmission used in the SK-105 light tank, giving the FSCV 90 a 320-horsepower diesel engine and a transmission with better gear ratios, as well as being a semiautomatic transmission. The tracks are a bit wider than those of the 4K 4FA, and are fitted with rubber track pads. These track pads can be replaced with pads that incorporate steel claws for use in icy weather. The shock absorbers have been improved, further smoothing out the ride. The engine compartment has an automatic fire extinguishing system, as does the crew and passenger compartments.

The driver is in the front left of the vehicle with the engine to his right; his forward vision block can be removed and replaced with an IR vision block. There is a double door in the rear of the vehicle. Options include a collective NBC system and air conditioning, but a heater is standard; Swiss examples typically have only a heater, while Greek models have both an air conditioner and heater. Swiss FSCV 90s have a French main gun, while Greek models have a NATO gun. The version with a French gun uses a TS-90 turret, while those with NATO main gun uses a LCST-90 turret.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
4K 7FA FSCV 90 (TS 90 Turret)	\$351,346	D, A	364 kg	16.95 tons	3+2	12	Passive IR (D, G), Image Intensification (G, C)	Enclosed
4K 7FA FSCV 90 (LCST 90 Turret)	\$381,282	D, A	321 kg	17.35 tons	3+2	12	Passive IR (D, G), Image Intensification (G, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
4K 7FA FSCV 90 (TS 90 Turret)	136/95	38/27	360	119	Trtd	T3	TF6 TS7 TR6 HF6 HS4 HR4
4K 7FA FSCV 90 (LCST 90 Turret)	132/92	37/26	360	119	Trtd	T3	TF5 TS5 TR5 HF6 HS4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
4K 7FA FSCV 90 (TS 90 Turret)	+3	Fair	90mm CN90F3 gun, MG3, M2HB (C)	64x90mm DEFA, 2000x7.62mm, 500x.50
4K 7FA FSCV 90 (LCST 90 Turret)	+3	Good	90mm Cockerill Mk 3 gun, MG3, M2HB (C)	64x90mm NATO, 2000x7.62mm, 500x.50

4K 7FA RASIT

Notes: This is a 4K 7FA KSPz armored personnel carrier modified to carry the RASIT (*Radar de Surveillance des intervalles*) ground surveillance radar and a computerized management system as well as extra radios and a datalink system to higher headquarters. The M2HB turret is removed in this vehicle, replaced by a machinegun on a pintle mount, but the hatch setup is otherwise similar to the 4K 7FA G-127 APC, though the roof troop hatch is replaced with the mount for the RASIT.

The radar has a range of 20 km and may be operated by a cable at a range of 30 meters. The radar operates in the I-band and a maximum power of two kilowatts. The radar may operate from its extendible telescopic mount, or be removed from the vehicle and placed on a ground mount (which is carried externally on the vehicle). A skilled operator can distinguish between personnel, vehicles, and low-flying aircraft and helicopters on the fly, but the vehicle includes a computer to help interpret the radar signals. Results are then disseminated to other stations in the unit and higher headquarters using data-capable radios. The radar may scan a box 2.5x2.5 kilometers, then fix on a particular target and track it automatically upon a command by an operator. While scanning, the operator may scan the entire search box, or automatically scan for moving targets. The tracking cone is 100 degrees wide at 20 kilometers.

The RASIT-E variation is the same vehicle, but with a higher-power radar with a range of 40 kilometers. The RASIT-E can also function as a counterbattery radar and a fire direction radar. The RASIT-E may operate using a 50-meter cable. RASIT-E has improvements to the radar's computer that can distinguish between enemy and friendly vehicles (to a point; friendly and enemy units, for example, both using T-72 tanks, cannot not normally be distinguished unless friendly units are using an IFF panel or transmitter).

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
4K 7FA RASIT	\$619,877	D, A	401 kg	15.26 tons	4	15	Radar (20 km), Passive IR (D)	Enclosed
4K 7FA	\$740,264	D, A	401 kg	15.25 tons	4	15	Radar (40 km),	Enclosed

RASIT-E

Passive IR (D)

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
4K 7FA RASIT	148/104	41/29	360	119	CiH	T3	TF1 TS1 TR1 HF6 HS4 HR4
4K 7FA RASIT-E	148/104	41/29	360	119	CiH	T3	TF1 TS1 TR1 HF6 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	MG3 (C)	1600x7.62mm

SK-105 Kürassier

Notes: While the chassis of this light tank is of Austrian design (a highly-modified 4K 4FA APC), the turret is a modified form of that found on the AMX-13. The Kürassier, however, is afforded with a better night vision suite and better fire control than the AMX-13 (in most versions), and uses a 105mm gun as standard. The turret uses the same two-magazine system with 6 rounds each, and as with the AMX-13, the spent shell casings are ejected out of the rear of the turret. (The weak point of the SK-105's autoloader system is that when these magazines are exhausted, the crew must manually reload the magazines, with the crew exposing themselves to potential hostile fire.) There are three light tank variations of the SK-105 in service; export customers such as Argentina, Bolivia, Morocco, and Tunisia mostly use the SK-105A1; the SK-105A2 is the version most commonly encountered in Austrian service; and the SK-105A3 was the newest version, in limited production starting in the early 1990s. In addition, appliqué armor of the same capabilities as that available for the AMX-13 is available for the SK-105 (however, an AMX-13 kit will not fit the SK-105 and vice versa). The A3, however, does not have an applique armor option, as applique armor is fitted as standard.

The SK-105 uses the same engine and transmission as the 4K 7FA series of APCs, (or more accurately, the other way around), and delivers 320 horsepower using a semiautomatic transmission. The 4K 7FA was, in fact, based heavily on the SK-105's automotive sets, allowing a high degree of parts commonality between the two vehicles. The SK-105 was designed for operations in mountainous terrain and the engine is turbocharged for operations at high altitude. The SK-105 can actually climb a 75% slope and mount a 40% side slope. The engine compartment is equipped with an automatic fire suppression system which can also be operated manually. The driver has a hatch on the front left side; he has seven vision blocks covering the front, left, and the right of his hatch. He can replace the front vision block with a night vision block, and a small windscreen with a wiper can be installed for wet weather operations with the driver's head out of his hatch. The commander is in the turret on the right side of the main gun, and the gunner is on the left side of the main gun, with a hatch above him. The commander controls the XSW-30-U 950 W white light/IR searchlight, which is mounted to the left of the main gun, with a range of about 3000 meters.

The Austrians classify and operate the SK-105 as a tank destroyer (*Jagdpanzer*) and to a lesser extent a fire support vehicle, however, the world at large classifies it as a light tank.

In 2005, Argentina decided to purchase nine SK-105 hulls, for a test program in which they would mount surplus AMX-13 turrets on the purchased SK-105 hulls. Eventually, the Argentine Army planned to produce 39 of these hybrid vehicles, for use as scout vehicles. However, after producing five such vehicles the project was shelved due to lack of funds. The five already-completed vehicles are in service with the Argentine Army, however. They are designated the Patagon. (In addition, Argentina already has a considerable force of SK-105A2s and early AMX-13s.)

The Bolivians use an almost standard SK-105A2; however, they mount an M2HB on the commander's pintle instead of an MG3.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
SK-105A1	\$440,991	D, A	388 kg	17.7 tons	3	16	Active/Passive IR (D), WL/IR Searchlight (C)	Enclosed
w/Applique	\$443,004	D, A	388 kg	17.93 tons	3	16	Active/Passive IR (D), WL/IR Searchlight (C)	Enclosed
SK-105A2	\$369,410	D, A	388 kg	17.8 tons	3	14	Passive IR (D, G), WL/IR Searchlight (C)	Enclosed
w/Applique	\$371,061	D, A	388 kg	18.03 tons	3	14	Passive IR (D, G), WL/IR Searchlight (C)	Enclosed
SK-105A3	\$437,333	D, A	399 kg	19.1 tons	3	10	Passive IR (D, G), Image Intensification (G, C), WL/IR Searchlight (C)	Enclosed
Patagon	\$346,422	D, A	375 kg	16.8 tons	3	12	Passive IR (D, G, C)	Enclosed
w/Applique	\$348,314	D, A	375 kg	17.03 tons	3	12	Passive IR (D, G, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
SK-105A1	132/92	37/26	420	119	Trtd	T3	TF6 TS5 TR3 HF8 HS4 HR2
w/Applique	130/91	36/25	420	119	Trtd	T3	TF9 TS7 TR3 HF11 HS4 HR2
SK-105A2	131/92	36/25	420	119	Trtd	T3	TF6 TS5 TR3 HF8 HS4 HR2
w/Applique	130/91	36/25	420	119	Trtd	T3	TF9 TS7 TR3 HF11 HS4 HR2
SK-105A3	124/87	34/24	420	119	Trtd	T3	TF13 TS10 TR6 HF16 HS8 HR4
Patagon	137/96	38/27	420	119	Trtd	T3	TF5 TS4 TR3 HF8 HS4 HR2
w/Applique	135/95	38/26	420	119	Trtd	T3	TF8 TS6 TR3 HF11 HS4 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
SK-105A1	+2	Fair	105mm CN105G1 Gun, MG3, MG3 (C)	42x105mm DEFA, 2000x7.62mm
SK-105A2	+3	Fair	105mm CN105G1 Gun, MG3, MG3 or M2HB (C)	42x105mm DEFA, 2000x7.62mm or 1000x7.62mm and 600x.50
SK-105A3	+4	Good	105mm L7 Gun, MG3, MG3 (C)	42x105mm NATO, 2000x7.62mm
Patagon	+2	Fair	90mm CN90F3 Gun, AAT-F1	42x90mm DEFA, 4600x7.62mm

Bernardini X1/A1/A2

Notes: These light tanks are a radical rebuild of the World War 2-era M3A1 Stuart, with a new suspension, new diesel engine, new turret, heavier armament, and a new fire-control system. (One has to look hard to see their M3A1 roots.) These were adopted by the Brazilian Army in the early 1970s since their Stuart progenitors were getting a bit long in the tooth, and 77 were delivered total, of X1s, X1A1s, and X1A2s. They have never been offered to the international market. The X1-series were used until the early 1990s, though in the mid-1980s, they were at first supplemented, then replaced by better vehicles in the mid-1980s.

X1

The X1 were based on heavily-modified M3 and M3A1 Stuart chassis. The Brazilian Army went through a process to weed out the still-usable chassis from those that were too far gone to continue as military vehicles. The Stuart chassis was modified with a new vertical volute suspension derived from that of the M4 artillery tractor which was more shock-absorbing. This suspension worked because it was related to the suspension already used on the M3 and M3A1. The frontal armor, in addition to applique, was given increased slope. The sides of the tank were given a moderate slope. The original engine was replaced with a Scania-Vabis DS-11 A05 CC1 diesel, with 256 horsepower. The hulls were extended slightly in the engine compartment to seat the new engines. The turret of the Stuart was completely shafted in favor of a new turret called the BT90; the turret ring had to be widened by 200 millimeters to accommodate the turret. This turret was armed with a licensed copy of the same French low-recoil 90mm gun that armed the EE9 Cascavel armored vehicle. (The designers decided to not go with the H90 turret of the EE9 because they wanted the turret to have more armor, though lessons learned from the H90 turret went into the design of the BT90.) Communications were brought up to date, and the fourth crewmember could now operate as a loader. The driver has a hatch on the front left side, and the commander and loader have hatches on the turret deck. The gunner uses loader's hatch.

Some 52 X1s were produced. Some of these were further modified into other members of the X1 family, including one into the X1A1. It is still somewhat of a mystery as to the fate of the X1 prototype; however, it is probable that the X1 prototype was modified into the prototype of the XLF40 MRL system, which was not proceeded with. X1s based on the M3 differ slightly from those based on the M3A1; those based on the M3 have flat rear plates, while those based on the M3A1 have curved rear plates.

X1A1

The X1A1 began as an update program to the X1, but as what became the X1A2 ran concurrently with the X1A1 program, the X1A1 reached only the prototype phase and was not proceeded with. The X1A1 is a stretched X1, primarily to allow for more ammunition stowage. A third bogie was added, replacing the massive idler wheel of the M4 artillery tractor's suspension, and the vehicle increased in length by 0.8 meters. The new suspension was a sort of hybrid between the suspensions of the M4 artillery tractor and the M4 Sherman MBT. The longer hull allowed for a larger fuel tank. The turret was fitted with a longer bustle to carry more ammunition. While many deficiencies were fixed in the X1A1, lengthening the hull causes a new problem – the width of the tracks remained the same, and the ground pressure of the treads therefore increased, making the X1A1 difficult to steer as the tracks dug more into the ground. This problem was later fixed in the X1A2 design. The X1A1 was not proceeded with.

X1A2

The X1A2 incorporated the features of the previous two vehicles, including the stretched length of the X1A1. However, unlike the X1 and X1A1, the X1A2 is a new-build vehicle, with the experience gained in producing the X1 and X1A1 allowing Bernardini to design a new hull. Improvements have been made in the turret and hull armor, night vision has been added, a laser rangefinder has been installed, and air conditioning is provided. The engine is also more powerful, replaced with a Scania-Vabis DS-11 A05 CC1 turbocharged diesel uprated to 280 horsepower to cope with the added weight, and the fuel tanks are larger. The transmission was replaced with an Allison CD-500.

The main gun is replaced with a more powerful 90mm gun that has more flexibility in ammunition and is low-pressure, and, along with a beefier muzzle brake, has much reduced recoil. This gun is a Brazilian copy of a French gun which was itself a copy of a British Cockerill Mk 3 gun. It should be noted that while the EC-90 was capable of firing APFSDS rounds, internal stowage in the X1A2 was such that there was no room for the carriage of APFSDS rounds, and the muzzle brake used on the main gun did not allow the use of a discarding-sabot round. Rough rangefinding was done with a graticule, but then the gunner switched to a coincidence/laser rangefinder. The loader position has been removed, with the commander working as a loader. The chassis lengthening and improvements were carried over to the X1A2, and rearranged ammunition stowage allowed more rounds to be carried. The X1A2 was also given a new name, the Carcara, after a Brazilian jungle bird. Some 24 X1A2s were built between 1979 and 1983, but only 10 entered active service, with the remainder going directly into storage or to museums and monuments.

X1/60 HVMS

In the early 1980s, Ecuador wanted to upgrade their M3A1 Stuarts with a new gun and engine. They looked to X1 that Brazil had made out of their M3s and M3A1s, but wanted something better still. Negotiations centered around the fitting of an Israeli 60mm L/70 HVMS autocannon and a Detroit Diesel 6V53T diesel engine (a variant of which powers the famous M113 series). The 60mm HVMS was considered by Ecuador since it had better antiarmor performance than any of the guns at that time manufactured in South America, and the 6V53T engine because it was a mechanically simpler design with slightly better performance (260 horsepower) than the X1's Scania-Vabis engine, and it could be hooked up to an automatic transmission. Such a conversion would have given the Ecuadoreans a vehicle with better antiarmor performance than any vehicle in South America at the time and with more ample

ammunition carriage than a vehicle with a larger-caliber gun.

It is believed that possibly as many as 30 of Ecuador's M3A1s were in good enough shape for the conversions. Unfortunately, the Ecuadorean government had other ideas; they had over the years been steadily cutting the defense budget and by the time negotiations took place in 1984, the MoD had already bought 32 EE9 Cascavels and there was no funding for the conversion project. The argument was also made that the Cascavels were new vehicles while the conversion project used 40-year-old hulls. The Ecuadorean M3A1s were eventually scrapped. The idea of mating a 60mm HVMS gun to a South American tank, however, later appeared in Chilean M4s.

It should be noted that in addition to the X1 series, the Brazilians retained some 100 stock M3 and M5 Stuarts, and these were not replaced until the mid-1980s. X1 and X1A1 variants were phased out in the 1990s and scrapped. X1A2s are maintained in working order by civilian employees of Bernardini and kept in a reserve role, but they were quickly supplanted by the superior M41C tank in Brazilian service.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
X1 Pioneiro	\$203,658	D, A	341 kg	15 tons	4	12	Headlights	Enclosed
X1A1 Carcara	\$241,529	D, A	385 kg	17 tons	4	13	Headlights	Enclosed
X1A2 Carcara	\$298,607	D, A	345 kg	19 tons	3	15	Active/Passive IR (D, G)	Enclosed
X1/60 HVMS	\$152,040	D, A	337 kg	17 tons	4	14	Active/Passive IR (D, G)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
X1 Pioneiro	120/84	33/23	245	71	Trtd	T2	TF9 TS7 TR7 HF13 HS7 HR5
X1A1 Carcara	114/80	32/22	320	71	Trtd	T3	TF9 TS7 TR7 HF13 HS7 HR5
X1A2 Carcara	113/79	31/22	600	98	Trtd	T3	TF12 TS8 TR7 HF16 HS10 HR5*
X1/60 HVMS	116/81	32/23	245	77	Trtd	T2	TF9 TS7 TR7 HF13 HS7 HR5

Vehicle	Fire Control	Stabilization	Armament	Ammunition
X1 Pioneiro	+1	Fair	90mm French DEFA D921A Gun, M1919A4, M1919A4 (Bow), M2HB (C)	44x90mm, 2240x.30-06, 670x.50
X1A1 Carcara	+2	Fair	90mm French DEFA D921A Gun, M1919A4, M1919A4 (Bow), M2HB (C)	58x90mm, 2240x.30-06, 670x.50
X1A2 Carcara	+3	Fair	90mm EC-90, M1919A4, M2HB (C)	68x90mm, 2500x.30-06, 750x.50
X1/60 HVMS	+2	Fair	60mm HVMS Autocannon, M1919A4, M1919A4 (Bow), M2HB (C)	66x60mm, 2240x.30-06, 670x.50

*Floor armor AV is 3Sp.

GDLS UK Ajax

Notes: The Ajax is both the designation for the class of vehicles to which the Ajax belongs and the designation of a specific vehicle, a reconnaissance/scout vehicle. The Ajax entered service with the British Army in 2017 and is still undergoing familiarization with the troops and units who are integrating it into their units. Units equipped with the Ajax are expected to be ready for deployment by 2020. The Ajax was formerly known, during development, as the Scout Specialist Vehicle. The roots of what would become the Ajax began in the early 1990s and the FRES (Future Rapid Effects Vehicle), which was also to have been a family of related vehicles, but did not bear fruit except in a general way. The Ajax is based on General Dynamics Land Systems' ASCOD 2 Common Base Platform, which is also a family of vehicles, and it beat out another family of vehicles developed from BAE/Hagglunds' CV-9040. The Ajax family will replace the CVR(T) range of vehicles currently in service with the British Army.

The Ajax has a wide turret ring and large turret basket, making it much more flexible and roomy than most AFVs.

The Ajax is equipped with a state-of-the-art ISTAR package linked to its radios, computers, location and mapping system (based on GPS) and the British T-BMS system. The ISTAR system uses several high-density solid-state hard drives which can store an estimated 12 TB of data and burst-transmit it to other friendly vehicles and higher HQ. The Ajax is generally connected to higher headquarters and other Internet capable vehicles via 20 Gbit intelligent open architecture system, which gives high speed internet connectivity as well as allowing for easy upgrading. This Internet system is the primary method by which the Ajax transmits information to higher headquarters. It uses the BOWMAN C4I system, which is a system which integrates HF, VHF, and UHF radios used by the Ajax, communicates with dismounted soldiers and other vehicles, and used encrypted frequency-hopping radios. (This will be replaced with the MORPHEUS C4I system in the future.) The Ajax has a feature which is still relatively rare on AFVs: an acoustic shot detection system (actually, three total). All crewmembers have an LCD screen, and have 100% access to all information the sensors find around them, BMS data, and vehicle state data. The Ajax has a limited weather reconnaissance function, able to measure wind, barometric pressure, and general weather conditions.

Armor is of course classified, but rumors say that the Ajax is able to stop hits from 35mm autocannons from the front, 20mm autocannons from the sides, and 14.5mm rounds from the rear. The turret is said to have similar levels of protection, or perhaps slightly less. Rumors also state that the armor is a combination of RHA, spaced armor, and composite armor in some strategic shots. I'll admit I'm not fond of rumor mills, but I'll stat this in below. There are armored track skirts and an obvious piece of added armor on the upper sides of the vehicle. Photos indicate that the Ajax is usually clad in radar and IR-reflective /absorbent camouflage-net-like form-fitting sheets, and the engine has IR suppression. These two give the Ajax Stealth 1 and IR Stealth 2. The floor armor is said to be very thick and includes spaced armor, able to take the blast of a 10-kilogram antiarmor mine. The tracks have unspecified resistance to mines, and are stronger than standard tracks. The Ajax can mount ERA or NERA on the glacis, hull sides, turret front, and turret sides. The armor is also modular; when more advanced armor is available or the armor is damaged, the old armor can be easily removed and replaced. The Ajax can also be equipped with cage armor; the Ajax is set up for this, but it is anticipated that it is only a contingency, since equipping the Ajax with cage armor would negate the Ajax's Stealth rating.

The Ajax has a crew of three: the driver, gunner/intelligence specialist, and the commander/intelligence specialist. The driver is in the front left of the hull behind the glacis, while the gunner is normally stationed down in the turret, and the commander down inside or standing in his hatch on the turret right. The gunner also has a hatch on the top turret right, but once the mission starts, he rarely uses it, staying inside with his sensor suite. The gunner is the primary intelligence specialist, while the commander is generally on the lookout for hazards and enemy units, but also evaluates and gathers some intelligence data. The commander is also responsible for monitoring the BMS and vehicle state computer. The driver primarily uses his LCD for navigation and to monitor fuel state, speed, terrain, etc. However, each crewmember may access 100% of the systems data. The crew has an air conditioner with NBC filters, NBC overpressure, and a passive APS. The passive RWS's decoy smoke is in addition to two clusters of four smoke grenade launchers on each side of the turret, which are electrically-fired by any crewmember as necessary. As with almost all British vehicles, the Ajax has a ration/water heater; it also has a 30-liter chilled drinking water tank.

Armament is surprisingly heavy for a reconnaissance vehicle, and advanced: the Ajax is armed with a CTAI 40mm CT40 autocannon, using case-telescoped ammunition which is lighter and more compact than standard 40mm ammunition, allowing for more ammunition onboard. (A 45mm standard-ammo autocannon was tested, but dropped in favor of the high-powered CTAI gun.) The gun's sensors can automatically find the most threatening targets, and at a command from the gunner, automatically lay the gun on the selected target. The 40mm CTAS is also able to engage helicopters, low-flying aircraft, and UAVs. The coaxial machinegun is an L94A1 7.62mm weapon. Ammunition is stored outside of the crew compartment in the turret bustle, except for ready-use ammunition (usually about 100 rounds of 40mm ammunition and 300 rounds of 7.62mm ammunition). The primary fire control system is Thales' ORION system, which combines all sights, vision equipment, and fire control equipment into an integrated whole. If desired, a Kongsberg RWS may be mounted on the turret ahead of the gunner's hatch; this RWS is projected to be armed with an M2HB heavy machinegun. The RWS can be controlled by the commander or gunner. The commander's station is equipped with a CITS, a reticle to aid in controlling artillery and air strikes, a reticle for the RWS (which may not be used if the Ajax is not equipped with an RWS), and a long-range laser designator with a range of 10,000 meters.

The Ajax is powered by a German MTU V8 199 TE21 turbocharged diesel with a heat-dampened exhaust, developing 805 horsepower. This is coupled to an automatic transmission, and the Ajax has power steering and power brakes. It is also capable of pivot steering. The Ajax has a 12kW APU for powering systems while on silent watch. The APU is diesel powered, using fuel from the vehicle's fuel tanks, and also having a heat-dampened exhaust and otherwise under the vehicle's armor, giving it protection and making it very quiet. An interesting fact (common to the entire Ajax family) is that it is capable of towing 62 tons, though if towing this much weight, fuel consumption is quadrupled.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Ajax	\$1,796,004	D, A	989 kg	42 tons	3	27	2 nd Gen Image Intensification (D, G, C), FLIR (G, C), 3xLong-Range Day/Night CCD Cameras (D, G, C), Backup Camera (D)	Shielded
Ajax w/RWS	\$1,814,422	D, A	989 kg	42.5 tons	3	29	2 nd Gen Image Intensification (D, G, C), FLIR (G, C), 2 nd Gen Thermal Imaging (RWS, Image Intensification (RWS) 3xLong-Range Day/Night CCD Cameras (D, G, C), Backup Camera (D)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor**
Ajax	137/96	38/27	900	298	Trtd	T5	TF 31Cp TS22Cp TR13 HF40Cp HS27Sp HR 17
Ajax w/RWS	136/96	38/26	900	298	Trtd	T5	TF 31Cp TS22Cp TR13 HF40Cp HS27Sp HR 17

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Ajax	+5	Good	40mm CTAI CT40 Autocannon, L94A1	500x40mm, 2000x7.62mm
Ajax w/RWS	+5*	Good	40mm CTAI CT40 Autocannon, L94A1, M2HB (RWS)	500x40mm, 3000x7.62mm, 1000x.50

*The RWS has a +4 Fire Control rating.

**Floor AV is 10Sp.

FV-101 Scorpion

Notes: Officially named the CVR-T (Combat Vehicle Reconnaissance – Tracked) by the British military, the Scorpion (also known as the Scorpion-76 to distinguish it from later 90mm-armed versions) is a light tank and scout vehicle developed to replace the Saladin armored car. The first versions appeared in British ranks in 1972, and by 1987 over 3500 were built for the British Army and for export. Most British Scorpions were replaced by the later Scimitar and Sabre, and the Scorpions sold to other countries (especially the turrets, which could be mounted on many different vehicles). Most British and Australian Scorpions have diesel instead of gasoline engines, but most export versions still have the original engine. There is a hatch on the front left deck for the driver and two hatches on the turret deck for the commander and gunner. Commander's weapons are not fitted by default, but many such field modifications were carried out during the war. The Scorpion requires a flotation screen to be raised to be amphibious; this takes about 5 minutes.

The original engine for the Scorpion was a Jaguar J60 Mk 100b 4.2-liter 220-horsepower gasoline engine; this was later thought of as too fuel-hungry and replaced with a Cummins BTA 5.9-liter diesel engine developing 190 horsepower for most domestic and allied Scorpions, and all Scorpion-90s used this engine. Most export Scorpion-76s, however, were exported with the Jaguar gasoline engine. The Irish had to be different, and replaced their Jaguar engines with a Steyr M16 TCA HD 194.4-horsepower diesel engine. (The Irish also developed a fume extractor for the L23A1 76mm gun.) The Scorpion-76 originally used a David Brown TN15 manual transmission, but this was later changed to a TN15X automatic transmission when the diesel engines replaced the gasoline engines. The Scorpion is noted for having a low ground pressure, little more per square centimeter than a soldier on foot; this particularly served well on the boggy ground of the Falklands.

The Scorpion-76 used a 76mm L23A1 short-barreled main gun, which has an elevation range of +35 degrees and -10 degrees; this was placed in a manual-traverse turret which was hand-cranked and slow, and later, electric traverse was installed. The main gun

was, after long deliberation, declared unsatisfactory, as the L23A1 lacked a fume extractor and toxic fumes gradually concentrated inside the turret, gradually making the turret unlivable in a fight. This led to the Scorpion-90 version and vehicles like the Scimitar (below).

The Scorpion is NBC sealed and has an overpressure system. The driver is on the front left behind the glacis; the commander is on the right side of the gun in the turret, with the gunner to the left. Each has a hatch above them.

The Scorpion-90 is the standard FV-101 Scorpion light tank, but with a 90mm Cockerill gun instead of the standard 76mm Cockerill. These vehicles were normally built with a diesel engine instead of the normal gasoline engine. They were built primarily for export, and Malaysia, Nigeria, Venezuela, and a few other countries ordered this variant.

The Scorpion-76 saw combat use by the British in Cyprus in 1974, and in the Falklands in 1982. They were occasionally called out as an antiterrorist measure to Heathrow Airport during the 1970s and 1980s. The British used Scorpion-76s during the 1991 Gulf War. The Iranians used the Scorpion-90 during the 1980-88 Iran-Iraq War, with various degrees of success; the Iranians continue to use the Scorpion hulls, topped with a multiple Toophan (Iranian TOW 2 copy) ATGM system (I will put these in Iranian ATGM Vehicles), or with the standard turret and a Toophan launcher added atop the turret; these are called by Iranians Tosans. The Australians put a large number of Scorpion-76 turrets on M113A1 hulls to use as fire support vehicles, and these were only retired from active service in 1996. Scorpions were exported far and wide, sometimes being third-hand vehicles, particularly in Africa and the Middle East, as well as Chile, Southeast Asia, Venezuela, and the Philippines. Nigerian Scorpion-90s have an upgraded Belgian OIP-5 fire control system incorporating a ballistic computer. UAE Scorpion-76s are similarly upgraded, with the Pilkington Optronics TLS system. Omani Scorpion-76s have an additional 20mm-thick steel plate installed under the hull floor for increased mine resistance; they are also equipped with special flaps around the tracks for dust suppression. The heaters and NBC system were removed and replaced with an air conditioner. Belgian Scorpion-76s were equipped with mounting lugs for applique armor (along with Belgian Scimitars) along with an armor repair kit (for sealing cracks) and minor improvements for crew comfort and ergonomics. These Scorpions were later sold to Botswana, after modifying them into Scorpion-90s. New Zealander Scorpion-76s had their NBC systems, night vision, and amphibious systems removed, and were upgraded with electronic fuel injection and US-built secure radios. The New Zealander Scorpion-76s later had their turrets removed and placed on M113A1 APCs, producing a vehicle similar to the Australian M113A1 MRV. Jordanian Scorpions are being upgraded with a number of improvements and modifications, including a new 235-horsepower diesel engine with a matching transmission, replacement of the main gun with a 30mm 2A72 autocannon, addition of a pair of AT-8 ATGM on each side of the turret, an upgraded suspension for a smoother ride, a new electrical bus, upgraded stabilization and fire control including an auto-tracking system, upgraded night vision, and air conditioning.

The Scorpion-76 holds the Guinness World Record for the fastest tank, doing 82.23 kilometers per hour at the QinetiQ Test Track in Chertsey, Surrey on 26 Jan 02.

Twilight 2000 Notes: They were in official service with 15 countries by the time of the Twilight War; one unusual user was the US Army and Marines, who ordered about 40 of them before the war for evaluation purposes, then put them to use during the war with about 12 going to the Marines and the other 28 going to the US Army's 9th Infantry Division. The US Marines had a number of them on loan from Britain before the Twilight War for evaluation as a fire support vehicle; when the Marines were deployed to Norway, they bought the test vehicles and ordered a few more for use in that campaign. The Marines primarily used the Scorpion-76, while about half of the Army's Scorpions were Scorpion-90s.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Scorpion-76 (Gas)	\$293,316	G, A	247 kg	8.07 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-76 (Diesel)	\$293,184	D, A	250 kg	8.1 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-90 (Gas)	\$331,647	G, A	247 kg	8.47 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-90 (Diesel)	\$331,515	D, A	249 kg	8.51 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Tosan	\$348,363	D, A	244 kg	8.16 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-90 (Nigerian/UAE)	\$347,115	D, A	245 kg	8.62 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-76 (Irish)	\$293,202	D, A	249 kg	8.1 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-76 (Omani)	\$322,636	G, A	240 kg	9.62 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Shielded
Scorpion-76 (New Zealand)	\$136,836	G, A	256 kg	7.97 tons	3	7	Headlights	Enclosed
Scorpion (Jordanian)	\$284,361	D, A	247 kg	7.85 tons	3	9	Image Intensification (D, G), Thermal Imaging (G, C)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
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Scorpion-76 (Gas)	183/128	51/36/4	423	122	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion-76 (Diesel)	162/113	45/31/4	423	71	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion-90 (Gas)	176/123	49/24/4	391	122	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion-90 (Diesel)	156/109	43/30/4	391	71	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Tosan	161/113	45/31/4	391	71	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion-90 (Nigerian/UAE)	154/108	43/30/4	391	71	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion-76 (Irish)	165/115	46/32/4	423	72	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion-76 (Omani)	158/111	44/31/4	423	122	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3*
Scorpion-76 (New Zealand)	185/130	51/36	423	122	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scorpion (Jordanian)	198/139	55/38/5	423	80	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Scorpion-76	+2	Fair	76mm L23A1 Gun, L7A2	42x76mm, 3000x7.62mm
Scorpion-90	+2	Fair	90mm Cockerill Mk 2 Gun, L7A2	33x90mm, 3000x7.62mm
Tosan	+2	Fair	90mm Cockerill Mk 2 Gun, Toophan ATGM Launcher, L94A1	31x90mm, 2xToophan ATGM, 3000x7.62mm
Scorpion-90 (Nigerian/UAE)	+3	Fair	90mm Cockerill Mk 3 Gun, L94A1	33x90mm, 3000x7.62mm
Scorpion (Jordanian)	+3	Good	30mm 2A72 Autocannon, 4xAT- 14 ATGM Launchers, L94A1	300x30mm, 4xAT-14 ATGM, 3000x7.62mm

*Hull floor AV is 6.

FV-107 Scimitar

Notes: This is basically a Scorpion with a slightly different turret mounting a 30mm Rarden autocannon instead of the 76mm gun. Other than being slightly lighter than the Scorpion and having a smoother-riding suspension and better night vision suite, the Scimitar is identical to the Scorpion. Most British versions are powered by the 190-horsepower diesel engine, but most export versions are powered by the 220-horsepower gasoline engine.

The Scimitar was employed by the British Army in the reconnaissance role. The Scimitar was replaced by the Ajax, but as Ajax production has not been as fast as desired, Warrior IFVs have supplemented the Ajax in the reconnaissance role temporarily. Scimitar Mk 2s have also been shipped to Ukraine, and to Latvia. Jordan employs some 175 Mk 1 examples. Nigeria fields five Scimitar Mk 1s, while Honduras has three. Belgium used Scimitars until 2010, and still maintains them in a reserve role. Scimitars have seen combat use in the Falklands, in the Gulf War, Bosnia, Kosovo, Iraq, Afghanistan, and Ukraine.

The Scimitar Mk 2 is designed for the export market, as Britain and Belgium passed on it. The engine is upgraded over the Scimitar, and the transmission is a David Brown TN15E+ automatic transmission. The engine is a little more fuel-efficient and the transmission provides more electrical power to Scimitar Mk 2 subsystems. This allowed an air conditioner to be installed. The interior is rearranged over the Mk 1, which allows the fuel tanks to be moved to a position where they are better protected by armor. Armor is enhanced over the Mk 1, including heavy plating on the hull floor, ceramic applique, and bar/slat armor for protection against RPGs. Armor has been added to the hull and turret roof. The hand-cranked turret traversed has been replaced with an electrically-powered solution. The Mk 2 has limited ECM to provide jamming of IED and mine fuzes. Located on the turret roof, the ECM transmitter jams the IED and mine fuzes on a task roll of 14 and a difficulty level of Difficult under most circumstances. In addition to the added hull floor plating, the Mk 2 has blast-resistant seats. Weight has ballooned, but Ukrainian Scimitar Mk 2 crews applaud the added protection despite the decreased agility. Due to its weight and the inability to employ a floatation screen, the Mk 2 is not amphibious.

The Sabre is a Scorpion light tank fitted with the turret of the Fox armored car, along with some upgrades in engine, transmission, smoke grenade launchers, and stowage. This was done to save money on the introduction of a new reconnaissance vehicle. The idea of the Sabre was to produce a vehicle similar in capability to the Scimitar, but with a lower profile turret; however, due to suspension improvements, the Sabre sits higher than the Scimitar despite the lower-profile turret, though it is superior to the Scimitar in a hull-down position. The Sabre has a laser and radar detector linked to the vehicle's smoke grenade launchers, allowing automatic or manual launching of smoke grenades. The smoke grenades may also be replaced with fragmentation grenades or flares. The coaxial machinegun on the Sabre is fed by an ammunition hopper, allowing fresh rounds to be simply poured into the hopper, reloading faster than a belt-fed machinegun. Unfortunately, the Sabre was not considered a successful design and it was withdrawn from service in 2004. Combat deployments included Iraq, Afghanistan, and the Yugoslavian Civil Wars.

Twilight 2000 Notes: 104 Sabre conversions were carried out before the Twilight War, but few were carried out after the war began as it was felt as many vehicles as possible would be needed as possible. The Scimitar Mk 2 is a rare bird, but did see service in the Twilight War.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Scimitar (Gas)	\$230,067	G, A	243 kg	7.8 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Enclosed

Scimitar (Diesel)	\$230,235	D, A	246 kg	7.84 tons	3	8	Passive IR (G, C), Image Intensification (D, G)	Enclosed
Scimitar Mk 2	\$176,327	D, A	253 kg	12 tons	3	9	Passive IR (D), Image Intensification (G, C), Thermal Imaging (G)	Shielded
Sabre	\$389,238	D, A	244 kg	8.1 tons	3	8	Passive IR (D), Image Intensification (G, C), Thermal Imaging (G)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Scimitar (Gas)	188/132	52/37/5	423	122	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scimitar (Diesel)	166/116	46/32/4	423	71	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR3
Scimitar Mk 2	119/83	33/23	423	64	Trtd	T3	TF8Sp TS6Sp TR6Sp HF9Sp HS5Sp HR5Sp*
Sabre	162/113	45/31/4	423	71	Trtd	T3	TF5 TS4 TR4 HF6 HS3 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Scimitar (Both)	+2	Fair	30mm L21 Rarden, L7A2	165x30mm, 2000x7.62mm
Scimitar Mk 2	+3	Good	30mm L21 Rarden Autocannon, L94A1	300x30mm, 3000x7.62mm
Sabre	+2	Fair	30mm L21 Rarden, L94A1	200x30mm, 3000x7.62mm

*Hull Floor armor is AV5Sp; Hull and Turret Roof AV is 3.

FV-432 Cymbeline Mk 2

Notes: This is an FV-432 Mk 2 armored personnel carrier fitted with a Cymbeline counterbattery/ground surveillance radar set. The basic chassis has a driver's compartment on the front left deck; behind him and slightly to the right is the commander's cupola. The usual practice of surrounding the cupola with gun shields was not done on this version of the FV432 – the shields would interfere with the radar. The roof hatch, and indeed most of the roof, is replaced by the radar set and mount. A cluster of three smoke grenade launchers are found on each side of the vehicle at the top of the glacis. The radar and the associated equipment takes up almost the entire passenger area of the vehicle, and there is no room for passengers. The interior has the electronic equipment, turntable, and radar receiver and transmitter, along with a computer to help interpret the signals from the radar. Also present are several radios, including at least one data-capable radio to transmit the radar's findings to other units and higher headquarters. The computer may also be connected by cable to other vehicles and units – depending upon the type of cable, this may stretch for kilometers. The vehicle is powered by a Rolls-Royce K60 multifuel engine; the Radar Vehicle is often accompanied by a vehicle or trailer mounting a generator so the FV432 does not have to continually run its engine or deplete its batteries.

The Cymbeline radar has a ground surveillance range of 10 km and a counterbattery range of up to 20 km. The radar scans in the X-Band at a 100-kilowatt signal output. The counterbattery function could locate a mortar-firing position within 50 meters. 81mm mortars can be detected at a range of 10 kilometers; larger mortars can be detected at a range of 20 kilometers. The radar dish may rotate 360 degrees. The Cymbeline Mk 2 uses a Foster Scanner to convert a relatively narrow beam to one 720 mils wide (720 meters wide at 1000 meters range) and 30 mils high; these are then split by radar horns into beams that are 25, 40, 45, 65, and 90 mils wide for more precise location and detection.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$220,330	G, D, A	297 kg	19.3 tons	4	17	Passive IR (D), Radar	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
100/70	28/19	454	100	Trtd	T2	TF2 TS2 TR2 HF6 HS4 HR3

Fire Control	Stabilization	Armament	Ammunition
None	None	L7A2 (C)	1600x7.62mm

KshTMS

Notes: This is a Bulgarian modification of the ACRV (MT-LBu) chassis, used as a command post vehicle at battalion level or above. In this role, the vehicle has at least three radios (and usually more), a computer with wireless modem and LAN capability, a teletype or teleprinter, and a tent that may be erected up to 100 meters away from the vehicle and connected by a fiberoptic cable. The tent is big enough for the crew and staff of the vehicle, plus four other people, or more standing. A couple of folding tables and several folding chairs are carried strapped to the sides.

The driver is in the front left of the KshTMS, with the commander to the right, and a small aisle between their positions that links to the rear of the vehicle. The driver and commander have hatches on the front face of the vehicle; these are not normally used for ingress and egress from the vehicle, as they open only part way (so that they are standing just slightly above straight out from the front face), and both the commander and driver have normal hatches above their positions. The front hatches are square, while those above their positions are oval; the hatch sometimes used by a gunner is large and circular. The KshTMS has only two firing ports, one in the front right side of the troop compartment, and the other in the rear door. This rear compartment hatchway is filled by a blanking plate. The armor of the KshTMS is of aluminum instead of the steel of the MT-LB, and provides no better protection than that of the MT-LB. The engine is a YaMZ-238N 300-horsepower diesel which is actually an adapted heavy truck engine. The engine gives the KshTMS the same 6.5-ton towing capacity as the MT-LB. The KshTMS has an automatic transmission, and the driver has conventional driving controls – a steering yoke, a gas pedal, and a brake pedal. Like the MT-LB, the KshTMS is amphibious with a minimal amount of preparation (a trim vane must be erected and bilge pumps turned on), though on the KshTMS a crewmember must leave the vehicle to erect the trim vane instead of simply climbing out onto the front of the vehicle, so 7 minutes are required for preparation instead of five. The KshTMS variants are generally equipped with an NBC overpressure system.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$106,402	D, A	736 kg	15.75 tons	4+3	17	Headlights	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
137/96	38/27/4	550	127	Std	T3	HF5 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	PK (C)	2000x7.62mm

KShM R-81 Delfin

Notes: This is a command and staff version of the MT-LB armored personnel carrier, used at company-level and above. In this version, the MT-LB carries at least 3 data-capable radios and four field telephones, and has a 4-meter flexible antenna mounted on the roof, along with a 5kW generator. Usually mounted are land-navigation computers, battle control computers, and map boards, and a computer with wireless modem and LAN capability. Two cable reels that hold a total of 1000 meters of communications wire are carried in the rear for field telephones. The machinegun cupola is retained; the turret uses 360-degree manual traverse, and the machinegun has manual elevation from +30 to -5 degrees. The commander has a hatch between his position and the driver's; the turret has no hatch. The driver can replace his front vision block with a night vision block, and the commander has a small, short-range WL/IR searchlight with a range of about 40 meters; this is primarily to aid the driver when driving at night. The engine is in the front of the vehicle. A small aisle between the commander and driver gives access to the troop compartment.

The engine of the MT-LB is a 240-horsepower YaMZ-238 diesel engine. This engine, while only modest in power for an armored vehicle, generates considerable torque and the MT-LB is capable of towing 6.5 tons. Like most Soviet-designed vehicles of the period, the MT-LB's suspension is of conventional torsion bars and has shock absorbers on the first and last set of roadwheels. Construction of the MT-LB is largely of steel and armor is rather thin, especially on the sides and rear.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$150,033	D, A	573 kg	12 tons	2+4	12	Passive IR (D), WL/IR Searchlight (C)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
141/99	39/27/4	450	100	Std	T3	HF5 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	PKT	2000x7.62mm

KShM R-55

Notes: This is an ACRV (MT-LBus) fitted out for the advanced communications role. The MT-LBus in this role is fitted with at least 5 radios of varying ranges including one very long-range VHF radio, four radio telephone sets, teletype, teleprinter, and computer with wireless modem and LAN, along with various scrambling and encrypting modules. This vehicle is used to facilitate higher

headquarters' communication with other headquarters and lower echelons, and one or more normally accompanies a division command element. It essentially functions as a communications node. They are not normally armed, but some have a mount for a PK machinegun by the commander's hatch.

The driver is in the front left of the R-55, with the commander to the right, and a small aisle between their positions that links to the rear of the vehicle. The driver and commander have hatches on the front face of the vehicle; these are not normally used for ingress and egress from the vehicle, as they open only part way (so that they are standing just slightly above straight out from the front face), and both the commander and driver have normal hatches above their positions. The front hatches are square, while those above their positions are oval; the hatch sometimes used by a gunner is large and circular. The R-55 has only two firing ports, one in the front right side of the troop compartment, and the other in the rear door. The rear compartment has a large square hatch on the rear deck which opens to the rear. The armor of the R-55 is of aluminum instead of the steel of the MT-LB, and provides no better protection than that of the MT-LB. The firing ports of the base MT-LBus are retained, one on the front right side and one in the rear door. The engine is a YaMZ-238N 300-horsepower diesel which is actually an adapted heavy truck engine. The engine gives the R-55 the same 6.5-ton towing capacity as the MT-LB, with the R-55 often towing a pair of generators to power its communications suite. The R-55 has an automatic transmission, and the driver has conventional driving controls – a steering yoke, a gas pedal, and a brake pedal. Like the MT-LB, the R-55 is amphibious with a minimal amount of preparation (a trim vane must be erected and bilge pumps turned on), though on the MT-LBu base a crewmember must leave the vehicle to erect the trim vane instead of simply climbing out onto the front of the vehicle, so 7 minutes are required for preparation instead of five. The R-55 has an NBC overpressure system.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$106,950	D, A	496 kg	12 tons	4	12	Passive IR (D)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
170/119	47/33/5	550	127	Stnd	T3	HF5 HS2 HR2

Type 62 Light Tank

Notes: The Type 62 is a scaled-down Type 59 tank, with a bit smaller body, reduced-caliber main gun, and thinner armor, in order to reduce weight. The object was to produce a tank that is more agile in areas of China like the mountainous southwest, like Tibet, and southern China with its rice paddies, lakes, ponds, and rivers and streams. The prototypes were developed from 1960-62, and the vehicle entered service in 1963. The vehicle is armed with an 85mm Type 62-85TC main gun, with Type 59T (PKT) machineguns at the coaxial position and bow, and a Type 54 (DShK) 12.7mm machinegun at the commander's hatch. The 85mm main gun is the same as mounted on the Type 63 Amphibious Light Tank below. The commander is on the left side of the main gun with an overhead cupola; the gunner is on the left side of the gun, and the loader on the right rear of the turret. The driver is on the front center offset to the left; he has three vision blocks to the front and sides, and the front block may be removed and replaced with a night vision block which slightly amplifies night vision through optics, allowing the driver to see to a range of 50 meters. The gunner's sights have been dumbed-down and are rather primitive, and the gun installation has poor accuracy, with only a very limited facility for fire on the move. Fire control equipment is likewise lacking in capability. Elevation maximum is +20, while depression is -4 degrees.

The suspension is also lightened, with small roadwheels of aluminum. The Type 59's original engine was made into a smaller version called the 12150L-3 powered down to 430 horsepower. The Type 62 can cross over 0.8 meters high, 2.85-meter trenches, and 30-degree side slopes. The Type 62 can ford 1.4 meters deep without preparation, or 5 meters with a snorkel. The turret is noted to have a large bulge at the right roof, which is a forced air blower, as the main gun has an inadequate fume extractor. There are lugs for stowage boxes or external fuel tanks on the rear fenders, four on the right and three on the left. The Type 62 may lay a thick, oily smoke screen by injecting diesel fuel into its exhaust, but has no smoke grenade launchers.

The Type 62-I upgrade was based on combat use in the Sino-Vietnamese War. The upgrade adds a laser rangefinder, side skirts, and a forward AV2 gun shield for the Type 54 gun on the roof. An external stowage rack for crew equipment is added to the turret sides and rear, and this also adds additional protection to the turret armor. The Type 70 is a Type 62-I with single-axis gun stabilization and improved sights, and without the gun shield for the Type 54 machinegun.

The Type 62G has an improved armor layout with applique and Kevlar antispalling liners for the interior. The original round turret is replaced with a new flat-plate welded turret that also has an increase in armor. This turret has four smoke grenade launchers on each side of the turret. The main gun is now a copy of the British L7 105mm gun with a fume extractor, and which has one-plane stabilization and a laser rangefinder with a ballistic computer. The Type 62G is equipped with night vision gear and sights.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Type 62	\$219,159	D, A	347 kg	21 tons	4	15	Headlights	Enclosed
Type 70	\$243,957	D, A	344 kg	22.14 tons	4	15	Headlights	Enclosed
Type 62-I	\$231,957	D, A	344 kg	22.08 tons	4	15	Headlights	Enclosed
Type 62G	\$341,279	D, A	354 kg	22.41 tons	4	14	Passive IR (D, G), Image Intensification (G, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Type 62	145/102	40/28	730	160	Trtd	T3	TF10 TS7 TR6 HF12 HS6 HR4
Type 70	139/98	39/27	730	160	Trtd	T3	TF10 TS7 TR6 HF12 HS8Sp HR4
Type 62-I	140/98	39/27	730	160	Trtd	T3	TF10 TS7 TR6 HF12 HS8Sp HR4
Type 62G	138/97	38/27	730	160	Trtd	T3	TF15Sp TS11Sp TR7 HF15Sp HS8Sp HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Type 62	+1	Basic	85mm Type 62-85TC gun, Type 59T, Type 59T (Bow), Type 54 (L)	47x85mm, 2000x7.62mm, 1250x12.7mm
Type 70	+2	Fair	85mm Type 62-85TC gun, Type 59T, Type 59T (Bow), Type 54 (L)	47x85mm, 2000x7.62mm, 1250x12.7mm
Type 62-I	+2	Basic	85mm Type 62-85TC gun, Type 59T, Type 59T (Bow), Type 54 (L)	47x85mm, 2000x7.62mm, 1250x12.7mm
Type 62G	+3	Fair	105mm Type 83 gun, Type 59T, Type 59T (Bow), Type 54 (L)	38x105mm, 2000x7.62mm, 1250x12.7mm

Type 63 Light Tank

Notes: In the mid-1950s, China received a few PT-76 light amphibious tanks from the Soviet Union for test and evaluation purposes. While the PLA felt the design had some merit, they also felt that a good deal of improvements could be made to the PT-76

before accepting into service. The first such attempt resulted in the Type 60, but this design was unsuccessful and a more comprehensive redesign was undertaken. This resulted in the Type 63, accepted into service in April 1963.

The design of the Type 63 is largely conventional, with the driver in the front left, commander and gunner in tandem on the turret left, and the loader at the turret rear on the right, with the engine in the rear of the vehicle and the turret in the center. The Type 63 has a flat, boat-like hull, with a nearly-horizontal glacis plate and a high-gradient bow. The sides are slightly bulged in the center. The turret looks like that of the Type 62, but is actually modified from the prototypical Type 60. The turret armament is an 85mm Type 62-85TC gun, the same as on the Type 62 light tank above, with a Type 59T coaxial machinegun and a Type 54 heavy machinegun on the roof, manned by the loader. Like on the basic Type 62 light tank, the main gun has poor accuracy and virtually no stabilization. The Type 63 uses the Soviet-style Christie suspension. The driver has a special night vision front vision block like that of the Type 62 above, but no true night vision devices are installed. Armor is of welded steel, with a cast turret; the Type 63 has no side skirts and the roadwheels are easily damaged. The overall armor is poor, giving protection primarily against small arms fire and shell fragments, though frontal armor can protect against heavy machineguns to an extent. The Type 63 is powered by a 6-cylinder 4-stroke inline diesel engine developing 241 horsepower, making it somewhat underpowered, and using a manual transmission. Amphibious operation requires switching on the bilge pumps, erecting the trim vane, and the replacement of the driver's front vision block by a special periscopic vision block that allows the driver to see over the trim vane. This preparation takes six minutes. The Type 63 is propelled in water by a pair of water jets as well as by track movement. The Type 63 can swim in wetlands and rice paddies and also seas with high Sea States.

The updated Type 63-I has its engine replaced with a 12150-L2 diesel developing 402 horsepower. The increase in performance is dramatic. The Type 63-II is the Type 63-I equipped with night vision equipment and a laser rangefinder for the turret armament. The laser rangefinder is the same as on the Type 59-I MBT. The Type 63-II upgrades were made in the early 1970s.

The Type 63HG (stands for "Sea Modification" in Chinese) was designed to increase swimming capability. There is a rounded bow extension which increases swimming stability and has incidental armor value. The main gun is also replaced by the 105mm Type 83. The main gun is too powerful to allow it to be fired while swimming.

The Type 63A is a greatly-upgraded Type 63-II. It has a new engine developing 581 horsepower, and this in addition to a modified bow profile enables a much higher swimming speed. This is further enhanced by additional floatation modules at the front and rear of the vehicle. The main gun is a low-pressure version of the 105mm Type 83 called the Type 83-I, and that along with a computerized fire control system and gun stabilization allows the main gun to be fired in the water. The main gun may also fire a 105mm version of the Russian 9M117 Bastion ATGM. The Type 63A has a GLONASS-based satellite navigation system with a mapping module. The Type 63A-I is a Type 63A with a further bow extension, wider track skirts, and lugs for ERA on the turret front. A small amount of applique armor has been applied. It also has more advanced sighting devices. The Type 63A-II adds lugs for ERA on the turret sides, hull front, and hull sides.

Notes: A Chinese version of the PT-76, used by China, North Korea, Pakistan, Sudan, and Vietnam, with a beefed-up suspension, transmission, and engine, and more powerful gun.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Type 63	\$216,316	D, A	874 kg	18.4 tons	4	12	Headlights	Enclosed
Type 63-I	\$217,036	D, A	884 kg	19.83 tons	4	14	Headlights	Enclosed
Type 63-II	\$302,835	D, A	878 kg	19.81 tons	4	14	Passive IR (D, G), IR Searchlight	Enclosed
Type 63HG	\$309,269	D, A	906 kg	20.12 tons	4	12	Passive IR (D, G), IR Searchlight	Enclosed
Type 63A	\$464,086	D, A	932 kg	20 tons	4	14	Thermal Imaging (G), Image Intensification (G, C), Passive IR (D)	Enclosed
Type 63A-I	\$474,743	D, A	926 kg	22 tons	4	14	Thermal Imaging (G), Image Intensification (G, C), Passive IR (D)	Enclosed
Type 63A-II	\$481,829	D, A	926 kg	22 tons	4	14	Thermal Imaging (G), Image Intensification (G, C), Passive IR (D)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Type 63	103/72/19	29/20/5	403	89	Trtd	T3	TF6 TS6 TR6 HF8 HS4 HR4
Type 63-I	144/101/27	40/28/7	403	143	Trtd	T3	TF6 TS6 TR6 HF8 HS4 HR4
Type 63-II	144/101/27	40/28/7	403	143	Trtd	T3	TF6 TS6 TR6 HF8 HS4 HR4
Type 63HG	142/99/29	39/28/8	403	143	Trtd	T3	TF6 TS6 TR6 HF10Sp HS4 HR4

Chinese Tracked Light Combat Vehicles

Type 63A	193/135/72	54/38/20	403	209	Trtd	T3	TF7Sp	TS6	TR6	HF12Sp	HS6Sp
Type 63A-I	178/125/66	50/35/18	403	209	Trtd	T3	TF8Sp	TS7	TR6	HF14Sp	HS7Sp
Type 63A-II	178/125/66	50/35/18	403	209	Trtd	T3	TF8Sp	TS7	TR6	HF14Sp	HS7Sp

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Type 63	+1	Basic	85mm Type 62-85TC gun, Type 59T, Type 54 (L)	47x85mm, 2000x7.62mm, 500x12.7mm
Type 63-I	+1	Basic	85mm Type 62-85TC gun, Type 59T, Type 54 (L)	47x85mm, 2000x7.62mm, 500x12.7mm
Type 63-II	+2	Basic	85mm Type 62-85TC gun, Type 59T, Type 54 (L)	47x85mm, 2000x7.62mm, 500x12.7mm
Type 63HG	+2	Basic	105mm Type 83 gun, Type 59T, Type 54 (L)	38x105mm, 2000x7.62mm, 500x12.7mm
Type 63A	+3	Good	105mm Type 83-I gun, Type 63, QJC-88 (L)	34x105mm, 4xGP105 ATGM, 2000x7.62mm, 500x12.7mm
Type 63A-I	+4	Good	105mm Type 83-I gun, Type 63, QJC-88 (L)	34x105mm, 4xGP105 ATGM, 2000x7.62mm, 500x12.7mm
Type 63A-II	+4	Good	105mm Type 83-I gun, Type 63, QJC-88 (L)	34x105mm, 4xGP105 ATGM, 2000x7.62mm, 500x12.7mm

DK-1

Notes: The DK-1 (also known as the M41 DK) is a radical upgrade of the M41 Walker Bulldog light tank. These upgrades were performed in the 1980s, and the DK-1 served until 1999. Upgrades included a new, smaller and more powerful Cummins VTA-903TR 465-horsepower engine, an internal automatic fire/explosion detection/suppression system, internal ammunition stowage has been rearranged for more room, electrical turret rotation and gun controls, a collective NBC system, night vision, a laser rangefinder, and the replacement of the machineguns with new ones. Four grenade launchers were mounted on each side of the turret. Appliqué armor has been added, including side skirts based on those of the Leopard 1.

Twilight 2000 Notes: 53 of these conversions were carried out by the Twilight War, and an unknown, though small, number after the start of the war.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$426,842	D, A	730 kg	23.49 tons	4	14	Thermal Imaging (G), Passive IR (D, G, C), Image Intensification (G, C), WL Searchlight	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
141/99	39/27	930	173	Trtd	T4	TF12Sp TS7Sp TR7 HF14Sp HS8Sp HR6

Fire Control	Stabilization	Armament	Ammunition
+2	Fair	76mm Cockerill Mk3, MG3, MG3 (C)	68x76mm, 6000x7.62mm

AMX-10 PAC-90

Notes: This is a fire support variant of the AMX-10P, used by the Indonesian Marines primarily for reconnaissance rather for fire support, and also used by Singapore. The vehicle is topped with a TS90 turret, the same as mounted on the Panhard ERC90 F4 Sagaie armored car. The long-barreled CN90 F4 gun is able to deal with most main battle tanks from the side aspect, and some, like the T-55, from the frontal aspect. The vehicle is powered by a Baudouin 6 F11 SRX- V-8 diesel engine developing 300 hp, coupled to a semiautomatic transmission. The engine is to the left of the driver, and the engine and transmission form a complete power pack. The suspension is of the torsion-bar type, with three track return rollers and five roadwheels. The first and last roadwheel on each side have shock absorbers. The steel tracks have replaceable rubber tracks. The AMX-10P is amphibious with little preparation; a trim vane must be erected at the front, a bilge pump switched on, and waterjets for propulsion turned on. The waterjets are the more powerful ones installed in the AMX-10P Marines.

Main entrance to the passenger compartment is by a power-operated ramp, which also has a pair of doors in it. The doors each have a firing port in them. The sides have no firing ports, but two vision blocks are found on each side and a rotating periscope at the front right. There is a hatch on the left front deck for the driver, and hatches on the turret for the commander and gunner. The AMX-10P PAC-90 has a minimum of night vision equipment, and the field of view is quite small with the night vision (7 degrees wide). Later, better day/night sights were added, with a much better field of view, though magnification was limited in day and night to x6. All told, fire control is excellent, with a laser rangefinder and ballistic computer, though the weak point is the unstabilized main gun and coax. On each side of the turret towards the rear are two smoke grenade launchers. The turret has space in the bustle for 16 rounds of main gun ammunition, with another four carried behind the commander's seat, and 10 rounds carried in the hull. 2000 rounds of 7.62mm rounds are carried in the turret, with the other 1200 rounds carried in the hull. Some AMX-10 PAC-90s have a pintle mount by the commander's hatch for another weapon, but this is not a standard installation and is not covered below.

Twilight 2000 Notes: Small amounts of this vehicle were diverted from shipments to Indonesia when the Twilight War began, and used by France and Belgium.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$167,067	D, A	1.01 tons	15.59 tons	3+4	12	Passive IR (D, C, G), Image Intensification (G)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
138/97	38/27/6	518	142	Trtd	T2	TF6 TS7 TR6 HF8 HS3 HR3

Fire Control	Stabilization	Armament	Ammunition
+3	Basic	90mm CN90 F4 gun, AAT-F1	30x90mm DEFA, 3200x7.62mm

AMX-13

Notes: The AMX-13 light tank began service with the French Army in 1952, and production continued until 1985. Initial prototypes weighed 13 tons (hence the name), but production versions were heavier. The AMX-13 has been steadily upgraded and improved to try to keep it useful, relevant, and attractive on the world market. Production stopped in 1985, but upgrades packages continued to be developed after that time, and over 7700 were manufactured. The amount of users is legion, and it was employed all over the world and saw combat in several wars and interventions. The base chassis was modified into variants ranging from AAA vehicles to ARVs.

The base chassis is conventional, but the FL-10 turret is unusual, being an oscillating turret, where the top and bottom half are hinged, and the top half rocks back and forth to provide elevation for the main gun and coaxial armament. In addition, the main gun is fed by an autoloader, and ammunition supplied by two revolving magazines at the rear of the turret, each holding 6 rounds. Empty shell cases are ejected automatically outside the turret after firing. This feature, while giving a good fire rate, also means that when the ammunition in those magazines is exhausted, they must be manually refilled, with the crew getting outside of the armor to do so. It also limits the amount of available ammunition. The driver's hatch is in the front center of the vehicle, with a commander's hatch on the turret deck. Later variants were progressively up-gunned and eventually able to deal with most threats, at least from the side aspect, or in the case of some earlier MBTs, from the front. However, the armor of the AMX-13 is nothing to write home about, so going toe to toe with threat vehicles is not recommended.

The initial variant for the French Army and other countries was the M51. This initial 75mm-armed version had a lightweight but underpowered gun, best suited for fire support or perhaps in a reconnaissance role. The long-barreled 75mm gun had good performance for a gun of its caliber, but armor improvements were already overtaking it by the time it was installed on the AMX-13 M51 variant. One way used to increase the firepower (and antiarmor range of earlier versions) was to mount ATGM launchers on either side of the turret; early versions with these launchers used SS-11 missiles, and later versions used HOT missiles. Later versions dispensed with the missiles and employed a 90mm CN90 F3 long-barreled main gun, which was a credible threat to most enemy vehicles of the time. Still later versions (from the late 1960s) used an FL-12 turret mounting a long-barreled CN105 L/57 main gun, a high-velocity cannon more powerful than the L7/M68 105mm gun found on most 105mm-armed vehicles of the time.

The base chassis went almost unchanged until 1985, when a new engine, fully automatic transmission and a new hydropneumatic

suspension were introduced. This was the AMX-13 M1987 variant. However, most countries using the AMX-13 phased it out in the late 1980s and early 1990s, many in favor of later French offerings such as the ERC-90 and AMX-10RC. They can be found in various states of repair all over the world in museum displays and other static displays in and outdoors; some are also in private collectors' hands. Others are range targets.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
AMX-13 M51	\$106,800	G, A	336 kg	15 tons	3	12	Headlights	Enclosed
AMX-13 M51/SS-11	\$149,608	G, A	320 kg	15.05 tons	3	13	Headlights	Enclosed
AMX-13 M51/HOT	\$235,264	G, A	319 kg	15.14 tons	3	13	Headlights	Enclosed
AMX-13/90 (Gas)	\$190,688	G, A	344 kg	15.5 tons	3	12	Active IR (D)	Enclosed
AMX-13/90 (Diesel)	\$190,808	D, A	347 kg	15.5 tons	3	12	Active IR (D)	Enclosed
AMX-13/105 (Gas)	\$220,072	G, A	351 kg	15.74 tons	3	12	Passive IR (D)	Enclosed
AMX-13/105 (Diesel)	\$220,192	D, A	354 kg	15.74 tons	3	12	Passive IR (D)	Enclosed
AMX-13/FL-15	\$376,192	D, A	356 kg	15.5 tons	3	13	Passive IR (D, G, C), Image Intensification (G, C)	Enclosed
Argentine AMX-13	\$267,608	D, A	347 kg	15.5 tons	3	12	Passive IR (D, G, C)	Enclosed
AMX-13 M1987	\$268,390	D, A	356 kg	15.9 tons	3	13	Passive IR (D, G, C), Image Intensification (G, C)	Enclosed
Ecuadorian AMX-13	\$200,891	G, A	352 kg	15.54 tons	3	12	Headlights	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
AMX-13 M51	123/86	34/24	480	130	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13 M51/SS-11	123/86	34/24	480	130	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13 M51/HOT	123/85	34/24	480	130	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13/90 (Gas)	120/84	33/23	480	130	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13/90 (Diesel)	122/86	34/24	480	95	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13/105 (Gas)	119/83	33/23	480	130	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13/105 (Diesel)	121/84	34/23	480	95	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13/FL-15	122/86	34/24	480	95	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
Argentine AMX-13	122/86	34/24	480	95	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2
AMX-13 M1987	120/84	33/23	480	95	Trtd	T3	TF8 TS4 TR3 HF10 HS3 HR2
Ecuadorian AMX-13	120/84	33/23	480	130	Trtd	T3	TF5 TS4 TR3 HF6 HS3 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
AMX-13 M51	+1	Basic	75mm SA50 Gun, AAT-52 or AAT-F1	37x75mm SA50, 3600x7.5mm or 7.62mm
AMX-13 M51/SS-11	+1	Basic	75mm SA50 Gun, 2xSS-11 Launchers, AAT-52 or AAT-F1	37x75mm SA50, 2xSS-11 ATGM, 3600x7.5mm or 7.62mm
AMX-13 M51/HOT	+1	Basic	75mm SA50 Gun, 6xHOT Launchers, AAT-52 or AAT-F1	37x75mm SA50, 6xHOT ATGM, 3600x7.5mm or 7.62mm
AMX-13/90 (Both)	+2	Fair	90mm CN90 F3 Gun, AAT-F1	32x90mm, 3600x7.62mm
AMX-13/105 (Both)	+2	Fair	105mm CN105-57 Gun, AAT-F1	32x105mm, 4000x7.62mm
AMX-13/FL-15, AMX-13 M1987, Ecuadorian AMX-13	+3	Fair	105mm CN105-57 Gun, AAT-F1, AAT-F1 (C)	32x105mm, 4000x7.62mm
Argentine AMX-13	+2	Fair	90mm CN90 F3 Gun, MAG	32x90mm, 3600x7.62mm

AMX RATAc

Notes: This is a version of the AMX VCI armored personnel carrier, with a ground surveillance radar set mounted on the roof of the

passenger compartment. As the AMX VCI is itself a variant of the AMX-13, this vehicle is also known as the AMX-13 RATAc, and as the non-APC variants of the AMX VCI are also called the VTT, this vehicle is also called the VTT/RATAc.

The RATAc radar dish is mounted on the roof of the vehicle on the right side, towards the rear. Inside the compartment is a management computer with controls for the radar, radios, and a datalink set. The RATAc radar has several possible functions, including ground surveillance radar, mortar and artillery counterbattery radar, and radar against low-flying aircraft and helicopters. It can also detect explosions and track them. The radar and the accompanying equipment automatically tracks, identifies, and classifies targets within range. The radar has a range of 20 km against vehicles and structures and 15 km against personnel and explosions. The AMX RATAc is also equipped with several data-capable radios.

The RATAc S is a more powerful version of the RATAc radar system. It uses a different-shaped, smaller dish which is mounted on an extendable 3-meter mast. Functions are the same, but range is greater at 38 kilometers against vehicles and structures and 28 kilometers against personnel and explosions. The computer system is also upgraded.

The AMX RATAc has a small turret in the front of the roof with a machinegun mounted in it.

The French army transferred their RATAc radars to VAB vehicles in the mid-1970s, but the AMX RATAc was still being used by Ecuador and Morocco by 2004.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
AMX RATAc	\$437,100	G, A	654 kg	16 tons	4	15	Radar, Passive IR (D)	Enclosed
AMX RATAc S	\$395,885	G, A	650 kg	16 tons	4	15	Radar, Passive IR (D)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
AMX RATAc	118/82	33/23	410	130	CiH	T3	TF2 TS2 TR2 HF8 HS4 HR4
AMX RATAc S	118/82	33/23	410	130	CiH	T3	TF2 TS2 TR2 HF8 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	AAT-F1 or AAT-52	2000x7.62mm or 7.5mm

TrFz ABRA

Notes: This German vehicle is an M113A1G (the German-made version of the M113 APC) mounting a locally-made variant of the French RATAC S multipurpose radar. The radar may be raised up to 3 meters above the ground. The vehicle is amphibious only when the radar is folded against the hull. The ABRA has a 5kW generator on the roof for running the radar with the engine off, to conserve fuel.

The RATAC S has several possible functions, including ground surveillance radar, mortar and artillery counterbattery radar, and radar against low-flying aircraft and helicopters. It can also detect explosions and track them. The radar and the accompanying equipment automatically tracks, identifies, and classifies targets within range. Range is 38 kilometers against vehicles and structures and 28 kilometers against personnel and explosions. The ABRA has several data-capable radios and a computer management system.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$534,766	D, A	455 kg	13.3 tons	4	13	Radar, Passive IR (D)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
136/96	30/20/3	360	124	Trtd	T2	TF2 TS2 TR2 HF6 HS4 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	M2HB (C)	1000x.50

Hotchkiss Light Tracked Vehicles

Notes: These small tracked scout vehicles were in service with the West German Army until the mid-1980s. They were designed for the French Army to operate with AMX-13s, but the French Army passed on them and the West Germans picked them up. Some of them passed into reserve units, but most of them were scrapped or used as range targets. They were replaced by the Marder, Luchs, and Wiesel.

The base vehicle is the SPz (Schützenpanzer, or Infantry Fighting Vehicle) 11-2. This is a small boxy hull with a well-sloped front end that bears a slight resemblance to the US M114 Lynx, but is much smaller. The driver is on the front left, with an overhead hatch. It has a small turret with a 20mm Rh-202 autocannon. The turret is behind the driver, offset to the left, and has a hatch. There are three hatches on the roof, one to the right of the turret and two on the rear deck. There are two doors in the rear of the hull. The passengers were normally dismounted scouts, though infantry were sometimes carried.

The SPz 22-2 is a command vehicle, and does not have a turret, though it does have a cupola. It is fitted with three radios, and the right front hatch on the roof has a pintle mount for a machinegun. The commander has a periscope with magnification of x4 (wide field) or x15 (narrow field); this periscope may be removed and placed on a tripod sight that is provided with the vehicle. A variant of this vehicle was used by FIST teams.

The SPz 51-2 is a light mortar carrier. In this role, the roof is raised slightly, and an 81mm mortar is mounted in the rear with large overhead hatches in the roof for firing. The rear of the hull has one large door instead of two smaller ones.

The SPz 2-2 is an armored ambulance. The vehicle has basic medical supplies and two stretchers. Two more stretcher patients may be carried in racks on the roof.

Some of the mortar carrier versions were converted into ground surveillance radar carriers and designated Radarpanzer kurz 1s. This radar has a range of 20 km. The Radarpanzer has a 2.5kW APU mounted on the left rear door.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
SPz 11-2	\$161,560	G, A	304 kg	8.2 tons	2+3	8	Headlights	Enclosed
SPz 22-2	\$156,141	G, A	290 kg	7.5 tons	5	8	Headlights	Enclosed
SPz 51-2	\$200,002	G, A	292 kg	8.2 tons	5	8	Headlights	Enclosed
SPz 2-2	\$150,310	G, A	288 kg	8 tons	2+3 sitting, or 1 stretcher + 1 sitting	8	Headlights	Enclosed
Radarpanzer kurz 1 SPz 91-2	\$947,710	G, A	235 kg	8.1 tons	3	10	Headlights	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
SPz 11-2	154/108	43/30	330	73	CiH	T2	TF2 TS2 TR2 HF4 HS3 HR2
SPz 22-2	165/115	46/32	345	73	Std	T2	HF4 HS3 HR2
SPz 51-2	154/108	43/30	375	73	Std	T2	HF4 HS3 HR2
SPz 2-2	157/110	44/31	295	73	Std	T2	HF4 HS3 HR2
Radarpanzer kurz 1	156/109	43/30	375	73	CiH	T2	TF1 TS1 TR1 HF4 HS3 HR2

SPz 91-2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
SPz 11-2	None	None	20mm Rh-202	500x20mm
SPz 22-2	None	None	MG3 (C)	500x7.62mm
SPz 51-2	None	None	Brandt Mle 27/31 L/15.6 81mm Mortar	50x81mm

Rheinmetall Wiesel 1

Notes: The Wiesel 1 is a light and inexpensive scout vehicle and fire support vehicle used by the German Army by the hundreds. They are easy to build, fast and maneuverable, and can be serviced using common automotive parts. The standard version uses a 20mm autocannon, but the design is very versatile and had spawned numerous variants, only some of which are listed below. The autocannon carriers typically have a crew of two, with the driver in the front right of the hull and the commander in the turret. They may be easily carried in aircraft and heavy helicopters, dropped by LAPES, or sling loaded by helicopters as small as the Blackhawk. (Dropping by parachute was tested, but the four test vehicles were destroyed due to suspension failures.) Production ended in 1993 in favor of the Wiesel 2 and vehicles such as the Fennek and other light scout vehicles and ATGM carriers. Though used only by the German Army, the Wiesel 1 did see combat service in Somalia with the German contingent to UNISOM II in 1993.

The Wiesel 1 MK20 is the version with a 20mm Rh-202 autocannon. The MK25 is the same vehicle with a modified turret mounting a KBA 25mm autocannon. The MK30 is equipped with a different turret equipped with an externally-mounted RMK 30 autocannon. The BTM-208 has a turret of the same name and is armed with a pair of machineguns. The three latter versions were not taken into service.

The Wiesel 1 Radar is equipped with a RATA S multipurpose radar system. The RATA S has several possible functions, including ground surveillance radar, mortar and artillery counterbattery radar, and radar against low-flying aircraft and helicopters. It can also detect explosions and track them. The radar and the accompanying equipment automatically tracks, identifies, and classifies targets within range. Range is 38 kilometers against vehicles and structures and 28 kilometers against personnel and explosions.

Power is provided by an Audi 2.1L 5-cylinder in-line turbo-diesel engine developing 86 horsepower. (That does not sound like a lot, but it is adequate for such a light vehicle.) The suspension is by simple torsion bars and the transmission is automatic, with three small and one large roadwheels as well as a drive sprocket and one return roller.

Twilight 2000 Notes: Dozens of these vehicles were used by the US 82nd Airborne Division and 75th Ranger Regiment during the Twilight War. Small amounts of MK25s, MK30s, and BTM-208s were employed, with the Rangers and 82nd Airborne using the MK25 due to the more readily-available 25x137mm ammunition in US supply chains. The suspension problem with parachute drops was solved in the US by improved rigging.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Wiesel 1 MK20	\$219,280	D, A	265 kg	2.8 tons	2	6	Passive IR (D, C)	Enclosed
Wiesel 1 MK25	\$220,887	D, A	269 kg	2.82 tons	2	6	Passive IR (D, C)	Enclosed
Wiesel 1 MK30	\$232,480	D, A	260 kg	2.91 tons	2	6	Passive IR (D, C)	Shielded
Wiesel 1 BTM-208	\$197,151	D, A	226 kg	2.86 tons	2	6	Passive IR (D, C)	Enclosed
Wiesel 1 Radar	\$472,989	D, A	226 kg	2.85 tons	2	9	Passive IR (D), Radar	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Wiesel 1 MK20	202/141	56/39	80	25	CiH	T2	TF3 TS3 TR3 HF4 HS2 HR2
Wiesel 1 MK25	200/140	56/39	80	25	CiH	T2	TF3 TS3 TR3 HF4 HS2 HR2
Wiesel 1 MK30	195/137	54/38	80	25	CiH	T2	TF3 TS3 TR3 HF4 HS2 HR2
Wiesel 1 BTM-208	198/139	55/39	80	25	CiH	T2	TF3 TS3 TR3 HF4 HS2 HR2
Wiesel 1 Radar	199/139	55/39	80	25	CiH	T2	TF3 TS3 TR3 HF4 HS2 HR2

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Wiesel 1 MK20	+2	Fair	20mm Rh-202 Autocannon	400x20mm
Wiesel 1 MK25	+2	Fair	25mm KBA Autocannon	320x25mm
Wiesel 1 MK30	+2	Fair	30mm RMK-30 Autocannon, MG3	300x30mm, 200x7.62mm
Wiesel 1 BTM-208	+1	Basic	M2HB, MG3	500x.50, 1500x7.62mm
Wiesel 1 Radar	None	None	MG3 (C)	500x7.62mm

ASCOD 105

Notes: The ASCOD 105 is a joint venture between Santa Barbara of Spain and Steyr-Daimler-Puch of Austria. Great Britain, Greece, and South Africa have also expressed interest in this light tank. It has also received attention in Asia. The vehicle uses a modified ASCOD IFV chassis and a turret from a Rooikat South African light combat vehicle, armed with a 105mm NATO cannon. The vehicle's joints are all welded, so that there are no rivets to pop loose and ricochet around if the vehicle is hit. The commander has a hatch on the turret roof, next to the loader. The gunner uses one of these hatches. The driver has a hatch on the front deck, and there is a rear hatch for quick escapes under fire. Night vision is provided for all crewmembers, as well as a sight for the commander and gunner equal to an image intensifier. Appliqué armor is available, adding 5 points of armor to the HF and TF and 3 points on all other faces except the HR.

The ASCOD 105 GDLS is an ASCOD armored personnel carrier reworked into a light tank, like the ASCOD 105, but this time using a casemated 105mm gun, similar to that on the Marder 105. This offers more protection for the crew as well as increased gun laying and response time, as the casemated turret has a faster traverse time as well as a better fire control system. All crewmembers are carried in the front of the hull, with the driver and commander side by side and the gunner behind them on a slightly elevated seat. The hull may use the same appliqué armor as other ASCOD designs, but the turret appliqué armor may not be used.

The ASCOD 105 (both versions) uses an MTU 8V-199-TE22 engine which develops 720 horsepower. They are equipped with a Sapa Placancia SG 850 automatic transmission, which can be switched by the driver to manual transmission if necessary. Suspension is by torsion bar with rotary dampers at the ends. The ASCOD 105 is able to drive at half full forward speed in reverse. On a road, the ASCOD 105 can accelerate to a Com Mov of 17 in 14 seconds. It can cross a 2.3-meter ditch, climb a 95-centimeter wall, and ford 1.2 meters, though it is not amphibious. The ASCOD 105 has an NBC overpressure system with a collective NBC backup.

The ASCOD 105 is equipped with the Kollsman Day/Night Range Sight (DNRS), which integrates a digital ballistic computer, day vision and night vision channels and a laser rangefinder. The Kollsman system also has an automatic target tracker; the gunner lases a target and the turret and gun slew to put the gun on target. The commander of the standard ASCOD 105 has a cupola with all-around vision blocks; the center front block has a magnification of x2.8; he also has an LCD screen which projects what the gunner is seeing. He does not have his own thermal imager. The TC has emergency controls for the gun to take care of sudden close threats. The ASCOD 105 GDLS's commander does not have the same cupola but does have the magnified vision blocks; he has a hunter/killer sight mounted on the turret roof. The ASCOD 105 GDLS's main gun is fed by a full autoloading system. Both are also equipped with a laser warning/detection and its smoke grenade launchers have prismatic aerosol smoke in them.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
ASCOD 105	\$368,180	D, A	635 kg	28.5 tons	4	18	Image Intensification (D, G, C), Thermal Imaging (G)	Shielded
w/Applique	\$371,196	D, A	626 kg	29.9 tons	4	18	Image Intensification (D, G, C), Thermal Imaging (G)	Shielded
ASCOD 105 GDLS	\$410,558	D, A	621 kg	26 tons	3	14	Thermal Imaging (G, C), Passive IR (D), Image Intensification (G, C)	Shielded
w/Applique	\$411,915	D, A	616 kg	26.93 tons	3	14	Thermal Imaging (G, C), Passive IR (D), Image Intensification (G, C)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
ASCOD 105	172/120	48/33	860	267	Trtd	T3	TF16 TS8 TR8 HF18Cp HS8Cp HR6
w/Applique	165/116	46/32	860	267	Trtd	T3	TF21 TS11 TR11 HF23Cp HS11Cp HR6*
ASCOD 105 GDLS	186/130	52/36	860	267	CiH	T3	TF11Cp TS7 TR6 HF18Cp HS8Cp HR6
w/Applique	180/126	50/35	860	267	CiH	T3	TF11Cp TS7 TR6 HF23Cp HS11Cp HR6*

Vehicle	Fire Control	Stabilization	Armament	Ammunition
ASCOD 105	+3	Good	105mm GT-7 Gun, MG3, MG3 (C)	40x105mm, 4600x7.62mm
ASCOD 105 GDLS	+4	Good	105mm L7 Gun, MG3	40x105mm, 4600x7.62mm

*Hull Floor, Hull Roof, and Turret Roof AV are 5.

M-41B/C/E

Notes: These are versions of the M-41 used by Brazil, Denmark, Greece, Turkey, and Spain. These versions have less thirsty diesel engines, upgraded armor, and a 90mm gun with one-axis stabilization. The M41B uses a Saab-Scania DS-14A 04 405-horsepower diesel; the M41C uses a Saab-Scania 430-horsepower diesel engine. The M41B and C use a 90mm Ca 76/90 M32 BR2

gun, which is a bored-out version of the 76mm M32 gun and has a barrel length of L/43.91, though the barrel has a bore evacuator and a new muzzle brake. The M41E uses a 90mm Cockerill main gun, again with a new muzzle brake. The M41B has a simple analog fire control computer, while the M41C adds a laser rangefinder. The M41B and C also have a white light/IR searchlight mounted above the main gun.

All three have side skirts added (the M41B in most cases, at any rate). All three have various armored boxes for vehicle and crew equipment added to the sides, rear, and turret sides, and the M41E has small bustle racks added to the sides of the turret bustle. One M41C would be produced with an advanced (for the time) spaced armor package. Most M41Cs, however were essentially upgraded M41Bs.

An upgrade to the M41B and C had spaced armor on the hull front and turret front and the hull sides. The transmission is upgraded and produces additional acceleration. The main gun has been replaced by the Ca 76/90 M32 BR3 gun, which has a thermal sleeve and upgraded fire control and night vision equipment, and is otherwise the equivalent in game terms to the Cockerill Mk 3.

The M41E has a laser rangefinder and a digital computer. The M41E also adds upgraded night vision equipment. The M41E uses a General Motors 8V-71T 400-horsepower diesel.

The M41B and C were primarily used by the Brazilians, the C by the Brazilian Marines. The M41E was designed by Spain's Santa Barbara as an upgrade kit, and used by Spain, Denmark, Greece, and Turkey on their M41s. The full M41C upgrade package was also bought by Uruguay.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M41B	\$374,114	D, A	503 kg	23.8 tons	4	14	Active/Passive IR (D, G), WL/IR Searchlight	Enclosed
M41B Upgrade	\$217,632	D, A	502 kg	25.1 tons	4	14	Passive IR (D, G), Image Intensification (G), WL/IR Searchlight	Enclosed
M41C	\$378,990	D, A	505 kg	23.8 tons	4	14	Active/Passive IR (D, G), WL/IR Searchlight	Enclosed
M41C Upgrade	\$222,508	D, A	504 kg	25.1 tons	4	14	Passive IR (D, G), Image Intensification (G), WL/IR Searchlight	Enclosed
M41C w/Advanced Armor	\$393,154	D, A	511 kg	25.42 tons	4	14	Active/Passive IR (D, G), WL/IR Searchlight	Enclosed
M41E	\$252,743	D, A	508 kg	25.69 tons	4	14	Passive IR (D, G, C), Image Intensification (G, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M41B	126/88	35/24	530	120	Trtd	T4	TF12 TS8 TR6 HF14 HS8 HR8
M41B Upgrade	121/84	34/23	530	120	Trtd	T4	TF15Sp TS8 TR6 HF17Sp HS10Sp HR8
M41C	132/92	37/26	530	126	Trtd	T4	TF12 TS8 TR6 HF14 HS8 HR8
M41C Upgrade	126/88	35/25	530	126	Trtd	T4	TF15Sp TS8 TR6 HF17Sp HS10Sp HR8
M41C w/Advanced Armor	125/88	35/24	530	126	Trtd	T4	TF17Sp TS10Sp TR6 HF19Sp HS11Sp HR9*
M41E	118/83	33/23	530	119	Trtd	T4	TF15Sp TS9Sp TR7 HF17Sp HS10Sp HR10**

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M41B	+1	Fair	90mm Ca 76/90 M32 BR2 gun, M60E2, M2HB (C)	45x90mm, 5000x7.62mm, 2175x.50
M41C	+2	Fair	90mm Ca 76/90 M32 BR2 gun, M60E2, M2HB (C)	45x90mm, 5000x7.62mm, 2175x.50
M41B/C Upgrade	+2	Fair	90mm Ca 76/90 M32 BR3 gun, M60E2, M2HB (C)	45x90mm, 5000x7.62mm, 2175x.50
M41E	+3	Fair	90mm Cockerill Mk 3 gun, MG3 or MAG, M2HB (C)	45x90mm, 5000x7.62mm, 2175x.50

*Hull and Turret Roof Armor is 5Sp; Hull Floor armor is 5Sp.

**Hull Roof, Turret Roof, and Hull Floor AV is 6.

Sherman Armored Ambulance (Ambutank)

Notes: This is an M-4 Sherman tank with the turret removed and replaced with a raised superstructure over the rear. It is used for the evacuation and treatment of casualties under enemy fire. The Sherman in this role has extensive medical supplies, including the equivalent of 5 doctor's medical bags, a refrigerator with 5 units of plasma and whole blood, refills for individual medical kits for a platoon, an oxygen unit, and other such supplies. The Ambutank has a 70-liter water tank with a water heater, and a respirator. The engine is moved to the center of the vehicle, and the floor of the passenger compartment has a hatch so that the vehicle may drive over a victim lying on the ground and pick him up. There is a hatch on the front deck for the driver, hatches on the roof of the passenger compartment, and a large door on the rear of the hull. The VVSS version below has a 380-horsepower engine, while the HVMS version uses a 460-horsepower engine which grants greater agility but is thirstier.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Ambutank VVSS	\$38,363	D, A	2.9 tons	34 tons	3+5 (or 2 stretchers)	28	Headlights	Enclosed
Ambutank HVSS	\$38,600	D, A	3.02 tons	34 tons	3+5 (or 2 stretchers)	28	Headlights	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Ambutank VVSS	93/65	26/18	700	113	Std	T5	HF12 HS6 HR4
Ambutank HVSS	106/74	30/21	700	132	Std	T5	HF12 HS6 HR4

Fire Control	Stabilization	Armament	Ammunition
None	None	M2HB (C) or M1919A4 (C)	600x.50 or 1000x.30-06

Sedena/Henschel HWK-12/13

Notes: These vehicles, unique to the Mexican Army, were first deployed in the 1990s. They are HWK-11 APC chassis topped with a turreted heavy ordnance weapon. The area where passengers were carried is largely filled with these turrets and ammunition for the main gun and the machineguns. These vehicles are normally used for long-range reconnaissance in the Mexican Army, or sometimes for infantry support.

A bank of four smoke grenade launchers is found along each side of the glacis. The suspension gave a rather good ride for this type of vehicle, using torsion bars with shock absorbers on the first, second, and fifth roadwheels (out of five) having hydraulic shock absorbers. The HWK-12 and 13 are not amphibious. The HWK-12 and 13 ride on German-made M-113A2-type tracks and uses an engine of unknown origin (but probably also German), with an estimated output of 280 horsepower. The transmission is automatic.

The HWK-12, also known as the HWK-13-90, is equipped with a light turret mounting a Mecar 90mm low-pressure gun with semiautomatic feed. The gun has a coaxial machinegun and the turret has a hatch on the roof for the commander, with a pintle-mounted machinegun. The turret is mounted at the rear of the vehicle and the gunner, loader, driver, and passengers have hatches on the hull roof towards the front.

The HWK-13, also known as the HWK-13-20, is the same vehicle with a Helio FVT900 turret with a 20mm Oerlikon KAA autocannon. The chassis gives the vehicle room for scads of ammunition. Though the HWK-13 can carry a fireteam of troops, it is more normally used for infantry support than as an APC and carries key leaders and command personnel or a scout team rather than line troops.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
HWK-12	\$208,178	D, A	377 kg	13 tons	4+2	10	Image Intensification (G, C), Passive IR (D, G, C)	Enclosed
HWK-13	\$191,464	D, A	556 kg	12 tons	4+4	8	Image Intensification (G, C), Passive IR (D, G, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
HWK-12	151/106	42/29	300	147	Trtd	T3	TF3 TS3 TR3 HF10 HS5 HR3*
HWK-13	161/113	45/31	300	147	Trtd	T3	TF5 TS3 TR3 HF10 HS5 HR3*

Vehicle	Fire Control	Stabilization	Armament	Ammunition
HWK-12	+2	Fair	90mm Mecar N Gun, MAG, M2HB (C)	30x90mm, 3000x7.62mm, 500x.50
HWK-13	+2	Fair	20mm Oerlikon KAA Autocannon, MG3, M2HB (C)	1800x20mm, 5000x7.62mm, 1000x.50

*Belly armor is AV 3.

M1981 Shin'heung

Notes: This a North Korean light tank (also known as the M1985 or PT-85), based on the chassis of the YW-531 armored personnel carrier. It had been in development since the late 1970s, but first appeared in a parade in Pyongyang in 1985 (it is even now a common sight in Pyongyang parades). The North Koreans felt they needed a light tank even smaller than the Type 63, for use in the rough and mountainous terrain so prevalent in North Korea, and with greater amphibious capability. To this end, they fitted a modified YW-531 chassis with a turret similar to the PT-76, a more powerful engine, and propellers to drive the vehicle in the water. The result is a light vehicle with greater speed than the PT-76 or YW-531, able to pursue vehicles and maneuver on rough terrain. This vehicle is used only by North Korea.

The goal of a vehicle lighter than the PT-76 was not achieved, however, as the M1981 is quite a bit heavier than the PT-76, being based on a stretched YW-531 chassis with extra armor. The entire chassis has been enlarged, with the hull being much longer and wider, but lower than a YW-531. The rear doors for infantry access have been removed, along with the hull roof hatches. The sides have acquired sloping armor. The M1981 is amphibious, and a hydrojet derived from those of the PT-76 has been added to the hull rear on each side. The engine has also been moved to the rear. Two possible engines have been postulated; I have included both possible engines in the stats below. One is the same 320-horsepower turbocharged engine found on the YW-531, and the other a 6-cylinder water-cooled 240-horsepower non-turbocharged engine. (It is possible that the lower-powered engine was employed for initial tests.)

Armament consists of a Type 62-85TC, which the North Koreans also used on their T-34/85s. The coaxial machinegun is unknown, but likely a Chinese copy of the PKT. By the commander's hatch on the right turret is likely a Chinese copy of the KPV. When initially observed in 1985, the M1981 mounted a launcher for a Maljutka ATGM launcher in between the commander's and loader's hatch; however, since then, they have not been observed mounted on M1981s, and they may have only been mounted on the vehicles for propaganda value. Recently, M1981s have been observed mounting a 9K38 Iгла launcher in the center rear of the turret, a mount that requires the gunner to operate the missile from outside of the vehicle. (I have included stats for the M1981 with both missile systems, as well as no missile system at all.)

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M1981 (240 hp Engine)	\$285,729	D, A	549 kg	20 tons	4	12	Active/Passive IR (D, G), IR Searchlight	Enclosed
M1981 (320 hp Engine)	\$286,089	D, A	552 kg	20 tons	4	12	Active/Passive IR (D, G), IR Searchlight	Enclosed
M1981 w/AT-3 (240 hp Engine)	\$311,570	D, A	540 kg	20.08 tons	4	12	Active/Passive IR (D, G), IR Searchlight	Enclosed
M1981 w/AT-3 (320 hp Engine)	\$311,930	D, A	543 kg	20.08 tons	4	12	Active/Passive IR (D, G), IR Searchlight	Enclosed
M1981 w/SA-14 (240 hp Engine)	\$351,678	D, A	534 kg	20.08 tons	4	12	Active/Passive IR (D, G), IR Searchlight	Enclosed
M1981 w/SA-14 (320 hp Engine)	\$352,038	D, A	537 kg	20.08 tons	4	12	Active/Passive IR (D, G), IR Searchlight	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M1981 (240 hp Engine)	97/68	27/19/4	450	88	Trtd	T4	TF10 TS7 TR6 HF12 HS6 HR4
M1981 (320 hp Engine)	120/84	33/23/6	450	118	Trtd	T4	TF10 TS7 TR6 HF12 HS6 HR4
M1981 w/AT-3 (240 hp Engine)	97/68	27/19/4	450	88	Trtd	T4	TF10 TS7 TR6 HF12 HS6 HR4
M1981 w/AT-3 (320 hp Engine)	120/84	33/23/6	450	118	Trtd	T4	TF10 TS7 TR6 HF12 HS6 HR4
M1981 w/SA-14 (240 hp Engine)	97/68	27/19/4	450	88	Trtd	T4	TF10 TS7 TR6 HF12 HS6 HR4
M1981 w/SA-14 (320 hp Engine)	120/84	33/23/6	450	118	Trtd	T4	TF10 TS7 TR6 HF12 HS6 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M1981	+2	Fair	85mm Type 62-85TC gun, PKT, KPV (C)	47x85mm, 2200x7.62mm, 550x14.5mm
M1981	+2	Fair	85mm Type 62-85TC gun, PKT,	47x85mm, 2200x7.62mm, 550x14.5mm, 4xAT-

North Korean Tracked Light Combat Vehicles

w/AT-3 M1981 w/SA-14	+2	Fair	KPV (C), AT-3 Launcher 85mm Type 62-85TC gun, PKT, KPV (C), SA-14 Launcher	3 ATGM 47x85mm, 2200x7.62mm, 550x14.5mm, 3xSA-14 SAM
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NM-116

Notes: The NM-116 is a modification of the WW2-vintage M-24 Chaffee light tank. The Norwegians were generally happy with the Chaffee; however, it was obvious by the mid-1960s that the Chaffee was no longer able to handle conditions on the modern battlefield, nor could its 75mm main gun reliably destroy modern main battle tanks and even some APCs and lighter armored vehicles. The NM-116 was unveiled in 1973, with the primary change being the modern 90mm main gun, which could handle Soviet MBTs from the sides and rear and other armored vehicles from the front. In addition, a plethora of internal and external components were added or upgraded.

A 6V-53T 260-horsepower diesel engine has replaced the gasoline engine; this engine also has increased torque, important on Norway's rough terrain. The NM-116 was also given an upgraded transmission. Four heat exchangers cool the oil. The fuel tank size has also been increased. Upgraded treads from Diehl in Germany were put on the sides; this made an upgrade of the sprocket necessary. The amount of shock absorbers was decreased, but they were replaced with a pair of more effective shock absorbers. The main gun was replaced with a French 90mm D-921 gun as armed the Panhard AML-90, which offered a dramatic increase in power while being a low-pressure design that would not overload the NM-116's light chassis; in addition, the concentric recoil system of the Chaffee was retained to save space. The muzzle brake of the D-921, however, was replaced with a T-shaped brake similar to that used on the M48 Patton, taken from the guns of Norwegian M48s whose 90mm guns were being upgraded at that time. A Simrad LV3 laser rangefinder has been added. The coaxial M1919A4 machinegun was replaced by an AN/M3 taken from retiring F-86 Sabre fighter aircraft. The bow machinegun has been removed to allow for additional ammunition storage and reduce the crew. Night vision was installed for the driver, gunner and commander. Four smoke grenade dischargers were added to each side of the turret in banks; all loaded grenades may be fired at once or one at a time. On the right rear fender, a telephone allowing infantry outside of the NM-116 to communicate with the tank crew was added. Varied and sundry equipment boxes and racks were also installed.

The NM-116 was built by Norway and used by that country and Taiwan.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$324,051	D, A	670 kg	18.4 tons	4	14	Passive IR (D, G, C)	Enclosed

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
109/76	30/21	416	134	Trtd	T3	TF10 TS4 TR4 HF10 HS5 HR4

Fire Control	Stabilization	Armament	Ammunition
+2	Basic	90mm D-921 gun AN/M3, M2HB (C)	41x90mm DEFA, 1000x.50BMG

Volgograd 2S25 Sprut-SD

Notes: The 2S25 is a light tank designed for use by the VDV (Airborne Forces) and Naval Infantry, although the Russians call it a self-propelled antitank gun. Currently the only users of the 2S25 is one brigade of the Airborne forces of the Russian Army, though South Korea and India have expressed interest in the design.

The 2S25's chassis is based on that of the BMP-3. The hull is extended and there are one more roadwheels on either side of the vehicle, increasing the number of roadwheels to seven on each side. The driver has a hatch on the front deck, the commander and gunner have hatches on the turret deck. The crew are protected by a complete NBC suite, which includes protection from radiation and an NBC Overpressure system. A pintle mount is supplied by the commander's hatch. The 2S25 is fully amphibious, propelled by a pair of hydrojets. The 2S25 may be airdropped from the Il-76 or aircraft of a similar size. The 2S25 is equipped with a hydropneumatic suspension, which lowers completely for parachute drops, and allows a ground clearance variable of 190-590 millimeters to give the 2S25 a better hull-down positioning. The hydropneumatic suspension also slows for a smoother drive and contributes to the recoil buffering of the main gun. The 2S25 is powered by a 510-horsepower 2V-06-2S multifuel engine, coupled to an automatic transmission which has five forward and five reverse gears.

The 125mm gun is a low-pressure version of the standard Russian 125mm gun (which uses standard 125mm rounds) and has an autoloader. The 2A75 Sprut-SD main gun fires the same ammunition as standard Russian 125mm guns, but the recoil forces are heavily-buffered and the gun barrel is shorter at L/51. The main gun can fire in both direct and indirect fire modes. The gun and coaxial machinegun may elevate to +15 degrees and depress to -5 degrees, though if the turret is rotated to the rear, elevation changes to +17 degrees and -3 degrees. The autoloader holds 22 of the vehicles ammunition supply; however, 9M119 Svir ATGM rounds do not fit into the autoloader and must be loaded manually by the gunner. The main gun may be fired while the vehicle is fully swimming, with accurate fire capable up to Sea State 3, though if fired while swimming the turret may only be rotated up to 17.5 degrees to either side of the front. The 2S25's fire control computer can be set to automatically track a target and rotate the turret and elevate and depress the weapons as necessary, in a manner similar to that of the newest generation of main battle tanks such as the M-1 Abrams, Challenger, or T-90. The 2S25's commander and gunner may also operate as a hunter/killer team, as the gunsights and vision gear have separate heads. The 2S25 has the standard for Russian vehicles PKT coaxial armament, and all 2000 rounds in the ammunition supply are ready to fire. A bank of three 902-series Tucha smoke grenade launchers are found on each side of the turret towards the rear.

The Sprut-SDM1 is a newer version with an upgraded fire control system and an RWS over the commander's station; commander's armament remains the same, though ammunition supply is larger.

Twilight 2000 Notes: The 2S25 was present in small numbers for fighting in China, Norway, and Poland.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
2S25 Sprut-SD	\$657,830	D, G, AvG, A	493 kg	18 tons	3	12	Image Intensification (D, G, C), Thermal Imaging (G, C)	Shielded
2S25 Sprut-SDM1	\$660,830	D, G, AvG, A	493 kg	18.5 tons	3	14	Image Intensification (D, G, C), Thermal Imaging (G, C)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor*
2S25 Sprut-SD	189/132	52/37/7	690	251	Trtd	T4	TF12Sp TS6Sp TR4 HF10Sp HS6Sp HR5
2S25 Sprut-SDM1	185/129	51/36/7	690	251	Trtd	T4	TF12Sp TS6Sp TR4 HF10Sp HS6Sp HR5**

Vehicle	Fire Control	Stabilization	Armament	Ammunition
2S25 Sprut-SD	+3	Good	125mm 2A75 low-pressure gun, PKT, NSVT (C)	34x125mm, 6x9M119 Svir ATGM, 2000x7.62mm, 500x12.7mm
2S25 Sprut-SDM1	+4; RWS +2	Good; RWS Fair	125mm 2A75 low-pressure gun, PKT, NSVT (RWS)	34x125mm, 6x9M119 Svir ATGM, 2000x7.62mm, 1000x12.7mm

*Belly armor for the 2S25 is 6.

**AV for the RWS is 5 in all directions except the roof, which is AV3.

Uralvagonzavod BMPT "Terminator"

Notes: This is another one of those vehicles that is not easily placed into one category or another; based on a T-72 tank hull, it is not really a light combat vehicle; carrying no dismount troops, it is not a heavy APC; and not having a heavily-armed, heavily-armored turret, it is not a tank. The Russians call the BMPT a "Tank Support Vehicle;" its job is to tackle the infantry; during the First and Second Chechen Wars, it was quickly discovered that foot soldiers hiding in buildings and ruins could easily tackle tanks by striking from above. They have lately also been marketing the BMPT as the "Terminator." APCs and IFVs, and other light vehicles to free tanks to take on other tanks and fortifications. The BMPT was first demonstrated to the public in 2000. It is normally based on a T-72 chassis, but the modifications can also be made to a T-90 chassis to provide a vehicle with better armor protection and mobility.

The hull is basically a modified tank hull which has the same level of armor protection as the base tank hull and a new engine; the turret, though fairly heavily-armored, is not anywhere as nearly protected as the hull. The modified turret has 2A42 or 2A72 30mm autocannons for use against lightly-armored or unarmored vehicles, two medium and one heavy machinegun for general antipersonnel or anti-aircraft use, and an armored box launcher on the left side of the turret containing four launchers for AT-9 Ataka ATGMs. The ATGM launchers have an elevation of +25 degrees and a depression of -5 degrees. The autocannons may elevate to +45 degrees and depress to -5 degrees. A rumor states that the reason that two autocannons were mounted is because the Russians are having a problem with the dual feed mechanism on the 2A42 and 2A72 cannons, so they mounted two autocannons and have them feed from different ammunition types. As I said, this is only a rumor.

On each side of the hull above the front track skirts is an AGS-30 grenade launcher for use against troops in the open. Each grenade launcher may be rotated to the right or left (depending on what side of the vehicle they are on) 27 degrees, and to the opposite direction 5 degrees. The maximum elevation is +20 degrees and the maximum depression is -5.5 degrees. Each side of the turret has six 902-series "Tucha" smoke grenade launchers to provide obscuring smoke. The hull has lugs for ERA on the glacis and hull front and the side skirts, and the BMPT is equipped with an NPC overpressure system and radiation shielding. Each crewmember has their own hatch; the driver is in the center front, the commander/right AGS-30 behind the driver on the right, the left AGS-30 gunner behind the driver on the right, and the turret gunners with hatches on either side of the autocannon on the flat portion of the forward deck of the turret. Any crewmember except the driver may take control of all the weapons if necessary, or replace an injured or dead crewman without leaving his station. The BMPT can also function as a hunter/killer team, as the commander and gunner have independent sights and the commander's sight may move and rotate independently of the turret. The gunner normally uses the turret weapons, but the commander may take control of the turret from the gunner with an override switch.

Fence-type armor protects the vehicle from the rear, in addition to the normal armor; this functions as spaced armor, except that it stops only 1d6 damage instead of 2d6. Power is provided by a V-92S2 diesel engine developing 1000 horsepower. A 5kW APU is located in an armored box on the right side of the vehicle. The BMPT is equipped with a GLONASS-based land navigation system. The BMPT is equipped with a soft-kill APS; chief among this system is a laser-warning system that automatically fires smoke grenades in the direction of the laser's source. The BMPT is equipped with lugs for Relikt ERA on the hull front, turret sides, and hull sides. The BMPT may be fitted with a KMT-7 or KMT-8 mine plow. The crew has the protection of NBC Overpressure.

Future versions of the BMPT are planned, with different armament packages and possibly on different tank chassis. One of these is the BMPT-14 "Terminator-3," based on a T-14 Armata hull, but I have not found enough information on this variant to accurately stat it up.

Twilight 2000 Notes: This vehicle's existence was rumored as early as 1995, but examples were not seen until 1998, in Iran, China, and Poland. These versions were the T-72-based BMPTs; the T-90-based model was not built during the Twilight War.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
BMPT-72	\$1,005,981	D, G, AvG, A	877 kg	47 tons	5	40	Passive IR (D, G, C), Image Intensification (G, C), Thermal Imaging (G, C)	Shielded
BMPT-90	\$1,048,731	D, G, AvG, A	1.02 tons	55 tons	5	60	Passive IR (D, G, C), Image Intensification (G, C), Thermal Imaging (G, C)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
BMPT-72	150/105	42/29	1200	362	Trtd	T6	TF40Sp TS12Sp TR12Sp HF130Cp HS20Sp HR10Sp
BMPT-90	132/93	37/26	1200	362	Trtd	T6	TF40Sp TS12Sp TR12Sp HF180Cp HS30Sp HR18Sp

Vehicle	Fire Control	Stabilization	Armament	Ammunition
(Both)	+4	Good	30mm Autocannon, 2xPKT, NSVT, 4xAT-9 Launchers; 2xAGS-30 (Hull)	850x30mm, 600x30mm Grenades, 7000x7.62mm, 2000x12.7mm, 8xAT-9 ATGMs

MT-LB SNAR-10 Jaguar

Notes: This is an MT-LB armored personnel carrier with a dish and equipment for the SNAR-10 (NATO reporting name Big Fred) ground surveillance/counterbattery radar system. The radar is on a turntable at the rear of the vehicle and can be rotated 360 degrees. Maximum range for vehicle and structure detection is 16 km while for counterbattery work the range is 10 km. The vehicle has a radio dedicated to datalink duties with higher headquarters and usually has at least two other radios. The radar can be set up for work in 5.5 minutes with an experienced crew. Unlike the APC version of the MT-LB, the SNAR-10 is not amphibious, as the radar assembly unbalances the vehicle.

The engine of the MT-LB is a 240-horsepower YaMZ-238 diesel engine. This engine, while only modest in power for an armored vehicle, generates considerable torque and the MT-LB is capable of towing 6.5 tons. Like most Soviet-designed vehicles of the period,

the MT-LB's suspension is of conventional torsion bars and has shock absorbers on the first and last set of roadwheels. Construction of the MT-LB is largely of steel and armor is rather thin, especially on the sides and rear. The machinegun cupola is retained; the turret uses 360-degree manual traverse, and the machinegun has manual elevation from +30 to -5 degrees. The commander has a hatch between his position and the driver's; the turret has no hatch. The driver can replace his front vision block with a night vision block, and the commander has a small, short-range WL/IR searchlight with a range of about 40 meters; this is primarily to aid the driver when driving at night. The engine is in the front of the vehicle. A small aisle between the commander and driver gives access to the troop compartment.

The SNAR-10M Pantera is an upgraded version of the SNAR-10. This radar has a range of 40 kilometers for vehicles and structures and 25 km for counterbattery work. The SNAR-10M is capable of detecting low-flying helicopters, aircraft, and drones.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
SNAR-10 Jaguar	\$220,664	D, A	680 kg	12.6 tons	5	12	Radar, Passive IR (D), WL/IR Searchlight	Shielded
SNAR-10M Pantera	\$589,964	D, A	726 kg	12.7 tons	5	12	Radar, Passive IR (D), WL/IR Searchlight	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
SNAR-10 Jaguar	136/95	38/27	450	100	Trtd	T2	TF2 TS2 TR2 HF5 HS2 HR2
SNAR-10M Pantera	136/95	38/26	450	100	Trtd	T2	TF2 TS2 TR2 HF5 HS2 HR2

Fire Control	Stabilization	Armament	Ammunition
None	None	PKT	2000x7.62mm

VTZ Kirov PT-76

Notes: This light scout tank was developed shortly after World War 2, going into service in 1950. In most of the Warsaw Pact, various reconnaissance models of the BMP-1, BMP-2, and BMP-3 have long replaced it, but it is still quite common in other parts of the world, being used in countries ranging from Vietnam to Cuba. The PT-76 chassis also formed the basis of the BTR-50 series armored personnel carriers. The chassis is a boat-hulled design for full amphibious mobility, and topped by a turret mounting the same 76.2mm D-56T gun used in the T-34 tank of World War 2, though ammunition has been upgraded over the years. In addition, any one PT-76 is about 50% likely to have a mount on the turret roof for a DShK machinegun. The PT-76 is powered by a 19.1L 240-horsepower diesel engine. There is a three-man crew, with the commander also acting as the gunner and radio operator. (His hands are therefore full in combat.) The driver is on the center front, while the commander is on the left side of the gun and the loader on the right. The commander and loader have a large oval double hatch on the turret roof which opens to the front. Under the driver's seat is an emergency exit which can also be used to pick up a casualty from the battlefield. The commander has a TPKU-2B day vision periscope which also has an illuminated reticule and can be rotated 360 degrees. His gunner sights are 4x and a sight/rangefinder. The loader has a simple vision block to assist him in firing the coaxial machinegun. At the rear of the PT-76 are four mounts for external long-range fuel tanks. The PT-76 is equipped with a gyro compass and an extendible long-range antenna. Though the PT-76 has been steadily upgraded over the years, it is a dated design.

In 1957, the PT-76's design was updated, with the D-56T gun being replaced with the D-56TM – incorporating a double-baffle muzzle brake and a fume extractor. (The fume extractor is at the rear of the turret.) PT-76s already in service had their guns updated. In addition, ground clearance was raised by 13 centimeters by beefing up the suspension, enhancing off-road mobility and making entrance to water easier. A collective NBC system was fitted. Finally, new radios were installed and better night vision gear replaced the Active IR sensors and IR searchlight combination (though the searchlight was retained).

In 1957, the earlier models were replaced by the PT-76B. This version used the improved D-56TS main gun, which had the double-baffle muzzle brake, fume extractor, and a cartridge ejector. The gun also had one-axis stabilization. The PT-76B also has a collective NBC system for the crew and radiation liners in the armor walls. It has an automatic fire extinguishing system, an improved gunsight, a filtration-ventilation system, and improved vision blocks. The PT-76B has a new engine developing 263 horsepower; this engine is essentially half of the V-12 used on the T-54 MBT. Additional internal fuel tanks were fitted, and it makes a PT-76B identifiable due to the change in the shape of the hull armor, which is bulged slightly. A recent upgrade replaces the engine with a V-6M developing 300 horsepower.

The PT-76A is a PT-76B with a circular, rotating mount for a DShK heavy machinegun at the commander's hatch and separate hatches for the commander and loader. The PT-76K is a PT-76B command variant with an additional long-range radio, additional antenna, and a 1.5kW generator on the rear deck in an armored box.

The PT-85 (not to be confused with the North Korean Type 82 or the Israeli up-gunned PT-76) is a PT-76 armed with an 85mm gun. It first appeared during the invasion of Czechoslovakia in 1968. The PT-90 (again, not to be confused with the Israeli up-gunned PT-76) was armed with the 90mm D-62 main gun; it did not get out of the technical design phase.

The PT76RKh is a PT-76B converted for the NBC Reconnaissance role. In this role, some of the ammunition storage is replaced

with a second long-range radio and NBC gear such as a pair of Geiger counters (set to detect different radiation) and chemical sniffers (several, to detect different agents). There is also a mini-lab for diagnosis of samples taken (which must be taken by dismantled crews). The PT-76RKh also carries a complete NBC suit spare for each crew member. The cupola has a dome above it to allow observation without breaking NBC seals. At the rear of the vehicle is a flag dispenser with 40 flags. The PT-76RKh is protected by an NBC Overpressure system.

The PT-76M may refer to two different variations of the PT-76. The Russian variant was designed for the Naval Infantry, but as this PT-76M did not have the technical enhancements of the PT-76B, the Naval Infantry snubbed the PT-76M in favor of the PT-76B. This PT-76M has an enlarged hull with flotation cells, allowing for more freeboard and a higher amphibious speed.

The second PT-76M was fielded by Belarus and is a variant of the PT-76A with a 300-horsepower engine.

Just to be more confusing, the Indonesian Marines fielded the Israeli up-gunned PT-76, calling it initially the PT-76(M) and later the PT-2000. This version is fitted with a Cockerill Mk 3 90mm main gun, an FN MAG as a coax, and another FN MAG mounted on a pintle mount by the commander's station. The main gun sight has been upgraded including a laser rangefinder and ballistic computer, and the vehicle is powered by a 300-horsepower Detroit Diesel 6V92T engine. For a short time, the IDF used this variant of the PT-76, calling it the PT-71 (not to be confused with the PT-71 below). A further proposed upgrade of the PT-2000 includes a Cockerill LCTS 90MP turret with the same Cockerill Mk 3 main gun with the enhancement of an autoloader. This main gun would also be able to launch Ukrainian-made Falrick-90 ATGMs. This upgrade would also include a Cummins 400-horsepower VT400 engine, and an Allison automatic transmission. The upgrade would also include a Zaslon-L hard kill APS, a Bazalt inertial land navigation system, and frequency-hopping radios by Harris. This additional upgrade has been delayed indefinitely due to the Russo-Ukrainian War.

"PT-71" was the unofficial designation for a PT-76 (1957) equipped with an external AT-3 Maljutka ATGM mounted by the commander's hatch, similar to the mounting on the BMP-1. Some main gun ammunition storage was sacrificed to provide space for reload missiles.

The PT-76E is fitted with a new turret armed with a 57mm autocannon and a commander's machinegun with separate hatches for the commander and loader. The engine may be a 300-horsepower UTD-20 multifuel engine, a 350-horsepower UTS-23 multifuel engine, or a 420-horsepower V-6BF diesel engine. 40-60 PT-76Es are in use by the Russian Naval Infantry. The PT-76E is not to be confused with the fictional PT-57 in Best Light Combat Vehicles That Never Were.

The PT-76 was used in some numbers by the OPFOR at NTC at Ft Irwin in California. They were modified by replacing the engine with a more reliable Caterpillar 300-horsepower diesel. As the exhaust system of the Caterpillar engine was very different than the original, the exhaust system outlets where the waterjets once were, robbing the NTC's PT-76s of their amphibious capability.

The PT-76 was involved in a notable first – a North Vietnamese example was the first combat kill of the TOW missile, in Apr 1972. The PT-76 was used by some 41 operators, with about 20 still using them.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
PT-76	\$211,304	D, A	520 kg	14.6 tons	3	10	Active IR (D), WL/IR Searchlight	Enclosed
PT-76 (1957)	\$215,384	D, A	524 kg	14.61 tons	3	10	Passive IR (D), WL/IR Searchlight	Enclosed
PT-76B	\$243,052	D, A	528 kg	14.66 tons	3	10	Passive IR (D), WL/IR Searchlight	Shielded
PT-76B (300 hp)	\$243,164	D, A	530 kg	14.75 tons	3	10	Passive IR (D), WL/IR Searchlight	Shielded
PT-76A	\$255,482	D, A	528 kg	14.73 tons	3	10	Passive IR (D), WL/IR Searchlight	Shielded
PT-76K	\$236,902	D, A	527 kg	14.69 tons	3	11	Passive IR (D), WL/IR Searchlight	Shielded
PT-85	\$278,375	D, A	538 kg	14.8 tons	3	10	Passive IR (D), WL/IR Searchlight	Shielded
PT-90	\$292,463	D, A	544 kg	14.92 tons	3	10	Passive IR (D), WL/IR Searchlight	Shielded
PT-76M (Russia)	\$248,208	D, A	538 kg	14.8 tons	3	10	Passive IR (D), WL/IR Searchlight	Enclosed
PT-76M (Belarus)	\$255,594	D, A	531 kg	14.82 tons	3	10	Passive IR (D), WL/IR Searchlight	Shielded
PT-76RKh	\$462,291	D, A	278 kg	15.18 tons	3	13	Passive IR (D), WL/IR Searchlight	Shielded
PT-2000/PT-71	\$258,650	D, A	551 kg	15.11 tons	3	11	Passive IR (D, G)	Shielded
PT-2000 (Upgraded)	\$335,265	D, A	545 kg	15.18 tons	3	13	Image Intensification (D, G, C), Thermal Imaging (G)	Shielded
"PT-71"	\$221,648	D, A	522 kg	14.57 tons	3	11	Passive IR (D), WL/IR Searchlight	Shielded

PT-76E (300 hp)	\$209,787	D, G, AvG, A	543 kg	15.44 tons	3	10	Passive IR (D, G), WL/IR Searchlight	Shielded
PT-76E (350 hp)	\$209,934	D, G, AvG, A	546 kg	15.56 tons	3	10	Passive IR (D, G), WL/IR Searchlight	Shielded
PT-76E (420 hp)	\$210,142	D, A	552 kg	15.73 tons	3	10	Passive IR (D, G), WL/IR Searchlight	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor					
PT-76	122/85	34/24/8	250+180	71	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76 (1957)	122/85	34/24/8	250+180	71	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76B	130/91	36/25/8	400+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76B (300 hp)	144/101	40/28/9	400+180	89	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76A	130/91	36/25/8	400+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76K	130/91	36/25/8	400+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-85	129/91	36/25/8	400+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-90	129/90	36/25/8	400+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76M (Russia)	129/91	36/25/9	250+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76M (Belarus)	144/101	40/28/9	400+180	89	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76RKh	130/91	36/25/8	400+180	78	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-2000/PT-71	141/99	39/27/9	400+180	89	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-2000 (Upgraded)	178/124	49/35/11	400+180	118	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
"PT-71"	122/86	34/24/8	400+180	71	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76E (300 hp)	139/97	39/27/9	400+180	89	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76E (350 hp)	156/109	43/30/10	400+180	104	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4
PT-76E (420 hp)	180/126	50/35/12	400+180	124	Trtd	T3	TF12	TS4	TR4	HF12	HS6	HR4

Vehicle	Fire Control	Stabilization	Armament		Ammunition
PT-76	+1	Basic	76.2mm D-56T Gun, SGMT		40x76.2mm, 1000x7.62mm
PT-76 (1957)/PT-76M (Russia)	+1	Basic	76.2mm D-56TM Gun, SGMT		40x76.2mm, 1000x7.62mm
PT-76B	+2	Fair	76.2mm D-56TS Gun, PKT		41x76.2mm, 1000x7.62mm
PT-76A/PT-76M (Belarus)	+2	Fair	76.2mm D-56TS Gun, PKT, DShK (C)		41x76.2mm, 1000x7.62mm, 600x12.7mm
PT-76K	+2	Fair	76.2mm D-56TS Gun, PKT		36x76.2mm, 1000x7.62mm
PT-85	+2	Fair	85mm D-58 Gun, PKT		37x85mm, 1000x7.62mm
PT-90	+2	Fair	90mm D-62 Gun, PKT		35x90mm, 1000x7.62mm
PT-76RKh	+2	Fair	76.2mm D-56TS Gun, PKT		22x76.2mm, 1000x7.62mm
PT-2000	+2	Fair	90mm Cockerill Mk 3, MAG, MAG (C)		38x90mm, 2000x7.62mm
PT-2000 (Upgraded)	+3	Fair	90mm Cockerill Mk 3M, MAG, MAG (C)		38x90mm, 2000x7.62mm
"PT-71"	+1	Basic	76.2mm D-56TM Gun, SGMT, AT-3 ATGM Launcher		36x76.2mm, 1000x7.62mm, 3xAT-3 ATGM
PT-76E	+2	Fair	57mm AU-220M Autocannon, PKT, NSVT (C)		150x57mm, 1000x7.62mm, 600x12.7mm

KAFV 90 (Korean Armored Fighting Vehicle)

Notes: This is a scout/fire support variant of the Korean Infantry Fighting Vehicle. The turret of the KIFV is replaced with one mounting a 90mm Cockerill cannon, and more internal space is given over to ammunition storage and communications equipment. Less space is given for passengers, and only a small scout team is normally carried. The engine is the D-2848T 350-horsepower engine, which is a turbocharged engine able to burn diesel or JP8 jet fuel. The transmission is the Allison X200-5K automatic transmission. A beefed up suspension is fitted that gives a smoother ride over rough terrain, and there is increased drive train and suspension tolerance to temperature extremes. The driver is seated on the front left, and has a conventional steering yoke with a brake and gas pedal. The driver has three vision blocks to his front and one to the right; the center front vision block be removed and replaced by a night vision block. A bank of six smoke grenade launchers is found on the center front hull, just below above the trim vane when it is in its stowed position. The KAFV 90 has one firing port in each side of the hull, one in the rear door (on the left side of the ramp), and another in the ramp to the right of the door; these firing ports can take the M231, CAR-15, MP5, M16 series, M4 series, K2, K1A1, M249 SAW, or K3 SAW. The rear door is part of a powered ramp, and the troop compartment also has a large hatch on the rear deck, opening to the rear. The turret is a modified CTG-90 turret which has 22 rounds of main gun ammunition stored in the turret and the rest stored in the hull, and all the machinegun ammunition is stored in the turret. The gunner's sight has indirect as well as indirect fire sights. Elevation of the main armament is +28 and -8 degrees.

Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
\$412,956	D, A	571 kg	15 tons	4+3	10	Passive IR (D, G, C), Thermal Imaging (G)	Shielded

Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
161/112	45/31/5	400	102	Trtd	T3	TF6Sp TS6Sp TR6 HF12Sp HS8Sp HR4*

Fire Control	Stabilization	Armament	Ammunition
+2	Good	90mm Cockerill Mk 3MA1, K12, M2HB (C)	44x90mm, 950x7.62mm, 600x.50

*Belly armor for these vehicles is 5; deck armor is 3.

Taiwanese M41 Variants

Notes: Taiwan, in the spirit of “any combat vehicle is better than none,” upgraded their M41A3s in the mid-1990s, turning them into much more capable combat vehicles than their M41A3 predecessors ever were. They began by replacing their M32 main guns with the 76mm M32K1 variant of the M32, an indigenous development of the M32. The M32K1 variant has a fume extractor and a different muzzle brake, allowing it to fire the new 76mm APFSDS rounds that had been developed for M32-type 76mm guns. Fire control has been significantly upgraded, with a laser rangefinder and ballistic computer. The M41D is equipped with a thermal imager which allows the commander to view through the gunner’s night sights, though it is not a hunter-killer thermal imager. The M41D has lugs for ERA on the turret front, turret sides, hull front, and hull sides. The vehicle is fitted with armored side skirts protecting the upper track and hull sides; these skirts also serve to keep dust down. The M41D is powered by a 405-horsepower 8V-71T diesel engine which, while it does not have the raw power of an M41A3’s engine, it is much less fuel-hungry. This is accentuated by the larger fuel tanks of the M41D. The engine is coupled to a CD500 automatic transmission. The coaxial armament of the M41D is the Type 74 (or T74) machinegun, which is a locally manufactured version of the MAG.

The Type 65 (or T65) is a variant of the M41D which has thick applique armor on the hull front and sides and a new cast turret which is also much more heavily armored. The coaxial machinegun is a locally manufactured version of the M60E2 instead of the Type 74 of the M41D. The cast turret’s interior dimensions are smaller than those of the M41D, which can increase crew fatigue.

The M41D and Type 65 are currently in service with the Taiwanese Army only in small numbers; Taiwanese M41A3s have recently been retired and the M41D and Type 65 are probably soon to follow.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M41D	\$408,096	D, A	509 kg	25 tons	4	16	Passive IR (D, G, C), Image Intensification (G, C) Thermal Imaging (G, C)	Enclosed
Type 65	\$410,242	D, A	506 kg	26.4 tons	4	16	Passive IR (D, G, C), Image Intensification (G, C) Thermal Imaging (G, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M41D	121/85	34/24	760	120	Trtd	T4	TF12 TS8 TR6 HF12 HS8Sp HR6
Type 65	116/81	32/23	760	120	Trtd	T4	TF16Sp TS10Sp TR6 HF16Sp HS10Sp HR6

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M41D	+3	Fair	76mm M32K1 gun, Type 74, M2HB (C)	65x76mm, 5000x7.62mm, 2175x.50
M551A1	+3	Fair	76mm M32K1 gun, M60E2, M2HB (C)	65x76mm, 5000x7.62mm, 2175x.50

FMC Lynx Reconnaissance Vehicle

Notes: The Lynx was originally called the M113 ½ by FMC, and it competed against the General Motors M114 for US Army requirements in the early 1960s and lost to that vehicle for the US Army contract. (Quite simply, the M114 had a cheaper RL cost.) The US Army then released the vehicle for export sales, and when they sold the vehicles to Canada, Canada chose the name Lynx for the vehicle, and it stuck for further export sales. Though tangentially related to the M114, as both are based on the M113, it is not simply another variant of the M114. However, like the M114, the Lynx uses a shortened version of the M113's suspension, and also uses the same General Motors 6V53 212 horsepower engine as the M113. It uses the same aluminum armor as the M113 and the same driver controls and transmission. It is much lighter and therefore much more agile than the M113. It is amphibious and uses the same preparation and flotation system as the M113! it also has the same poor freeboard as the M113.

The Lynx has a crew of three, including a commander, driver, and RTO/observer. The driver is on the front left. On Dutch versions of the Lynx, the RTO is on the front right, and the commander is at the center of the vehicle in a cupola with a machinegun that can be aimed and fired (but not reloaded) from under armor. (Dutch versions are known as the M113 C&V.) On Canadian Lynxes, the commander's cupola is in the middle right, and the RTO is on the rear left; the cupola is otherwise the same as on Dutch M113 C&Vs. In both cases, the RTO has a pintle-mounted MAG machinegun. Dutch M113 C&Vs later had their cupolas replaced with an Oerlikon GBD-ADA turret mounting a 25mm KBA autocannon. Dutch M113 C&Vs and Canadian Lynxes also have numerous small differences in internal arrangements, radios, etc.

Canadian Lynxes were withdrawn from service in 1993, and Dutch Lynxes shortly thereafter. Both countries passed their Lynxes on to further export customers, most notably Bahrain and Chile. Other users of the Lynx include Iran. The US tested both Canadian and Dutch 25mm-armed variants, and Britain also tested the Canadian variant. Canadian Lynxes are also liberally scattered around Canada in static displays or running examples, and in museums. They are also found in private collections in the US and Canada. By and large, however, most Lynxes were scrapped or became range targets. M113 C&Vs are largely still in service with export countries or in storage in the Netherlands, though some have also become range targets.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
Lynx	\$83,313	D, A	262 kg	8.77 tons	3	8	Passive IR (D)	Shielded
M113 C&V	\$207,663	D, A	314 kg	9.07 tons	3	9	Passive IR (D, C), Image Intensification (C)	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
Lynx	166/116	46/32/4	300	124	Std	T2	HF6 HS4 HR4
M113 C&V	161/113	45/31/4	300	124	CiH	T2	TF2 TS2 TR2 HF6 HS4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
Lynx	+1	Basic	M2HB (C), MAG (RTO)	1200x.50, 3000x7.62mm
M113 C&V	+1	Basic	25mm KBA Autocannon, MAG (RTO)	600x25mm, 3000x7.62mm

ACF Industries M3 Stuart

Notes: The M3 was a design evolved from the earlier M2 light tank in the 1930s. They were used by the Allies; after World War 2, many of them were bought by Latin American and other countries, some of which still use them to this day. About 1500 of these vehicles were built with diesel instead of gasoline engines. The M3 is generally inadequate for modern antitank use, and most of them are used as infantry support vehicles.

Most M3s were built powered by a Continental W-670 radial 240-horsepower gasoline engine, or with a Guiberson T-1020 250-horsepower diesel engine. Both of these were originally developed as aircraft engines. These radial engines were at the rear of the vehicle, with the transmission at the front; the drive shaft went through the fighting compartment and took a lot of the crew's space and it contributed to the M3's relatively high profile (some 2.5 meters). When a revolving turret floor was introduced on the hybrid M3 and the M3A1, this problem got worse. Other differences in the M3A1 include a new turret and removal of the driver's machineguns for more ammunition space for the main gun. Extra fuel tanks may be added to improve the range. (Some M3s were fitted with the M3A1's turret but not the turret basket. These were referred to as M3 Hybrids.)

The M3A3 introduced a transfer case that took up a lot less room in the fighting compartment and was quieter and cooler, but this arrangement had a lot more weight. The M3A3 used the Continental W-670 exclusively. It has a new turret, and the hull is stretched to allow for more ammunition carriage, more internal fuel, and better suspension. These vehicles were not built with diesel engines.

The M5 has twin Cadillac V8 gasoline automotive engines developing a total of 220 horsepower instead of the modified aircraft radial of the M3. This was done to relieve aircraft engine manufacturers of pressure. The M5 has the improved transfer case of the M3A3. It also has improved frontal turret armor. The M5A1 has an improved ammunition storage layout and the turret of the M3A3. The automatic transmission introduced on the M5 eased crew training and fatigue. Though the main criticism of the M3 was its lack of firepower, the same 37mm gun was used, though the improved M6 gun supplanted the M5.

All told, the M3 and M5 took part in some 15 conflicts from World War 2 to the War in Angola, and served with 33 countries. The M3 is still on the active vehicles list of Paraguay in 2024, used in a training role. The M5 probably should have been the M4, but this designation was skipped on the Stuart in order to avoid confusion with the M4 Sherman tank.

Other Variants

All variants of the M3 and M5 themselves had subvariants which were developed as command vehicles. These had hulls with an upgraded electrical bus to allow for the installation of several radios (usually two long-range and a short-range radios). The turret was deleted and the space used to install the radios. The turret is replaced by a small superstructure, topped with an M2HB machinegun on a pintle. Diesel versions of these Stuarts were not produced. The M5 and M5A1 Command Tanks are identical for game purposes.

In 1943, the US Navy Seabees converted 24 M3A1s for the US Marines for use in the Pacific campaigns. The 37mm cannon was mostly removed, with the entire action removed and all but about one-quarter of the gun barrel chopped off. Into this was fitted a Ronson flame gun, and a shroud was built around the barrel of the Ronson, which looked like a severely shortened 75mm gun. The coaxial M1919A4 was retained. This was hooked up to a 644-liter fuel tank, which produced about two minutes of flame-on time total. The turret in which the Ronson gun was mounted could be traversed up to 10 degrees left and 80 degrees right of center, and at an elevation range from +18 to -15 degrees. Armor could not be rigged up for the flame gun mount and this provides a small weak point in the front of the turret, though an enemy soldier would have to use an aimed shot to have a chance to hit it. The crew was reduced to two: the commander/gunner and the driver – there was simply no room for anyone else with the large fuel tank. The modified Stuarts were christened “Satan” by their crews, though this was an unofficial name.

The reasonable success and continued lack of availability of M4 Shermans for conversion to flame tanks led to the conversion of the M5A1 to a flame tank, using lessons learned from the Satans. This led to the E7-7 Mechanized Flamethrower. This designation came from its flamethrower gun, the E7-7. The E7-7's unofficial nickname was the Quickie, due to the haste in which it was designed. It was designed in a similar manner to the Satan, but with improvements, most notably in the turret, which could rotate a full 360 degrees. This was partially accomplished by moving the power traverse controls to the turret bustle; because of this placement, the radio was moved to the right sponson, replacing the hull machinegun. The turret basket was made cylindrical instead of the standard conical basket; this allowed the placement of some of the flamethrower fuel tanks. This meant that the internal equipment and ammunition storage had to be rearranged. The armor weak point at the flame gun was eliminated. Crew was reduced to three – the driver, the assistant driver/bow gunner, who would also operate the radio, and the commander/gunner. Only four E7-7's would be produced and sent to battle; more heavily armed Japanese tanks had made the M3 light tanks obsolete by this time.

Other experiments and jury-rigged flamethrower tanks were developed from the Stuart. The ESR1-M3 series was developed from M3A1s and M5A1s by replacing the bow machinegun with a modified M1A1 portable flamethrower and a pair of five-gallon fuel tanks installed on the floor of the fighting compartment. Early attempts had problems with the components coming apart due to the vibrations of the vehicle, and initial offerings were steadily improved upon, though these improvised flame guns never had rock steady reliability. They also suffered from the short range of their personnel flamethrower roots, but they achieved their purpose of shielding the gunners from small arms fire long enough to apply the flamethrower stream and burn out the enemy. However, they were never an official issue and were only field improvisations, a sort of substitute standard at best.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M3 (Early)	\$93,792	G, A	319 kg	12.8 tons	4	12	Headlights	Enclosed
M3 (Hybrid)	\$93,792	G, A	319 kg	12.7 tons	4	12	Headlights	Enclosed
M3 (Hybrid, Diesel)	\$93,820	D, A	320 kg	12.7 tons	4	12	Headlights	Enclosed
M3A1	\$91,780	G, A	320 kg	12.9 tons	4	12	Headlights	Enclosed
M3A1 (Diesel)	\$91,808	D, A	321 kg	12.9 tons	4	12	Headlights	Enclosed
M3A3	\$101,396	G, A	323 kg	14.7 tons	4	12	Headlights	Enclosed
M5	\$116,140	G, A	320 kg	15 tons	4	12	Headlights	Enclosed
M5A1	\$118,540	G, A	320 kg	15.2 tons	4	12	Headlights	Enclosed
M3 Command	\$67,330	G, A	317 kg	12.1 tons	4	12	Headlights	Enclosed
M3A1 Command	\$68,898	G, A	317 kg	12.19 tons	4	12	Headlights	Enclosed
M3A3 Command	\$69,380	G, A	321 kg	13.89 tons	4	12	Headlights	Enclosed
M5 Command	\$69,312	G, A	318 kg	14.18 tons	4	12	Headlights	Enclosed
M3A1 Satan	\$112,426	G, A	318 kg	16.55 tons	2	12	Headlights	Enclosed
M5A1 with ESR1-M3	\$128,942	G, A	321 kg	15.3 tons	4	12	Headlights	Enclosed
M3A1 with ESR2-M3	\$79,942	G, A	320 kg	13 tons	4	12	Headlights	Enclosed
E7-7 Quickie	\$112,174	G, A	295 kg	16.5 tons	3	12	Headlights	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor					
M3 (Early)	134/94	37/26	204	106	Trtd	T2	TF10	TS7	TR5	HF9	HS5	HR5
M3 (Hybrid)	135/95	38/26	204	106	Trtd	T2	TF10	TS7	TR5	HF9	HS5	HR5
M3 (Hybrid, Diesel)	139/97	39/27	204	68	Trtd	T2	TF10	TS7	TR5	HF9	HS5	HR5
M3A1 (Gas)	133/93	37/26	224+170	106	Trtd	T2	TF10	TS7	TR5	HF10	HS5	HR5
M3A1 (Diesel)	137/96	38/27	224+170	68	Trtd	T2	TF10	TS7	TR5	HF10	HS5	HR5
M3A3	121/85	34/23	416	106	Trtd	T2	TF10	TS7	TR5	HF10	HS5	HR5

M5	111/78	31/22	340	89	Trtd	T2	TF11	TS7	TR5	HF10	HS5	HR5
M5A1	110/77	31/21	340	89	Trtd	T2	TF11	TS7	TR5	HF10	HS5	HR5
M3 Command	140/98	39/27	204	106	CiH	T2	TF3	TS3	TR3	HF9	HS5	HR5
M3A1 Command	139/98	39/27	224	106	CiH	T2	TF3	TS3	TR3	HF10	HS5	HR5
M3A3 Command	126/88	35/25	416	106	CiH	T2	TF3	TS3	TR3	HF10	HS5	HR5
M5 Command	116/81	32/23	340	89	CiH	T2	TF3	TS3	TR3	HF10	HS5	HR5
M3A1 Satan	111/77	31/22	224+170	106	Trtd	T2	TF10	TS7	TR5	HF10	HS5	HR5
M5A1 with ESR1-M3	110/77	30/21	340	89	Trtd	T2	TF11	TS7	TR5	HF10	HS5	HR5
M3A1 with ESR2-M3	133/93	37/26	224+170	106	Trtd	T2	TF10	TS7	TR5	HF10	HS5	HR5
E7-7 Quickie	111/78	31/22	340	89	Trtd	T2	TF11	TS7	TR5	HF10	HS5	HR5

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M3 (Early)	None	Basic	37mm M5 gun, M1919A4, M1919A4 (D), M1919A4 (C)	103x37mm, 8270x.30-06
M3 (Hybrid, Both)	None	Basic	37mm M6 gun, M1919A4, M1919A4 (D), M1919A4 (C)	103x37mm, 8270x.30-06
M3A1 (Both)	None	Fair	37mm M6 Gun, M1919A4, M1919A4 (D), M1919A4 (C)	106x37mm, 7220x.30-06
M3A3	None	Fair	37mm M6 Gun, M1919A4, M1919A4 (D), M1919A4 (C)	174x37mm, 7500x.30-06
M5	+1	Fair	37mm M6 Gun, M1919A4, M1919A4 (D), M1919A4 (C)	123x37mm, 6250x.30-06
M5A1	+1	Fair	37mm M6 Gun, M1919A4, M1919A4 (D), M1919A4 (C)	147x37mm, 6750x.30-06
M3/M5 Command	None	None	M2HB (C)	1000x.50
M3A1 Satan	None	None	Ronson Flame Gun, M1919A4	60xFlamethrower Fuel, 2000x.30-06
M5A1 with ESR1-M3	+1	Fair	37mm M6 Gun, M1919A4, ESR1-M3 Flame Gun (D), M1919A4 (C)	147x37mm, 4500x.30-06, 4xFlamethrower Fuel
M3A1 with ESR2-M3	None	Fair	37mm M6 Gun, M1919A4, ESR1-M3 Flame Gun (D), M1919A4 (C)	106x37mm, 4800x.30-06, 4xFlamethrower Fuel
E7-7 Quickie	None	None	E7-7 Flame Gun, M1919A4	37xFlamethrower Fuel, 3000x.30-06

Cadillac M24 Chaffee

Notes: After experience in North Africa and the Pacific Islands in World War 2, it was discovered that the M3 and M5 Stuart, designed before the War, were obsolete, especially in the M3 and M5's main armament, the 37mm M6. Design work began on a more heavily armed light tank; the design process was hampered by the fact that the desired armament, a 75mm gun, was too heavy to mount in a vehicle that was to weigh no more than 18 tons. After some experimentation, a compatible (with work) gun was found in the 75mm M6 gun, which began life as a gun in a B-25H gunship variant. The resulting gun was light in weight and had heavily buffered recoil. The gun was also stabilized in the elevation plane. The Chaffee was noted by its crews to be roomy, especially in the turret. The gun had both direct and indirect fire sights, with the direct fire sight being telescopic.

The commander had six all-around vision blocks in a manually rotating cupola, with an M2HB on a pintle mount. The driver had three vision blocks to the front and left, while the assistant driver had three to the front and right. The gunner also had a vision block to the front, while the loader has a pistol port and vision block on the right side of the turret. The M24 is not NBC sealed and does not have a collective NBC system, with the crew being dependent on their own protective masks and suits. The radio is mounted in the rear of the turret; on command tanks, another radio was mounted in front of the assistant driver. In both cases, the assistant driver operated the radio or radios. Though it is not included in the stats below, the Chaffee has brackets in the turret and hull for four M1 or M3 submachineguns, each next to the crewmembers' positions, along with 720 rounds of .45 ACP ammunition. There are also brackets for eight hand grenades. Also mounted in the turret is a M3 two-inch smoke mortar, with space for 14 rounds of ammunition. (The smoke mortar was deleted after World War 2, replaced by smoke grenade launchers.) There are also brackets for signal flags.

The engine is the same as on the M5 Stuart – a twin Cadillac 16-cylinder (double V8) 220-horsepower gasoline engine. This is coupled to a hydromatic synchromesh automatic transmission. Steering is by controlled differential. The Chaffee is capable of excellent speed in reverse, able to back up at half the maximum speed forward. The tracks are wide and the Chaffee's ground

pressure is remarkably low. It can be further lowered by adding grousers to the tracks. The turret itself has no basket; the seats for the commander, gunner and loader are attached to the turret.

In addition to the US, the M24 was supplied to Britain during World War 2. After the war, it was distributed to a wide number of users. The Chaffee, however, is out of service in all countries, with Uruguay being the last country to retire their Chaffees in 2019.

Taiwanese Chaffees have their 75mm guns replaced by French 90mm guns, their M1919A4s replaced by MAG machineguns, and plug-ins for the crewmembers' protective masks. Some of these vehicles have had their bow machineguns replaced by flamethrowers. Various countries have replaced their M24's engines with more up to date or more powerful engines; these replacements are too numerous to mention or stat out, and I do not have enough information about all of these engine changes. The French and other countries replaced some of their Chaffee's turrets with AMX-13 turrets. (AMX-13s with Chaffee turrets were also made, in small numbers; this will not be covered here.) Uruguayan M24s have had their engines replaced by 230-horsepower Saab-Scania DN11 diesel engines, and their transmissions replaced with a more reliable GAV 762 automatic transmission., In some cases their main guns were replaced with 76mm high-velocity guns able to fire APFSDS rounds. (This gun swap was also a common upgrade in some other countries.) The Uruguayan M24s were kept in service until 2019, for an incredible nearly 80 years of service. The Chileans upgraded the guns on their M24s in the 1980s, replacing them with the Israeli 60mm HVMS autocannon, a gun which nearly has the effectiveness of a 90mm gun. The Chileans operated this version until 1999.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M24	\$167,250	G, A	447 kg	18.37 tons	5	16	Headlights	Enclosed
M24 (Taiwanese)	\$237,186	G, A	457 kg	18.75 tons	5	16	Headlights	Enclosed
M24 (Flamethrower)	\$291,074	G, A	456 kg	18.9 tons	5	18	Headlights	Enclosed
M24/AMX-13	\$243,872	G, A	470 kg	17.41 tons	4	13	Headlights	Enclosed
M24 (Uruguay)	\$200,499	D, A	447 kg	18 tons	4	14	Headlights	Enclosed
M24 (Chile)	\$179,434	D, A	368 kg	17.84 tons	3	14	Headlights	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M24	97/68	27/19	416	89	Trtd	T3	TF9 TS5 TR5 HF10 HS4 HR4
M24 (Taiwanese)	96/67	27/19	416	89	Trtd	T3	TF9 TS5 TR5 HF10 HS4 HR4
M24 (Flamethrower)	95/67	26/19	416	89	Trtd	T3	TF9 TS5 TR5 HF10 HS4 HR4
M24/AMX-13	101/71	28/20	416	89	Trtd	T3	TF5 TS4 TR3 HF10 HS4 HR4
M24 (Uruguay)	102/71	28/20	416	68	Trtd	T3	TF9 TS5 TR5 HF10 HS4 HR4
M24 (Chile)	102/72	28/20	416	68	Trtd	T3	TF9 TS5 TR5 HF10 HS4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M24	+1	Fair	75mm M6 gun, M1919A4, M1919A4 (Bow), M2HB (C)	48x75mm, 3750x.30-06, 440x.50
M24 (Taiwanese)	+2	Fair	90mm CN90 F3 Gun, MAG, MAG (Bow), M2HB (C)	44x90mm DEFA. 3750x7.62mm, 440x.50
M24 (Flamethrower)	+2	Fair	90mm CN90 F3 Gun, MAG, Type 67M Flamethrower (Bow), M2HB (C)	44x90mm DEFA, 2500x7.62mm, 20xFlamethrower Fuel, 440x.50
M24/AMX-13	+2	Fair	90mm CN90 F3 Gun, AAT-F1, M1919A4 (Bow)	44x90mm DEFA, 1875x7.62mm, 1875x.30-06
M24 (Uruguay)	+2	Fair	76mm GT4 Gun, MAG, M2HB (C)	52x76mm, 3750x7.62mm, 440x.50
M24 (Chile)	+2	Fair	60mm HVMS Autocannon, MAG, M2HB (C)	140x60mm HVMS, 2750x7.62mm, 440x.50

Cadillac M41 Walker Bulldog

Notes: This is a US-built light tank of 1950s vintage, though it missed the Korean War by about a month, and it is possible that M41s reached the Korean Peninsula just as hostilities ceased. The M41 would later see extensive combat use in Vietnam, the Sino-Vietnamese War, and the Guatemalan Civil War, among several other wars; some unusual actions included the Bay of Pigs Invasion and the 2005 Thai coup d'état. Most were later heavily modified with external stowage, range finders, or even lugs for reactive armor. There are now few countries using the Walker Bulldog, though more keep them in Reserve status.

The M41 is the basic version, being a standard sort of light tank, with thin armor and a reasonably effective main gun, designed for the reconnaissance and scouting role rather than to engage in direct combat. It is equipped with the M32 76mm gun, a gun designed to be heavily buffered and not stress the light chassis too much, allowing for the crew to better take follow-up shots. The gun mount also incorporates a coaxial machinegun. The turret has a built-in coincidence rangefinder, with heads on each side of the turret sides, towards the front. The gun is stabilized in the vertical plane. The assistant driver/radio operator position has been deleted, with ammunition stowage taking his place along with a more easily used radio. The turret has an electrical drive to power the traverse, eliminating the hand cranking of earlier light tanks. The M41 is powered by a 500-horsepower AOS-895-3 gasoline engine, and coupled to an automatic transmission. Armor is of all-welded steel, and as stated, deliberately not especially heavy, though it is better

armor than the Chaffee it replaced.

The M41A1 version corrects the over 4000 technical and engineering issues that the US Army identified during testing of the M41. Most notable among these changes is rearranged ammunition storage, greatly increasing the ammunition load carried. Though not quantifiable in game terms, the main gun is upgraded to an M32A1, which can be reloaded slightly faster than the M32 of the M41, and be laid on target slightly faster (the GM may want to take this into account in tight situations). The M41A2 is equipped with a much less fuel-hungry AOS-895-5 fuel injection version of the M41's engine, power traverse for the commander's cupola, and the main gun has a pinion-gear elevation system, again increasing the speed with which the gun may be laid on target. The M41A3 upgrades M41A1s to the AOS-895-5 engine, and adds one of the first night vision systems fitted to an armored vehicle. These were the variants in service with the US and most export customers.

The M41 105, also known as the Bulldog/Stingray, is an M41 chassis topped with the complete turret of a Stingray medium tank. It was marketed by Cadillac Gage as an inexpensive upgrade to the M41, an upgrade with great bang for the buck, but it was not picked up by any user of the M41. This upgrade brings the M41 a 105mm L7 Low-Recoil Force gun able to fire all types of NATO 105mm ammunition and modern fire control systems as well as up to date gun stabilization.

The T49 is an M41 with a modified turret housing a 90mm T132E3 semi-smoothbore main gun. This is a medium recoil force gun with a fume extractor and a T-shaped muzzle brake. The T132E3 has the same space and weight profile as the M32 76mm gun. Military authorities proved to be uninterested in the design and it was not proceeded with into production.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M41	\$210,765	G, A	508 kg	23.5 tons	4	16	Headlights	Enclosed
M41A1	\$224,301	G, A	502 kg	23.7 tons	4	16	Headlights	Enclosed
M41A2	\$224,301	G, A	502 kg	23.7 tons	4	16	Headlights	Enclosed
M41A3	\$334,581	G, A	500 kg	23.75 tons	4	18	Active IR (D, G), IR Searchlight	Enclosed
M41 105	\$368,698	G, A	512 kg	22.53 tons	4	16	Passive IR (D, C, G), Image Intensification (C, G)	Enclosed*
T49	\$386,728	G, A	511 kg	23.85 tons	4	16	Active IR (D, G), IR Searchlight	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M41	150/105	42/29	530	223	Trtd	T4	TF12 TS8 TR6 HF12 HS6 HR6
M41A1	149/104	41/29	530	223	Trtd	T4	TF12 TS8 TR6 HF12 HS6 HR6
M41A2/A3	149/104	41/29	530	201	Trtd	T4	TF12 TS8 TR6 HF12 HS6 HR6
M41 105	155/108	43/30	530	201	Trtd	T4	TF32 TS11 TR10 HF12 HS6 HR6
T49	148/104	41/29	530	201	Trtd	T4	TF12 TS8 TR6 HF12 HS6 HR6

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M41	+1	Fair	76mm M32 gun, M1919A4, M2HB (C)	57x76mm, 5000x.30-06, 2175x.50
M41A1/A2	+1	Fair	76mm M32 gun, M1919A4, M2HB (C)	65x76mm, 5000x.30-06, 2175x.50
M41A3	+2	Fair	76mm M32 gun, M1919A4, M2HB (C)	65x76mm, 5000x.30-06, 2175x.50
M41 105	+2	Good	105mm L7 LRF Gun, M240C, M2HB (C)	32x105mm, 5000x7.62mm, 2175x.50
T49	+2	Fair	90mm T132E3 gun, M1919A4, M2HB (C)	55x90mm, 5000x.30-06, 2175x.50

*The turret is Shielded.

FMC M114 C&R

Notes: The M114 was based (somewhat loosely) on its larger brother, the M113 APC, but is a much smaller vehicle. The vehicle is sometimes called the M113 ½ or the Lynx, though the latter title more properly belongs to the M114 variant used by Canada and the Netherlands after the M114 ceased production. The M114 C&R (Command & Reconnaissance) was designed in 1960 as a scout and leader's reconnaissance vehicle, to serve as an armored alternative to the Jeeps typically used by scout units at the time. It looks very much like a shrunken M113, but is actually very different than the M113. The M114 is not an APC, and has no provision for troops other than its crew. It is about two-thirds the size of the M113, and only just over half its weight. The suspension components are perhaps the most like the M113, but the M114 has only four roadwheels instead of the M113's five. The engine is also smaller, a Chevrolet 283-V8 gasoline engine developing 160 horsepower. This engine is in the rear instead of the front. The rear door is round, and there is no ramp.

The standard M114 had the M2HB on a pintle on a cupola, and required the commander manning the machinegun to expose himself to possible enemy fire when using the M2HB. At the rear the one passenger had an M60 machinegun on a pedestal mount. The M114A1 changed the commander's machinegun mount to one that allowed him to aim and fire the M2HB from under armor, with the hatch closed. (He could not reload the machinegun from under armor.) The M114A2 had a hydraulically-powered cupola with an external mount for the M139 20mm autocannon, which was aimed and fired from within the vehicle, and contained all of its ammunition within the external mount. All M114s had a rack on the rear door for 3 M72 LAWs (not included below).

The M114 had a short service life with the US Army, ending service in 1979, branded as a failure, as it proved unsuited to US Army tactics and the conditions present in Vietnam. Some ended up as range targets (there was one on the LAW range at Ft Benning in

1984 when I went to Basic). Others were sold off, most notably to El Salvador, where they were eventually modified almost beyond recognition. Some were also sold or donated to various police departments in the US, Mexico, and Canada; some are still in police service, and one can be seen in the movie *Die Hard*.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M114	\$81,710	G, A	202 kg	6.8 tons	3	4	Passive IR (D)	Enclosed
M114A1	\$82,527	G, A	200 kg	7 tons	3	4	Passive IR (D)	Enclosed
M114A2	\$159,534	G, A	226 kg	7.2 tons	3	5	Passive IR (D, C)	Enclosed

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M114	161/113	45/31/4	303	71	Std	T2	HF9 HS4 HR4
M114A1	158/110	44/31/4	303	71	Std	T2	HF9 HS4 HR4
M114A2	154/108	43/30/4	303	71	CIH	T2	TF2 TS2 TR2 HF9 HS4 HR4

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M114	None	None	M2HB (C), M60 (R)	1000x.50, 3000x7.62mm
M114A1	None	None	M2HB (C), M60 (R)	1000x.50, 3000x7.62mm
M114A2	+1	Basic	20mm M139 Autocannon, M60 (R)	650x20mm, 3000x7.62mm

Cadillac Gage M551 Sheridan AR/AAV

Notes: This light tank was originally designed for scouting duties and to provide light firepower for airborne divisions in the US. Most leadership in the US Army felt that the M41 Walker Bulldog was too heavy to truly be a light tank, and that a new light tank design could incorporate some new technology and gun designs, and yet be decently protected and still come in as a light tank. At the same time, a replacement for the M56 Scorpion assault gun was sought, and it was felt that the new design could fulfill both the assault gun and scout tank roles. In the summer of 1960, the Cadillac design became the XM551 Sheridan AR/AAV (Armored Reconnaissance/Airborne Assault Vehicle). The AR/AAV designation came from the Army switching to one MBT concept instead of previous roles as light, medium, and heavy tanks; the Army felt that Congress would not want to fund two tank development programs, so the Army simply designated the XM551 as something else other than a tank. It was still a tank.

The US Marines briefly considered procuring the M551 to replace the Ontos, but then decided that the M551 would be too expensive. The M551 equipped the armor battalion of the 82nd Airborne Division, and some battalions of the 11th ACR, and later partially equipped most Cavalry battalions deployed to Vietnam. The M551s fared sorely in Vietnam, losing several to mines and RPG fire; in addition, heavy machinegun rounds could often penetrate the sides and rear of the Sheridan. M551s did not get stuck in mid and soft ground as often as M48 tanks, and the M551 was faster and more agile than the M48. Infantry appreciated the mobile firepower. The only combat parachute drops of the M551 occurred in 1989 in Panama; one burned in, but the shock value of the remaining three M551s upon the Panamanian forces was marked. Desert Storm in 1991 marked the only combat use of the Shillelagh missile, with six being fired and accounting for several antitank guns and a couple of T-55s. The M551s assigned to the 82nd Airborne acquitted themselves well in Desert Storm. After Desert Storm, several attempts were made to replace the M551 with various vehicle programs, all of which were cancelled before achieving any concrete results. The M551 was retired without a replacement in 1996 for frontline use, and their use at NTC was ended in 2003.

The M551 is protected by some rather thin aluminum armor in the hull; it is especially lacking on the sides and rear. The turret is of steel. The main gun choice was controversial from the beginning – it was a heavy gun for such a lightweight chassis, and when fire with conventional rounds, the recoil was especially violent, with sometimes the first, second, and third roadwheels coming off the ground. Whenever a conventional round (but not a Shillelagh missile) is fired from the main gun, roll 1D10; on a 1-2, minor damage is inflicted on the rangefinder. In addition, the commander, when standing in his hatch when a conventional main gun was fired, would sometimes be slammed into the front of the hatchway, bruising, cracking or breaking ribs. Whenever a conventional main gun round is fired, and the commander is standing in his hatch, roll 1D100; on 001-003, the commander sustains 1D6 damage to the chest. (Presumably, an M551 commander learns quickly not to stand in the hatchway when the gun is being fired.) Due to the violent recoil, the M551's gun should not be fired from the move, particularly at a fast pace, though it has enough stabilization to be fired accurately from a slow move. Despite its large faults, the M81 gun/missile launcher had one virtue -- it was much lighter than the 105mm M68 otherwise being considered for arming the M551.

The M551 is amphibious; a large flotation screen must be erected and bilge pumps turned on. (The M551 was originally to have been powered in the water by waterjets, but this feature was eliminated early in testing.) The front of the flotation screen had a clear plastic window for the driver to see, but in practice, the driver had poor vision from this window and relied more on directions from the commander. The M551 is powered by a Detroit Diesel 6V53T turbocharged diesel developing 300 horsepower. The transmission is an XTG-250-1A automatic transmission. Suspension is by torsion bars, with five roadwheels and no return rollers, and the track is a flat design.

The M551A1 added a laser rangefinder to the M551's fire control system, and a TTS (Tank Thermal Sight) to the gunner's night

vision suite.

Twilight 2000 Notes: The only users of the M551 at the time of the Twilight War were the OPFOR units stationed at Fort Irwin in southern California and Fort Polk in Louisiana. These were largely restored to functional status at the time of the Mexican invasion, often still with the modifications used to make them look like enemy vehicles, and in this way were able to make many surprise attacks and accomplish infiltrations at night for reconnaissance.

Vehicle	Price	Fuel Type	Load	Veh Wt	Crew	Mnt	Night Vision	Radiological
M551	\$495,132	D, A	517 kg	15.18 tons	4	10	Passive IR (D, G), WL Searchlight	Shielded
M551A1	\$509,532	D, A	517 kg	15.24 tons	4	11	Passive IR (D, G), Thermal Imaging (G), WL Searchlight	Shielded

Vehicle	Tr Mov	Com Mov	Fuel Cap	Fuel Cons	Config	Susp	Armor
M551	141/99	39/27/3	598	111	Trtd	T4	TF13 TS4 TR4 HF16 HS3 HR3
M551A1	140/98	39/27/3	598	111	Trtd	T4	TF13 TS4 TR4 HF16 HS3 HR3

Vehicle	Fire Control	Stabilization	Armament	Ammunition
M551	+1	Fair	152mm M18E12 Gun/Missile Launcher, M73 or M219, M2HB (C)	20x152mm, 9xShillelagh, 3080x7.62mm, 1000x.50
M551A1	+2	Fair	152mm M18E1 Gun/Missile Launcher, M240C, M2HB (C)	20x152mm, 9xShillelagh, 3080x7.62mm, 1000x.50