Systeme dArme Antipiste BAP 100

Outlook

- Production may have concluded
- Unless new orders are received, this production stoppage will become permanent
- Sales prospects appear to be few
- Availability of newer weapons has undercut demand for BAP 100
- France used the BAP 100 in combat in Chad during 1986 and Iraq in 1991

Orientation

Description. An anti-runway dibber bomb.

Sponsor. The French Ministry of Defense, through the French Air Force, sponsors the development and French procurement of the BAP 100.

Licensees. None

Status. Development through serial production (as needed).

Total Produced. Through 2007, we estimate the contractor produced about 50,300 Systeme d'Arme Antipiste BAP 100 munitions.

Application. An air-delivered, anti-runway dibber bomb optimized for the destruction or long-term damage of enemy runways, taxiways, aprons, and some concrete hardened shelters. The BAP 100 is also suitable against any concrete-hardened target (semi-hardened aircraft shelters, blockhouses, harbor facilities, etc.).

Price Range. In 2008 U.S. dollars, a standard package of 18 BAP 100 munitions and one 30-6-M2 adapter reportedly maintains a unit price of $10,950.

Contractors

Prime

TDA Armements SAS	http://www.thaleson-line.com/landjoint/, Route d'Ardon, La Ferté Saint-Aubin, 45240 France, Tel: + 33 2 38 51 63 63, Fax: + 33 2 38 51 63 97, Email: dpt.communication@tda.thalesgroup.com, Prime
Nexter Munitions	http://www.nexter-group.fr, 7, route de Guerry, Bourges, 18023 France, Tel: + 33 2 48 21 91 11, Fax: + 33 2 48 21 91 42, Second Prime

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown,

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Technical Data

Launch/Carrier Vehicle. Most tactical aircraft that are compatible with NATO-standard munitions (Mirage III/5/50/2000/F1, Jaguar, Rafale, Super Etendard, AlphaJet, Hawk, MB 326, MB 339, A 4, A-7, F-4, F-5, etc.) can carry and deploy the BAP 100. Other aircraft applications, such as the Typhoon, are probable.

Munitions per Dispenser. Each 14-3-M2 adapter mounts nine BAP 100 munitions; each 30-6-M2 adapter mounts 18 BAP 100 munitions.

Dimensions. The following data reflect the latest production-standard BAP 100 munition.

	SI Units	U.S. Units
Length (overall)	1.78 m	5.84 ft
Diameter	10 cm	3.94 in
Launch weight	32.50 kg	71.5 lb

Performance. The contractor provides the following performance data.

	SI Units	U.S. Units
Maximum release speed	1,020 kmph	550 kt
Minimum release altitude	65 m	213 ft
Terminal velocity	265 mps	869.41 fps
Concrete penetration	30 cm	11.81 in
Area of runway damage	40 m2	444.50 sq ft
Reliability	95%	95%

Propulsion. A high-impulse solid-fuel rocket motor, featuring Groupe SNPE propellant. A quartz sequencer activates propellant ignition about 3.75 seconds after ejection. The burn time is slightly under 0.3 seconds.

Warhead. An 18-kilogram (39.6-lb) hard steel alloy-penetrating warhead, including a 3.5-kilogram (7.7-lb) High Explosive secondary warhead that detonates after perforating the runway. Instantaneous or delayed fuzing options are available.

Variants/Upgrades

Variants. Not generally applicable. BAP 100 munitions with various warhead options exist as distinct products.

Modernization and Retrofit Overview. Not generally applicable. The contractor integrates any improvements as production cut-ins.

Program Review

Background. Following the outstanding success of Israel's French and indigenous dibber bombs in several Middle East conflicts, French contractors accelerated the development of anti-runway/anti-airfield munitions.

Alternative to Durandal

In the mid-1970s, the armaments division of Thomson Brandt began developing an autonomous release anti-runway weapon that was significantly smaller and lighter than the Durandal. Designated the Systeme d'Arme Antipiste BAP 100, the weapon is more commonly known simply as the BAP 100.

The program pursued a slightly different approach in the anti-runway mission field, favoring the highest number of munitions delivered per strike aircraft pass. The Thomson Brandt Armements design can perforate 30 centimeters (11.81 in) of concrete, the maximum thickness of over 90 percent of all the runways in the world. An aircraft as small as the Hawk can carry up to 36 BAP 100 munitions, as opposed to a load of 8-10 Durandals.

Development of the BAP 100 was completed in 1979; following operational evaluations, the French Air Force selected the BAP 100 as its standard anti-runway weapon that same year. Serial production of the BAP 100 commenced in 1980; service deliveries began immediately thereafter.

In 1991, Thomson Brandt Armements and Matra Defense created the Vélifer SA consortium to continue the development, marketing, and production of anti-

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runway/anti-airfield munitions. Shortly thereafter, Giat Industries absorbed Matra Defense (and Vélifer SA) into the Giat Weapon Systems and Ammunitions Division. In 1995, the Thomson Brandt armaments component of Thomson-CSF became a component of Thomson-DASA Armements (TDA).

Description. The contractor developed the BAP 100 munition from the 100mm anti-shelter demolition rocket, which has been in production since 1968 for the French Air Force and Navy. The BAP 100 weapon system consists of the following components:

- The multi-store carrier, using one of two available adapters that are compatible with the NATO-standard two-lug suspension system.
- A munitions payload of either nine or 18 BAP 100 munitions, depending upon the adapter.

Focus on Ease of Use

The 14-3-M2 nine-round adapter is a NATO-standard 35.56-centimeter (14-in) type that accommodates one cluster of nine BAP 100 munitions. The total loaded weight of the system is 320 kilograms (704 lb). The 30 6-M2 18-round adapter is a 76.2-centimeter (30-in) type that accommodates two clusters of nine BAP 100 munitions in tandem. The total loaded weight of this system is 710 kilograms (1,562 lb).

The adapter secures the munitions via a ball-type locking device. The ground crew can load two BAP 100 clusters in less than 10 minutes. The BAP 100 is an all up round, ready for use.

The individual BAP 100 munition consists of the following components:

- The kinetic energy penetrating HE warhead.
- The suspension/ejection mechanism (with automatic electrical connectors and capacitors).
- The solid-fuel rocket booster assembly.
- The tailfin assembly (with drag parachute).

Almost any tactical aircraft can employ the BAP 100 system. An aircraft's onboard fire control computer can automatically initiate the release of the BAP 100, based on continuous updating of target parameters. On aircraft without a fire control computer, a quartz-driven intervalometer mounted in the adapter governs the release rate once the pilot initiates the release.

Delay Fuze Capability

Just prior to release, the launch aircraft's electrical system powers up the BAP 100 capacitors. Approximately 0.5 second after ejection, the drag parachute deploys pyrotechnically; this retards the munition and orients it at an angle of 50 degrees to the horizon. About 3.75 seconds after ejection – if the munition attains an optimum non ricochet angle of 40 degrees and the decelerometer senses sufficient deceleration – the solid rocket booster ignites, accelerating to about 265 meters per second (869.41 ft/sec). Upon impact, a piezoelectric device ignites a pyrotechnic delay fuze mechanism that allows the munition to perforate the runway before detonation.

To allow for area denial capability, some BAP 100 munitions can accommodate a delay fuze mechanism. This eliminates the need to deploy another area denial munition on the same target. It is also a marketing asset in that it reduces overall costs by requiring fewer munitions per target.

Combat-Proven

Extensive operational testing has confirmed that the BAP 100 can perforate a runway composed of 30 centimeters of hard concrete or similar material. When the warhead detonates, considerable fracture and heaving of the runway results; the disrupted area measures around 40 square meters (444.5 sq ft).

The Systeme d'Arme Antipiste BAP 100 has the great marketing asset of being a combat-proven weapon. In 1986, French Jaguar aircraft (each carrying 18 BAP 100 munitions) neutralized the Libyan-built airfield of Ouadi Doum. The French Air Force also employed the Systeme d'Arme Antipiste BAP 100 during Operation Desert Storm (1991), reportedly with considerable success.

Related News

Nexter Earnings Drop as Programs are Completed – Nexter Systems (Giat Industries subsidiary) held a board meeting on February 26, 2008, and closed the Nexter Group consolidated accounts for the 2007 financial year.

The Nexter Group 2007 order intake amounted to EUR495 million, compared with EUR780 million in 2006. The drop is explained by the lack of a large export order during 2007, whereas, in 2006, a contract was obtained for 76 CAESAR artillery systems for the Middle East.

Export orders thus totaled EUR67 million in 2007. Domestic orders were slightly higher in 2007 than in 2006.

Nexter Group turnover in 2007 (EUR587 million) decreased compared to 2006 (EUR715 million). This was expected and was related to the end of the Leclerc MBT deliveries to the French Army (14 vehicles, against 47 in 2006), whereas the initial VBCI and CAESAR deliveries only started in the second half of 2008.

The main element of the 2007 financial year was the continuing improvement of the group's profitability. The Nexter Group operating profits were EUR69.9 million. "Current operating profits" (not including non-recurring elements) reached EUR44 million in 2007 versus EUR42 million in 2006. The 2007 operating margin was up to 7.4 percent, against 5.8 percent in 2006.

The Nexter Group's consolidated net profits were EUR151.1 million. This includes a considerable non-recurring part due to the incorporation, for the first time, of future benefits to carry forward tax deficits that were transferred from Giat Industries to Nexter Systems.

These profits also take into account the high level of expenditures dedicated to research and development of new products (17 percent of turnover, against 13 percent in 2006). Nexter Group orders in hand amounted to EUR1.825 million, representing around three years of activity. (Nexter, 2/08)

Market Intelligence Service Subscribers: The Airline Inventories, Orders and Options appendix provides instructions on how to access an online database of up-to-date listings. Use this database to obtain detailed, current information.

Funding

The French Ministry of Defense, through the French Air Force, funds the development and French procurement of the Systeme d'Arme Antipiste BAP 100.

Contracts/Orders & Options

Not available, as the French Ministry of Defense and the contractors have not released contractual information relating to the Systeme d'Arme Antipiste BAP 100.

Timetable

Month	Year	Major Development
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Mid	1970s	Development begun
	1980	Development completed; French Air Force selects BAP 100
	1981	Serial production begun
Feb	1986	Combat debut in Chad
Mar	1988	Federal Republic of Germany selects BAP 100
	2007	Production reportedly continues on an as-needed basis
	2008	Production reportedly dormant

Worldwide Distribution/Inventories

Export Potential. While its 1986 combat debut in Chad was a major marketing success, the Systeme d'Arme Antipiste BAP 100 continues to suffer on the international market from persistent confusion with the Durandal. Nevertheless, the BAP 100 has benefited from the liberal arms sales policy of France, with many sales in connection with French tactical aircraft.

Countries. France, Federal Republic of Germany, and at least nine unidentified countries.

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Forecast Rationale

The Systeme d'Arme Antipiste BAP 100 provides customers with the ability to attack runways with the high probability of making them unusable for an unspecified period. This system proved itself in combat, neutralizing the Libyan-built airstrip at Ouadi Doum, northern Chad, in 1986, and performing similar missions during Operation Desert Storm (1991).

Orders for the BAP 100 have been few in recent years, resulting in the slow decline and eventual termination of its production run. Unless new orders appear soon, this production stoppage will become permanent.

Thales and Nexter believe that a large BAP 100 order from the French Air Force will arrive any day now or at least some time in the near future. However, the availability of newer alternatives (such as the SCALP EG and Storm Shadow) has effectively preempted any realistic demand for the BAP 100. Because it did not participate in Operation Iraqi Freedom (2003-present), France was unable to display the capabilities of the Systeme d'Arme Antipiste BAP 100.

Forecast International does not foresee any further orders for the BAP 100.

Ten-Year Outlook

No additional production of the BAP 100 anticipated.

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