

## **ANTITANK GUIDED MISSILES**



**[Argentine ATGM](#)**

**[British ATGMs](#)**

**[Chinese ATGM](#)**

**[French ATGM](#)**

**[German ATGM](#)**

**[Indian ATGM](#)**

**[International ATGM](#)**

**[Iranian ATGM](#)**

**[Israeli ATGM](#)**

**[Japanese ATGM](#)**

**[Pakistani ATGM](#)**

**[Russian ATGM](#)**

**[South African ATGM](#)**

**[Spanish ATGM](#)**

**[Swedish ATGM](#)**

**[Taiwanese ATGM](#)**

**[US ATGM](#)**

**[Yugoslavian ATGM](#)**

**CIBEL-2K**

Notes: This is a second-generation ATGM developed by Argentina in the mid-1980s to replace the earlier Mathogo. The CIBEL-2K is similar in appearance to the Mathogo, but uses a semi-automatic command to the line of sight (SACLOS) guidance system, which makes the missile much easier to guide than the Mathogo. The CIBEL-2K is guided by an infrared beam rather than wires; this allows the missile to fly faster, and it can be fired over water (unlike most wire-guided missiles). The guidance system includes a counter-countermeasure system that makes the CIBEL-2K less vulnerable to IR countermeasures and interference. The missiles are fired from a box launcher; these are connected to the guidance unit used by the gunner by wires, and the operator may be connected to as many as 12 launcher boxes (though he may guide only one at a time). The operator may be as far as 50 meters from any individual missile. An image intensifier or a thermal imager may be connected to the guidance optics, though such night vision devices must be of standard NATO or Israeli-compatible types. This missile, unfortunately, fell victim to budget cuts.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>CIBEL-2K</b>	(Launcher) 12 kg; (Missile in Box) 12.44 kg	110mm	IR SACLOS	1500	(Launcher) \$2500; (Missile) \$734

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>CIBEL-2K</b>	3	HEAT-T	100	4000	C14 B35	82C/103C	AVG

**Mathogo**

Notes: Though developed in the late 1970s, the Mathogo is a first-generation ATGM design. It's not bad for a first effort, but it was quickly replaced by other missiles, both foreign and domestic in design. It is similar in appearance to a smaller version of the old British Vigilant ATGM, and has about the same performance. The missile is wire guided, and controlled from a guidance unit that is connected by wires to the launcher box. Up to 4 launcher boxes may be connected to the guidance unit. Two versions of the missile are available: the standard Mathogo-1, and the Mathogo-2 with an improved motor for longer range and improved warhead. The Mathogo-1 is an extremely slow missile; Mathogo-2 is only a little faster.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Mathogo-1</b>	(Launcher) 8.2 kg; (Missile in Box) 11.3 kg	102mm	Wire MCLOS	450	(Launcher) \$5253; (Missile) \$576
<b>Mathogo-2</b>	(Launcher) 8.2 kg; (Missile in Box) 11.3 kg	102mm	Wire MCLOS	675	(Launcher) \$5253; (Missile) \$576

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Mathogo-1</b>	1	HEAT	400	2000	C10 B30	75C	DIF
<b>Mathogo-2</b>	1	HEAT	400	3000	C12 B35	95C	DIF

### **BAe Swingfire**

Notes: The Swingfire was an early ATGM development; it was developed in the mid-1960s, but proved to be very effective and served with the British Army until 2005, when it was replaced by the US-designed Javelin ATGM. When fired from a modified Land Rover, it is also known as the Beeswing; when carried and fired from a helicopter it is also known as the Hawkswing; and when carried and fired from a small trailer of Argocat light cargo vehicle, it is also known as the Golfswing. The Swingfire has seen service in both Iraq and Afghanistan, where it was primarily used as a bunker-buster.

The name "Swingfire" comes from a unique deployment ability. The operator can place the primary guidance module up to 50 meters away, and this primary guidance module may be pointed up to 90 degrees from the operator. The operator has a radio link to his own primary sight, and when the Swingfire is fired, it can swerve up to 90 degrees to place the missile and target inside the sight module radius. The Swingfire uses a simple box launcher, so there is a cold launch and the launch signature does not occur until the Swingfire has traveled 10 meters, at which point the main engine ignites. Thus, finding the operator of a Swingfire can be a bit difficult, especially if the operator is camouflaged and the crew can pack up and leave after the missile is hits its target. (Most Swingfire teams carried multiple primary guidance modules so that retrieving the original module is not as urgent). Despite the large control surfaces, the Swingfire is actually controlled by thrust squibs. Detonation is by impact upon the target (or an accidental hit on something else).

In the 1980s, the Swingfire received upgraded guidance systems, changing the Guidance and Difficulty below. Explosives and warhead design improvements made the warhead more effective. This advanced warhead became available in 1985.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Swingfire (Early)</b>	(Launcher) 6 kg; (Missile) 27 kg	170mm	MCLOS Wire	925	(Launcher) \$2295; (Missile) \$3009
<b>Swingfire (Late)</b>	(Launcher) 6 kg; (Missile) 27 kg	170mm	SACLOS Wire	925	(Launcher) \$2695; (Missile) \$1063

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Swingfire (Early)</b>	4	HEAT	150	4000	C29 B55	129C	AVG
<b>Swingfire (Late)</b>	4	HEAT	150	4000	C38 B60	197C	AVG

### **Vickers Vigilant**

Notes: One of the first developed man-portable ATGMs, the Vigilant began as a private development by Vickers in 1956, and began service with the British Army and to a more limited extent, the US Marine Corps, in the early 1960s. In addition, Finland, Kuwait, Dubai, and Switzerland used the Vigilant during the same time period. The Vigilant, though effective for its time, had a short service life, as a greatly improved version of the Vigilant, the Swingfire, entered service in 1966.

The Vigilant was flexible in its setup, as the components included a launcher box, a sight/controller, a battery, and a controller with a joystick where the operator actually steers the missile and gives the launch commands. The operator could, therefore, be located 63 meters from where the missile is located and the launch signature occurs. This could make finding the operator difficult, even though he must stay in place until the Vigilant hits (or misses). The sight unit has a 3.2x sight and simple engraved stadia lines to aid in steering. The missile is fired, then steered into his line of sight, then the missile and the target steered into the same sight picture. The Vigilant was unusual for the time in that its flight was gyroscopically stabilized. This was used to enable the shooter to be located so far from the launcher. An optional missile selection box allowed the crew to control up to six emplaced missiles with one controller (IE, six missiles could be set up, but only one could be controlled at a time by a given gunner).

Normal HEAT warheads were not deployed with the Vigilant. Instead, one was developed with a HEAT warhead and standoff probe, and the other with a hardened steel nose containing a HEAT warhead. For game purposes, both function as a sort of tandem warhead, though neither are tandem warheads in the normal sense of the term.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Vigilant</b>	(Launcher) 6 kg; (Missile) 14 kg	120mm	MCLOS Wire	778	(Launcher) \$1240; (Missile) HEAT-P \$231; HEAT-HP \$241

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Vigilant</b>	3	HEAT-P	200	1375	C12 B40	20/65C	AVG
<b>Vigilant</b>	3	HEAT-HP	200	1375	C11 B30	23/65C	AVG

**HJ-73**

Notes: HJ-73 is a short-ranged ATGM built to replace the AT-3 Sagger in some roles in Chinese service. The Chinese felt that the Sagger was too heavy a system for general use in their army, and so developed a lighter, more portable system. The HJ-73 is also fired from vehicles in place of the Sagger. Later the Chinese developed an improved version, the HJ-73B, using a more advanced SACLOS interface and a better missile; however, the HJ-73B was only a stopgap measure until the HJ-8 production ramped up, and it is the rarest version of the HJ-73. The HJ-73C is a rather new development; it totally gives up the joystick controls, only requiring the gunner to keep the target in the crosshairs, and adds thermal imaging. It is also capable of firing AT-3 Sagger missiles of all types, giving it an even greater degree of flexibility.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>HJ-73</b>	(Launcher) 10 kg; (Missile) 11.3 kg	120mm	Wire MCLOS	600	(Launcher) \$900; (Missile) \$566
<b>HJ-73B</b>	(Launcher) 10 kg; (Missile) 11.2 kg	120mm	Wire SACLOS	600	(Launcher) \$1700; (Missile) \$648
<b>HJ-73C</b>	(Launcher) 10 kg; (Missile) 11.2 kg	120mm	Wire SACLOS	600	(Launcher) \$3700; (Missile) \$972

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>HJ-73 Missile</b>	1	HEAT	150	1000	C14 B40	89C	DIF
<b>HJ-73B Missile</b>	1	HEAT	150	1900	C17 B40	113C	AVG
<b>HJ-73C Missile</b>	1	HEAT-T	100	2200	C19 B45	110/137C	ESY

**HJ-8**

Notes: HJ-8 is a newer ATGM also designed to be fired from tripods and vehicle mounts, and from helicopters. It usually replaces AT-3 and AT-4 missiles on Chinese vehicles, and has also been exported to several Mideast countries and to Yugoslavia. The basic HJ-8 launcher is similar to the TOW-1 launcher. Along with the HJ-8C missile, an upgraded launcher was introduced with an image intensifier for night use. When the HJ-8E missile was introduced, a new launcher that replaces the image intensifier with thermal imaging was also introduced. The latest version of the launcher came with the HJ-8L missile; it has a periscope that allows the gunner to fire and guide the weapon from a prone position.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>HJ-8</b>	(Launcher) 47 kg; (Missile) 22.5 kg	120mm	Wire SACLOS	1000	(Launcher) \$2100; (Missile) \$932
<b>HJ-8A</b>	(Launcher) 47 kg; (Missile) 22.5 kg	120mm	Wire SACLOS	1000	(Launcher) \$2100; (Missile) \$900
<b>HJ-8C</b>	(Launcher) 49 kg; (Missile) 22.5 kg	120mm	Wire SACLOS	1000	(Launcher) \$3100; (Missile) \$1350
<b>HJ-8E</b>	(Launcher) 48 kg; (Missile) 22.5 kg	120mm	Wire SACLOS	1000	(Launcher) \$4100; (Missile) \$1322
<b>HJ-8L</b>	(Launcher) 49 kg; (Missile) 22.5 kg	120mm	Wire SACLOS	1000	(Launcher) \$4200; (Missile) \$1322

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Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
HJ-8 Missile	6	HEAT	100	2000	C17 B40	121C	AVG
HJ-8A Missile	6	HEAT	100	3000	C17 B40	126C	AVG
HJ-8C Missile	5	HEAT-T	100	3000	C19 B45	114C/143C	AVG
HJ-8E Missile	5	HEAT-T	100	4000	C19 B45	122C/153C	AVG
HJ-8L Missile	5	HEAT-T	100	4000	C19 B45	132C/165C	ESY

**ACCP**

Notes: ACCP (AntiChar Courte Portée, or portable antitank missile) is a short-range ATGM designed for urban warfare. The French-built weapon has little backblast and can be safely fired from enclosed spaces. The missile is inexpensive, light, and disposable if necessary. This missile fell victim to budget cuts and the lighter Eryx ATGM and never went beyond the prototype phase.

Twilight 2000 Notes: In a desperation measure, the French government authorized the production of the ACCP; it is partially credited with helping them maintain their borders.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices		
<b>ACCP</b>	(Launcher) 12 kg; (Missile) 11 kg	160mm	Wire SACLOS	1000	(Launcher) \$1780; (Missile) \$392		
Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>ACCP</b>	4	HEAT	25	600	C30 B55	120C	AVG

**Entac**

Notes: This was one the first Western ATGMs, being introduced by France in the early 1960s. Today, it is used only in some Latin American and Southeast Asian countries, being locally produced in those countries or drawn from retired First World stocks. It is an old ATGM with limited effectiveness. Like many early ATGMs, the Entac is a rather slow missile.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices		
<b>Entac</b>	(Launcher) 14.8 kg; (Missile in box) 12.2 kg	152mm	Wire MCLOS	425	(Launcher) \$1088; (Missile) \$229		
Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Entac</b>	2	HEAT	400	2000	C19 B45	84C	DIF

**Eryx**

Notes: Eryx is another French-built ATGM designed for short-range urban warfare. It has very little backblast and a low launch velocity. NATO-standard thermal imagers or image intensifiers may be attached to the Eryx. Missile speed is 1225 meters per phase. The Eryx was first issued to French units in 1991; with orders shortly thereafter by Germany, Canada, the Netherlands, Norway, and Brazil; there are rumors of it also being used by Great Britain and the US in the recent fighting in Afghanistan and Iraq.

Twilight 2000 Notes: The Eryx was also used during the Twilight War by the Swiss and Austrians, as well as special operations units of the US, Great Britain, Mexico, Israel, and Jordan.

Merc 2000 Notes: Inexpensive and light, the Eryx is a popular missile worldwide, and it could turn up almost anywhere.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices		
<b>Eryx</b>	(Launcher) 4.5 kg; (Missile) 12 kg	160mm	Wire SACLOS	1425	(Launcher) \$1660; (Missile) \$356		
Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Guidance
<b>Eryx</b>	3	HEAT	50	600	C34 B60	179C	Wire

**SS-11 Harpon**

Notes: One of the world's first ATGMs, the SS-11 is now an obsolete weapon, which is used only in smaller armies or in reserve stocks. It can be fired from helicopters (one per hardpoint, due to their size), from vehicle mounts, or ground box mounts. The SS-11 is a very difficult missile to use; the gunner must keep both the missile and target in his sights, and proper steering requires a light but steady touch on the joystick control, something that takes a lot of practice to do properly. The SS-11 is cheap, but it also huge and difficult to transport and reload.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>SS-11 (HEAT Missile)</b>	(Launcher) 15 kg; (Missile) 29.9 kg	164mm	Wire MCLOS	780	(Launcher) \$1000; (HEAT Missile) \$345, (HEAT-FRAG Missile) \$311, (FRAG-HE Missile) \$277 kg

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>SS-11 Harpon</b>	3	HEAT	500	3000	C22 B45	102C	FOR
	3	HEAT-FRAG	500	3000	C17 B56	41C	FOR
	3	FRAG-HE	500	3000	C26 B75	14C	FOR

**Cobra 2000**

Notes: This predecessor of the Mamba is very similar to that missile, but built using older technology. It uses an older, less accurate guidance method and a smaller, less powerful warhead. It is by virtue of its design a compact, fairly robust system that is very resistant to ECM and EMP. It has long been out of use in Europe, but can still sometimes be found in Central America and South America.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Cobra 2000</b>	(Guidance Unit) 10.3 kg; (Missile) 10.3 kg	100mm	Wire MCLOS	425	(Launcher) \$937; (Missile) \$224

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Cobra 2000</b>	2	HEAT	400	2000	C10 B30	73C	DIF

**Mamba**

Notes: This is a lightweight, man-portable ATGM used by Germany. The Mamba uses an unusual "jump-start" launch which requires no launcher--the missile's fins are extended and the missile is simply placed on the ground, and small jets throw the Mamba into the air before the rocket motor is started. The Mamba comes in HEAT and HE warheads. It is not a particularly advanced or effective missile by modern standards.

Twilight 2000 Notes: The Mamba is light and cheap, which is why it was retained; however, it is mostly used as a bunker-buster than an antiarmor weapon.

Merc 2000 Notes: The Mamba is primarily a Third World weapon.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Mamba</b>	(Sight Unit) 7.5 kg; (Missile) 11 kg	120mm	Wire SACLOS	700	(Sight Unit) \$800; (HEAT Missile) \$190, (HE Missile) \$164

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Mamba</b>	1	HEAT	300	2000	C14 B40	86C	AVG
	1	HE	300	2000	C22 B45	11C	AVG



**Flame**

Notes: This Indian ATGM launcher is a hybrid weapon, using the AT-5 Spandrel launcher to fire Milan-2 missiles. Two versions of this launcher are available: The Flame-G ground mount version, which may only fire Milan-2 series missiles, and the Flame-V vehicle-mounted launcher, which is used on the Indian version of the BMP-2 and may fire Milan-2, and AT-5 missiles. The Flame launcher in both cases is improved with the addition of an integral thermal imager for night use.

Twilight 2000 Notes: Close to 200,000 of the ground/light vehicle mount alone for these launchers were deployed during the Twilight War, which is many times the intelligence estimates said the Indians had.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Flame</b>	(Ground/Light Vehicle Launcher) 35.5 kg; (Milan-2 Missile) 12.23 kg, (Milan-2T Missile) 12.62 kg, (9K113 Missile) 28.5 kg, (9K113M Missile) 26.5 kg	(Milan-2) 115mm, (Milan-2T) 117mm, (9K113/9K113M) 135mm	(All) Wire SACLOS	(Milan-2/2T) 1050, (9K113/9K113M)1350	(Ground/Light Vehicle Launcher) \$3760; (Milan-2 Missile) \$352, (Milan-2T Missile) \$527 kg, (9K113 Missile) \$409, (9K113M) \$613

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Flame (Milan-2)</b>	1	HEAT	25	2000	C15 B40	121C	AVG
<b>Flame (Milan-2T)</b>	1	HEAT-T	25	2000	C16 B40	97C/122C	AVG
<b>Flame (9K113/AT-5)</b>	4	HEAT	75	4000	C21 B45	141C	AVG
<b>Flame (9K113M/AT-5)</b>	4	HEAT-T	75	4000	C21 B45	112C/141C	AVG

**Nag**

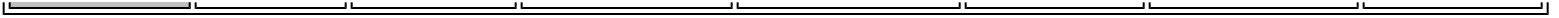
Notes: Nag (Serpent) is an Indian ATGM introduced just before the Twilight War. Development began as early as 1990, but delays plagued the program, and very few have actually been deployed. Nag is a third-generation, top attack, fire and forget missile using IR guidance. A millimetric wave guidance version that is not vulnerable to IR countermeasures such as flares was planned, but the guidance package gave the experts many problems and was never fielded. However, decoying the Nag with flares is one level more difficult. This missile is also used from helicopters and on a modified BMP-2 chassis.

Twilight 2000 Notes: Delays plagued the program, and the weapon was not introduced to combat units until 1998. The ground-mount for the Nag was extremely rare and more likely to be used mounted on a light vehicle.

Merc 2000 Notes: The MMW version became available in 2005.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Nag-1</b>	(Ground/Light Vehicle Mount) 42 kg; (Missile) 23.5 kg	130mm	IR Fire and Forget, Top Attack	1500	(Mount) \$6765; (Missile) \$9250
<b>Nag-2</b>	(Ground/Light Vehicle Mount) 42 kg; (Missile) 23.5 kg	130mm	MMW Fire and Forget, Top Attack	2000	(Mount) \$6765; (Missile) \$18938

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Nag-1</b>	3	HEAT-T	70	5400	C22 B45	134C/167C	AVG
<b>Nag-2</b>	3	HEAT-T	70	5400	C22 B45	134/167C	ESY



**EADS Trigat LR**

Notes: This is a longer-ranged, heavier warhead version of the Trigat MR, primarily used as helicopter armament, but also fired from mast-mounted launchers on vehicles such as the Panther. The missile is able to make a top attack by climbing above the target or being launched from above it, then diving downwards. Budget difficulties are still delaying full deployment of the Trigat LR.

Twilight 2000 Notes: This missile is much rarer than the Trigat MR, not being fielded until 1997.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Trigat LR</b>	(Launcher) Vehicle Only; (Missile) 49 kg	150mm	Semi-Active Laser Homing	2000	(Launcher) Vehicle Only; (Missile) \$13098

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Trigat LR</b>	4	HEAT-T-TA	400	8000	C30 B55	162C/203C	ESY

**EADS Trigat MR**

Notes: This weapon is a joint project of France, Germany, and Great Britain. Belgium and the Netherlands also use the missile. It is a laser-guided missile with a tandem HEAT warhead. The missile is prepacked in a container, and the firing post has a thermal imager. The firing post electronics are not affected by EMP. The Trigat can be mounted on a pintle in vehicles and Warrior ICVs. In a pinch, the Trigat may be fired from Milan firing unit, but range is then limited to 2000 meters, and the Milan firing unit is not equipped with its own laser designator as the Trigat MR firing unit is.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Trigat MR</b>	(Launcher) 17 kg; (Missile) 17 kg	152mm	Laser Designation	1150	(Launcher) \$12130; (Missile) \$2161

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Trigat MR</b>	2	HEAT-T	50	2400	C30 B55	162C/202C	ESY

**Euromissile HOT**

Notes: HOT is a heavy antitank missile built by a collaboration of France and Germany. It is in service with those countries and at least 14 others, and can be used from tripod, vehicle, and helicopter mounts. The HOT launcher can fire the HOT-1, the HOT-2 with increased warhead and penetration, or the HOT-3 with a tandem HEAT top-attack warhead. HOT is normally a missile fired from vehicular or helicopter launchers; though a tripod mount exists, it is extremely rare. The HOT-1 Launcher is a basic launcher with a telescopic sight; HOT-2 launchers add an image intensifier; HOT-3 is very different as the guidance for a HOT-3 missile is different, and also uses a thermal imager for night vision. HOT-1 and HOT-2 launchers may use HOT-1 or HOT-2 missiles; a HOT-3 launcher may fire any sort of HOT missile.

Twilight 2000 Notes: HOT-3 is not available.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>HOT-1</b>	(Tripod Launcher) 26.8 kg; (Missile) 23.5 kg	136mm	Wire SACLOS	1250	(Launcher) \$2335; (HE Missile) \$292, (HEAT Missile) \$322
<b>HOT-2</b>	(Tripod Launcher) 28.8 kg; (Missile) 23.5 kg	150mm	Wire SACLOS	1250	(Launcher) \$2835; (HE Missile) \$304, (HEAT Missile) \$345
<b>HOT-3</b>	(Tripod Launcher) 39.5 kg; (Missile)	165mm	CCD Fire and Forget	1175	(Launcher) \$6195; (HE Missile) \$2450, (HEAT-T-TA Missile) \$3396

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>HOT-1</b>	2	HEAT	75	4000	C18 B45	137C	AVG
<b>HOT-1</b>	2	HE	75	4000	C28 B55	13C	AVG
<b>HOT-2</b>	2	HEAT	75	4000	C26 B50	198C	AVG
<b>HOT-2</b>	2	HE	75	4000	C39 B65	16C	AVG
<b>HOT-3</b>	3	HEAT-T-TA	75	4000	C36 B60	158C/198C	ESY
<b>HOT-3</b>	3	HE	75	4000	C54 B75	18C	ESY

**Euromissile Milan**

Notes: Though Milan is a French acronym, the word *Milan* also means “kite” in French and “bird” in German. Design of the Milan began in 1962, was ready for trials in 1971, and entered service in 1972. The initial version was a wire-guided SACLOS missile, aimed by a large unitary firing post which may be ground or vehicle-mounted; Milan can also be fired from several models of helicopters. Though the firing post has no night-vision capability of itself, but a MIRA thermal imager can be added to it. Standard sights include a x7 day sight. Initially a French and German development, the Milan is now license-built by Italy, Spain, Britain, and India, and used by some 33 countries.

The Milan missile is packaged as a round of ammunition in a cylindrical container that is attached directly to the firing post; in most cases, the round of ammunition is 1.2 meters long. The missile fires using an ejection charge that kicks the missile away before the main rocket charge fires; this charge also kicks the expended missile tube backwards off of the firing post. Though quite accurate, range is short and a well-trained operator is required. The warhead is HEAT; later developments include progressively more effective warheads, tandem warheads, and an extended-range motor. The firing post is able to fire any of the different types of Milan missiles. Upgrading a Milan 1/2 firing post to the Milan 3 standard is a simple and inexpensive upgrade. Milan 1 and Milan 2 are basic, direct-action HEAT-warhead missiles, with Milan 2 having a heavier-caliber warhead that, due to better technology, is only fractionally heavier than Milan 1.

The Milan 2T has a pair of warheads (a tandem warhead) to help defeat ERA; the second warhead fires a few microseconds after the first one does, as the first warhead is primarily to detonate any ERA in the way. It is therefore a bit heavier than a standard Milan 2 missile. The Milan 2T uses a long stand-off fuze which carries only a 30mm warhead, and does not have much penetration by itself. The precursor warhead and its fuze to not extend until the missile has cleared its launch tube and has traveled its minimum range, to provide extra protection against a premature detonation.

The Milan 3 system uses a new firing post – it is still wire-guided, but it has a CCD localizer feature, which provides increased resistance from jamming (such as present in the various soft-kill APS systems today) and can also provide up to two seconds of self-guidance if the gunner’s attention strays due to enemy fire or suchlike. The new firing post also has a thermal imager built in, which has a range of 7 kilometers. A Milan 3 missile, as such, does not exist – the improvements are in the launcher unit.

Twilight 2000 Notes: The Milan 3 firing post was not available in the Twilight 2000 timeline. The Italians and Greeks used the Milan, as well as many NATO countries – and because of this, low-level Milan production took place in the Ukraine (for Soviet use) and Czechoslovakia. In addition to most other NATO countries, US Marines in Europe and the Persian Gulf used small quantities of the Milan.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Milan 1</b>	(Launcher) 16.4 kg (Missile) 11.5 kg	103mm	Wire SACLOS	1000	(Launcher) \$2460 (Missile) \$241
<b>Milan 2</b>	(Launcher) 16.4 kg (Missile) 11.5 kg	115mm	Wire SACLOS	1000	(Launcher) \$2460 (Missile) \$243
<b>Milan 2T</b>	(Launcher) 16.4 kg; (Missile) 11.7 kg	117mm	Wire SACLOS	1000	(Launcher) \$2460 (Missile) \$274

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Milan 1</b>	2	HEAT	400	2000	C11 B30	75C	AVG
<b>Milan 2</b>	2	HEAT	400	2000	C15 B40	108C	AVG
<b>Milan 2T</b>	2	HEAT-T	400	2000	C1 B10/C16 B40	23C/110C	AVG

### Hughes/Gyconsa TOW LWL

Notes: The TOW LWL (LightWeight Launcher) was developed jointly by Hughes Aerospace of the US and Gyconsa of Spain in the late 1980s and early 1990s. Initial development was done at the behest of the Spanish Army and Marines, but it was later picked for use by the US, particularly by light formations and special operations for use on small vehicles like Fast Attack Vehicles. The LWL is basically a TOW launcher with miniaturized components that are smaller and lighter. The LWL includes an integral 2<sup>nd</sup> generation thermal imager with a magnification of 15.3x or 5.1x, and an optical sight with a magnification of 10x. It may operate from vehicle or battery power. Unlike a standard TOW launcher, the sight and guidance units are integrated into a single package. The LWL is not capable of firing TOW 3 missiles, but may fire any other sort of TOW series missile.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>TOW LWL</b>	(Launcher) 73 kg; (Missile) See TOW Series	127mm or 152mm	Wire SACLOS	See TOW Series	(Launcher) \$12800; (Missiles) See TOW Series

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>TOW-1 (BGM-71A)</b>	3	HEAT	65	3000	C16 B40	104C	DIF

<b>TOW-1A (BGM-71B)</b>	3	HEAT	65	3750	C16 B40	104C	AVG
<b>I-TOW (BGM-71C)</b>	3	HEAT	65	3000	C16 B40	114C	AVG
<b>TOW-2 (BGM-71D)</b>	4	HEAT	65	3750	C23 B50	134C	AVG
<b>TOW-2A (BGM-71E)</b>	5	HEAT	65	3750	C27 B50	135C/169C	AVG
<b>TOW-2B (BGM-71F)</b>	5	EFP-T-TA	65	3750	C23 B70	147C/184C	AVG
<b>TOW-2C (BGM-71G)</b>	5	HEAT-T-TA	65	3750	C30 B55	147C/184C	AVG
<b>TOW-BLAAM (BGM-71TBD)</b>	7	EFP-HEDP	65	3750	C35 B70	96C	AVG

### Oto-Melara/ORBITA MAF

Notes: This advanced man-portable ATGM was developed jointly by OTO-Melara of Italy and ORBITA of Brazil. The missile consists of a missile in its container and a firing post. There is an ejection charge that kicks the missile out of the launcher and a sustaining charge that powers the missile for flight. The missile is guided by laser, and has a high-resistance to jamming. The firing post incorporates thermal vision for night use. The MAF was designed for man-portable, vehicular, and helicopter use. The MAF is an ADATS missile, meaning it may also be used against low-flying, slower aircraft. In emergencies, the MAF can be fired as an unguided rocket. Though the MAF was developed in response to a Brazilian request for an advanced, lightweight ATGM, the development cost got away from them, and the project was eventually cancelled.

Twilight 2000 Notes: Most MAF's were actually used during the Twilight War by Italy. Some were also supplied to Libya, and there was reportedly some use of the MAF by Pact special operations units and by Iraq. The Brazilians probably had fewer than 40 of the launchers, with perhaps as little as 200 missiles total.

Merc 2000 Notes: The Italians were eventually able to interest the armies of Libya, Iraq, Iran, and Vietnam in the MAF, and did some pretty good business with the missile system. (Where the Vietnamese got the money is unknown; there may have been some oil concessions in the Spratly Islands.)

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>MAF</b>	(Launcher) 23 kg; (Missile) 20 kg	130mm	Laser SACLOS	1450	(Launcher) \$10780; (Missile) \$1413

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Guidance
<b>MAF</b>	2	HEAT	70	3000	C22 B45	149C	Laser
<b>(Unguided)</b>	2	HEAT	0	500*	C22 B45	149C	None

\*When fired in this mode, the MAF is treated as a rocket launcher.

**RAAD**

Notes: This is an Iranian modification of the Russian AT-3 Sagger antitank missile. Penetration is improved, and the firing post has a sight equivalent to an image intensifier. The I-RAAD version adds a precursor charge to detonate reactive armor before the main charge detonates against the armor of the target. This system is used by Iranian forces and by Hezbollah guerillas in Lebanon.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>RAAD</b>	(Launcher) 16 kg; (RAAD Missile) 11.78 kg, (I-RAAD Missile) 11.78 kg	120mm	Wire MCLOS	600	(Launcher) \$2520; (RAAD Missile) \$178; (I-RAAD Missile) \$267

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>RAAD</b>	1	HEAT	400	3000	C17 B40	93C	DIF
<b>I-RAAD</b>	1	HEAT-T	400	3000	C17 B40	74C/93C	DIF

**MAPATS**

Notes: This Israeli laser-guided ADATS missile was developed in the early-1990s from the TOW series. A new engine, tandem warhead, and laser guidance replaced those components in the TOW II, and an HE-warhead bunker buster was developed as well. The MAPATS has thermal sights for night use. The MAPATS is a fire-and-forget weapon.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>MAPATS</b>	(Launcher) 51.5 kg; (Missile) 29.5 kg	148mm	Laser Designation, Fire and Forget	1525	(Launcher) \$12210; (HE Missile) \$3383; (HEAT-T Missile) \$5413

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>MAPATS</b>	2	HEAT-T	65	5000	C29 B55	129C/162C	AVG
	2	HE	65	5000	C44 B65	15C	AVG

**Nimrod**

Notes: This is a large laser-guided missile that can be fired from towed launchers, vehicle launchers, or helicopters. The Israelis use vehicle launchers based on the Land Rover (known as a Hobbit in that configuration), or sometimes an Abir light vehicle. The trailer-mounted version is quite rare, as it was only an experiment. The primary helicopter launch platform for the Nimrod was modified CH-53 helicopters; this was not only due to the large size of the Nimrod missile (100 kilograms, and over 2.5 meters long), but because the CH-53 was a common delivery vehicle for Israeli special operations teams. Some limited aircraft launching was also carried out. Two versions of Nimrod exist: the standard ground-launched version, and the lighter and shorter-ranged version meant primarily for helicopter and light aircraft launches. The warhead is designed to be useful against armored vehicles, bunkers, ships, and personnel. The launching vehicle or aircraft may fire up to 4 Nimrods at once; the coding instructions for the corresponding laser designators are put into the missiles with the push of a button, and the missiles then seek their targets. If launched from the air, the missile will automatically dive beneath any obscuring cloud layer and then look for the laser designating beam. Twilight/Merc 2000 Story: As Notes.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Nimrod</b>	(Launcher) Vehicle Only; (Missile) 100 kg	210mm	Semi-Active Laser Homing	2000	(Launcher) Vehicle Launcher; (Missile) \$5912

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Nimrod (Ground)</b>	26	HEAT-FRAG-T	300	26000	C55 B106	245C/307C	VESY
<b>Nimrod (Air)</b>	23	HEAT-FRAG-T	300	20000	C55 B106	245C/307C	VESY

**NT-G Gill/NT-S Spike**

Notes: This weapon is meant to replace the Dragon and TOW in some applications in Israeli service, but as it entered full-scale production in 1997, it is relatively rare. It may be shoulder-fired or tripod-fired as tactical requirements dictate. The firing post includes a thermal imager, and the Gill/Spike has a top-attack capability. The Gill is the shorter-range system, with a fire-and-forget capability, while the Spike uses a longer-range fiber-optic guidance system, which must be guided for its entire flight. The missile has a tandem warhead for defeating ERA.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>NT-G Gill</b>	(Launcher) 11.9 kg; (Missile) 13 kg	115mm	CCD Fire and Forget	900	(Launcher) \$6520; (Missile) \$8533

<b>NT-S Spike</b>	(Launcher) 13.4 kg; (Missile) 13 kg	115mm	FOG	900	(Launcher) \$5720; (Missile) \$8533		
<b>Weapon</b>	<b>Reload</b>	<b>Round</b>	<b>Min Range</b>	<b>Max Range</b>	<b>Damage</b>	<b>Pen</b>	<b>Difficulty</b>
<b>NT-G Gill</b>	2	HEAT-T-TA	200	2500	C17 B40	117C/147C	ESY
<b>NT-S Spike</b>	2	HEAT-T-TA	200	4000	C17 B40	117C/147C	ESY



**Type 65 MAT**

Notes: This Japanese ATGM looks very much like the Russian AT-3 Sagger, and is launched from a rail or ground-mound, but is actually an independently designed weapon. The MAT is normally launched from a triple launcher mounted on a Jeep, but can be fired from a box launcher similar (but smaller) to that of the Swingfire. It can also be fired from helicopters. It is now obsolete and out of service.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Type 65 MAT</b>	(Ground Launcher) 15 kg; (Missile) 15.7 kg	120mm	Wire MCLOS	425	(Ground Launcher) \$1420; (Missile) \$222

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Type 65 MAT</b>	2	HEAT	350	1800	C12 B35	65C	FOR

**Type 79 Jyu-MAT**

Notes: This Japanese ATGM is derived from the TOW-1 system, and has resulted in an ATGM similar to the TOW 2. The Jyu-MAT can be fired from a ground tripod and from various vehicular mounts, as well as from helicopters from mounts similar to the TOW 2. (A Jyu-MAT missile can actually be fired from the Bradley's TOW 2 launcher.) The Jyu-MAT uses an active/passive IR sight, similar again to the TOW 2; but its warhead is not as efficient as the TOW 2.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Type 79 Jyu-MAT</b>	(Launcher) 84.6 kg; (Missile) 19.9 kg	152mm	Wire SACLOS	1000	(Launcher) \$3050; (HEAT Missile) \$324, (HEAT-FRAG Missile) \$465

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Type 79 Jyu-MAT</b>	2	HEAT	320	4200	C27 B50	145C	AVG
	2	HEAT-FRAG	320	4200	C25 B72	60C	AVG

**Type 87 Chu-MAT**

Notes: This advanced ATGM was developed shortly before the start of hostilities. Production is being carried out at a rather low rate until (about 24 launchers per year). The Chu-MAT uses a smaller missile, but with a more advanced warhead that is more effective than that of the Jyu-MAT. The warhead is a sort of general purpose type that can be used against armor and bunkers, and also has a fragmentation jacket for antipersonnel work. The missile is laser-guided, and may be guided by a separate laser designator or by the integral designator on the launcher. The use of a separate designator is preferred, as the exhaust gas of the missile tends to interfere with the launcher's laser beam. The launcher includes a periscope to allow the gunner to use a prone position while guiding the Chu-MAT.

Twilight 2000 Notes: Production of these weapons was tripled in 1996.

Merc 2000 Notes: Besides Japan, a small number of Chu-MATs were supplied to Filipino, Thai, and Taiwanese forces.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Type 87 Chu-MAT</b>	(Launcher) 46.6 kg; (Missile) 12 kg	120mm	Laser Designation	1500	(Launcher) \$10924; (Missile) \$4046

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty

<b>Type 87 Chu-MAT</b>	1	HEAT-DP-FRAG-T	100	6000	C18 B64	156C/195C	ESY
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**Baktar Shikan**

Notes: This ATGM is basically a locally-produced version of the Chinese HJ-8 missile system. As such, the Baktar Shikan may fire both HJ-8 missiles of all types and locally-produced Baktar Shikan missiles. The Baktar Shikan launcher may be broken into several units for transport: the sight unit (goniometer), weighing 12.5 kg; the guidance unit, weighing 24 kg; and the tripod, weighing 23 kg. Thus, if you have enough people, the system may be manpacked. A night sight may be added to the Baktar Shikan, though it is not included in the basic cost of the launcher; any missile sight of Western or Chinese manufacture may be used. A rare variant of the Baktar Shikan is also able to fire TOW-1, TOW-2, or TOW-BLAAM series missiles; this version is very rare (about 10% of the launchers available), and more expensive than the standard Baktar Shikan launcher.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Baktar Shikan</b>	(Launcher) 59.5 kg; (Baktar Shikan Missile) 11.2 kg	(Baktar Shikan Missile) 120mm	Wire SACLOS	(Baktar Shikan Missile) 1100	(Launcher) \$2060; (Baktar Shikan-1 Missile) \$275, (Baktar Shikan-2 Missile) \$413
<b>Baktar Shikan (TOW-Capable)</b>	(Launcher) 61 kg; (Baktar Shikan Missile) 11.2 kg	(Baktar Shikan Missile) 120mm	Wire SACLOS	(Baktar Shikan Missile) 1100	(Launcher) \$3090; (Baktar Shikan-1 Missile) \$275, (Baktar Shikan-2 Missile) \$413

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Baktar Shikan-1</b>	2	HEAT	100	3000	C17 B40	133C	AVG
<b>Baktar Shikan-2</b>	2	HEAT-T	100	3000	C17 B40	106C/133C	AVG
<b>Baktar Shikan (HJ-8)</b>	2	HEAT	100	2000	C14 B30	121C	AVG
<b>Baktar Shikan (HJ-8A)</b>	2	HEAT	100	3000	C14 B40	126C	AVG
<b>Baktar Shikan (HJ-8C)</b>	2	HEAT-T	100	3000	C17 B40	114C/143C	AVG
<b>Baktar Shikan (HJ-8E)</b>	2	HEAT-T	100	4000	C17 B40	122C/153C	AVG
<b>Baktar Shikan (HJ-8L)</b>	2	HEAT-T	100	4000	C19 B45	132C/165C	AVG
<b>Baktar Shikan (TOW-1)</b>	3	HEAT	65	3000	C16 B40	104C	AVG
<b>Baktar Shikan (TOW-1A )</b>	3	HEAT	65	3000	C16 B40	104C	AVG
<b>Baktar Shikan (I-TOW )</b>	3	HEAT	65	3000	C16 B40	114C	AVG
<b>Baktar Shikan (TOW-2 )</b>	4	HEAT	65	3000	C23 B50	134C	AVG
<b>Baktar Shikan (TOW-2A)</b>	5	HEAT	65	3000	C27 B50	135C/169C	AVG
<b>Baktar Shikan (TOW-2B)</b>	5	EFP-T-TA	65	3000	C23 B70	147C/184C	AVG
<b>Baktar Shikan (TOW-2C)</b>	5	HEAT-T-TA	65	3000	C30 B55	147C/184C	AVG
<b>Baktar Shikan (TOW-BLAAM)</b>	7	EFP-HEDP	65	3000	C35 B70	96C	AVG

**AT-1 Snapper**

Notes: The Soviet's first attempt at an ATGM, the Snapper is now considered an antique. Nevertheless, the Snapper can still be found in mobilization-only units and Third World nations like North Korea. The AT-1 can be used from a ground mount or from makeshift vehicle mounts; some of the original mountings include quadruple mounts on BRDM and UAZ-469 vehicles. The AT-1 is a very slow missile; on a smooth road, some vehicles may actually be able to outrun it.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-1 Snapper (2K15 Shmel)</b>	(Ground Mount) 22.5 kg; (9K12 Missile) 22.25 kg	140mm	Wire MCLOS	268	(Ground Mount) \$2000; (Missile) \$302

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-1 Snapper</b>	3	HEAT	370	2700	C13 B45	69C	FOR

**AT-2 Swatter**

Notes: This old ATGM currently has the same status as the AT-1. The AT-2 is occasionally found on some very old BRDMs or UAZ-469s on a 4-round mount. The 3M11 missile is radio-guided and thus susceptible to jamming; 9M17M and 9M17P missiles use IR guidance and cannot be jammed, but can be affected by flares or screening smoke.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-2 Swatter-A (3K11 Fleyta)</b>	(Launcher) 29.4 kg; (3M11 missile) 26.5 kg	132mm	Radio MCLOS	750	(Launcher) \$2064; (3M11 Missile) \$398
<b>AT-2 Swatter-B (3K11M Fleyta)</b>	(Launcher) 29.4 kg; (9M17M/9M17P Missiles) 26.5 kg	132mm	IR SACLOS	750	(Launcher) \$2840; (9M17M Missile) \$477, (9M17P Missile) \$482

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-2 (3M11 Missile)</b>	3	HEAT	600	2500	C11 B35	71C	FOR
<b>AT-2 (9M17M Missile)</b>	3	HEAT	500	3000	C11 B35	71C	FOR
<b>AT-2 (9M17P Missile)</b>	3	HEAT	300	4000	C14 B40	98C	DIF

**AT-3 Sagger**

Notes: This is the Western designation for the 9K11 Malyutka ATGM. It was first introduced in the early 1960s, and over the years, there were several new versions of the missile to cope with increasing armor threats and to increase flexibility. It is a wire guided missile that is guided from a separate guidance unit that may be physically separated from the launcher by up to 3 meters, connected by wire. The missile is very difficult to guide and requires considerable operator skill and practice, since the operator must keep both the target and missile in his sights for the entire duration of the flight. The AT-3 has long been out of service in most Warsaw Pact armies as well as Russian Category 1 and 2 units, but is still issued to lower category units and the armies of many Third World countries.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-3 Sagger (9K11 Malyutka)</b>	(Launcher) 10.9 kg; (9M14 Missile) 11.3 kg, (9M14M Missile) 10.9 kg, (9M14P Missile) 10.9 kg, (9M14MP1 Missile) 12.5 kg, (9M14-2 Missile) 13.5 kg, (9M14G Missile) 12 kg	125mm	(9M14, 9M14M Missiles) Wire MCLOS; (Others) Wire SACLOS	(9M14-2, 9M14G Missiles) 650; (Others) 600	(Launcher) \$2074; (9M14 Missile) \$190, (9M14M Missile) \$186 kg, (9M14P Missile) \$262, (9M14MP1 Missile) \$278, (9M14-2 Missile) \$458, (9M14G Missile) \$490

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-3 (9M14 Missile)</b>	1	HEAT	500	3000	C13 B35	70C	FOR
<b>AT-3 (9M14M Missile)</b>	1	HEAT	500	3000	C13 B35	70C	DIF
<b>AT-3 (9M14P Missile)</b>	1	HEAT	500	3000	C15 B40	89C	DIF
<b>AT-3 (9M14MP1 Missile)</b>	1	HEAT	500	3000	C18 B40	108C	DIF
<b>AT-3 (9M14-2 Missile)</b>	2	HEAT-T	500	3000	C21 B45	121C/152C	DIF
<b>AT-3 (9M14G Missile)</b>	1	Thermobaric	500	3000	C62 B40	48C	DIF

**AT-4 Spigot**

Notes: This man-portable replaced the AT-3 Sagger in most Russian units as well as those of most First World and Second World Soviet and Russian client states. It is a large improvement in terms of guidance over the Sagger, and many comparisons have been made between the AT-4 and the Milan with regards to form factor and method of guidance. Though the AT-4's tripod/sight unit are less bulky, they are heavier than that of the Milan; the AT-4 also lacks the toughness of the Milan's electronics and is quite easy to put out of commission by a stray bump or being dropped in the wrong way. Most AT-4's are sold with a clip-on night vision system; this is IR in the case of export systems, but usually thermal vision for Russian systems. A handicap of both of these night vision systems is that neither has the range of the 9M111-2 or 9M111M missiles that can be fired from it (2000 meters of range for the NOD, 2500 meters of range for the missiles mentioned). A later thermal imaging unit increases the observation range of the viewer to 3600 meters. Despite these shortcomings, the AT-4 has proliferated widely throughout the world. Note that the updated 9P135M-series firing units may also fire AT-5 Spandrel missiles.

Croatia has a variant with an alternate Wire MCLOS guidance system. This is for use in high-countermeasures environments.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-4 Spigot (9P135 Fagot)</b>	(9P135 Launcher) 22.5 kg, (9P135M/M3 Launchers) 35.5 kg, (9S451M2 Launcher) 31.5 kg; (9M111 Missile) 13 kg, (9M111-2 Missile) 13.4 kg, (9M111M Missile) 13.4 kg	120mm	Wire SACLOS	(9M111 Missile) 930, (Others) 900	(9P135 Launcher) \$1900, (9P135M Launcher) \$2900, (9P135M3 Launcher) \$3900, (9S451M2 Launcher) \$4125; (9M111 Missile) \$417, (9M111-2 Missile) \$391 kg, (9M111M Missile) \$

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-4 (9M111 Missile)</b>	4	HEAT	70	2000	C14 B40	79C	AVG
<b>AT-4 (9M111-2 Missile)</b>	4	HEAT	70	2500	C17 B40	113C	AVG
<b>AT-4 (9M111M Missile)</b>	4	HEAT	70	2500	C19 B45	137C	AVG

**AT-5 Spandrel**

Notes: The Spandrel was designed to replace older AT-1, 2, and 3 missiles on vehicular launchers. It was supposed to replace all vehicular AT-1, AT-2, and AT-3 missiles, there are still a lot of AT-3 and even in some smaller countries, AT-2 missiles in circulation. In some cases, the older missiles were in fact replaced by AT-4 ATGM. Also, in some cases, the deployment of the AT-5 has been leapfrogged by the newer AT-14 system. In addition, provisions were made to allow the AT-5 to be fired from newer iterations of the AT-4 Spigot launcher.

Twilight 2000 Notes: Though the AT-5 was massively deployed, generations of missiles as early as AT-1 continued to be used by Mobilization-Only units and by Third World countries such as North Korea and Afghanistan.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-5 Spandrel (9K113 Konkurs)</b>	(Launcher) Vehicular Launcher or AT-4 Launchers; (9M113 Missile) 25.2 kg, (9M113M Missile) 26.5 kg	135mm	Wire SACLOS	1000	(Launcher) Vehicular Launcher or AT-4 Launcher; (9M113 Missile) \$568, (9M113M Missile) \$914

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-5 (9M113 Missile)</b>	6	HEAT	70	4000	C17 B40	129C	AVG
<b>AT-5 (9M113M Missile)</b>	6	HEAT	70	4000	C22 B45	119C/149C	AVG

**AT-6 Spiral**

Notes: This missile is designed for use as a helicopter and aircraft armament. It is designed as an antitank weapon, but has limited use as an air-to-air missile. The 9M114, 9M114M1, and 9M114G1 missiles use frequency-hopping radio guidance and must be guided throughout their entire flight; the 9M114M2 and 9M114G2 use IR Fire-and-Forget guidance, but can be decoyed by flares or screening smoke.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-6 Spiral-A (9K114 Shturm)</b>	(Launcher) Vehicle Mount; (9M114, 9M114M1, 9M114G1 Missiles) 35 kg	140mm	Radio SACLOS	1900	(Launcher) Vehicle Mount; (9M114 Missile) \$606, (9M114M1 Missile) \$999, (9M114G1 Missile)

					\$1092
<b>AT-6 Spiral-B (9K114 Shturm)</b>	(Launcher) Vehicle Mount; (9M114M2, 9M114G2 Missiles) 35 kg	140mm	IR Fire and Forget	1900	(Launcher) Vehicle Mount; (9M114M2 Missile) \$6912, (9M114G2 Missile) \$8961

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-6 (9M114 Missile)</b>	5	HEAT	400	5000	C19 B45	118C	DIF
<b>AT-6 (9M114M1 Missile)</b>	5	HEAT-T	400	5000	C19 B45	106C/133C	AVG
<b>AT-6 (9M114M2 Missile)</b>	5	HEAT-T	400	5000	C23 B50	122C/153C	AVG
<b>AT-6 (9M114G1 Missile)</b>	5	Thermobaric	400	5000	C58 B40	53C	AVG
<b>AT-6 (9M114G2 Missile)</b>	5	Thermobaric	400	5000	C68 B45	67C	AVG

### AT-7 Saxhorn

Notes: Originally believed to be in form and function similar to the US Dragon ATGM, that missile was subsequently revealed to in fact be a captured Dragon that the Soviets were testing with the intent to reverse-engineer. They found the Dragon's performance as lacking as US troops did, and came up with their own missile instead. The actual AT-7 is a tube-launched missile mounted on a lightweight tripod launcher. It is small and light and can even be used against slow-moving helicopters or aircraft. It is normally issued with the 1PN86V/Mulat-115 thermal imaging sight, and I have included this as part of the AT-7's cost. The AT-7 can be fired from enclosed spaces, though Russian doctrine recommends at least 2 meters of space between the back of the weapon and the wall. If fired at a target less than 500 meters away, the AT-7 may be shoulder-fired.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-7 Saxhorn (9K115 Metis)</b>	(Launcher) 10.2 kg; (Missile) 6.3 kg	94mm	Wire SACLOS	800	(Launcher) \$3600; (Missile) \$284

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-7 (9M115 Missile)</b>	2	HEAT	40	1000	C10 B30	90C	AVG

### AT-8 Songster

Notes: Called Kobra in Russian service, this ATGM is fired through the gun tube of the T-64, T-72, T-80, T-86, T-90, and T-94 tanks, addressing their poor long-range gun accuracy. The Songster is carried in two stages, which click together in the gun tube. The autoloader cannot handle the Songster, so the gunner must leave his station and load the missile by hand, and this causes a long loading time. The Songster is guided by the tank's laser rangefinder. It can also be used to engage helicopters.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-8 (9K112 Kobra)</b>	(Launcher) NA; (9M112 Missile) 30 kg, (9M112M Missile) 32 kg	125mm	Laser Designation	2000	(Launcher) NA; (9M112 Missile) \$558, (9M112M Missile) \$837

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-8 (9M112 Missile)</b>	5	HEAT	1000*	4000	C15 B40	113C	AVG
<b>AT-8 (9M112M Missile)</b>	5	HEAT-T	1000*	4000	C15 B40	90C/113C	AVG

\*The Songster may be fired at shorter ranges, but the guidance system may not acquire the missile in time to properly guide it. If fired at a target between 750-999 meters away, hitting the target is one level more difficult; if fired at a range of 500-749 meters, hitting is two levels more difficult; and if fired at a range of 100-499 meters, hitting is three levels more difficult.

### AT-9 Spiral-2

Notes: This is known to the Russians as the 9M120 Ataka. The AT-9 is an upgraded AT-6, with a better guidance system that is more resistant to jamming, a somewhat faster speed of 2000 meters per phase, and a longer range and more effective warhead. Most use of the AT-9 is from helicopters, particularly the Mi-24, Mi-28, Mi-38, and Mi-40 series, the Helix series, and the Ka-50s. The AT-9 has sufficient speed and guidance capability that it can be used against helicopters and slower aircraft. The AT-9 is one of the rarer Russian ATGM, despite having not been introduced until 1990; the Russians developed a heavier and more advanced version of the AT-6/AT-9 series, the AT-16, soon thereafter.

Twilight 2000 Notes: Special operations variants of the Ka-60 and Ka-115 are also capable of using the AT-9. About 10% of the MT-LB AT-6 ATGM vehicles were also able to use the AT-9.

Merc 2000 Notes: Production of this missile was dropped within 4 months of its introduction in favor of the AT-16.

Weapon	Weights	Missile	Guidance	Missile	Prices
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		Caliber		Speed	
<b>AT-9 (9K120 Ataka)</b>	(Launcher) Vehicle Launcher; (Missiles) 48.5 kg	140mm	Radio SACLOS	2000	(Launcher) NA; (9M120 Missile) \$670, (9M120F Missile) \$1095, (9M220 Missile) \$1004, (9A220 Missile) \$512

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-9 (9M120 Missile)</b>	6	HEAT	400	6000	C23 B50	153C	AVG
<b>AT-9 (9M120F Missile)</b>	6	Thermobaric	400	6000	C68 B45	67C	AVG
<b>AT-9 (9M220 Missile)</b>	6	HEAT-T	400	7000	C23 B50	122C/153C	AVG
<b>AT-9 (9A2220 Missile)</b>	6	FRAG-HE	400	7000	C26 B75	14C	AVG

### AT-10/12 Stabber

Notes: This is a laser-guided ATGM fired from the gun barrel of a tank or IFV using a 100mm or 115mm gun and equipped with certain special equipment. There are seven versions of the Stabber, consisting four basic versions and three improved versions. The basic versions are the 9M117 Bastion (fired by a specially-equipped version of the T-55 tank known as the T-55 AM2), the 9M117 Kastet (fired by versions of the MT-12 field gun equipped with a laser guidance module), the 9M117 Basnya (fired by BMP-3 IFV's), and the 9M116 Sheksna (fired by a specially-modified T-62 tank known as the T-62M). The improved versions are the 9M117M1 Kan (fired by the MT-12 field gun, as above), the 9M117M1 Arkan (fired by the BMP-3), and the 9M116M1 Sheksna (fired by the T-62M). The difference between the basic and improved versions is the tandem warhead used by the improved models to allow a better result against ERA. The basic rounds are all virtually identical (except for the caliber difference between the 9M117 and 9M116), but are different enough that they cannot be interchanged; a Kastet cannot be fired from a BMP-3, an MT-12 cannot fire a Bastion, etc. The same is true for the improved missiles. The speed of the 9M116 and 9M117 missiles is 1850 meters per phase, while the heavier 9M116M and 9M117M fly at 1500 meters per phase.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-10/12</b>	(Launcher) NA; (9M116 Sheksna/9M117 Kastet/9M117 Basnya/9M117 Bastion Missiles) 24.5 kg; (9M116M1Sheksna/9M117M1 Kan/9M117M1 Arkan Missiles) 26.3 kg	(AT-10) 115mm, (AT-12) 100mm	Laser Designation	(9M116/9M117 Missiles) 1850; (9M116M1/9M117M1 Missiles) 1500	(Launcher) NA; (9M116/9M117 Missiles) \$1432; (9M116M1/9M117M1 Missiles) \$2148

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Guidance
<b>AT-10/12 (9M116/117 Missile)</b>	3	HEAT	100	4000	C12 B35	98C	AVG
<b>AT-10/12 (9M116M1/117M1 Missile)</b>	3	HEAT-T	100	5500	C13 B45	90C/113C	AVG

### AT-11 Sniper (9M119 Svir)

Notes: This is an improved gun-fired ATGM designed for later Russian tanks. There are three types of Sniper missiles: the 9M119 Svir, fired by the T-72B, T-72S, and 2A45M antitank gun; and the 9M119 Reflects and 9M119M Reflects-M, fired by the T-80B, T-80U, T-84, T-90, and T-94 tanks. The difference between the Svir and Reflects is a more powerful warhead and a more powerful motor in the Reflects. The 9M119M1 Reflects-M is a further improved version of the Reflects which has a tandem warhead. While a vehicle that is capable of firing the Reflects may fire the Svir, a vehicle designed for the Svir cannot fire the Reflects. The 9M119M Invar is a Ukrainian version of the Reflects with a more advanced warhead and seeker.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-11 Sniper</b>	(Launcher) NA; (9M119 Svir/Reflects Missiles) 28 kg; (9M119M1 Reflects-M/Invar Missile) 24.5 kg	125mm	Laser Designation	1700	(Launcher) NA; (9M119 Svir/Reflects Missiles) \$1464; (9M119M1 Reflects-M Missile) \$2166; (Invar Missile) \$2383

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Guidance
<b>AT-11 (9M119 Svir)</b>	3	HEAT	100	4000	C18 B40	118C	AVG
<b>AT-11 (9M119M Reflects)</b>	3	HEAT	100	4500	C21 B45	143C	AVG
<b>AT-11 (9M119M1 Reflects-M)</b>	3	HEAT-T	100	5000	C21 B45	110C/138C	AVG

<b>AT-11 (9M119M Invar)</b>	3	HEAT-T	100	5000	C24 B50	121C/152C	ESY
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**AT-13 (9M131 Metis-M)**

Notes: This ATGM is an improved version of the AT-7 Saxhorn ATGM. The AT-13 can use an add-on thermal sight, and the missile has a larger warhead with a choice of two warheads. The AT-13 can be fired from a confined space, though a minimum distance of 2 meters is recommended between the rear of the missile and any wall that may be present.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-13 (9K131 Metis-M)</b>	(Launcher) 15 kg; (9M131 Missile) 13.8 kg, (9M131G Missile) 14.15 kg	130mm	Wire SACLOS	1000	(Launcher) \$3696, (9M131 Missile) \$474, (9M131G Missile) \$539

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-13 (9M131 Missile)</b>	2	HEAT-T	80	1500	C22 B45	132C/165C	AVG
<b>AT-13 (9M131G Missile)</b>	2	Thermobaric	80	1500	C68 B45	75C	AVG

**AT-14 Kornet**

Notes: This weapon was intended to replace the AT-5 Spandrel ATGM, but as it was not introduced until 1994, it has not yet fully supplanted that system. It is a laser-guided system, and all the operator must do is to keep the crosshairs on target to ensure a hit. A thermal sight is added for night use.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-14 Spriggan (9P163 Kornet)</b>	(Launcher) 29 kg; (9M163/9M163G Missile) 29 kg	152mm	Laser SACLOS	1250	(Launcher) \$7290; (9M163 Missile) \$957, (9M163G Missile) \$1056

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-14 (9M163 Missile)</b>	6	HEAT-T	100	5500	C30 B55	165C/206C	ESY
<b>AT-14 (9M163G Missile)</b>	6	Thermobaric	100	5500	C92 B54	88C	ESY

**AT-15 Springer**

Notes: This is a new ATGM fired from the KBM tank destroyer. The AT-15 may be guided using millimeter-wave radar or laser guidance. The AT-15 comes in two warheads, a HEAT warhead and a thermobaric warhead for engaging troops and bunkers. The fate of the AT-15 is in doubt; the Russians don't have a lot of money for the program, and they haven't managed to attract any foreign buyers.

Twilight 2000 Notes: The first use of the AT-15 was in August of 1997 in the Ukraine, but it was not often seen during the Twilight War.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-15 Springer (9P123 Khrizantema)</b>	(Launcher) Vehicle Launcher; (9M123-2/9M123F-2 Missiles) 31 kg	150mm	Laser SACLOS or Radar SACLOS	2000	(Launcher) NA; (9M123-2 Missile) \$3948, (9M123F-2 Missile) \$5064

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>AT-15 (9M123-2 Missile)</b>	5	HEAT-T	100	6000	C30 B55	149C/187C	ESY
<b>AT-15 (9M123F-2 Missile)</b>	5	Thermobaric	100	6000	C90 B50	87C	ESY

**AT-16 Scallion**

Notes: Known as the 9M127 Vikhr to the Russians, the Scallion was introduced shortly after the AT-9 Spiral-2, and is a greatly-improved version of that missile and the AT-6 Spiral. It is a fast, powerful missile that is used not only from the latest Russian attack helicopters, but also from aircraft such as the SU-25 and SU-39 Frogfoot, and the various versions of the Flanker. Several versions of the Scallion are available for the Twilight War, including a few experimental models that are rather rare. The Scallion has the speed and maneuverability to take down helicopters and slow-flying aircraft; the 9M227F is particularly useful for this, as it can be used as a conventional heat-seeking air-to-air missile in addition to being able to attack ground targets. Speed of the 9M127 series is 2000 meters per phase, while the speed of the 9M227 series is 2175 meters per phase.

Twilight 2000 Notes: The MiG-35, MiG-37, and Su-40 are also able to use the AT-16. Though it was not designed for firing from



ground vehicles, some of the MT-LB AT-6 ATGM carriers were reportedly modified late in the war to use the Scallion.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-16 Scallion (9P127 Vikhr)</b>	(Launcher) Vehicle Launcher; (Missiles) 60 kg	135mm	(9M127, 9M227, 9M127F, 9M127G, 9M227G1 Missiles) Laser SACLOS; (9M227M1, 9M227F, 9M227G2 Missiles) IR Fire and Forget; (9M227M2 Missile) Antiradiation	(9M127 Series Missiles) 2000; (9M227 Series Missiles) 2175	(Launcher) NA; (9M127 Missile) \$2703, (9M227 Missile) \$2716, (9M227M1 Missile) \$14580, (9M227M2 Missile) \$4983, (9M127F Missile) \$1652, (9M127G Missile) \$3304, (9M227F Missile) \$17570, (9M227G1 Missile) \$35140, (9M227G2 Missile) \$19139

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Guidance
<b>AT-16 (9M127 Missile)</b>	8	HEAT-T	400	10000	C24 B50	139C/174C	Laser
<b>AT-16 (9M227 Missile)</b>	8	HEAT-T	400	15000	C24 B50	139C/174C	Laser
<b>AT-16 (9M227M1 Missile)</b>	8	HEAT-T	300	15000	C24 B50	139C/174C	IRFF
<b>AT-16 (9M227M2 Missile)</b>	8	HEDP-FRAG	300	15000	C23 B70	63C	ARM
<b>AT-16 (9M127F Missile)</b>	8	HE-FRAG	400	10000	C27 B75	13C	Laser
<b>AT-16 (9M127G Missile)</b>	8	Thermobaric	400	10000	C72 B45	78C	Laser
<b>AT-16 (9M227F Missile)</b>	8	HE-FRAG	300	15000	C27 B75	13C	IRFF
<b>AT-16 (9M227G1 Missile)</b>	8	Thermobaric	400	15000	C72 B45	78C	Laser
<b>AT-16 (9M227G2 Missile)</b>	8	Thermobaric	300	15000	C72 B45	78C	IRFF

### AT-17 Satchel

Notes: This weapon does not exist in real life.

Twilight/Merc 2000 Notes: When the Russians decided to use a 135mm main gun on the T-95 and Black Eagle tanks, most of the gun's designers felt the gun-fired ATGM was not necessary anymore, considering the variety of ammunition they developed for the gun, the gun's range advantage over the 125mm gun, and the superior fire control system on those tanks. However, the Army felt that new technology would also allow for a more effective missile that could be fired through the main gun, and also allow the T-95 and Black Eagle to do some things that other tanks could not. To this end, the 9M133 Rosomaha (Wolverine) was developed, known to the West by the NATO reporting name AT-17 Satchel. Like other gun-fired Russian ATGMs, the Satchel comes in a variety of warheads, including some normally found only in the West, to allow it to accomplish antivehicle, antipersonnel, antibunker, and antihelicopter attacks at extended range. With a speed of 2400 meters per phase, the missile is swift and deadly.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>AT-17 Satchel (9P133 Rosomha)</b>	(Launcher) NA; (Missiles) 32 kg	135mm	(9M133F2, 9M233M2) IR Fire and Forget; (Others) Laser SACLOS	2400	(Launcher) NA; (9M133 Missile) \$2539, (9M133F1 Missile) \$2596, (9M133F2 Missile) \$2368, (9M133G Missile) \$3157, (9M133M1 Missile) \$3613, (9M233 Missile) \$2708, (9M233M1 Missile) \$2891, (9M233M2 Missile) \$3554

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Guidance
<b>AT-17 (9M133 Missile)</b>	6	HEAT-T	100	9800	C24 B50	150C/188C	Laser
<b>AT-17 (9M133F1 Missile)</b>	6	EFP-FRAG	100	9800	C14 B75	84C	Laser
<b>AT-17 (9M133F2 Missile)</b>	6	HE-FRAG	100	9800	C27 B75	15C	IRFF
<b>AT-17 (9M133G Missile)</b>	6	Thermobaric	100	9800	C72 B45	78C	Laser
<b>AT-17 (9M133M1 Missile)</b>	6	EFP-T	100	9800	C18 B60	150C/188C	Laser
<b>AT-17 (9M233 Missile)</b>	6	HEAT-T-TA	100	9800	C24 B50	150C/188C	Laser
<b>AT-17 (9M233M1 Missile)</b>	6	EFP-T-TA	100	9800	C18 B60	150C/188C	Laser
<b>AT-17 (9M233M2 Missile)</b>	6	TERM-KE	100	9800	C11 B38	97C	IRFF

**Ingwe**

Notes: A South African ATGM, the Ingwe (Leopard) is normally fired from the launcher on the Ratel ZT-3 tank destroyer or by helicopters. It is a laser-guided with medium anti-armor performance, not too useful against heavily armored vehicles, but adequate against the armor fielded by its neighbors. There are two versions, the standard ZT-3 with a HEAT warhead, and the ZT-3B with a HEAT-Tandem warhead to defeat reactive armor. The Ingwe is basically an unlicensed copy of a prototype laser-guided TOW missile, and it is a mystery where the South Africans got the plans for that prototype TOW.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Ingwe</b>	(Launcher) Vehicle Launcher; (ZT-3 Missile) 25 kg, (ZT-3B Missile) 26 kg	127mm	Laser Designation	1500	(Launcher) NA; (ZT-3 Missile) \$1688, (ZT-3B Missile) \$2532

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Ingwe ZT-3</b>	6	HEAT	100	5000	C19 B45	157C	AVG
<b>Ingwe ZT-3B</b>	6	HEAT-T	100	5000	C19 B45	125C/157C	AVG

**Aries**

Notes: This was Spain's first candidate to replace its aging MAWs with a light ATGM. The Aries was to be a light system to be fired from a small tripod similar to the later Israeli Gill/Spike System. The Missile was to be self-contained in a throwaway container, and have a tandem warhead with a fragmentation jacket for antipersonnel effect. The launcher includes an image intensifier. Further development led to the MACAM-3, which was much lighter and more advanced in design, and the Aries was passed by the wayside for later technology.

Twilight 2000 Story: The Aries was fielded in early 1993 and became one of the mainstays of Spanish and Portuguese light antitank forces.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Aries</b>	(Launcher) 11.4 kg; (Missile) 15.9 kg	148.6mm	Wire SACLOS	1175	(Launcher) \$2752; (Missile) \$1205

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Aries</b>	5	HEAT-T-FRAG	65	2000	C22 B69	137C/171C	AVG

**MACAM-3**

Notes: This weapon is the new Spanish light ATGM, produced by Gyconsa. It is a rather new weapon, and is rather rare. The launcher unit clips on to the missile tube, which comes pre-packed from the factory. The firing unit is powered by a small battery that lasts for four hours in the "on" position. The missile is guided by fiberoptic strands that reel out from the missile, similar to a wire-guided missile, but more reliable and responsive. The firing unit incorporates a passive IR unit for night use. In an emergency, the MACAM-3 missile tube can be placed on a TOW missile launcher and launched and guided that way. The warhead is of the tandem HEAT variety, and is a top-attack missile. Once fired, the operator can then drop the missile and firing unit, and the missile will guide on a fire-and forget basis. Locking on in this manner requires 3 phases (15 seconds) of aiming. The missile may also be guided in a conventional manner (i.e. throughout its entire flight); this requires only one phase of aiming. Pintle mounts for this weapon exist.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>MACAM-3</b>	(Guidance Unit) 9 kg; (Missile) 13.8 kg	147mm	FOG or IR Fire and Forget	1000	(Launcher) \$5490; (Missile) \$5925

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>MACAM-3 (FOG-Guided)</b>	1	HEAT-T-TA	50	5000	C29 B55	136C/170C	ESY
<b>MACAM-3 (Fire &amp; Forget)</b>	1	HEAT-T-TA	50	2500	C29 B55	136C/170C	AVG

**Bantam**

Notes: The Bantam ATGM is an old, first-generation ATGM that was one of the first successful ATGM ever produced. It is a small and lightweight missile that, when first designed, was used primarily by Swedish and Swiss forces, with some limited use by British, Norwegian, Danish, and US forces. As the Bantam initially got little combat use, but was produced in large numbers, they became popular "hand-me-down" weapons for client states of US and NATO countries. By 2000, the Bantam is found mostly in the Third World, and mostly in the poorer Third World countries at that. Bantam is fired from a box launcher, connected by wire to a control unit. The control unit may be directly connected to three launch boxes, and a distribution box may be added to allow the gunner to control up to 18 launch boxes. (Only one missile may be guided at a time, however.) The gunner may position himself up to 120 meters from the missiles. The Bantam has a maximum range of 2000 meters; at this point, the missile runs out of wire, and it automatically self-destructs by detonating the warhead.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Bantam</b>	(Guidance Unit) 12.5 kg; (Missile in Box) 25.5 kg	100mm	Wire MCLOS	425	(Guidance Unit) \$950; (Missile) \$174

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Bantam</b>	1	HEAT	300	2000	C13 B35	81C	FOR

**MBT LAW**

Notes: This is a light ATGM fielded by the Swedish in early 1998, and is now being used in growing numbers by the British, Dutch, and Norwegians. The MBT LAW combines features from the M-136 antitank rocket and the Bill-2 ATGM. The system uses a soft launch feature that kicks the missile clear of the launch tube before igniting the rocket motor. This allows the MBT LAW to be fired from confined spaces as well as minimizing launch signature. It may be employed as both an antiarmor weapon and as a bunker buster; for bunker busting, the weapon is fired without its top-attack capability, and penetrates the target before detonating the main warhead. The weapon is disposable, and can use a night sight if desired.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>MBT LAW</b>	(Launcher/Missile) 12 kg	150mm	IR Fire and Forget	1500	(Launcher/Missile) \$14781

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>MBT LAW</b>	0	HEAT-T-TA	20	600	C30 B55	117C/147C	ESY

**RBS-56 Bill**

Notes: The RBS-56 Bill is the world's first operational top-attack missile. The Bill flies over the target and uses its canted warhead to attack the thin overhead armor. The Bill tracker automatically corrects for wind drift and has a computer that assists the gunner in steering the missile. The Bill can be ground-mounted, but is very heavy; it can also be vehicle or helicopter-mounted.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>RBS-56-1 Bill-1</b>	(Launcher) 36.3 kg; (Missile) 20 kg	150mm	Wire SACLOS	770	(Launcher) \$2236; (Missile) \$498

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>RBS-56-1 Bill</b>	4	HEAT-TA	150	2200	C26 B50	158C	AVG

**RBS-56-2 Bill 2**

Notes: This is externally similar to the RBS-56 Bill above; however the firing stand has been given a day/night capability and the electronics are more compact.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>RBS-56-2 Bill-2</b>	(Launcher) 20 kg	150mm	Wire SACLOS	770	(Launcher) \$4660; (Missile) \$701

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>RBS-56-2 Bill 2</b>	4	HEAT-T-TA	150	2200	C30 B55	138C/173C	ESY

**Kuen Wu 1**

Notes: This Taiwanese ATGM is basically a reverse-engineered AT-3 Sagger; the antiquated guidance equipment was largely retained, but an improved engine and warhead were added. They have been almost completely replaced by later missiles. It can be used in conjunction with IR or thermal imaging.

Twilight 2000 Notes: By the Twilight War, these missiles were largely replaced by missiles from the US, France, and Great Britain; later the Kuen Wu 1's were pulled back out of storage.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Kuen Wu 1</b>	(Launcher) 15 kg; (Missiles) 11.3 kg	119mm	Wire MCLOS	600	(Launcher) \$1930; (HEAT Missile) \$192, (HE Missile) \$165

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Kuen Wu 1</b>	1	HEAT	500	3000	C14 B35	91C	FOR
	1	HE	500	3000	C21 B45	11C	FOR

**Hellfire**

Notes: This is a large, long-range ATGM developed for use by helicopters against armored vehicles. Hellfire is laser-guided, and is actually able to climb out of cover and acquire a target illuminated by a third party. Only one phase of illumination is required for target lock-on. Some Hellfires were produced on an experimental basis as antiradar missiles, with IRFF guidance, and with ICM warheads. These variants are extremely rare. The Hellfire is supersonic and travels 1985 meters per phase. The ground mount is currently used only by Sweden, but other countries are evaluating it.

Twilight 2000 Notes: The Hellfire was adapted to vehicular mounts for use on the M-2A3 and M-3A3 Bradley Fighting Vehicles, the Hellfire HMMWV, and some other ground vehicle mounts.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Hellfire</b>	(Ground Mount) 48 kg; (Missiles) 45 kg	178mm	(AGM-114D) IR Fire and Forget; (AGM-114E) Antiradiation; (AGM-114L) IR/CCD Fire and Forget; (Others) Laser Designation	1985	(Ground Mount) \$31280; (AGM-114A/B/C Missile) \$1658; (AGM-114D Missile) \$6558; (AGM-114E Missile) \$3716; (AGM-114F Missile) \$8469; (AGM-114K Missile) \$8453; (AGM-114L Missile) \$19223

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Hellfire (AGM-114A/B/C Missile)</b>	5	HEAT	200	6000	C31 B45	136C	AVG
<b>Hellfire (AGM-114D Missile)</b>	5	HEAT	200	6000	C32 B45	136C	AVG
<b>Hellfire (AGM-114E Missile)</b>	6	ICMDP	200	7000	B80	Grenade*	ESY
<b>Hellfire (AGM-114F Missile)</b>	5	HEAT-T	200	8000	C37 B60	152C/190C	AVG
<b>Hellfire (AGM-114K Missile)</b>	5	HEAT-T	200	10000	C42 B65	166C/207C	ESY
<b>Hellfire (AGM-114L Missile)</b>	6	HEAT-T-HE	200	10000	C63 B80	182C/227C	ESY

**Javelin**

Notes: This weapon is an upgraded version of the Tankbreaker ATGM listed in the *Twilight 2000 Version 2.2* rules. (The Tankbreaker was an experimental missile that led to the Javelin, but was never actually fielded). While the missile is heavier and more capable, the firing unit is lighter and easier to carry. The firing unit uses thermal imaging for night launches, and incorporates a 9x magnifying sight. Like the Tankbreaker, the Javelin is fire-and-forget and top-attacking. Unlike the Tankbreaker, the warhead is a tandem warhead.

Twilight 2000 Notes: The Javelin began to replace the Tankbreaker and Dragon just before the Twilight War in 1995, and a few were exported to friendly countries in Europe and to countries such as South Korea, Saudi Arabia, and Israel.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Javelin</b>	(Launcher) 6.4 kg; (Missile) 15.9 kg	127mm	FLIR Fire and Forget	1000	(Launcher) \$6520; (Missile) \$8531

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Javelin</b>	2	HEAT-T-TA	50	2500	C21 B45	116C/146C	ESY

**LOSAT**

Notes: LOSAT (Line-Of-Sight AntiTank) is due to be adopted around 2005 by NATO as an antiarmor and anti-aircraft missile. It will initially be deployed from specially-modified HMMWVs, but may be adapted to other vehicles. The LOSAT is merely a tungsten slug powered by a high-velocity rocket engine, guided by a laser designator or fire-and-forget guidance. It uses its speed to penetrate virtually all armor and catch targets before they can dodge away. The LOSAT is launched from vehicle or aircraft pallets. The LOSAT also has the ability to be fired as an unguided rocket.

Twilight 2000 Notes: Only 22 examples of this weapon were available at the time of the Twilight War; all were deployed to the Middle East.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>LOSAT</b>	(Launcher) Vehicular Launcher; (Missiles) 80 kg	163mm	(LOSAT-1) Laser SACLOS or Designation; (LOSAT-2) CCD Fire and Forget	7620	(Launcher) Vehicular Launcher; (LOSAT-1) \$12068; (LOSAT-2) \$5968

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>LOSAT-1</b>	19	KEP	30	8800*	110	302/292/248/131*	AVG
<b>LOSAT-2</b>	19	KEP	30	8800*	110	302/292/248/131*	ESY
<b>LOSAT (Any)</b>	19	KEP	0	550**	110	302**	Rocket

\*Penetration is 302 at ranges from 30-2200 meters, 292 from 2201-4400 meters, 248 from 4401-6600 meters, and 131 from 6601-8800 meters.

\*\*In the unguided mode, the LOSAT is aimed and fired like a rocket launcher. At this short range, penetration is always 302.

**M-47 Dragon Series**

Notes: The Dragon was developed in the late 1960s to replace the 90mm recoilless rifle in US service as a MAW (Medium Antiarmor Weapon). Early versions proved to be none too potent against armor, though hundreds were used as bunker busters by the US and Israelis. The Dragon PIP (Product Improvement Program) produced the M47A2 Dragon 2, M-47A3 Dragon 2T, and M47A4 Dragon 3, with the Dragon 2 improving penetration, the Dragon 2T using a heavier tandem warhead, and the Dragon 3 improving range and penetration as well as adding a day/night tracker. The Dragon's missile tube and launcher are disposable, and any tracker can fire any missile type. Though the Dragon 1 and 2 were widely fielded, the Dragon 2T and Dragon 3 largely fell by the wayside in favor of the Javelin in the US and the Gill and Spike in Israel.

Twilight 2000 Notes: The Dragon 2T and 3 were produced in larger numbers than in the Notes; they were deployed mostly in the Continental US and in Canada.

Merc 2000 Notes: All four of these missiles were produced, but the 2T and 3 ended up mostly in Third World countries, and most stocks of the Dragon 1 and 2 were also sold off after the fielding of the Tankbreaker, and later the Javelin.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Dragon 1</b>	(Sight Unit) 6.2 kg; (Missile) 14 kg	127mm	Wire SACLOS	445	(Sight Unit) \$1650; (Missile) \$228
<b>Dragon 2</b>	(Sight Unit) 6.97 kg; (Dragon 2 Missile) 15.4 kg, (Dragon 2T Missile) 16.16 kg	127mm	Wire SACLOS	435	(Sight Unit) \$2650; (Dragon 2 Missile) \$236, (Dragon 2T Missile) \$553
<b>Dragon 3</b>	(Sight Unit) 12.2 kg; (Dragon 3 Missile) 23.8 kg	127mm	Wire SACLOS	435	(Sight Unit) \$3650, (Missile) \$339



Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
Dragon 1 (M-47A1)	1	HEAT	65	1000	C16 B40	83C	AVG
Dragon 2 (M-47A2)	1	HEAT	65	1000	C19 B45	129C	AVG
Dragon 2T (M-47A3)	3	HEAT-T	65	750	C24 B50	103C/129C	AVG
Dragon 3 (M-47A4)	3	HEAT	65	1500	C19 B45	133C	AVG

### Predator

Notes: This is a short-range ATGM designed for use in street fighting. It is designed to partially supplement the M-136 and M-72 rocket launchers, and provides a much superior weapon to either of those weapons. The Predator can be fitted with either an HEDP anti-bunker warhead (in which case it is known as the MPIM-SRAW or Predator-AB), or the standard top-attack EFP warhead. The missile comes pre-packed and is disposable. As of 2003, the Predator is being deployed in small numbers in the US, and the British, Norwegians, Israelis, and South Africans are looking at it.

Twilight 2000 Notes: This weapon began to equip US Army and Marines in 1997, and was rather rare in the Twilight War.

Merc 2000 Notes: Predator largely fell victim to budget cuts in the early 2000s.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
Predator	(Launcher/Missile) 9 kg	140mm	IR Fire and Forget	1500	(Launcher/Missile) \$5828
Predator-AB	(Launcher/Missile) 9 kg	140mm	IR Fire and Forget	1500	(Launcher/Missile) \$7924

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
Predator	0	EFP-TA	17	600	C20 B65	111C	ESY
Predator-AB	0	EFP-FRAG-HE	17	600	C22 B80	48C	ESY

### Shillelagh

Notes: An ATGM used in the 152mm gun/missile system of the M-60A2 and M-551 tanks. The Shillelagh is fired through the gun tube of the M-551 Sheridan (the M60A2 being long out of service) and uses IR guidance. There are significant disadvantages to the Shillelagh, such as its high minimum range, the tendency for the Sheridan's gun tube to crack after a large amount of Shillelagh launches (possibly as few as 100) unless using the MGM-51C version of the missile, and the tendency of the guidance system to lose track of the missile altogether. The first version of the Shillelagh is the MGM-51A, the MGM-51B increased range by 50%, but is longer and heavier; the MGM-51C is essentially identical to the MGM-51B is, but eliminates the gun barrel cracking and guides more reliably. With the removal of Sheridans from the 82<sup>nd</sup> Airborne, the Shillelagh also passed out of service.

Twilight 2000 Notes: The Sheridans put in a spectacular performance during the Twilight War, and the crews partially credit the Shillelagh for that. Most Shillelaghs used during the Twilight War were MGM-51C's.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
Shillelagh	(Launcher) NA; (MGM-51A Missile) 28.6 kg, (MGM-51B/C Missile) 29.6 kg	152mm	IR SACLOS	1645	(Launcher) NA; (MGM-51A Missile) \$1544, (MGM-51B/C) \$2548

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty

<b>Shillelagh (MGM-51A)</b>	5	HEAT	730	4000	C23 B50	144C	FOR
<b>Shillelagh (MGM-51B/C)</b>	5	HEAT	730	6000	C27 B50	159C	AVG

### Superdragon

Notes: This is the ultimate version of the M-47 Dragon ATGM series. Its day/night tracker is equipped with active/passive IR, and the tracker has digital electronics and test equipment that allows the user to test and repair many problems without special equipment. The missile has a tandem warhead with an increased propellant charge that allows it to defeat reactive armor and achieve greater range. The Superdragon tracker may fire all types of Dragon missiles. This missile fell victim to missiles with newer technology and lower cost.

Twilight 2000 Notes: This missile was not used much by the US, Israel, and most other countries formerly using the Dragon, as in most of those cases the Dragon was replaced by missiles such as Tankbreaker, Javelin, Predator, NT-S Spike/NT-G Gill, and other newer weapons. However, it was widely marketed in the Second and Third World, and was diverted to US and Canadian military use after the Mexican invasion of the Southwestern US and Russian Invasion of Alaska and Western Canada.

Weapon	Weights		Missile Caliber	Guidance	Missile Speed	Prices	
<b>M-47A5 Superdragon</b>	(Sight Unit) 13.39 kg; (Missile) 11.21 kg		127mm	Wire SACLOS	870	(Sight Unit) \$2650, (Missile) \$478	
Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Superdragon</b>	2	HEAT-T	65	2000	C21 B45	121C/151C	AVG

### TOW Series

Notes: The TOW (Tube-launched, Optically-tracked, Wire-guided) is the standard heavy ATGM in nearly 20 nations. It is also used to arm dozens of APCs and tank destroyers, as well as helicopters. The TOW system has been continually updated since its first use in Vietnam in the early 70s; the newest versions are state-of-the-art. Differences between TOW versions are mostly in the missile, although launching equipment has been lightened. TOW-1 is the basic version, and can fire only TOW-1, TOW-1A, or I-TOW missiles; all other launchers can fire all types of missiles except the TOW-3 (only a TOW-3 launcher may fire that missile). There is no dedicated I-TOW ground mount launcher. The TOW-2 and TOW-3 launchers add a thermal imager as well as miniaturizing some of the electronics.

Weapon	Weights		Missile Caliber	Guidance	Missile Speed	Prices	
<b>TOW-1</b>	(Launcher) 87.5 kg; (TOW-1 Missile) 18.5 kg; (TOW-1A, I-TOW Missiles) 19 kg		127mm	Wire SACLOS	1000	(Launcher) \$2220; (TOW-1 Missile) \$384, (TOW-1A Missile) \$392, (I-TOW Missile) \$399	
<b>TOW-2</b>	(Launcher) 93 kg; (TOW-2 Missile) 21.4 kg; (TOW-2A and 2B Missiles) 22.6 kg; (TOW-2C Missile) 23.1 kg; (TOW-BLAAM Missile) 27.8 kg		152mm	Wire SACLOS	1000	(Launcher) \$3960; (TOW-2 Missile) \$427, (TOW-2A Missile) \$481, (TOW-2B Missile) \$922, (TOW-2C Missile) \$770, (TOW-BLAAM Missile) \$1319	
<b>TOW-3</b>	(Launcher) 87 kg; (TOW-3 Missile) 24.5 kg		152mm	IR Fire and Forget	1000	(Launcher) \$6760, (TOW-3 Missile) \$8986	
Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>TOW-1 (BGM-71A)</b>	3	HEAT	65	3000	C16 B40	104C	DIF

<b>TOW-1A (BGM-71B)</b>	3	HEAT	65	3750	C16 B40	104C	AVG
<b>I-TOW (BGM-71C)</b>	3	HEAT	65	3750	C16 B40	114C	AVG
<b>TOW-2 (BGM-71D)</b>	4	HEAT	65	3750	C23 B50	134C	AVG
<b>TOW-2A (BGM-71E)</b>	5	HEAT	65	3750	C27 B50	135C/169C	AVG
<b>TOW-2B (BGM-71F)</b>	5	EFP-T-TA	65	3750	C23 B70	147C/184C	AVG
<b>TOW-2C (BGM-71G)</b>	5	HEAT-T-TA	65	3750	C30 B55	147C/184C	AVG
<b>TOW-3 (BGM-71H)</b>	5	EFP-T-TA	65	3750	C23 B70	155C/194C	ESY
<b>TOW-BLAAM (BGM-71TBD)</b>	7	EFP-HEDP	65	3750	C35 B70	96C	ESY

### Viper

Notes: The XM-132 Viper was an early attempt at a Guided LAW (a very lightweight, disposable antitank missile). It is basically a rocket from an M-72 series LAW rocket equipped with a guidance package and a slightly larger, more effective warhead. As a first attempt, it was not too bad an effort, but the technology at the time it was designed (early 1980s) did not allow for a reliable guidance package in such a small missile. XM-132 missiles are therefore 25% likely to miss, even if the firer's roll to hit indicates a successful hit on the target. As it was, the project was shelved as being not possible with the technology of the time.

Twilight 2000 Notes: A later version, the M-132A1, does not have the problem with accuracy that the XM-132 has. Special operations liked the Viper, especially the M-132A1, but it was never produced in large quantities, and the small warhead meant that it was not very effective against even moderately-armored vehicles.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>XM-132 Viper</b>	(Launcher/Missile) 5.73 kg	70mm	IR Fire and Forget	1000	(Launcher/Missile) \$6151
<b>M-132A1 Viper</b>	(Launcher/Missile) 5.73 kg	70mm	IR Fire and Forget	1000	(Launcher/Missile) \$6151

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>XM-132 Viper</b>	0	HEAT	50	635	C6 B25	70C	FOR
<b>M-132A1 Viper</b>	0	HEAT	50	635	C6 B25	77C	AVG

**Bumbar**

Notes: The Bumbar (Bumblebee) is a Yugoslavian ATGM based on the French Eryx, but is a significant improvement of that weapon. The missile features a soft-launch capability; it has an ejection charge that kicks the missile clear of the tube, and then starts the motor. This results in a low backblast (similar to Davis Countershot weapons) and little firing signature. The weapon has excellent counter-jamming abilities and is not likely to be decoyed (two levels harder). Development and production of the Bumbar appears to have stopped in the wake of the breakup of Yugoslavia; its status is now unknown.

Twilight 2000 Notes: This weapon was just being produced before the Twilight War and is little encountered.

Merc 2000 Notes: This weapon was of great interest throughout the world, but supply never nearly matched demand.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Bumbar</b>	(Launcher) 6 kg; (Missile) 12 kg	136mm	CCD	1200	(Launcher) \$5860; (Missile) \$1246

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Bumbar</b>	2	HEAT-T	60	600	C24 B50	140C/175C	ESY

**Maljutka**

Notes: This Yugoslavian ATGM is a development and improvement of the Russian AT-3 Sagger, and in fact the name "Maljutka" is simply the Yugoslavian version of the Russian name of the Sagger, "Malyutka." Improvements include a better guidance system and a standoff probe to provide better effect for its warhead. Up to four missiles may be connected to one guidance unit, but only one missile may be controlled at a time. The Maljutka-1 launcher is not very different from the standard AT-3 Sagger launcher; the Maljutka-2's launcher is more advanced. The Maljutka-1 may only fire the Maljutka-1 missile, while the Maljutka-2 launcher may fire either missile.

Weapon	Weights	Missile Caliber	Guidance	Missile Speed	Prices
<b>Maljutka-1</b>	(Launcher) 19.5 kg; (Missile) 11 kg	125mm	Wire MCLOS	600	(Launcher) \$1340; (Missile) \$172
<b>Maljutka-2</b>	(Launcher) 19.5 kg; (Missile) 11 kg	125mm	Wire SACLOS	600	(Launcher) \$2140; (Missile) \$266

Weapon	Reload	Round	Min Range	Max Range	Damage	Pen	Difficulty
<b>Maljutka-1</b>	1	HEAT	400	3000	C15 B40	95C	FOR
<b>Maljutka-2</b>	1	HEAT	250	3000	C18 B40	116C	DIF
	1	Thermobaric	250	3000	C41 B30	56C	DIF