

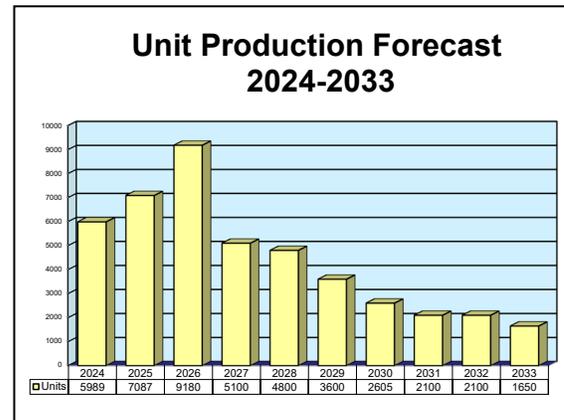
# ARCHIVED REPORT

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## AT4/M136 and AT12T

### Outlook

- NATO member states reinvesting in AT4 procurement amidst heightened strategic tensions in Europe and donations to Ukraine
- XM919 IAM successor system scheduled to enter U.S. service as early as 2026; Saab and General Dynamics submitting proposals to fulfill requirement
- Forecast reflects ongoing U.S., NATO procurement surge



### Orientation

**Description.** Man-portable anti-armor weapons.

**Sponsor.** The Swedish Ministry of Defense, through the Swedish Army, sponsored the initial development and Swedish Army procurement of the AT4.

The U.S. Army sponsored further development and U.S. procurement. In addition, Alliant Techsystems (later Orbital ATK and now Northrop Grumman) pursued some development as a private venture.

**Status.** Development through serial production.

**Total Produced.** Through 2023, we estimate the prime contractor produced at least 526,164 AT4 series weapons. Alliant Techsystems produced an additional 319,413 M136 series weapons under license.

**Application.** A lightweight, man-portable, shoulder-fired anti-armor weapon, optimized for employment by infantrymen on the move.

**Price Range.** According to U.S. Army FY25 budget request documentation, the M136A1 AT4-CS (Confined Space) carried a unit price (for a complete round) of \$3,940.

### Contractors

#### Prime

<b>Saab Dynamics</b>	<a href="http://www.saab.com">http://www.saab.com</a> , Boforsvägen 1, Karlskoga, Sweden, Tel: + 46 586 810 00, Fax: + 46 586 857 00, Prime
<b>Airbus SE</b>	<a href="http://www.airbus.com">http://www.airbus.com</a> , Mendelweg 30, PO Box 32008, Leiden, Netherlands, Tel: + 31 71 52 456 00, Fax: + 31 71 52 328 07, Licensee

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; [rich.pettibone@forecast1.com](mailto:rich.pettibone@forecast1.com)

**AT4/M136 and AT12T****Technical Data****AT4/M136**

**Dimensions.** The following data reflects the latest production standard of the basic AT4, with the original-pattern High Explosive Anti-Tank (HEAT) warhead.

	<u>SI Units</u>	<u>U.S. Units</u>
Projectile length	62.5 cm	24.60 in
Total length	1.01 m	3.31 ft
Projectile diameter	84 mm	3.31 in
Total diameter	8.9 cm	3.50 in
Projectile weight	3.1 kg	6.82 lb
Total weight	6.72 kg	14.8 lb
Finspan	17.5 cm	6.88 in
Cone standoff	2.6 cal	2.6 cal

**Performance.** The armor perforation data reflects the prime contractor's published literature concerning the standard AT4/M136 with the original-pattern HEAT warhead.

	<u>SI Units</u>	<u>U.S. Units</u>
Speed	290 mps	951.43 fps
Altitude	Line of sight	Line of sight
Range	20-350 m	21.87-382.76 yd
Armor perforation	42+ cm	16.53+ in

**Propulsion.** Solid fuel rocket motor. The motor employs "high-low" combustion technology (developed by the Germans during World War II), in which the combustion chamber remains in the launch tube after firing.

**Launcher Mode.** The AT4 launcher consists of a glass fiber-reinforced plastic tube. The launcher includes a shoulder pad and sling, an aluminum venturi, sights, and the firing mechanism. The launch tube is disposable; the sights and firing mechanism are reusable.

**Control & Guidance.** Upon firing, six folding fins automatically deploy to provide aerodynamic stabilization for the warhead.

**Warhead.** The basic AT4/M136 warhead features a hollow or shaped-charge configuration, containing an Octol (HMX/TNT) filler. The warhead geometry and composition are optimized for an enhanced "behind armor" effect, causing increased spalling, heat, overpressure, and fire on the inside of the vehicle.

Alliant Techsystems had been working on several advanced warheads employing chemical or kinetic energy for frontal armor perforation. ATK stated that AT4 warhead development offers significant growth potential.

**AT12T**

**Design Features.** The AT12T fires an advanced-design tandem HEAT warhead, optimized to defeat explosive reactive armor (ERA).

**Dimensions.** The following data reflects the last preproduction AT12T with a HEAT warhead. We estimate the projectile length and finspan based on photographic evidence.

	<u>SI Units</u>	<u>U.S. Units</u>
Projectile length	112.5 cm	3.69 ft
Total length	1.2 m	3.94 ft
Projectile diameter	120 mm	4.72 in
Total diameter	13.2 cm	5.19 in
Projectile weight	9.96 kg	21.91 lb
Total weight	13.92 kg	30.62 lb
Finspan	27.8 cm	10.94 in
Cone standoff	2.7 cal	2.7 cal

## AT4/M136 and AT12T

**Performance.** The armor perforation data reflects the prime contractor's published literature concerning the AT12T with the tandem-pattern warhead.

	<u>SI Units</u>	<u>U.S. Units</u>
Speed	300 mps	984.24 fps
Altitude	Line of sight	Line of sight
Range	20-300 m	21.87-328.1 yd
Armor perforation	95+ cm	37.4+ in

**Propulsion.** Same as the AT4.

**Launcher Mode.** Same as the AT4.

**Control & Guidance.** Same as the AT4.

**Warhead.** The AT12T warhead features a tandem hollow or shaped-charge configuration, which contains an Octol (HMX/TNT) filler. The warhead geometry and composition are optimized for defeating ERA. In a tandem warhead configuration, the first charge

perforates the target's first layer of armor. In the case of ERA, the first charge detonates the ERA module. The second charge then engages the target's base layer of armor protection.

Saab Bofors Dynamics maintains that the advanced-design AT12T tandem warhead would remain effective over the frontal arc against any tank likely to be in the field during the decade.



AT4, Ready to Fire

Source: U.S. Army

**AT4/M136 and AT12T****Variants/Upgrades**

**Variants.** The basic AT4 has served as the basis for a number of variants. As the following table illustrates, some variants merely represent the basic AT4 with advanced warheads; others are true variants of the basic AT4.

<u>Designation</u>	<u>Description</u>
AT4/Carl Gustaf/HEDP 502	In the mid-1980s, (then) Forenade Fabriksverken integrated the 84mm Carl Gustaf High Explosive Dual-Purpose (HEDP) 502 munition with the 84mm AT4. Testing began in August 1986; it continues under Saab Bofors Dynamics. The AT4/HEDP 502 was a contender for the XM141 Bunker Defeat Munition program.
AT4/Carl Gustaf/AT4 HP	A further development of the original AT4/Carl Gustaf/HEDP 502. The AT4 High Penetration (HP) warhead carries a 60-centimeter (23.62-in) armor perforation rating at 500 meters (546.8 yd); it retains the "behind armor" effects of the original AT4 warhead.
AT4/Carl Gustaf/AT4 HP-T	A tandem warhead variant of the AT4/Carl Gustaf/AT4 HP, optimized for employment against ERA. The AT4 HP-T also incorporates a solid-fuel rocket motor to accelerate the projectile to a velocity of 325 mps (1,042.6 fps).
Anti-Char Troupes Touts Armes	In July 1990, Thomson-Brandt Armements (later Thomson-DASA Armements, now a component of Airbus SE) and Forenade Fabriksverken signed a cooperative agreement to further develop the AT4 to meet the French Army's requirement for a near-term weapon similar to the U.S. Army's Multipurpose Individual Munition. Subsequently, the Anti-Char Troupes Touts Armes requirement went dormant. The French Army ultimately selected the AT4-CS for what had become the French Army's Anti-Blindé Léger requirement.
AT4-CS (Confined Space)	A slightly redesigned version of the original AT4, which can safely fire from an enclosed space of 3 square meters (3.61 sq yd). Features a liquid countermass, which exits the rear of the launch tube upon firing. Procured thus far by the French Army (for its Anti-Blindé Léger requirement), U.S. Army and U.S. Special Operations Command (USSOCOM), and Venezuela.
AT4I	A developmental incendiary warhead version of the AT4.
AT12T (Tandem)	Tandem warhead version of AT4. Featured monopod mount to compensate for greater length and weight. Serial production commenced in 1995 for the Swedish Army. However, Sweden determined that the AT12T was too heavy; the program was terminated shortly after production began.
Light Multipurpose Assault Weapon	A variant of the AT4 optimized for use in built-up areas. Features two optional fuze settings ("I" for engaging armor; "D" for troops in bunkers) for the standard 84mm HEDP round.

**Alliant Techsystems AT4 Variants.** Alliant Techsystems, as the U.S. licensee for the AT4 program, attempted to capitalize on U.S. Department of Defense procurement of the AT4 by developing enhanced versions of the weapon. Some of this development work involved the Swedish prime contractor.

<u>Designation</u>	<u>Description</u>
AT4 E1	AT4 with the Forenade Fabriksverken 751 advanced anti-armor warhead. Testing ran from October 1988 into the early 1990s. None were procured.
AT8 (AT4 E2)	In 1987, (then) Honeywell proposed integrating the AT4 with the Mk 150 Shoulder-Launched Multipurpose Assault Weapon warhead. The contractor originally demonstrated this 7.2-kilogram (15.84-lb) weapon as the technological baseline for the Multipurpose Individual Munition mission requirement. In 1988, the contractor began promoting this version, as well as the AT4 E1 (see above), as an alternative to the all-new Multipurpose Individual Munition.

## AT4/M136 and AT12T

### Designation

AT9

### Description

In 1988, reports surfaced concerning a further development of the basic AT4 weapon, designated AT9, for use against heavier armor than the AT4 could defeat. It has yet to be determined whether this program was an effort of the U.S. Navy and the Defense Advanced Research Projects Agency (DARPA) to meet the Short-Range Anti-Tank Weapon mission requirement, or a private venture of the contractor to meet an anticipated requirement. By the mid-1990s, this program had fallen to a minimal level of activity.

**Modernization and Retrofit Overview.** The AT4 has minimal modernization and retrofit potential. The contractor usually incorporates any product improvements as production cut-ins.

Alliant Techsystems developed a sight rail for mounting on the AT4/M136 launch tube. This equipment permits the operator to mount a variety of night sights on the weapon.

## Program Review

**Background.** When the Swedish Ministry of Defense issued a requirement for the replacement of the obsolescent Miniman man-portable anti-armor weapon, (then) Forenade Fabriksverken sought to meet the requirement with a weapon that would be viable on the export market as well. Consequently, the contractor held low costs and a lightweight design as paramount considerations in the initial AT4 development program.

contractor in the development of other warheads, full and subcaliber training rounds, and simulators. Originally, Forenade Fabriksverken planned a monthly production rate of 5,000 units. A significantly higher production rate is possible to meet domestic Swedish and export demand.

### *Corporate Shuffle*

Over its life, the AT4 program has undergone a somewhat complex series of acquisitions, mergers, and name changes. Saab Bofors Dynamics now acts as the prime contractor.

### *AT4 Hits U.S. Market*

As an alternative to the terminated M132 Viper program, Honeywell Defense Systems negotiated a contract with Forenade Fabriksverken to market and further develop the AT4 in the United States. When Congress demanded a test of European Viper-like systems, Forenade Fabriksverken submitted the required 70 units through the Defense Division of Honeywell for tests. The test program ran from 1983 through most of 1985.

### *'Adequate' Performance*

As Forenade Fabriksverken and the Swedish Army did not consider weapons of this weight class capable of engaging the frontal armor of main battle tanks, the original version of the AT4 featured what was termed "adequate" armor perforation capability (42+ cm/16.53+ in at full effective range), along with a greatly enhanced "behind armor" capability.

Though the U.S. Army initially did not commit itself to any purchases of the AT4 beyond those required for tests, the Army procured an additional 1,000 units for the test program. The contractor modified the 1,000 units to meet Army specifications following the 1983 trials. The modifications included a wider carrying sling, a modified sight similar to that of the defunct Viper, a folding cocking lever, and oversized end caps to prevent damage to the weapon when it falls or rolls. The contractor delivered an additional 36 modified rounds in January 1985.

The warhead design optimizes its effect after perforating the sides and other non-frontal armored portions of tanks through the following mechanisms:

- Overpressure within the target vehicle
- Flash
- Heat
- Spalling and secondary fragmentation

Testing was completed by July 1985, and the U.S. Army issued a favorable report in September. Although details of the competition remain sensitive, the AT4 reportedly did not fail any of the test criteria; the U.S. Army judged the AT4 the easiest of the competing weapons to use.

Although all high-explosive anti-tank (HEAT) warheads exhibit these effects, the contractor reportedly enhanced the effects in the AT4 warhead.

About the same time, Honeywell began work on advanced warheads for the AT4, including a kinetic energy warhead incorporating a depleted uranium penetrator.

The contractor financed the initial development cost of the AT4, estimated at \$3.9 million, as a private venture. The Swedish Army continues to cooperate with the

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In September 1985, the U.S. Army announced that the AT4 had won the competition. In October 1985, the Army awarded the initial procurement contract for 55,000 units, worth \$44.7 million, to Forenade Fabriksverken, through Honeywell.

### *AT4/M136 Enters U.S. Service*

The U.S. Army type-classified the AT4 as the M136 Light Multipurpose Weapon. The Swedish prime contractor made the initial deliveries of 271,283 units with technical assistance from Honeywell during the first five years of the program. Honeywell subsequently manufactured the next 95,000 units of the M136 (plus 13,800 for the U.S. Marine Corps) in the U.S. at the government-owned Joliet Arsenal facility (Joliet, Illinois). With an original procurement objective of nearly 1 million units, the initial procurement schedule called for the delivery of 362,000 units from 1986 to 1991, at a cost of \$273 million.

When the M72E4 finally completed its tests and gained type classification in 1993, the AT4/M136 became a second-line weapon. The U.S. Army subsequently reduced the AT4/M136 procurement objective to 447,000 units. The FY90 contract for 103,879 units was originally to have ended the U.S. Army's AT4/M136 procurement program. However, in 1992, the Army awarded a contract for another 25,724 weapons.

### *New U.S. Demand for AT4-CS*

With the emergence of Operation Enduring Freedom (2001-2014) and Operation Iraqi Freedom/Operation New Dawn (2003-2011), the U.S. Army and Marine Corps once again had an immediate requirement for the AT4. In April 2004, the U.S. Special Operations Command (USSOCOM) awarded Saab Bofors Dynamics a contract worth \$14 million for the AT4-CS (Confined Space) variant.

The U.S. Army began funding a limited procurement of M136A1 AT4-CS weapons in FY17. This represented the first such DoD funding for AT4 procurement since FY12.

### *Dealing with Explosive Reactive Armor*

We must offer a caveat regarding the AT4 as well as all other man-portable anti-tank weapons firing HEAT warheads. The integration of explosive reactive armor with tanks essentially renders conventional HEAT warheads of this class ineffective in any reasonable caliber. Since termination of the AT12T program, only the AT4 HP-T employs tandem HEAT warhead technology that is effective against ERA.

## Funding

The following table reflects U.S. Army FY25 budget documentation for the procurement of the AT4 and AT4-CS. All amounts are in millions of U.S. dollars.

U.S. ARMY FUNDING						
	FY20	FY20	FY21	FY21	FY22	FY22
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
<b>Procurement</b>						
AT4-CS, M136A1	17,924	48.7	-	9.9	25,794	72.4
	FY23	FY23	FY24	FY24	FY25	FY25
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
<b>Procurement</b>						
AT4-CS, M136A1	-	0.8	-	0.1	0.04	-
	FY26	FY26	FY27	FY27	FY28	FY28
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
<b>Procurement</b>						
AT4-CS, M136A1	-	-	-	-	-	-

Under the FY25 budget line Direct Support Munitions, the U.S. Navy appropriated funding for the acquisition of 1,882 84mm CA30 Confined Space rockets.

**AT4/M136 and AT12T**

## Contracts/Orders & Options

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In May 2011, Saab Bofors Dynamics secured a contract worth \$16.5 million with an undisclosed customer for additional deliveries of the AT4-CS RS (Confined Space, Reduced Sensitivity) man-portable weapon system. Deliveries reportedly occurred in 2012.

In Dec 2014, the French Ministry of Defense awarded Saab an initial procurement contract worth \$34.68 million for the Roquette NG (Nouvelle Génération) shoulder-launched weapon system for the French armed forces. The total program, including all options, is valued at approximately \$241 million.

In Mar 2017, Saab Dynamics announced a contract of unreported value with an undisclosed customer for deliveries of the AT4-CS ER (Extended Range) and AT4-CS HP (High Penetration). Deliveries were to occur in 2018.

In Jul 2019, Saab signed a multiyear framework agreement with the U.S. government that allows the U.S. Army, U.S. Marine Corps, and U.S. Special Forces to place orders worth up to \$445 million during a five-year period for AT4 weapons and Carl Gustaf ammunition. This order was extended in September 2023.

In Dec 2019, the Latvian armed forces ordered an undisclosed quantity of AT4 weapon systems. Deliveries were to take place in 2021.

In late 2023, Saab received a EUR63.0 million contract from the NATO Support and Procurement Agency (NSPA) to provision NATO member states with AT4 systems.

Generally, the prime contractor does not release detailed contractual information regarding the AT4.

## Worldwide Distribution/Inventories

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**Export Potential.** Although official Swedish government policy restricts Sweden from selling weapons to certain areas of the world (particularly the Middle East, for example), the AT4 has nevertheless proliferated across the globe.

**Countries.** The AT4 is in service in **Brazil, Canada, Denmark, France, Iraq, Latvia** (deliveries to begin in 2021), the **Netherlands, Sweden, the Republic of China (Taiwan), Ukraine, the United States, and Venezuela**. Other customers remain unidentified.

## Forecast Rationale

Serial production of the AT4 is ongoing for the United States military and other NATO member states. Although the impending emergence of a successor system signals the beginning of the base AT4's gradual transition into obsolescence, in the more immediate term, market demand for the system has exhibited a resurgence as a result of the Russian Federation's invasion of Ukraine in 2022.

NATO member states have made extensive donations of AT4 systems to Ukraine in order to bolster that country's capacity to negate Russia's numerical advantage in armored forces. In 2022, the United States donated 6,000 AT4 weapons systems to Ukraine, while Sweden has reportedly donated more than double that figure.

The battlefields of Ukraine have amply demonstrated the immense tactical value and lethal potential of man portable anti-tank weapons while also drawing attention

to the extraordinary rate at which they are expended in a modern conventional conflict. Correspondingly, states across NATO and the globe are stepping up efforts to replenish their stocks of anti-tank systems.

While the anti-armor capabilities of the AT4 are nothing state of the art for a weapon of this class, the urgency of the requirement has proven beneficial to the prospects of familiar and battlefield-proven assets such as the AT4/M136.

Furthermore, the AT4-CS (Confined Space) variant integrates the ability to safely fire from an enclosed space with the proven AT4 design. This confined-space firing capability is proving to be a major factor in the AT4's market appeal.

### *U.S Procurement Activity and Successor*

In September 2023, the U.S. DoD announced the extension of its 2019 procurement framework with Saab

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for the acquisition of munitions for the AT4-CS RS and Carl Gustaf requirements. This latest \$104.9 million order (encompassing munitions for both systems) will be delivered to the Army, Marine Corps, and select Air Force formations over 2025-2026.

Although U.S. procurement of the AT4-CS RS model is ramping up for the near term, the DoD is moving swiftly to introduce the system's planned successor into service. Designated the XM919 Individual Assault Munition (IAM), the new system is intended to provide U.S. soldiers and Marines with a capability improvement in the anti-armor and anti-fortification domains while simultaneously rationalizing the military's shoulder-launched munitions inventories by replacing a diverse host of existing systems, including the current AT4 variants, the M141 bunker defeat munition, and the M72 light anti-armor weapon. The Army has articulated an ambition to begin provisional fielding of this new system as early as 2026 and released a Request for Proposals (RFP) in 2023.

The outcome of this competition will prove consequential in determining the long-term market outlook for the AT4 system. Saab is presenting an

evolutionary development of the AT4 system, dubbed the AT4-CS TW (Tandem Warhead), for the requirement, while General Dynamics is due to submit a variant of its Recoilless Grenade Weapon 90/60 series. Regardless of which submission is selected, U.S. procurement of earlier AT4 models appears destined to wind down over the latter half of the forecast period as the system begins to be supplemented and ultimately superseded by the more modern alternative, represented by the XM919.

### *European Replenishment*

In late 2023, Saab received a EUR63.0 million contract from the NATO Support and Procurement Agency (NSPA) to provision NATO member states with AT4 systems. This order is intended to both buttress the capabilities of NATO member states and compensate for stocks donated to Ukraine.

In January 2022, France placed a EUR24.0 million order with Saab for additional AT4 systems; the AT4 is designated the Roquette NG in French service. Deliveries were reported to have been executed over 2023.

## Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
<b>Saab Dynamics</b>												
<b>AT4 (M136) Tube/CS (Confined Space) &lt;&gt;</b>												
	526,164	5989	7087	9180	5100	4800	3600	2605	2100	2100	1650	44,211
<b>Total</b>	526,164	5989	7087	9180	5100	4800	3600	2605	2100	2100	1650	44,211