

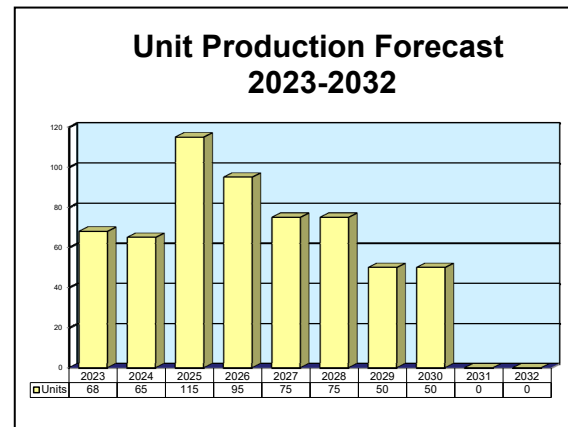
ARCHIVED REPORT

For data and forecasts on current programs please visit
www.forecastinternational.com or call +1 203.426.0800

Armbrust

Outlook

- Despite increased demand for shoulder-fired weapons of this type, the Armbrust's relatively low anti-armor capability continues to hurt sales
- ST Kinetics' 90mm Matador will be the eventual replacement for Armbrust
- Forecast reflects the potential for sporadic sales of Armbrust on the international market



Orientation

Description. A man-portable, anti-armor multipurpose weapon.

Sponsor. Messerschmitt-Bölkow-Blohm originally pursued the Armbrust as a private venture.

Since 1986, Singapore Technologies Kinetics Ltd (formerly Chartered Industries of Singapore) has assumed further development and production of the Armbrust.

Status. Development through as-needed serial production.

Total Produced. Through 2022, we estimate the various contractors produced at least 67,577 Armbrust weapons.

Application. A man-portable, anti-armor multipurpose weapon optimized for use in built-up areas. The Armbrust is particularly suitable for specialized and second echelon military units, internal security units, and national police.

Price Range. In 2023 U.S. dollars, the Armbrust reportedly maintains a unit price of \$5,308 for low-rate purchases (up to 50 units).

Contractors

Prime

Singapore Technologies Land Systems Ltd, (ST Land Systems)

<http://www.stengg.com>, 249 Jalan Boon Lay, Singapore, Singapore,
 Tel: + 65 6265 1066, Fax: + 65 6261 6932, Email: comms.kinetics@stengg.com, Prime

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

Armbrust

Technical Data

Design Features. The Armbrust employs a modified Davis recoilless system, incorporating the Antonin sliding piston system, to allow firing in an enclosed space.

Dimensions. The following data reflect the P1 version of the Armbrust.

	<u>SI Units</u>	<u>U.S. Units</u>
Projectile length	42.5 cm	16.73 in
Total length	85.1 cm	33.50 in
Projectile diameter	6.7 cm	2.64 in
Total diameter	7.5 cm	2.95 in
Projectile weight	1.0 kg	2.20 lb
Total weight	6.3 kg	13.86 lb
Cone standoff	3.0 cal	3.0 cal

Performance. The following data reflect published ST Kinetics literature concerning the Armbrust.

	<u>SI Units</u>	<u>U.S. Units</u>
Speed	210 mps	688.98 fps
Altitude	Line of sight	Line of sight
Range	300 m	328.08 yd
Armor perforation	30 cm	11.81 in

Propulsion. Employs a modified Davis-Antonin principle, with two solid-propellant charges.

Launcher Mode. The Armbrust launcher is a composite fiber tube with an integral side-mounted sighting unit and a pistol-grip firing mechanism. The operator disposes of the entire launcher after firing.

Warhead. Three basic 67mm warhead types are currently available for the Armbrust:

- A standard High Explosive Anti-Tank (HEAT) warhead
- An Anti-Personnel (AP) warhead, with a lethal radius of 14 meters
- A Target Practice (TP) round

Reports suggest ST Kinetics may also be developing a specialized anti-bunker round for the Armbrust.



Armbrust Light Anti-Tank Weapon

Source: Singapore Ministry of Defense

Variants/Upgrades

Variants. There are no variants of the Armbrust per se. The contractor assigns modified designations to product-improved versions. In 1981, the original contractor began development of an enhanced Armbrust, designated Armbrust P2; the standard Armbrust then received the retroactive designation P1.

The contractor claims the P2 features an armor perforation performance of 40 centimeters (15.75 in) at 300 meters. The P2 became available for sale in 1984.

The dimensional differences between the two versions are as follows.

	<u>Armbrust P1</u>	<u>Armbrust P2</u>
Projectile weight	1.0 kg/2.2 lb	1.2 kg/2.64 lb
Total weight	6.3 kg/13.86 lb	6.9 kg/15.18 lb
Total length	85.1 cm/33.5 in	92 cm/36.22 in

In September 2004, the Singapore Ministry of Defense unveiled the 90mm Matador short-range anti-armor weapon (SRAAW) as the eventual replacement for the Armbrust. The government of Singapore initiated the Matador program in 2000 as a joint development program encompassing:

- The Singapore Armed Forces (SAF)
- The Defense Science & Technology Agency (DSTA)
- Dynamit Nobel Defense GmbH (Burbach, Germany)

The shoulder-fired Matador (Man-portable Anti-Tank Anti-DOor) is a lightweight, man-portable, disposable anti-armor weapon system. It is reportedly among the lightest weapons of its class, retaining the enclosed-space firing capability of the Armbrust. The Matador is optimized for employment against both armored vehicles and brick/masonry structures.

Modernization and Retrofit Overview. Not applicable. The contractor incorporates product improvements as production cut-ins.

Program Review

Background. In 1972, Messerschmitt-Bölkow-Blohm began developing a new lightweight anti-armor weapon optimized for use in built-up areas. Important design criteria included major reductions in, or the elimination of, noise, flash, smoke, and recoil.

Davis Recoilless System

To achieve these ends, the contractor employed a modified Davis recoilless system, incorporating the Antonin sliding piston system. For a discussion of these systems and the countershot principle, see Appendix I ("Glossary of Military Vehicle/Ordnance/Munitions Technology") of *Ordnance & Munitions Forecast*.

In the Armbrust (Crossbow) application, a countermass of 5,000 small plastic flakes exits the rear of the launcher tube upon firing, negating the back-blast effect of the munition. After leaving the launcher tube, the flakes fan out and fall to the ground about 15 meters (16.4 yd) behind the weapon.

Corporate Evolution

In 1986, Chartered Industries of Singapore purchased the sales and production license for the Armbrust. Since 2000, this contractor has operated as Singapore Technologies Kinetics Ltd.

With the sale of marketing and production rights for the Armbrust to (then) Chartered Industries of Singapore, all other licensing agreements were terminated. ST Kinetics remains the only active producer of the Armbrust. Poudreries Réunies de Belgique SA (Brussels, Belgium) previously had a license to internationally market and produce the Armbrust. Prior to 1982, Boeing Aerospace Co (Seattle, Washington) teamed with Messerschmitt-Bölkow-Blohm to market and produce the Armbrust in the United States.

Description. The Armbrust arrives from the contractor as a sealed round, with no maintenance requirements. The original contractor stated the Armbrust storage life to be at least eight years. Two sealed rounds can clip together, allowing one person to carry four rounds with ease.

Sequence of Operation

Like all weapons of this type, the Armbrust is a shoulder-fired weapon. The sighting and firing mechanisms are integral to the launcher. After acquiring and sighting-in the target, the operator pulls the trigger, activating the piezoelectric firing mechanism. After firing, the operator discards the entire launcher. Alternatively, the Armbrust is

Armbrust

reloadable with a new 67mm round or a 17mm subcaliber training device.

The Armbrust firing system allows the operator to fire the weapon within an enclosed space, with the rear of the weapon as close as 80 centimeters (31.5 in) to a wall. During firing, the Armbrust is about as loud as a 9mm pistol.

Operational Limitations

The 67mm HEAT warhead is of only limited effectiveness against modern armor; it is *not* effective

against explosive reactive armor (ERA). Consequently, the Armbrust is no longer suitable for frontline use against modern heavy armor.

The Armbrust is much better suited for specialized and second echelon military units, internal security units, and national police. Its ability to safely fire from an enclosed space makes it an ideal weapon for military operations in urban terrain (MOUT) scenarios – e.g., counterterrorist operations.

Funding

Messerschmitt-Bölkow-Blohm funded the initial development and production of the Armbrust as a private venture. Singapore Technologies Kinetics Ltd has subsequently funded development and production.

Worldwide Distribution/Inventories

Export Potential. The Armbrust has failed to gain a foothold in the glutted international market. Its marketability suffers in comparison to its many competitors due to its relatively poor anti-armor performance. Singapore Technologies Kinetics Ltd maintains a low-key marketing effort, primarily targeted at special military units, police, and other internal security units.

Countries. **Belgium, Cameroon, Denmark, Germany** (Border Police), **Kuwait, Oman** (following an accident with the Armbrust, Omani authorities disposed of the weapons at sea), and the **United States** (an unknown number for Special Operations Forces). Available evidence also indicates at least six other orders from Latin America, Africa, and Asia.

Small numbers of Armbrust weapons have turned up with various insurgent groups operating in **Bosnia-Herzegovina, Cambodia, Croatia, Mexico, Nicaragua, Peru, Slovenia, Sri Lanka, Yugoslavia**, various areas of **sub-Saharan Africa**, and elsewhere.

Forecast Rationale

The Armbrust has never really caught on in the glutted international market. This light anti-tank weapon suffers in comparison to its many competitors due to its relatively poor anti-armor performance. Consequently, it is no longer suitable for frontline use against modern heavy armor.

The Armbrust is better suited for specialized and second echelon military units, internal security units, and national police. Its ability to safely fire from an enclosed space makes it an ideal weapon for military operations in urban terrain (MOUT) scenarios – e.g., counterterrorist operations. Yet, even this capability has not significantly helped Armbrust sales.

In September 2004, the Singapore Ministry of Defense unveiled the 90mm Matador short-range anti-armor weapon (SRAAW) as the eventual replacement for the Armbrust. If the Singapore Armed Forces ever begin procuring the Matador in quantity, the Armbrust will lose its most reliable customer.

As it is still an effective weapon against light-skinned vehicles and minor structures, the Armbrust may be able to score a moderate level of sales. Nevertheless, with the introduction of the Matador, the days of Armbrust production are clearly numbered.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Singapore Technologies Land Systems Ltd												
Armbrust P2												
	67,577	68	65	115	95	75	75	50	50	0	0	593
Total	67,577	68	65	115	95	75	75	50	50	0	0	593