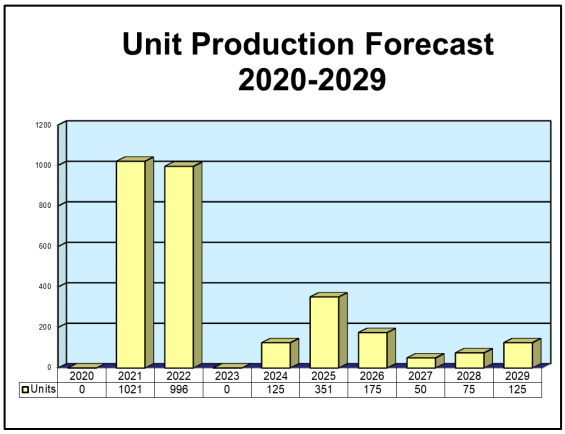
Strix Guided Anti-Armor Mortar Projectile

Outlook

- Sweden and Switzerland remain the only confirmed Strix customers
- Saab Bofors Dynamics still hopes to score new orders for this munition
- Production forecast reflects only the contractor's expectations for future Strix sales
- This program is unlikely to be affected by the COVID-19 pandemic



Orientation

Description. A guided 120mm mortar projectile.

Sponsor. The Swedish Ministry of Defense, through the Swedish Army, sponsors the development and Swedish Army procurement of the Strix projectile.

Status. Development through serial production. The production line is currently dormant but available for new orders.

Total Produced. Through 2019, we estimate that the prime contractor produced at least 4,700 Strix projectiles.

Application. A precision-guided anti-armor mortar munition providing indirect fire support for both offensive and defensive infantry operations.

Price Range. In 2020 U.S. dollars, the Strix projectile reportedly maintains a unit price of $23,940.

Contractors

Prime

Saab Dynamics	http://www.saabgroup.com, Boforsvägen 1, Karlskoga, Sweden, Tel: + 46 586 810 00, Fax: + 46 586 857 00, Prime
General Dynamics Ordnance and Tactical Systems, Marion Operations	http://www.gd-ots.com, 150 Johnston Rd, Marion, VA 24354-4324 United States, Tel: + 1 (276) 783-3121, Fax: + 1 (276) 783-9667, Licensee

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Strix Guided Anti-Armor Mortar Projectile

Technical Data

Design Features. A precision-guided 120mm mortar projectile optimized for employment against explosive reactive armor (ERA).

Launch/Carrier Platform. Any smoothbore 120mm mortar can fire the Strix projectile.

Dimensions. The following data reflect the initial production units of the Strix projectile.

	SI Units	U.S. Units
Projectile diameter	120 mm	4.72 in
Projectile length	84 cm	2.76 ft
Projectile weight	18.20 kg	40.04 lb
Shipping weight (in container)	26.5 kg	58.3 lb

Performance. As a top attack munition, the Strix High-Explosive Anti-Tank (HEAT) warhead can defeat any known vehicle armor in service.

	SI Units	U.S. Units
Minimum range	600 m	656.20 yd
Unassisted maximum range	5,000 m	5,480 yd
Assisted maximum range	7,000+ m	7,655.20+ yd
Muzzle velocity (maximum)	320 m/sec	1,049.90 ft/sec
Armor perforation	75.60 cm	29.80 in

Propulsion

Primary Propulsion. Conventional incremental mortar charges.

Secondary Propulsion. A band of solid-fuel side-thrust rockets for course correction during the terminal phase of flight.

Assisted Propulsion. A solid-fuel sustainer motor, increasing the maximum range by around 2,000 meters (2,187.2 yd).

Warhead. Advanced-design high-explosive shaped-charge warhead optimized for maximum spalling and other behind-armor effects. The Strix warhead has demonstrated its effectiveness against ERA.

Control & Guidance. Four wraparound fins deploy as the projectile leaves the mortar tube. These fins provide the initial aerodynamic stabilization via the slow spinning of the projectile. The proportional navigation guidance system activates as the projectile leaves the mortar tube. An imaging infrared seeker in the forward portion of the projectile activates for the terminal phase of flight. Through the projectile's micro-circuitry, the IIR seeker generates course correction commands for the solid-fuel thrusters around the circumference of the projectile.

The IIR seeker can distinguish between vehicles that are already burning and vehicles that are still operational.

Variants/Upgrades

Variants. None at this time. In response to a Japanese request, the contractor (with the assistance of Thomson-DASA Armements) is reportedly developing a version featuring slip rings to allow firing from the popular rifled Brandt-pattern 120mm mortars.

Possible Improvements

Following the initial production run in 2001, the contractor began working on various ways to enhance the performance of the Strix. These improvements could include integration of the following features and components:

- A GPS receiver
- A midcourse trajectory change capability
- Electro-optic target identification capability
- Advanced seeker components

The contractor is also developing a new multipurpose warhead, effective against a wider variety of targets.

Modernization and Retrofit Overview. Not applicable at this time.

Program Review

Background. In the late 1970s, the Swedish Ministry of Defense funded the initial study of a smart mortar projectile. In 1980, the Ordnance Division of Forenade Fabriksverken, with the assistance of Saab Missiles, began privately funding the development of a new smart 120mm mortar projectile. In December 1984, the Defense Materiel Department of the Swedish Defense Ministry awarded a contract worth SEK275 million to Forenade Fabriksverken and Saab Missiles for continued development of their new mortar projectile, known as the Strix (Latin for "owl").

Development, including extensive contractor firings, took place between 1985 and 1991. The contract team completed final development and testing of the Strix in 1993. Serial production began shortly thereafter; the new munition entered Swedish Army service in 1994.

Corporate Evolution

In 1992, following a series of mergers, acquisitions, and name changes, Bofors absorbed Forenade Fabriksverken. In 2000, United Defense Industries acquired Bofors. As a wholly owned subsidiary of United Defense, Bofors Defence AB became part of BAE Systems in June 2005 with BAE Systems' acquisition of UDI. The contractor currently operates as Saab Dynamics.

Description. Mortar crews handle and fire the Strix in the same manner as any other 120mm mortar round. Crews can reportedly fire three Strix projectiles within 20 seconds. The contractor claims the projectile has a shelf life of around 10 years.

In appearance, the Strix resembles other mortar projectiles, though it is somewhat longer. The forward portion of the projectile contains the infrared guidance and control components. The middle of the projectile houses the electronics, batteries, and shaped-charge warhead. The rear portion of the projectile contains the solid-fuel thruster rocket motors and the wraparound stabilizing fins. An additional sustainer rocket motor can mount on the rear of the projectile for greater range.

IR Seeker & Guidance

As the projectile exits the mortar tube, four wraparound fins deploy to stabilize the projectile via a slow rotation during flight. Once the projectile is over the top of the trajectory, the IR sensor is activated. Upon acquiring a target, the seeker generates the appropriate guidance and control commands to steer the projectile to strike the top of the target.

The mortar crew programs the Strix for the guidance phase in a manner similar to setting a standard proximity fuze. The seeker/guidance system can filter out already attacked (burning) tanks, other false targets, and decoys. The Strix projectile can engage moving or stationary targets both day and night.

Potent Warhead

The Strix employs a chemical (HEAT) shaped-charge warhead to defeat armor. Even if a tank mounts ERA on top, the detonation of the Strix projectile will almost certainly destroy or severely disrupt the tank's fire control optics, rendering the tank almost impotent.

Funding

The Swedish Ministry of Defense funds the development and Swedish Army procurement of the Strix munition.

Timetable

Month	Year	Major Development
Late	1970s	Concept exploration and initial development
	1980	Forenade Fabriksverken begins development of the guided mortar round
Dec	1984	Swedish government provides funding
	1985-89	Full-scale engineering development/test-firing
Jul	1991	Sweden awards initial production contract
	1994	U.S. Army tests the Strix for precision-guided mortar munition (PGMM) requirement
Sep	1994	U.S. Army eliminates the Strix from PGMM program
Dec	1996	Switzerland places first export order for the Strix
	2020	Production dormant; development and marketing continue

Strix Guided Anti-Armor Mortar Projectile

Worldwide Distribution/Inventories

Export Potential. With the steady worldwide acceptance of 120mm mortars as standard, Saab Bofors Dynamics should have the inside track on what may prove to be a lucrative market. Precision-guided mortar projectiles will likely become hot items on the international market, as they offer a highly cost-effective means for infantry units to engage armor at long ranges. Yet, the Strix has thus far failed to secure export orders beyond the Swiss procurement. Moreover, any export of the Strix will have to comply with strict Swedish export laws.

Countries. **Sweden**, **Switzerland**.

Forecast Rationale

The Strix remains the only precision-guided 120mm mortar munition available on the international market.

As demand for precision-guided munitions grows worldwide, this projectile could become the industry standard for guided 120mm mortar rounds.

The primary potential competitors of the Strix have been the German 120mm Bussard and the U.S. 120mm XM395 precision-guided mortar munition (PGMM).

The Diehl Bussard program was reportedly suspended in the mid-1980s due to lack of funding.

The Northrop Grumman (formerly Orbital ATK) XM395 PGMM is still in its engineering and manufacturing development phase under the U.S. Army's Accelerated Precision Mortar Initiative (APMI). Until the XM395 PGMM becomes available internationally, the Strix will remain in a good position to exploit a near-term advantage in a developing market.

Saab Dynamics clings to expectations of winning additional orders for its Strix. However, until these new orders arrive, production of this round will remain suspended.

Potential near-term customers include Finland and Norway, both of which are looking for new 120mm self-propelled mortar systems.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION

Designation or Program	High Confidence				Good Confidence			Speculative			
	Thru 2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Saab Dynamics												
Strix												
	4,718	0	1021	996	0	125	351	175	50	75	125	2,918
Total	4,718	0	1021	996	0	125	351	175	50	75	125	2,918