

# ARCHIVED REPORT

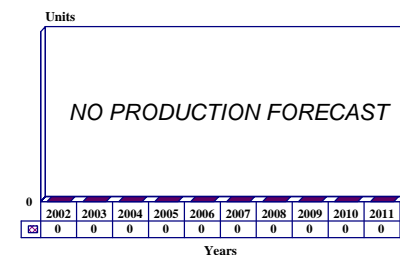
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## Tactical Anti-Satellite Program – Archived 4/2003

### Outlook

- Main efforts completed
- Program in limbo for all practical purposes
- Continued development on kill mechanism technology through other programs
- GAO said program in a state of disarray
- This report will be archived in the near future

10 Year Unit Production Forecast  
2002 - 2011



### Orientation

**Description.** The Tactical Anti-Satellite Program (also known as Kinetic Energy Anti-Satellite or KE ASAT) is a US effort to develop kinetic energy weapons (hit-to-kill) to destroy satellites in orbit.

#### Sponsor

US Army  
Space and Missile Defense Command  
PO Box 1500  
Huntsville, Alabama (AL) 35807-3801  
USA  
Tel: +1 256 955 2158  
Web site: <http://www.smhc.army.mil>

#### Contractors

The Boeing Company  
BMC# & Strategic Systems  
3370 Miraloma Venue  
PO Box 3105  
Anaheim, California (CA) 92803-3105  
USA  
Tel: +1 714 762 5195  
Web site: <http://boeing.com/defense-space.ic/keasat>  
(KE ASAT Development)

#### Rockwell International Corp

Aerospace  
2201 Seal Beach Blvd.  
Seal Beach, California (CA) 90740  
USA  
Tel: +1 562 797 3311  
Web site: <http://www.rockwell.com>  
(Development)

**Status.** Developmental program which apparently has been halted after successful ground testing but before actual flight testing.

**Total Produced.** Two prototype kill vehicles produced for testing.

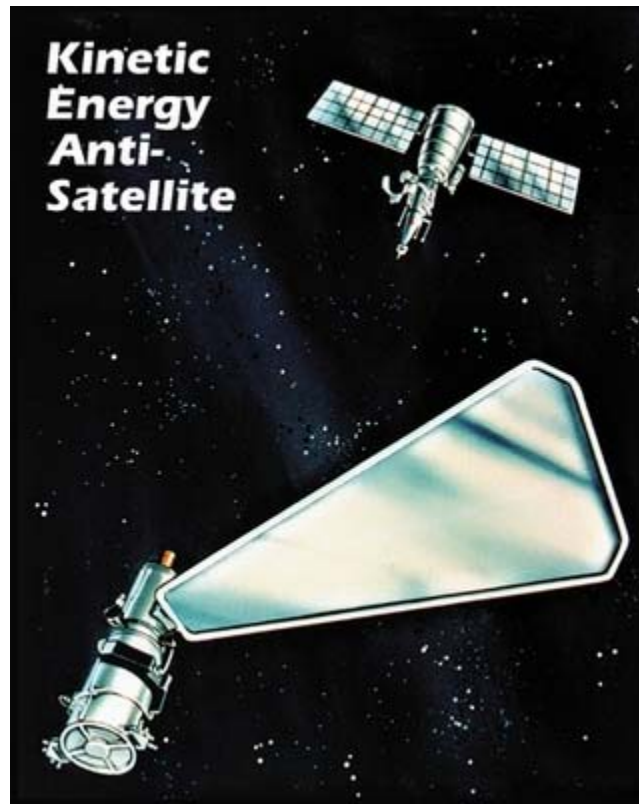
**Application.** Destroy orbiting satellites for tactical military purposes.

**Price Range.** Indeterminate at this time.

## Technical Data

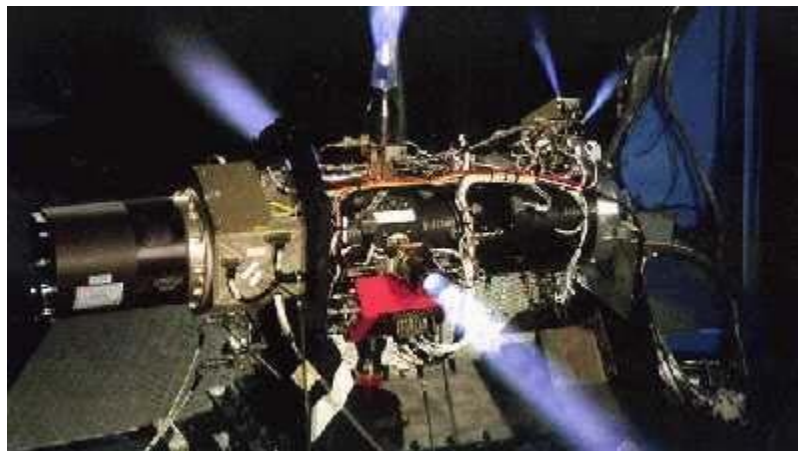
**Design Features.** The kinetic energy anti-satellite (KE ASAT) weapon is intended to provide the US with the capability to destroy hostile satellites so that an enemy cannot derive any important information from space-based satellite surveillance, targeting, or communications. The weapon consists of a kill vehicle

(missile/ rocket) with guidance sensors and explosives, although the weapon's main deterrent is its ability to slam into the satellite at such a high speed that the impact destroys the satellite, or at the very least renders it useless.



Kinetic Energy Anti-Satellite (KE ASAT) weapon as part of the overall US Army-led Tactical Anti-Satellite Program

Source: US Army



This picture shows the kill vehicle and weapon control subsystem

Source: US Army

## Variants/Upgrades

None known. Currently a technology development program.

## Program Review

**Background.** The US Department of Defense (DoD) initiated the Tactical Anti-Satellite Program in 1989 with the objective of developing a ground-launched kinetic energy anti-satellite weapon system (KE ASAT) that would leverage off technologies developed by the US Army Space and Strategic Defense Command (now known as Space and Missile Defense Command) in support of the Strategic Defense Initiative Organization (since the end of the Cold War and a slight shift in mission emphasis, more widely known as the Ballistic Missile Defense Organization).

Following a Milestone I Defense Acquisition Board Review in December 1989, the Army was given responsibility for developing the system’s weapon elements (booster, kill vehicle, launch and ground support systems, and the mission and battery control centers). The US Air Force was given responsibility for developing the command and control elements that would allow the Commander-in-Chief, US Space Command (USCINCSpace) to plan and control ASAT engagements.

With the end of the Cold War, the perceived need for an anti-satellite weapon system, as well as support for continued funding, diminished rapidly, and the program was restructured several times. The US National Defense Authorization Act for FY94 directed that the program be converted to a tactical anti-satellite (ASAT) technology program as opposed to an acquisition program with a low funding level. Under the current program, the KE ASAT was test fired in September 1994, successfully meeting all requirements. The successful 94-pound kill vehicle was viewed as the critical component of the KE ASAT.

Much of the main development was completed by the end of year 2000, including the KE hover test at the

National Hover Test Facility at Edwards Air Force Base; Weapon Control Subsystem (WCS) Demonstrator software upgrade and test; the addition of the Graphical Display System to the WCS; and the kill vehicle (KV) Divert and Attitude Control System (DACs) design upgrade and components fabrication. In addition, KV flight software was developed and initiated testing on a software testbed; KV Digital Flyout Simulation was completed; and seeker processors were upgraded.

Efforts then focused on kill mechanism technology development, digital simulations, integration of the technology with future space control activities, and program management.

Last known funding for this program appears to have been in FY00, and then only through a congressional add-on. Although the KE ASAT concept is still technically alive, at present the program is dead for all practical purposes. Whatever research and funding was destined to go into this program in the future has more than likely been reassigned to the Space-Based Laser (SBL) program and similar efforts.

In a report released in December 2000, the US General Accounting Office (GAO) said that the ASAT program was in a state of disarray. It questioned whether or not funding had been inappropriately allocated to support efforts not directly related to the program, and found fault with other spending practices. It appears that upon release of this GAO report, Congress stopped funding the program. Although ground-based concept tests seem to have been successful, the ASAT program went no further than that. It is unlikely that the ASAT effort will ever see a flight test unless it can make major corrections to all the slamming done by the GAO report.

## Funding

	<b>US FUNDING</b>							
	FY00		FY01		FY02		FY03	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
<b>RDT&amp;E (US DoD)</b>								
PE#0603892D8Z <sup>(a)</sup>	-	7.1	-	0	-	0	-	0

All \$ are in millions.

Source: US Department of Defense FY2002 DoD RDT&E Budget Item Justification R-2

<sup>(a)</sup>The original program element, PE#0603392A, was established in 1989. By FY1996 congressional action, this PE was transferred to OSD under PE#0603392D. Then later, in 1996, the PE was changed to PE#0603892D8Z for more appropriate execution (Budget Activity 4). This was a continuation of the same Anti-Satellite program.

## Recent Contracts

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No recent contracts have been identified. The prime contract was awarded on a competitive basis in 1990 to Rockwell International. FY96 and FY97 funds were obligated on the existing contract. A technical analysis contract was awarded on a competitive basis. Other major activities will be performed in-house.

<u>Contractors</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Rockwell	7.5	Aug 1990 – Cost plus fixed fee for near-term Kinetic Energy anti-satellite (KE ASAT) program. (DASG60-90-0121)
Boeing	0.209	Sep 1999 – Contract for additional KE ASAT development work. (DASG60-97-C-0039, P00007)

## Timetable

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1989	ASAT program initiated
Dec	1989	US Army given weapons development. US Air Force given command and control elements responsibility
	1990	Prime contract awarded to Rockwell International
Sep	1994	Successful test fire of kill vehicle
Dec	2000	Kill mechanism technology development; integration with future space activities
Dec	2000	GAO report issued slamming program for being in a state of disarray
Dec	2004	Possible first flight test

## Worldwide Distribution

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This is a **US Department of Defense (DoD)/US Army**-led program.

## Forecast Rationale

A number of nations, especially the US, have become overly dependent on the use of satellites as a means of information collection and distribution. While using satellites for intelligence, surveillance, warning, navigation, and communications certainly enhances one's military position (knowledge is power), overreliance can also leave one very vulnerable. (Don't put all your eggs in one basket.) An exercise held at the US War College a few years ago exemplified this

vulnerability. In the simulation, each side immediately knocked out the other's satellites, which virtually shut down the game for the rest of the scenario, as there was no way to communicate with troops. It was a shocking experience, as the planners never anticipated the impact satellites would have on the battlefield.

In December 2000, the US General Accounting Office (GAO) released a report critical of the Tactical Anti-Satellite Program. Upon release of the GAO report,

Congress stopped funding the program. Although ground-based concept tests seem to have been successful, the Tactical Anti-Satellite Program went no further. It is unlikely that the program will ever see a flight test unless a major effort is made to address the GAO's criticisms.

Last known funding for this program was in FY00, and only then through a congressional add-on. Although the Tactical Anti-Satellite Program concept is still technically alive, research and funding originally destined to go into this program have more than likely been reassigned to such programs as the Space-Based Laser (SBL).

That said, things are starting to look a bit more positive for the program, which was given a booster shot in April 2002 with the installation of its former program manager and a series of hires for software and hardware engineers. The Bush administration appears to be a little more enthusiastic about the program, and officials

are hoping to hold the satellite interceptor's first flight test around December 2004.

The need to keep one's enemy from getting and using information is the heart of the Tactical Anti-Satellite Program, for it is designed to destroy the messenger (the satellite) of such crucial data. However, keep in mind that it is technically a technology development program, meaning that no actual anti-satellite weapons have knowingly gone into production; this effort simply proves that the concept and technology could work should such a weapon be built. While no further funding is being officially allocated for the Tactical Anti-Satellite Program, R&D likely will be continued, but more on a component basis that is probably buried somewhere as part of another program. Should the need arise, the US will quickly put all the pieces together and officially restart the program. It is best to think of the Tactical Anti-Satellite Program as hibernating for the time being, not dead.

## Ten-Year Outlook

Main program efforts completed. Minor technology development continuing under other programs. No further funding allocated by Congress following GAO report on poor program management. Barring any sudden surge of activity, this report will be archived in the near future.

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10 Year Unit Production Forecast  
2002 - 2011

