

## AIR-TO-SURFACE-MISSILES



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**Martin Pescador**

Notes: The Martin Pescador (Kingfisher in Spanish) is an ASM that is primarily meant to take down ships, but is also useful against land targets. It can be fired from helicopters or fixed-wing aircraft. It borrows heavily from the US Bullpup, including the simple radio command with joystick control in the cockpit. Though the missile was shown as early as 1979, none were used in the 1982 Falklands War, and the missile has not been seen much. Acquisition may have been slowed or stopped by budgetary problems.

Weapon	Difficulty	Guidance	Weight	Price
Martin Pescador	Average	Radio Command	140 kg	\$4568

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
Martin Pescador	3910	KEP/HE	2500	9000	C70 B82	119C

**ALARM**

Notes: This is the antiradiation missile most normally carried by European aircraft. It was first used in combat in the 1991 Gulf War and proved very effective in the Gulf War and the Twilight War. The missile has a loiter capability; if it loses its target, the missile will climb to 12,000 meters, deploy a parachute, and slowly descend over the last known location of the target, waiting for more radar emissions. It can also home in on the last known location of its target, achieving a hit that way.

Weapon	Difficulty	Guidance	Weight	Price
ALARM	Easy	Antiradiation	200 kg	\$32290

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
ALARM	5100	HE-FRAG	400	40000	C80 B130	28C

**MDBA Brimstone**

Notes: The Brimstone is an air-launched antiarmor missile, originally designed for use by RAF attack aircraft. It was quickly discovered that the Brimstone was not much bigger than, though heavier, than a Hellfire, and it was okayed for use on British, Saudi, and German Helicopters. MDBA is also studying the Brimstone for use on UAVs and from surface launchers, particularly from ships. The US, France, India, and Indonesia have also expressed interest in the Brimstone. First combat use was by the RAF in Libya.

**Brimstone 1**

The Brimstone uses a millimetric radar wave for guidance, though a later version can home in on a laser source in high-ECM environments or in places where the ground weather is bad. The warhead is a tandem HEAT warhead that is designed not only to defeat armor, but for use against fortifications, particularly those made of reinforced concrete. Brimstone can be fired in ripples for use against columns of vehicles or especially hard targets. Once locked on and launched, the Brimstone goes into fire-and-forget mode, and if the target is in the Brimstone software aboard the launching vehicle or so designated by the WSO, the Brimstone can on its own pick out the most vulnerable spot on a vehicle or fortification. As many as 24 Brimstones may be in the air and controlled by one designating aircraft, and targets may be changed after launch by a guiding aircraft.

Being much heavier than the Hellfire, only three Brimstones may be mounted on an MER (though four will fit in an F-35B's weapons bays, along with a Meteor AAM). Brimstones have been tested by the US with launches from an MQ-9 Reaper UAV, with one Brimstone under each wing instead of the normal complement of two Hellfires per wing.

**Dual-Mode Brimstone**

The original impetus for the Dual-Mode Brimstone was the rules of engagement imposed on aerial ordnance in Afghanistan. There was often close proximity between Taliban forces and civilians, and Taliban males and civilian males usually dressed the same way and were likewise armed. The Afghanistan ROE requires that there be a "man in the loop" – an operator which can guide the missile or destroy it in flight if necessary. For the Brimstone, this required the addition of a laser seeker, so the gunner could know when a missile should be destroyed short of its target or sent flying off in an arbitrary direction. The designator need not be the aircraft to fire the missile, or even an aircraft; individual soldiers can carry a designator, or FISTV vehicles or other vehicles with designators may be used. The MMW seeker may be used at the same time as the laser seeker, to essentially double the chances to hit; when used in dual mode, this version of the Brimstone has a +3 to hit, above any other bonuses.

**Brimstone 2**

Brimstone 2, also known as SPEAR 2 (Selective Precision Effects At Range) and FAHW (Future Attack Helicopter Weapon), increases the safety to ground crews and ground fire by the use of incentive rocket propellant and insensitive warhead explosives. It has an improved MMW seeker and retains the laser seek mode. The warhead and seeker are designed to be modular, so that merely warheads need to be changed instead of the entire missile, and the seeker can be updated as they become available. The standard warhead is supplemented with an AT/Antimateriel warhead, able to be effective against vehicles, buildings, fortifications, and troops in the open. The Brimstone 2 can be given a straight-in (LOS) trajectory, a top-down trajectory, and a high-low trajectory. The warhead can also use airburst, delayed detonation (with KEP capability), and proximity fuzing. Brimstone 2 began service in 2016, and has been used by Qatari and Saudi aircraft in combat. The RAF is expected to begin combat use of Brimstone 2 in Syria and Iraq against ISIS in 2020.

**Brimstone 3**

Still in the testing phase, the Brimstone 3 is a ground-mounted launcher for three Brimstone missiles, with the launcher being equipped with an MMW radar and a laser designator.

**Sea Spear**

Also known as the Naval-Launched Brimstone (though it can also be launched from aircraft). The Sea Spear is, however, designed for use against small-boat swarms and its chief warhead is a Flechette warhead. It has been demonstrated hitting a 6-meter boat in Sea State 3, moving at 30 knots. It has also been tested against a squadron of full-speed Fast Boats, eliminating them.

MDBA says that the Sea Spear is just out of development and is ready for sale.

### SPEAR 3

Still in testing, the SPEAR 3 Brimstone is a standoff attack weapon designed to be used attack targets 360 kilometers away. This is done with a rocket launch motor and a turbojet sustainer. It will fly at high subsonic speeds, and will use a wing kit. Guidance is by a multimode seeker, but using a combination of INS and GPS. SPEAR 3 capability will be integrated in the software package of the RAF's F-35Bs in the British Block 4 upgrades, and British Typhoons will also be upgraded to carry SPEAR 3.

The SPEAR EW is an ARM version of the SPEAR 3, to be used against enemy radars, communication nodes, and possibly even radar-homing missiles and SAMs. Work is being done to allow the SPEAR EW to be effective against large radar-using aircraft like AWACS aircraft. Like the SPEAR 3, the SPEAR EW is still in its testing phase.

Weapon	Difficulty	Guidance	Weight	Price
<b>Brimstone 1</b>	Average	MMR/FF	48.5 kg	\$67985
<b>Dual-Mode Brimstone</b>	Average*	MMR/Laser/FF	48.6 kg	\$68485
<b>Brimstone 2</b>	Easy	MMR/Laser/FF	50 kg	\$89925
<b>Sea Spear</b>	Easy	INS/MMW/Laser	60 kg	\$90028
<b>SPEAR 3</b>	Easy	INS/GPS	100 kg	\$90600
<b>SPEAR EW</b>	Easy	Anti-Radiation	100 kg	\$93350

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>Brimstone 1/Dual-Mode Brimstone</b>	2250	HEAT-FRAG	200	20000	C55 B83	104C/207C
<b>Brimstone 2 (Airburst Mode)</b>	2250	KEP/HEAT-FRAG	200	40000	C64 B110	20C
<b>Brimstone 2 (Antiarmor Mode)</b>	2250	KEP/HEAT-FRAG	200	40000	C49 B100	105C/209C
<b>Brimstone 2 (Delayed Mode)</b>	2250	KEP/HEAT-FRAG	200	40000	C49 B100	116C/209C
<b>Sea Spear (Flechette Warhead)</b>	2250	Flechette	100	20000	D: 90 Degrees, 100 m	1-Nil
<b>Sea Spear (Antiarmor/Ship Mode)</b>	2250	HEAT/FRAG	100	20000	C55 B100	116C/209C
<b>SPEAR 3</b>	1207	HEAT/FRAG	500	360 km	C55 B100	116C/209C
<b>SPEAR EW</b>	1207	HEAT/FRAG	300	360 km	C64 B120	20C

**YJ-62**

Notes: This is a Chinese development of the Russian AS-9 Kyle. It is a large missile only able to be carried by larger aircraft. Two versions exist: the C-601 base version and the C-611 with an improved engine for extended range. It is a long-range stand off missile for high-value targets.

Weapon	Difficulty	Guidance	Weight	Price
YJ-62 C-601	Average	Radar	750 kg	\$62370
YJ-62 C-611	Average	Radar	750 kg	\$63055

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
YJ-62 C-601	4860	HE	1000	95000	C199 B140	106C
YJ-62 C-611	4860	HE	1000	193000	C199 B140	106C

**YJ-802**

Notes: This Chinese development is primarily meant for anti-ship use, but has a secondary role as a land attack missile. It is also deployed as a surface-to-surface missile by countries such as Iran. The guidance is by radar, but the missile has strong anti-jamming capability, and jamming the missile is one level harder than normal. Westerners perhaps know this missile best by the name of "Silkworm."

Weapon	Difficulty	Guidance	Weight	Price
YJ-802	Average	Radar FF	715 kg	\$62025

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
YJ-802	1320	HE	1200	120000	C194 B140	84C

**Armat ARM**

Notes: Armat is a French antiradiation missile. It homes in on radar emissions given off by air defense radars and surface-to-air missile sites. It is a large weapon with a large warhead, carried one per hardpoint. It was first used in combat by Iraq against Iran in the war in the 1980s.

Weapon	Difficulty	Guidance	Weight	Price
Armat	Average	Antiradiation	550 kg	\$28270

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
Armat	1425	HE	1200	120000	C280 B165	106C

**AS.12**

Notes: Described by some as an "SS.11 on steroids," the AS.12 is a much larger version of the SS.11 ATGM, nearly 3 times the launch weight and 4 times the warhead weight. It is primarily a helicopter-launched missile, but some slower fixed-wing aircraft such as the Alize, Neptune, Atlantic, and Nimrod have also been known to carry it. The AS.12 was in fact used by both sides in the 1983 Falklands War.

Weapon	Difficulty	Guidance	Weight	Price
AS.12 (KEP/HE)	Difficult	Wire	76 kg	\$1828
AS.12 (HEAT)	Difficult	Wire	76 kg	\$2128
AS.12 (FRAG-HE)	Difficult	Wire	76 kg	\$1528

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS.12	470	KEP/HE	500	8000	C46 B68	72C
AS.12	470	HEAT	500	8000	C36 B50	119C
AS.12	470	FRAG-HE	500	8000	C41 B94	19C

**Nord AS.20**

Notes: The AS.20 was adapted from an early air-to-air radar guided missile, the AA.20. Pilots using the AA.20 found that if they lined up their aircraft with a ground target properly and aimed just right, they could steer their AA.20 missiles into the ground target. To produce the AS.20, the guidance was changed to direct radio command, and the fuze was changed from a proximity fuze to an impact fuze. A larger warhead was fitted, and a choice of four warheads was given. The AS.20 was the first ASM to achieve mass use by European fixed wing aircraft, but is now long obsolete, and is now found primarily in Third World countries.

Weapon	Difficulty	Guidance	Weight	Price
AS.20 (HE)	Difficult	Radio Command	143 kg	\$4520
AS.20 (FRAG)	Difficult	Radio Command	143 kg	\$4520
AS.20 (HEAT)	Difficult	Radio Command	143 kg	\$4945
AS.20 (KEP/HE)	Difficult	Radio Command	143 kg	\$5770

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS.20	2890	HE	2900	10000	C78 B90	31C
AS.20	2890	FRAG	2900	10000	C59 B112	25C
AS.20	2890	HEAT	2900	10000	C52 B70	143C
AS.20	2890	KEP/HE	2900	10000	C65 B80	87C

**AS.30**

Notes: The AS.30 is a scaled-up AS.20. It can be launched at lower as well as higher speeds, and has a longer range and more powerful warhead. The AS.30 is command guided like its predecessor, but the AS.30L version is laser guided and more advanced. It is normally used to attack large targets such as buildings, bridges, and large concentrations of troops. The missile has a high speed and is coated with steel, and is able to penetrate 2 meters of concrete before detonating.

Weapon	Difficulty	Guidance	Weight	Price
AS.30	Average	Radio Command	520 kg	\$18768
AS.30L	Average	Laser	520 kg	\$21136

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS.30	2550	KEP/HE	2000	11250	C114 B105	265C
AS.30L	2550	KEP/HE	1000	11250	C134 B115	333C

**AS.34 Kormoran**

Notes: This weapon is primarily meant as an anti-ship weapon, but was often employed against land targets in the 1991 Gulf War. It was employed by both French and NATO forces. It is known for its stand off range and high accuracy.

Weapon	Difficulty	Guidance	Weight	Price
AS.34 Kormoran	Average	Active Radar	600 kg	\$57810

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS.34 Kormoran	1320	HE	1000	36800	C207 B145	90C

**Apache CWS**

Notes: This is basically a smaller version of the MW-1, with the addition of wings and a guidance system for stand-off capability. Three types are available: Apache I, a gliding weapon with no engine; Apache II, a weapon with a rocket engine; and Apache III, with a jet engine for extended range. All munitions available for the MW-1 are used in the Apache. In addition, the Apache contains a 500-pound bomb to make one terminal attack.

1) KB-44: These are antiarmor bomblets. Each weighs 0.6 kg, and an Apache carries 4536 of them. Divide the number of targets by the number of bomblets to determine the number of attacks on each target, to a maximum of 10 attacks per target.

2) MIFF: These are antitank mines. Each weighs 3.2 kg, and an Apache carries 872 of them. This results in a minefield with a density of 0.02.

3) MUSA: This container drops APERS/AT mines designed to defeat personnel and light armor and soft skinned vehicles. Each weighs 4.2 kg, and the Apache carries 648 of them. This results in a minefield with a density of 0.02.

4) MUSPA: This is an area denial mine, fragmentation APERS mines designed to damage aircraft, soft skinned vehicles, and personnel. Each weighs 4.2 kg, and 648 of them are carried in an Apache, resulting in a minefield with a density of 0.02. The mines are acoustic; noise will set them off.

5) STABO: These are runway and roadway penetrators designed to crater a surface. A pilot charge blows a small hole, and then a larger charge is fired into the hole to create the runway. The charge is automatically considered tamped. Each charge weighs 17 kg, and the Apache carries 200 of them.

6) ASW: This is a STABO submunition that has a delay in the follow-on charge that detonates inside a penetrated structure. It is meant for buildings and bunkers. Divide the number of structures by the number of projectiles to determine the number of attacks against each structure, to a maximum of 10 per structure. Each charge weighs 17 kg, and the Apache carries 200 of them.

Twilight 2000 Notes: This weapon was used all over Europe, by NATO, US, French, and Italian forces.

Weapon	Difficulty	Guidance	Weight	Price
Apache I	Easy	Inertial	4500 kg	\$244,280
Apache II	Easy	Inertial/TFR	4676 kg	\$245,670
Apache III	Easy	Inertial/TFR	4754 kg	\$262,100

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
Apache I/II/III ASW	Glide/3040/1520	HEAT/HE	1000	10/30/50 km	(B400) C15 B30	40C
Apache I/II/III KB-44	Glide/3040/1520	HEAT	1000	10/30/50 km	(B400) C4 B8	35C
Apache I/II/III MIFF	Glide/3040/1520	AT Mine	1000	10/30/50 km	(B200) C2 B4	36C
Apache I/II/III MUSA	Glide/3040/1520	AT/AP Mine	1000	10/30/50 km	(B200) C9 B15	18C
Apache I/II/III MUSPA	Glide/3040/1520	APERS Mine	1000	10/30/50 km	(B200) C15 B25	9C
Apache I/II/III STABO	Glide/3040/1520	HEAT/HE	1000	10/30/50 km	(B400) C7 B14	40C
Apache I/II/III Bomb	Glide 3040/1520	HE	1000	10/30/50 km	C125 B56	68C

**AS.37/AJ.168 Martel**

Weapon	Difficulty	Guidance	Weight	Price



<b>AS.37</b>	Easy	Antiradiation	550 kg	\$66255
<b>AJ.168</b>	Average	TV	550 kg	\$15055

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>AS.37</b>	1425	HE/FRAG	1200	120000	C210 B206	106C
<b>AJ.168</b>	1425	HE/FRAG	1200	120000	C210 B206	106C

### MW-1 CWS (Container Weapon System)

Notes: This is not a missile, but rather a pod slung below the belly of US and NATO aircraft. The pod contains a large amount of various warhead types, saturating an area with bomblets or mines. An MW-1 can carry any one of six warhead types, with varying amounts of warheads depending on the type carried:

- 1) KB-44: These are antiarmor bomblets. Each weighs 0.6 kg, and an MW-1 carries 4536 of them. Divide the number of targets by the number of bomblets to determine the number of attacks on each target, to a maximum of 10 attacks per target.
- 2) MIFF: These are antitank mines. Each weighs 3.2 kg, and an MW-1 carries 872 of them. This results in a minefield with a density of 0.02.
- 3) MUSA: This container drops APERS/AT mines designed to defeat personnel and light armor and soft skinned vehicles. Each weighs 4.2 kg, and the MW-1 carries 648 of them. This results in a minefield with a density of 0.02.
- 4) MUSPA: This is an area denial mine, fragmentation APERS mines designed to damage aircraft, soft skinned vehicles, and personnel. Each weighs 4.2 kg, and 648 of them are carried in an MW-1, resulting in a minefield with a density of 0.02. The mines are acoustic; noise will set them off.
- 5) STABO: These are runway and roadway penetrators designed to crater a surface. A pilot charge blows a small hole, and then a larger charge is fired into the hole to create the runway. The charge is automatically considered tamped. Each charge weighs 17 kg, and the MW-1 carries 200 of them.
- 6) ASW: This is a STABO submunition that has a delay in the follow-on charge that detonates inside a penetrated structure. It is meant for buildings and bunkers. Divide the number of structures by the number of projectiles to determine the number of attacks against each structure, to a maximum of 10 per structure. Each charge weighs 17 kg, and the MW-1 carries 200 of them.

Weapon	Difficulty	Guidance	Weight	Price
<b>MW-1 CWS</b>	Easy	NA	3400 kg	\$184565

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>MW-1 ASW</b>	NA	HEAT/HE	0	0	(B400) C15 B30	40C
<b>MW-1 KB-44</b>	NA	HEAT	0	0	(B400) C4 B8	35C
<b>MW-1 MIFF</b>	NA	AT Mine	0	0	(B200) C2 B4	36C
<b>MW-1 MUSA</b>	NA	AT/AP Mine	0	0	(B200) C9 B15	18C
<b>MW-1 MUSPA</b>	NA	APERS Mine	0	0	(B200) C15 B25	9C
<b>MW-1 STABO</b>	NA	HEAT/HE	0	0	(B400) C7 B14	40C

**Type 80**

Notes: This is a Japanese air-to-surface missile, also known as ASM-1. It is primarily meant as an anti-ship missile, and is also shore and ship-launched, but is also used against land targets.

Weapon	Difficulty	Guidance	Weight	Price
Type 80	Average	Inertial + Active Radar	600 kg	\$59725

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
Type 80	1425	KEP/HE	500	50000	C178 B132	195C

**AS-2 Kipper**

Notes: One of the first ASMs used by the Soviet Union, the Kipper (Russian designation: K-10S) was designed to be slung underneath the center fuselage of a TU-16 Badger-C bomber. It has to be slung since it is so large. The conventional version shown here carries a 1000-pound high-explosive warhead, but is a very inaccurate weapon, with a CEP of 1-2 kilometers against land targets and 150 meters against ships. The Kipper is now almost entirely out of service, used only by a few Third World nations that also fly TU-16s, such as Syria and Libya.

Weapon	Difficulty	Guidance	Weight	Price
AS-2	Formidable	Active Radar	4200 kg	\$101427

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-2	1945	HE	4000	350 km	C253 B80	64C

**AS-3 Kangaroo**

Notes: The Kangaroo (Russian designation: Kh-20) was designed to provide a larger punch for Russian cruise-missile carrying bombers. It is a large missile carried one per Bear-B or Bear-C bomber, and is primarily designed for use with a nuclear weapon against enemy aircraft carriers. However, a version does exist carrying a conventional warhead (if a GM wants to put a nuclear weapon on one, the nuclear weapon normally used by the Kangaroo is an 800 kiloton thermonuclear warhead). Production of the AS-3 stopped at about the same time as the Kipper (1965); perhaps the only country that might still be using it is China, but even this is doubtful. A major shortcoming of the Kangaroo is that it is a beam riding missile that must be controlled by the firing aircraft for its entire flight through a radio link. This also makes it quite vulnerable to ECM.

Twilight 2000 Notes: China did use some of these missiles during the Twilight War, as well as Russia and India.

Merc 2000 Notes: These are primarily museum pieces.

Weapon	Difficulty	Guidance	Weight	Price
AS-3	Formidable	Beam Riding	11000 kg	\$206886

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-3	3165	HE	4000	650 km	C1128 B168	278C

**AS-4 Kitchen**

Notes: The AS-4 (Kh-22) was originally designed to be fired by the supersonic Tu-22 Blinder bomber. It is carried recessed under the center fuselage of the Blinder (and the Tu-22M Backfire and Tu-95 Bear) and is guided by the firing aircraft or a Tu-95 Bear in the area until the missile comes within range of the Kitchen's own active radar or IR homing devices (about halfway through its maximum range). There are three variants: the AS-4A (Kh-22N) with inertial guidance and a 350-kiloton nuclear warhead (not dealt with here); the AS-4B (Kh-22M) with active radar for attacking ships and land targets; and the AS-4C (Kh-22MP) with infrared guidance for use in high-ECM environments. Despite their age, these missiles are still in fairly common use.

Weapon	Difficulty	Guidance	Weight	Price
AS-3B	Average	Active Radar	5890 kg	\$176069
AS-3C	Average	IR	5780 kg	\$173908

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-3B	5555	HE	3000	460 km	C1013 B320	128C
AS-3C	5555	HE	3000	460 km	C1013 B320	128C

**AS-5 Kelt**

Notes: This is a smaller missile designed to allow Russian bombers such as the Badger to carry two cruise missiles instead of one of the larger ones such as the AS-2, AS-3, or AS-4. The Kelt resembles a small jet fighter and may be based on the design of the MiG-17. The AS-5 Kelt is one of the few Russian cruise missiles actually used in combat; the Egyptian Air Force fired about 25 of them at Israeli targets during the 1973 Yom Kippur War, with 20 of them being shot down before they could hit their targets. There are at least three variants: AS-5A is a nuclear-tipped missile (not dealt with here); AS-5B has a conventional warhead and radar guidance; and AS-5C has a conventional warhead and antiradiation guidance.

Weapon	Difficulty	Guidance	Weight	Price
AS-5B	Difficult	Active Radar	3000 kg	\$92174
AS-5C	Difficult	Antiradiation	3000 kg	\$96014

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-5B	1500	HE	3000	320 km	C1215 B350	128C
AS-5C	1500	HE-FRAG	3000	320 km	C911 B438	102C

**AS-6 Kingfish**

Notes: This is basically a smaller version of the AS-4, designed to allow the Backfire, Blinder, and Badger bombers to carry two missiles instead of one. This was done using more advanced and miniaturized components rather than reducing the size of the warhead; the range is also longer. By 2003, the only countries still using the Kingfish on a regular basis are Iraq, Russia, and the Ukraine, though the status of the Iraqi missiles is now in serious doubt, as are the Badgers they used to carry them.

Weapon	Difficulty	Guidance	Weight	Price
AS-6B	Average	Active Radar	5000 kg	\$116120
AS-6C	Average	Antiradiation	5000 kg	\$119960

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-5B	1500	HE	3000	560 km	C1215 B350	128C
AS-5C	1500	HE-FRAG	3000	560 km	C911 B438	102C

**AS-7 Kerry**

Notes: This was the first tactical air-to-surface missile built by Russia, and was still in widespread use by the Twilight War. It is an older missile, guided by radio commands from the pilot, and must be steered its entire flight by the operator. It comes in two versions, the lighter Kh-66 and the heavier and faster Kh-23. The Kh-66 has a speed of 3250 meters per phase, and the Kh-23 version has a speed of 3995 meters per phase.

Weapon	Difficulty	Guidance	Weight	Price
AS-7 Kh-66	Difficult	Radio	278 kg	\$5215
AS-7 Kh-23	Difficult	Radio	286 kg	\$5455

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-7 Kh-66	3250	HE	1000	10000	C95 B95	68C
AS-7 Kh-23	3995	HE	1000	10000	C113 B105	68C

**AS-10 Karen**

Notes: This Russian tactical missile equips both fixed-wing aircraft and helicopters. There are three versions: the heavier Kh-25 for aircraft, the lighter Kh-25ML for helicopters, and the long-range Kh-25MP. All are product-improved AS-7 missiles.

Weapon	Difficulty	Guidance	Weight	Price
AS-10 Kh-25	Average	Laser	320 kg	\$8695
AS-10 Kh-25ML	Average	Laser	300 kg	\$6890
AS-10 Kh-25MP	Average	Laser	320 kg	\$11080

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-10 Kh-25	2950	HE	800	10000	C113 B105	68C
AS-10 Kh-25ML	2950	HE	800	10000	C105 B98	63C
AS-10 Kh-25MP	2950	HE	800	40000	C123 B108	63C

**AS-11 Kilter**

Notes: This is a Russian air-to-surface missile that usually equips Su-24 aircraft. It is a large missile with high accuracy and a long range that keeps the launching aircraft out of range of enemy air defenses.

Weapon	Difficulty	Guidance	Weight	Price
AS-11 Kh-58U	Easy	Antiradiation	640 kg	\$27375
AS-11 Kh-58	Easy	Active Radar	640 kg	\$59375

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-11 Kilter	5280	HE	1200	120000	C253 B160	100C

**AS-12 Kegler**

Notes: This is an improved version of the AS-7 Kerry mentioned above. It is an antiradiation missile, homing in on the radar of SAM sites. It also has a two-stage motor able to reach much longer ranges, keeping the launching aircraft hopefully out of range of enemy air defenses.

Weapon	Difficulty	Guidance	Weight	Price
AS-12	Average	Antiradiation	320 kg	\$17320

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-12 Kegler	2600	HE	800	60000	C132 B115	68C

### AS-13 Kingbolt

Notes: This weapon was first displayed in an arms show in the United Arab Emirates in 1991. It is a fire-and-forget missile related to the heavier AS-18 Kazoo. Because the missile is TV-guided, it can be thrown off by obscuring smoke if caught early in its flight.

Weapon	Difficulty	Guidance	Weight	Price
AS-13	Average	TV FF	760 kg	\$25520

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-13 Kingbolt	1425	HE-FRAG	400	40000	C190 B200	100C

### AS-14 Kedge

Notes: This ASM was designed by the Molniya Design Bureau. It is their only ASM design; Molniya's claim to fame is air-to-air missiles. The AS-14 was built to be carried by small and medium tactical aircraft, such as the MiG-27, Su-17, Su-24, and MiG-29. It is specifically designed to be used against hardened targets, with a reinforced nose section and almost half the weight of the missile being the warhead. There are 3 versions: the AS-14A (Kh-29L) is laser-guided; the AS-14B (Kh-29T) is TV-guided; and the AS-14C (Kh-29D) has fire-and-forget thermal imaging guidance. All three versions have been heavily exported and can be encountered almost anywhere in the world.

Weapon	Difficulty	Guidance	Weight	Price
AS-14A	Average	Laser	657 kg	\$39064
AS-14B	Average	TV	680 kg	\$37236
AS-14C	Average	Thermal FF	657 kg	\$50380

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-14A	3000	HE/KEP	1000	8000	C167 B130	373C
AS-14B	3000	HE/KEP	1000	9000	C167 B130	373C
AS-14C	3000	HE/KEP	1000	10000	C167 B130	373C

### AS-15 Kent

Notes: The AS-15 (Russian designation: K-55/65/555 Granat) was originally designed as a strategic cruise missile for use against large ships such as aircraft carriers and against land targets. The Kh-55 was the original version, with a 200-kiloton nuclear warhead and a range of 2500 or 3000 kilometers depending upon the model. (This will not be elaborated on here.) The Kh-65 (NATO AS-15C) is a tactical model; it has a greatly-reduced range to comply with the SALT and START treaties, and carries a high-explosive warhead. The Kh-555 (AS-15D) is a newer model that complies with revised START restrictions; it has the same HE warhead, but has a range of 3000 kilometers. These missiles do have a defect: they are designed to be used against large targets. If the target is between 150-299 meters square (based on the angle of approach of the missile), increase difficulty by one level. If the target is smaller than 150 square meters, increase difficulty by two levels.

Twilight 2000 Notes: The AS-15D does not exist. The AS-15C does exist, but the range should be increased to 600 kilometers.

Merc 2000 Notes: All three versions exist, but most AS-15Cs are using the increased range engine.

Weapon	Difficulty	Guidance	Weight	Price
AS-15C	Easy	Inertial + TERCOM	1250 kg	\$123342
AS-15D	Easy	Inertial + TERCOM	1700 kg	\$131919

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-15C	1310	KEP/HE	3000	280 km	C384 B196	289C
AS-15D	1310	KEP/HE	3000	3000 km	C384 B196	289C

### AS-16 Kickback

Notes: This weapon is roughly analogous to the US AGM-69 SRAM, being a short-range attack missile meant to be deployed primarily from rotary launchers on large bombers such as the Backfire and Blackjack. Once launched, the missile climbs to an altitude of 40000 meters, turns on its radar or seeker, acquires its target, and then dives at maximum speed towards it, using momentum to penetrate. It then detonates its warhead. Though some Kickbacks were produced with nuclear warheads, most of them carry conventional warheads.

Weapon	Difficulty	Guidance	Weight	Price
AS-16A	Easy	Inertial + Antiradiation	1200 kg	\$48296
AS-16C	Easy	Inertial + Active Radar	1200 kg	\$74856

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-16A	8495	KEP/HE-FRAG	2500	150 km	C258 B232	225C
AS-16C	8495	KEP/HE	2500	150 km	C344 B186	300C

### AS-17 Krypton

Notes: This is a modern antiradiation missile employed by Russia and her allies. It can even be used against AWACS aircraft. The missile has a rocket booster motor and a ramjet sustainer, resulting in long range. The Krypton was specifically designed to deal with the US Patriot SAM. The missile may home in on the last known location of the target if the target's radar has been turned off.

Weapon	Difficulty	Guidance	Weight	Price
AS-17A	Easy	Antiradiation	600 kg	\$41520
AS-17B	Easy	Active Radar	600 kg	\$54070

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-17A	5000	HE	1500	110000	C227 B150	94C
AS-17B	5000	HE	1500	70000	C227 B150	94C

### AS-18 Kazoo

Notes: This is an updated version of the AS-13 Kingbolt. In the Kazoo, the missile is boosted by a rocket, but the sustainer motor is a small turbojet engine. This results in vastly increased range. In addition, the guidance system is supplemented by a radio command guidance system that allows the firing pilot to make course corrections or take over if the target is obscured by smoke. The size of the warhead is greatly increased, and two warheads are available.

Weapon	Difficulty	Guidance	Weight	Price
AS-18 (KEP-HE)	Average	TV FF	930 kg	\$33360
AS-18 (HE-FRAG)	Average	TV FF	930 kg	\$23360

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AS-18 Kazoo	1425	KEP-HE	400	115000	C191 B140	449C
	1425	HE-FRAG	400	115000	C217 B212	100C

**Rb-04**

Notes: The original Rb-04 was the first active radar homing missile of the post World War 2 period, and only the second such ASM ever devised. It is a large missile with wings that allow it to fly for a very long distance to hit its target. Though work on the Rb-04 began in 1948, it was not until 1958 that the Rb-04C entered squadron service with the Swedish Air Force. The Rb-05D model was introduced about 4 years later, with an improved engine for more range. The Rb-04E came into service in 1968, and has improved guidance and a more powerful warhead.

Weapon	Difficulty	Guidance	Weight	Price
<b>Rb-04C</b>	Difficult	Active Radar	600 kg	\$20704
<b>Rb-04D</b>	Difficult	Active Radar	600 kg	\$20600
<b>Rb-04E</b>	Average	Active Radar	616 kg	\$20616

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>Rb-04C</b>	1550	KEP/HE-FRAG	4000	32000	C260 B160	181C
<b>Rb-04D</b>	1550	KEP/HE-FRAG	3000	40000	C260 B160	181C
<b>Rb-04E</b>	1550	KEP/HE-FRAG	2000	42000	C312 B175	231C

**Rb-05A**

Notes: This is a simple command-guided missile using a blast warhead and a hardened nose penetrator. The Rb-05A is unusual for a command-guided weapon because of its supersonic speed; this would normally render a command-guided missile difficult to control, but the microprocessor on the Rb-05A and the radio link is fast enough to allow such performance. The Rb-05A is highly resistant to jamming (two levels more difficult). Rb-05B and Rb-05C were supposed to be TV and laser-guided versions, but the Swedish decided to go with the Maverick instead.

Weapon	Difficulty	Guidance	Weight	Price
<b>Rb-05A</b>	Average	Radio Command	305 kg	\$10776

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>Rb-05A</b>	3400	KEP/HE	1000	9000	C112 B105	136C

**Boeing AGM-130A**

Notes: AGM-130A is a product-improved GBU-15 (2000-pound) smart bomb. It consists of the GBU-15 bomb with strap-on rocket motor and updated electronics to allow it to be guided by TV, IR, GPS, or manual guiding.

Weapon	Difficulty	Guidance	Weight	Price
AGM-130A	Average	TV FF	1313 kg	\$44690
AGM-130A	Average	IR FF	1313 kg	\$55890
AGM-130MCG	Easy	GPS FF	1313 kg	\$59890

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AGM-130	2330	HE	400	64000	C418 B205	124C

**BAe APKWS II**

In 2002, it was realized that technology had increased to the point that advanced laser self-guiding missiles could be packaged into a size that could fit into the Hydra-70 unguided rocket. By 2005, General Dynamics, one of the contractors charged with developing the idea, had dropped out of the program due to consistently poor results with its design. BAe, on the other hand, was having great success with its Hydra-70 modification and in 2006 was made the prime contractor for the program. Successful tests were made in 2007, and in 2008, with the US Army no longer interested in the program, the APKWS II program was transferred to the US Navy and Marines. In 2012, first combat tests were made in Afghanistan with excellent results by US Marine and British helicopters, and the same year field tests were made from fixed-wing aircraft, with successful combat use from A-10 Warthogs in Afghanistan in 2013. In addition in 2013, tests were made from the MQ-8 Fire Scout UAV, Bell 407GT, UH-1Y, OV-10, OH-58, V-22, AH-6, A-29, F/A-18 Hornet, AH-1Z, and CN-235s, and from small patrol boats, both US Navy and British Navy. Later came integration with the MH-60S, AH-64 Apache (with the US Army now with the program), Australian Tiger gunships, MH-60Rs, and US Marine Harriers. In 2016, they were first used by USAF F-16 aircraft, with them being deployed in 2017 from F-16 and A-10s against ISIS targets. They continue to be used, with BAe having produced some 7500 APKWS II. The APKWS II package has also been successfully tested built into the Dutch FZ unguided rocket. This also proves that the APKWS II technology can be adapted for use on other unguided rockets. Current users include the US, Britain, Jordan, Lebanon, Iraq, and the Mexican Navy.

The APKWS II essentially fits the Hydra-70 unguided rocket with a laser seeker in its nose and a small laser designator on the each of the front fin roots. The APKWS II has 90% parts commonality with the Hydra-70. It is primarily fired in self-guiding mode, but can also use more robust laser designators on the ground or aircraft-mounted designators to achieve greater accuracy (reduces difficulty one level). They may be fired from single, double, quintuple, or octuple wing launchers, though they have recently been successfully tested fired from a modified seven-round LAU-68 rocket pod, including with mixes of APKWS II missiles and Hydra-70 rockets. The pod, however, is slightly modified, primarily in electrical connections and in lengthening the pod. The APKWS II is guided using a semi-active laser seeker. The seeker can lock on to targets as far away as 14 kilometers, though actual range is limited by the Hydra-70 motor's range. (A more powerful motor is part of the Block I improvements, with Nammo designing the motor.) The seeker has a view angle of 40 degrees. The smaller warhead is quite useful for attacking limited-engagement targets where an ATGM or ASM like a Hellfire or Maverick would be overkill. Speed and acceleration are similar to the Hydra-70, and an APKWS II reaches its maximum range in less than five seconds. The firing envelope is, unfortunately, quite narrow, something Block I also addressed.

Recently coming to service is the APKWS II Block I. This has improvements in the motor, designator, and seeker to dramatically increase its range while increasing the length of the missile by less than 25 centimeters and weight by some. Nammo of Norway designed the motor, while BAe did the seeker and designator. Some reliability and ruggedness improvements were also done to the missile and launchers in general. While the APKWS II has been in full-rate production since 2013, the Block I is still in LRIP as of July 2018.

Weapon	Difficulty	Guidance	Weight	Price
APKWS II	Average	Laser	14.79 kg	\$1728
APKWS Block I	Average	Laser	17.19 kg	\$1776

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
APKWS II	461	HEAT	1100	5088	C6 B25	77C
APKWS II Block I	327	HEAT	523	20662	C6 B25	77C

**Martin Marietta AGM-12 Bullpup**

Notes: The AGM-12 Bullpup was the first mass-produced air-to-surface guided missile. It was developed in response to disappointing experiences with bombing bridges in the Korean War; small bridges in particular can be extremely difficult to accurately strike from the air without resorting to mass saturation bombing. The original example was quickly upgraded further to produce the AGM-12B Bullpup-A. The Bullpup-A carried a 250-pound warhead, but the guidance method was quite cumbersome, requiring radio control using a joystick in the cockpit of the firing aircraft. The AGM-12C Bullpup-B is a much larger version of the same weapon, carrying a 1000-pound semi-piercing warhead. AGM-12D Bullpup-C is slightly larger in the center; this allowed the choice of either a



nuclear or conventional warhead. The final model was the AGM-12E Bullpup-D, which carried a high-explosive warhead with a fragmentation jacket for use against troop concentrations. By 1976, the Bullpup was out of service in the US, but several foreign countries still use it as a training weapon, and some Third World nations use the Bullpup-A and B as second-line weapons.

Twilight 2000 Notes: The US and Britain used about 15 Bullpup-Cs with nuclear warheads as tactical nuclear weapons. In one controversial incident, a convoy of Russian cargo ships carrying actual humanitarian aid to Iran was hit by one of those Bullpups.

Merc 2000 Notes: The Bullpup was one of those surplus weapons that found a market in the Third World despite its age.

Weapon	Difficulty	Guidance	Weight	Price
AGM-12B Bullpup-A	Difficult	Radio Command	259 kg	\$8168
AGM-12C Bullpup-B	Difficult	Radio Command	810 kg	\$35344
AGM-12D Bullpup-C (Conventional)	Difficult	Radio Command	825 kg	\$35344
AGM-12D Bullpup-C (Nuclear)	Difficult	Radio Command or Unguided	825 kg	\$5 Million
AGM-12E Bullpup-D	Difficult	Radio Command	810 kg	

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AGM-12B Bullpup-A	4075	HE	3000	11300	C116 B110	78C
AGM-12C Bullpup-B	3060	HE/KEP	3000	18400	C217 B145	165C
AGM-12D Bullpup-C	3060	HE/KEP	3000	18400	C217 B145	165C
AGM-12D Bullpup-C	3060	HE/KEP	3000	18400	Special	Special
AGM-12D Bullpup-D	3060	HE-FRAG	3000	18400	C196 B200	62C

### Boeing AGM-86 CALCM

Notes: The CALCM (Conventional Air Launched Cruise Missile) is an adaptation of the standard ALCM to carry conventional warheads. This was done because while the cruise missile is an excellent weapon, a cruise missile armed with a nuclear warhead is close to worthless these days in a warfighting sense. Most CALCMs in the past have been made by modifying ALCMs; after the 1991 Gulf War and the NATO participation in Bosnia and Kosovo, supplies began to run critically low. Therefore, new build CALCMs were authorized. There are 5 variants of the CALCM: The AGM-86C Block 0, which is the early version with a 1500-pound explosive warhead; the AGM-86C Block I, which has a warhead increased to 3000 pounds; the AGM-86C Block 1A, which has increased accuracy as well as a 3000-pound warhead; the AGM-86D Block II, which uses a hardened nose section and a penetrating warhead; and the AGM-86E Block II, which has the penetrating warhead and increased range.

Twilight 2000 Notes: As in the Gulf War, Middle Eastern targets were deluged with cruise missiles in the opening stages of the war, as were targets in Eastern Europe, Russia, and North Korea. Enemy shipping was also hit by CALCMs on some occasions. However, as the Twilight War progressed, a lot of CALCMs were converted back into ALCMs with nuclear warheads.

Merc 2000 Notes: Cruise missile use became more and more sparing as time went on, due to their cost.

Weapon	Difficulty	Guidance	Weight	Price
AGM-86C Block 0	Easy	TERCOM	1474 kg	\$130972
AGM-86C Block I	Easy	TERCOM or GPS	1474 kg	\$184532
AGM-86C Block 1A	Very Easy	TERCOM or GPS	1474 kg	\$193759
AGM-86D Block II	Very Easy	TERCOM or GPS	1474 kg	\$211312
AGM-86E Block II	Very Easy	TERCOM or GPS	1474 kg	\$221878

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AGM-86C Block 0	1550	HE-FRAG	2000	1105 km	C581 B350	86C
AGM-86C Block I	1550	HE-FRAG	2000	1105 km	C822 B495	121C
AGM-86C Block 1A	1550	HE-FRAG	2000	1105 km	C822 B495	121C
AGM-86D Block II	1550	HE-FRAG/KEP	2000	1105 km	C643 B252	413C
AGM-86E Block II	1550	HE-FRAG/KEP	2000	2485 km	C643 B252	413C

### Texas Instruments AGM-88 HARM

Notes: HARM (High-speed AntiRadiation Missile) is the standard ARM of the US and most of its allies. It is an advanced missile with high countermeasure resistance (one level harder than normal to decoy) and the ability to home in on the last known location of the target if the target shuts its radar off.

Weapon	Difficulty	Guidance	Weight	Price
AGM-88A HARM	Average	Antiradiation	360 kg	\$35375
AGM-88B HARM	Easy	Antiradiation	360 kg	\$39375
AGM-88C HARM	Easy	Antiradiation	360 kg	\$39375

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AGM-88A HARM	3170	HE-FRAG	400	48000	C85 B130	62C

<b>AGM-88B HARM</b>	3170	HE-FRAG	400	48000	C85 B130	62C
<b>AGM-88C HARM</b>	3170	HE-FRAG	300	48200	C97 B144	62C

### **Raytheon AGM-65 Maverick**

Notes: This missile is carried only by fixed-wing aircraft. It is a large, TV-guided or IR-guided weapon, with a shaped charge warhead, and a fire-and-forget guidance system. Mavericks are carried on a triple underwing launcher, usually two launchers per aircraft.

Weapon	Difficulty	Guidance	Weight	Price
<b>AGM-65A</b>	Average	TV FF	207.9 kg	\$4440
<b>AGM-65B</b>	Average	IR FF	207.9 kg	\$13640
<b>AGM-65D</b>	Average	IR FF	218.25 kg	\$15560
<b>AGM-65E</b>	Average	Laser FF	286 kg	\$9655
<b>AGM-65F</b>	Easy	IR FF	301.5 kg	\$22735
<b>AGM-65G</b>	Easy	IR FF	301.5 kg	\$24735

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>AGM-65A</b>	1595	HEAT	1000	27000	C92 B95	237C
<b>AGM-65B</b>	1595	HEAT	1000	27000	C92 B95	237C
<b>AGM-65D</b>	1595	HEAT	1000	27000	C107 B105	298C
<b>AGM-65E</b>	1595	HEAT	800	27000	C107 B105	298C
<b>AGM-65F</b>	1595	KEP/HE	800	27000	C123 B110	359C
<b>AGM-65G</b>	1595	KEP/HE	800	27000	C123 B110	378C

### **Rafael AGM-142 Popeye**

Notes: Popeye is an American continuation of an Israeli weapon program. It is also known as the AGM-142 Raptor; Popeye I is also known as Have Nap, and Popeye II is also known as Have Lite. It was available during Desert Storm, but not used in that conflict due to the political implications of launching Israeli-designed weapons against Arab targets. Popeye is designed to attack hardened targets or troop concentrations, and may have either a penetrating or blast/fragmentation warhead. The missile is large, but may be carried by most NATO, Israeli, or US aircraft. The missile is fire and forget with either a TV or infrared imaging guidance, or may be guided to the target by the pilot.

Twilight 2000 Notes: Popeye II does not exist.

Weapon	Difficulty	Guidance	Weight	Price
<b>Popeye I (HE-FRAG)</b>	Easy	TV or IR FF	1360 kg	\$57160
<b>Popeye I (KEP-HE)</b>	Easy	TV or IR FF	1360 kg	\$67360
<b>Popeye II (HE-FRAG)</b>	Easy	TV or IR FF	1134 kg	\$57055
<b>Popeye II (KEP-HE)</b>	Easy	TV or IR FF	1134 kg	\$67055

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>Popeye I</b>	2800	HE-FRAG	2000	75000	C426 B300	146C
	2800	KEP-HE	2000	75000	C375 B195	633C
<b>Popeye II</b>	2800	HE-FRAG	2000	150000	C533 B330	146C
	2800	KEP-HE	2000	150000	C469 B215	633C

### **China Lake AGM-45 Shrike**

Notes: Shrike was the first antiradiation missile fielded by anyone since World War 2. It was based partially on the Sparrow AAM. Deployment began in 1963, but early use by F-105Gs and EA-6As was disappointing and there have been numerous modifications, mostly to cope with different sorts of SAMs and fire direction radars. The Shrike was largely replaced by the HARM in most countries' militaries by 2003, though many were kept for use as training weapons.

Weapon	Difficulty	Guidance	Weight	Price
<b>AGM-45A Shrike</b>	Difficult	Antiradiation	177 kg	\$12400
<b>AGM-45B Shrike</b>	Difficult	Antiradiation	177 kg	\$10968

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>AGM-45A Shrike</b>	3400	HE-FRAG	1200	16000	C39 B88	35C
<b>AGM-45B Shrike</b>	3400	HE-FRAG	1200	46000	C39 B88	35C

### **Motorola AGM-122 Sidarm**

Notes: The Sidarm is a US antiradiation missile in the body of an AIM-9C Sidewinder. It is designed for use by light aircraft

unable to carry the heavier HARM, such as the Harrier and helicopters. It is vulnerable to countermeasures and carries a small warhead, but does provide a useful defense against lighter enemy SAMs and radar installations.

Weapon	Difficulty	Guidance	Weight	Price
Sidearm	Average	Antiradiation	85 kg	\$9760

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
Sidearm	3375	HE-FRAG	800	18000	C26 B75	26C

### China Lake AGM-123 Skipper

Notes: Skipper is a short-range PGM, made by adding a rocket motor to a Mk 83 (1000-pound) bomb and adding a smart bomb's guidance unit. It is a quick and dirty way to provide stand off capability to a launch aircraft, to protect it from enemy air defenses.

Weapon	Difficulty	Guidance	Weight	Price
Skipper	Average	Laser	582 kg	\$25350

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
Skipper	1525	HE	250	25000	C500 B225	136C

### Boeing AGM-84E SLAM (Stand-off Land Attack Missile)

Notes: The AGM-84E SLAM is a land attack version of the Harpoon anti-ship missile. Its warhead has better penetration than the Harpoon, and the missile is guided by GPS, IR, inertial guidance, or manual guidance. A later version, the SLAM-ER, has an upgraded engine for better range and a titanium nosecone for better penetration. It is primarily used for very hardened targets such as bunkers.

Twilight 2000 Notes: There were only very limited quantities of SLAM-ER available for the Twilight War.

Weapon	Difficulty	Guidance	Weight	Price
SLAM	Very Easy	GPS or IR FF	629.55 kg	\$82230
SLAM-ER	Very Easy	GPS or IR FF	629.55 kg	\$80075

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
SLAM	1200	KEP-HE	1000	111000	C136 B115	336C
SLAM-ER	1200	KEP-HE	1000	277800	C155 B125	405C

### General Dynamics AGM-78 Standard

Notes: In 1966, the military was frustrated with the rather poor success it was getting from the Shrike ARM. At the same time, the North Vietnamese were beginning to harden and armor their SAM and AAA sites. Development of an ARM with longer range, more flexibility and accuracy, and a larger warhead began; this became the Standard. The first missiles had the seeker of the Shrike and thus accuracy wasn't any better, but at least the range and warhead were. This was replaced by the AGM-78B, with a much improved seeker. AGM-78D and D-2 were to be even more improved, but about that time (1978) HARM came into production and was a much better weapon than either Shrike or Standard. An interesting point about the AGM-78B version is that in addition to the standard warhead, the explosion gives off a puff of red or white smoke to aid in directing further strikes to the same target.

Twilight 2000 Notes: Standard is still in limited use by the US.

Merc 2000 Notes: The Egyptians are the only known user of the Standard by 2000.

Weapon	Difficulty	Guidance	Weight	Price
AGM-78A Standard	Difficult	Antiradiation	635 kg	\$26360
AGM-78B Standard	Average	Antiradiation	816 kg	\$33344

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
AGM-78A Standard	4250	HE-FRAG	3000	56000	C110 B150	66C
AGM-78B Standard	4250	HE-FRAG	3000	75000	C132 B168	66C

### General Dynamics BGM-109 Tomahawk

Notes: This is one of the US standard cruise missiles. The missile is launched from a very long range, unfolds wings, starts a turbojet engine, and flies in to the target, using terrain-matching AI guidance (the missile takes constant pictures of the terrain below through a camera in the body, and matches them to a map contained in its guidance computer, making course corrections as necessary). It can also be guided or make adjustments by GPS. The Tomahawk was used in large numbers beginning in the late 1980s for bombardment of heavily-defended targets or to spare the possibly of pilot loss in politically controversial actions. This missile was normally ship or submarine-launched, but could be launched from land bases, or airdropped from certain aircraft such as the F/A-18 or A-6. Tomahawks that dispense ICM-DP submunitions have 100 submunitions; SADARM-equipped tomahawks have 50 submunitions. SADARM-warhead Tomahawks' submunitions attack as if using a TAC Missile skill level of 13.

Twilight 2000 Notes: Though used often in the early portions of the Twilight War, supplies were depleted rather rapidly, and the Tomahawk is rather rare by 2000.

Merc 2000 Notes: There was always a fight between the budget committees and the military to fund cruise missiles; however, it was usually agreed that it was cheaper and less sensitive to use cruise missiles than manned aircraft.

Weapon	Difficulty	Guidance	Weight	Price
<b>Tomahawk (HE)</b>	Very Easy	TERCOM/GPS (Air-Launched)	1193 kg, (Ship/Land-Launched) 1440 kg	\$110205
<b>Tomahawk (ICM-DP)</b>	Very Easy	TERCOM/GPS (Air-Launched)	1193 kg, (Ship/Land-Launched) 1440 kg	\$246405
<b>Tomahawk (SADARM)</b>	Very Easy	TERCOM/GPS (Air-Launched)	1193 kg, (Ship/Land-Launched) 1440 kg	\$355365

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>Tomahawk</b>	1220	HE	2000	1104 km	C537 B230	142C
	1220	ICM-DP	2000	1104 km	B670 (C4 B16)	30C
	1220	SADARM	2000	1104 km	B335 (C4 B16)	30C

**Raytheon AGM-176 Griffin**

Notes The Griffin is a small AGM, a mere 110 centimeters long and 140 millimeters in diameter. It's small size is intended to minimize casualties and destruction, as the Griffin is designed to be used in urban environments, with a mere 5.9-kilogram warhead. The Griffin is currently primarily used on AC-130W and J gunships, the USMC's MC-130W Dragon Spear, and from UAV, particularly smaller ones. The SOW is also using them from their Little Bird choppers. It is fired from a 140 millimeter tube, and can also be fired as a surface-to-surface or SAM, stacking up 4x5 tubes or more. The Navy's Littoral Combat Ships are being currently tested with the Griffin, The Navy's primary interest is a simple, cheap, and effective means of zapping things like Iranian motorboats. On a Predator, three Griffins can take the place of one Hellfire on a Predator or Reaper's Hellfire rack. Other launch platforms include the A-29 Super Tucano, KV-130J Harvest Hawk, Cyclone-class Patrol Ship, the Fire Scout, the F-35B, and the V-22 Osprey.

The Griffin is primarily an ASM, but it can be dropped as a freefall bomb for very short range engagements, The Griffin has large winglets up front and smaller square fins at the rear. The Griffin firing requires an initial point of the target by the firer's radar, then GPS/INS takes over, with midcourse corrections (if necessary) by UHF radio. Griffins may be fired en masse by larger aircraft, but are primarily designed for smaller aircraft and UAVs, except in certain special installations.

The Block II version has an additional laser seeker which allows it to track mobile targets; rumors state that Griffins have hit targets moving as 125 kph, and further rumors have stated that the Block II is being developed into a Block III for antihelicopter use.(This projected version is not listed below due to lack of information.) The Block II version is listed here, but the ground launch range is approximate, as it has been used so far only with aircraft.

Weapon	Difficulty	Guidance	Weight	Price
<b>ABM-175A Griffin I/Sea Griffin/GL Griffin</b>	Easy	SALH/GPS/INS	20 kg	\$2207
<b>AGM-175B Griffin II</b>	Very Easy	SALH/GPS/INS/TV/Acoustic	20.67 kg	\$2447

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>ABM-175A Griffin I/Sea Griffin/GL Griffin</b>	723	HEAT	30	(GL) 8230 (AL) 20420	C7 B13	80C
<b>AGM-175B Griffin II</b>	745	HEAT	30	(GL) 8365 (AL) 20757	C7 B13	80C

**Grom**

Notes: This is a Yugoslavian air-to-service missile, for use against enemy strongpoints, troop concentrations, and vehicles. It is a large missile with a large warhead that uses explosive power to penetrate.

Weapon	Difficulty	Guidance	Weight	Price
<b>Grom-1</b>	Difficult	Radio	330 kg	\$11205
<b>Grom-2</b>	Average	TV FF	330 kg	\$11370

Weapon	Speed	Round	Min Range	Max Range	Damage	Pen
<b>Grom-1</b>	2400	KEP/HE	600	12000	C262 B140	404C
<b>Grom-2</b>	2400	KEP/HE	400	12000	C305 B175	507C