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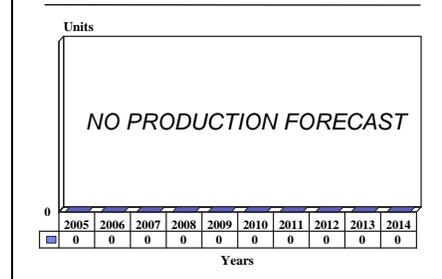
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## Kill Runway Improved Submunition - Archived 12/2006

### Outlook

- With the APACHE-AP out of production, the KRISS has lost its only submunition-dispensing platform to date
- Although integration with other dispensers (such as SCALP-EG and Storm Shadow) is possible, there is no evidence such integration has yet occurred
- Production forecast reflects a probable suspension of KRISS production, pending integration with another platform

10 Year Unit Production Forecast  
2005 - 2014



### Orientation

**Description.** An air-delivered anti-runway submunition (dibber bomb).

**Sponsor.** The contractors developed the Kill Runway Improved Submunition, also known as the Kill Runway Improved Sub-System (KRISS), as a private venture.

**Licensees.** None

**Status.** Development through serial production. With the APACHE-AP out of production, it is likely the KRISS is also out of production at this time.

**Total Produced.** Through 2004, we estimate the contractors produced 4,157 Kill Runway Improved Submunitions.

**Application.** An air-delivered submunition (dibber bomb), optimized for the destruction or long-term damage of runways, taxiways, aprons, and some concrete-hardened shelters. The Kill Runway Improved Submunition is also suitable against any concrete-hardened target (semi-hardened aircraft shelters, blockhouses, harbor facilities, etc.).

**Price Range.** In 2003 U.S. dollars, the Kill Runway Improved Submunition carried a unit price of \$12,600.

### Contractors

Giat Industries - Weapon Systems and Ammunitions Division, <http://www.giat-industries.fr>, 7, route de Guerry, Bourges, 18023 France, Tel: + 33 2 48 21 891 11, Fax: + 33 2 48 21 91 42, Prime

TDA Armements, <http://www.tda-arm.com/index-uk.html>, 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](mailto:dpt.communication@tda.thalesgroup.com), Second Prime

### Technical Data

**Launch/Carrier Vehicle.** The contractors designed the Kill Runway Improved Submunition specifically for employment with the Arme Propulsee à Charge Ejectable (APACHE), a missile-based dispenser system.

Integration with other modular dispensing platforms, such as the SCALP-EG and Storm Shadow, is possible.

Most tactical aircraft that are compatible with NATO-standard munitions (Mirage III/5/50/2000/F1, Jaguar,

AlphaJet, F-4, F-15, F-16, F-111, etc.) can carry and deploy KRISS-compatible submunition dispensers. Dimensions. The contractors have released the following dimensional data for the KRISS.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	1.11 meters	3.61 feet
Diameter	17 centimeters	6.69 inches
Fin span (estimated)	36 centimeters	1.18 feet
Launch weight	50 kilograms	110 pounds

**Performance.** The contractor provided the following concrete perforation figure; some data suggest a greater perforation figure.

	<u>SI Units</u>	<u>U.S. Units</u>
Terminal velocity	>300 meters per second	>984.24 feet per second
Concrete perforation	1.08 meters	3.54 feet

**Propulsion.** An unspecified solid rocket boost motor.

**Warhead.** An 8-kilogram (17.6-pound) high explosive (HE) component which, when combined with the kinetic energy of the munition, is sufficient to perforate and destroy almost any runway. Although the contractors have not released details of operation, it is probable that the bottle-shaped HE warhead detonates

after the munition perforates the runway, thus enhancing the destructive effect. A programmable fuze controls detonation of the HE charge, with a delay from one second up to 12 hours after the initial attack.

**Control and Guidance.** After the submunition dispense releases the KRISS, four cruciform fins and a braking parachute deploy for aerodynamic stabilization.

## Variants/Upgrades

Variants. None

**Modernization and Retrofit Overview.** The KRISS may integrate with other delivery systems, such as SCALP-EG and Storm Shadow.

## Program Review

**Background.** France has had a long interest in military strategy and technology related to attacking runways. In 1967, during the Six Day War, Israel used a prototype dibber bomb from France with great effect in combat. In 1968, (then) Engins Matra and (then) Dornier GmbH jointly began serious development work on a winged dibber bomb. Although this project was terminated about a year later, Matra resumed work on another runway dibber bomb system in 1971, with full development starting in 1973. This munition, the Durandal, went into production in 1977 for the export market, including the United States.

While the Durandal (U.S. Air Force designation BLU-107/B) is a very effective weapon, the French Air Force desired a lighter weapon that could be deployable in greater numbers on a greater variety of tactical aircraft. This capability has proven to be a major marketing asset, especially with the NATO nations.

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. The overall program, the Systeme d'Arme Antipiste BAP 100, pursued a slightly

different doctrine in the anti-runway mission field, favoring the highest number of munitions delivered per strike-aircraft pass.

For a more complete discussion of the Durandal and BAP 100 munitions, see our "Durandal/BLU-107/B" and "Systeme d'Arme Antipiste BAP 100" reports in Tab F.

In 1991, Matra Defense and Thomson-Brandt Arme-ments created the Vélifer SA consortium to continue the development, marketing, and production of anti-runway/anti-airfield munitions.

Vélifer initiated the development of three submunitions specifically for the APACHE dispensing system:

- The Altair
- The Samanta
- The Kill Runway Improved Submunition (KRISS)

Vélifer launched the KRISS program first, as the APACHE-AP (anti-runway) application was to be the first in service.

Shortly thereafter, Giat Industries absorbed Matra Defense (and Vélifer SA) into the Giat Weapons and Ammunition Systems Division. In 1995, the Thomson-Brandt armaments component of Thomson-CSF became a component of Thomson-DASA Armements (TDA).

As Vélifer developed the KRISS specifically for the APACHE missile, a brief review of the APACHE program is in order (for a detailed discussion of the APACHE program, see the *Missile* Forecast).

**APACHE.** In January 1983, Engins Matra began development of the Arme Propulsee à Charge Ejectable (APACHE), a missile that is essentially the same as the powered version of the old modular Container Weapon System program. Vélifer enlisted the aid of Aerospatiale in the development program. In 1989, the effective termination of the primary competition to the APACHE, the multinational Modular Stand-Off Weapon program, gave a significant boost to the APACHE program.

The basic design of the APACHE is that of a cruise or winged missile. The roughly cylindrical fuselage mounts fold-back wings in the mid-section; a solid rocket motor and aerodynamic control surfaces mount at the rear. The modular dispensing system contains 44 tubes, each 18.4 centimeters (7.24 in) in diameter,

which eject the submunitions laterally. Each APACHE is capable of dispensing 20 Altair, 10 KRISS, or 6 Samanta submunitions.

Initial deliveries of the APACHE reportedly occurred in 1997; production deliveries to the French Air Force began in 2001. The KRISS was the first submunition ready for integration into the APACHE-AP. However, by 2002, the APACHE fell out of production, effectively replaced by later modular dispensing systems such as the SCALP-EG and Storm Shadow.

While the SCALP-EG and Storm Shadow are also compatible with the KRISS, we have no evidence that either platform has integrated the KRISS.

**Description.** Many of the details related to the submunition remain sensitive. The KRISS submunition is of cylindrical configuration with cruciform fins to the rear. A nose cone serves to streamline the specially shaped warhead, which is notched in order to enhance runway perforation. After the submunition exits the dispenser, the four fins deploy, followed by a braking parachute, which stabilizes and properly orients the submunition before the boost rocket automatically fires. Following penetration of the runway, the warhead detonates.

## Funding

The contractor funded the development of the Kill Runway Improved Submunition program as a private venture.

## Recent Contracts

Not available, as the French government and the contractors have not released contractual information relating to the KRISS.

## Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
January	1983	Engins Matra announces development of APACHE program
Early	1991	Vélifer SA consortium forms to develop anti-runway munitions
June	1991	Vélifer SA announced KRISS program
	1997	Initial production of KRISS for APACHE-AP
	2001	Initial deliveries of APACHE-AP with KRISS to French Air Force
	2002	APACHE-AP falls out of production
	2005	KRISS production apparently dormant; no indications of integration with other platforms

## Worldwide Distribution

**Export Potential.** As sales of the Kill Runway Improved Submunition are largely dependent on APACHE-AP sales, the fact that the APACHE-AP is out of production effectively halts the KRISS program. If the contractors integrate the KRISS with other platforms, such as the SCALP-EG and the Storm Shadow, future sales are possible to **Italy, Kuwait, Pakistan, Republic of China (Taiwan), Saudi Arabia, Spain, United Arab Emirates (UAE), and United Kingdom.**

**Countries.** France, Germany, Qatar

## Forecast Rationale

It is likely the production line for the Kill Runway Improved Submunition (KRIS) is now dormant. By 2002, the APACHE-AP dispensing system fell out of production, replaced by the SCALP-EG and the Storm Shadow. Since the APACHE-AP was the only confirmed application for the KRIS to date, KRIS production remains directly tied to that dispenser. While the follow-on SCALP-EG and the Storm Shadow could integrate the KRIS, we have no open-source evidence that any such integration has actually occurred.

The APACHE missile dispensing platform with the KRIS reflected France's continuing effort to keep itself at the forefront of anti-airfield technology in general and anti-runway technology in particular. As the APACHE was a true stand-off missile, it was free of the problem of strike aircraft having to overfly the air

defenses of an airfield. The SCALP-EG and Storm Shadow, as follow-on systems to the APACHE, offer enhanced capabilities over the APACHE-AP.

Our ten-year production outlook reflects the probability that the KRIS production line fell dormant with the end of APACHE-AP production. We currently have no indications that the KRIS remains in production. Further, as we have no evidence that the contractors have integrated the KRIS with the SCALP-EG or the Storm Shadow, we do not forecast KRIS production for those follow-on submunition dispensing systems at this time.

If we do not find any evidence of new KRIS production by this time next year, we will drop and archive this report.

## Ten-Year Outlook

### ESTIMATED CALENDAR YEAR PRODUCTION

Munition	thru 04	High Confidence Level			Good Confidence Level			Speculative			Total 05-14	
		05	06	07	08	09	10	11	12	13		14
GIAT INDUSTRIES/MATRA DEFENSE												
KILL RUNWAY IMPROVED SUBM	4157	0	0	0	0	0	0	0	0	0	0	0
Total Production	4157	0	0	0	0	0	0	0	0	0	0	0



Release of APACHE

Source: MBDA