

Space Weapons Spending in the FY 2009 Defense Budget

March 2008

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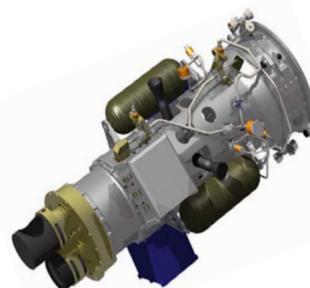
In the absence of a clear national consensus on military missions in space, the administration of U.S. President George W. Bush is continuing to fund research that could result in the development and/or deployment of anti-satellite and space-based weapons.

Major concerns in the Fiscal Year 2009 (FY 09) Budget Request are:

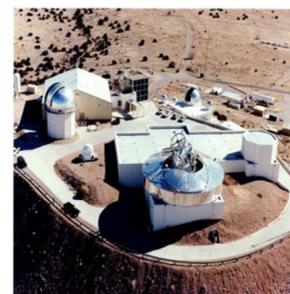
- **Space Test Bed:** MDA in FY 07 had planned to ask for \$45 million in FY 08 to begin work on the test bed, the FY 08 request asked for only \$10 million – a request Congress denied. MDA is again asking for funds in FY 09 of \$10 million and \$268.3 million through FY 13. If approved, this would represent the first dedicated space-based weapons program since 1993.
- **Near Field Infrared Experiment (NFIRE):** The current incarnation of this maneuvering satellite was stripped of its kill-vehicle. Nonetheless, experiments planned for FY 08 will include target fly-bys at ranges less than 10 kilometers, raising concerns about the experiment's applicability to hit-to-kill operations in space. MDA is requesting \$9 million for NFIRE for FY 09, the last planned request. The second and final flight test is scheduled for the second quarter of FY 08.
- **Experimental Spacecraft System (XSS):** Based on the old BMDO "Clementine 2" program, the first two microsatellites were launched in 2003 and 2005 to conduct "proximity operations" in Low Earth Orbit (LEO). USAF budget documents show that the XSS program is related to PE 0603605F Advanced Weapons Technology, which is dedicated to research on laser and microwave weapons. Also, the related Spacecraft Payloads project includes research for both space situational awareness and offensive/defensive counterspace missions. Thus, the XSS program could evolve into a space-based kinetic energy and/or a directed energy ASAT program. The FY 09 budget calls for a follow-on satellite.
- **Autonomous Nanosatellite Guardian for Evaluating Local Space (ANGELS):** As announced in 2005, ANGELS is designed to provide "localized" space situational awareness and "anomaly characterization" for host satellites. The USAF budget line believed to represent ANGELS develops "an active and/or passive threat warning sensor for detection of a direct ascent or co-orbital vehicle." The FY 09 request schedules selection of "two technology options that provide defensive capability" for "incorporation" in Geosynchronous (GEO) and LEO satellites. The capabilities being developed could also have offensive applications.
- **Starfire Optical Range:** Experiments at USAF's Starfire Optical Range are funded under PE 0603605F Advanced Weapons Technology, which specifically funds developments of solid-state lasers with "weapons-class power" for applications including a ground-based laser. Starfire experiments include "compensated beam propagation" to satellites, which raises concerns that applications may go beyond stated space surveillance activities. Indeed, the FY 07 request cited ASAT operations as one goal.



NFIRE



XSS-11



Starfire Optical Range

Selected Space Programs in the President's FY 09 Defense Budget Request

<i>PE</i> ¹	<i>RI</i>	<i>Program</i>	<i>Service</i>	<i>2007</i> ²	<i>2008</i>	<i>2009</i>	<i>+/-</i>	<i>Note</i>
06030401F	26	Advanced Spacecraft Technology	USAF	105.4	78.7	80.9	+2.2	This PE "develops, integrates and demonstrates ... spacecraft payloads, spacecraft protection, spacecraft and launch vehicles," among other technologies. The Integrated Space Technology Demonstration sub-element, which is believed to fund XSS, develops microsatellites (10-100kg) for "space situational awareness and/or tactical satellite concepts." While the FY 09 request does not specifically mention using the microsats for "autonomous proximity operations," the FY 07 request did. Congressional adds in the FY 08 budget will raise actual 08 spending to an estimated \$100.6 million.
		Experimental Satellites Series (XSS) ³		35.1	28.9	29.3	+0.4	
0602601F	11	Space Technology	USAF	101.3	109.6	117.5	+7.9	This PE is believed to include ANGELS. Efforts under this project include 1. "develop key satellite threat warning technologies and tools for high value satellite asset defense," and 2. "develop high value space asset defensive capabilities." Congressional adds in the FY 08 budget will raise actual 08 spending to an estimated \$128.4 million.
		Spacecraft Protection Technology		1.8	2.5	6.3	+3.8	
0603438F	45	Space Control Technology	USAF	23.6	37.6	76.8	+39.2	This incubation project supports a range of space control activities from technology development and prototyping to simulations and exercises. USAF notes: "Consistent with DOD policy, the negation efforts of this program <i>currently</i> (emphasis added) focus on negation technologies which have temporary, localized and reversible means." Congressional adds in the FY 08 budget will raise actual 08 spending to an estimated \$66.2 million, and include a new diagnostics project called Self Awareness Space Situation Awareness. However, while the FY 08 request showed \$2.5 million in 07, \$2.4 million in 08 and \$2.4 million in 09 for Offensive Counterspace, the FY 09 request shows zero across all three years. The budget documentation provides no explanation.
		Space Range		5.7	12.1	21.6	+9.5	
		Defensive Counterspace		7.3	9.2	11.8	+2.6	
		Offensive Counterspace		0	2.4	0	-2.4	
0604857F	61	Operationally Responsive Space	USAF	42.1	87.0	110.0	+23.0	This program encompasses research and development on quick-reaction launch vehicles and satellites. Congressional adds in the FY 08 budget will raise actual 08 spending to \$96.5 million, and includes \$6.1 million for an unspecified "classified" effort and \$4 million for a new Low Earth Orbit Nanosatellite Integrated Defense System.
0604421F	76	Counterspace Systems	USAF	44.6	53.4	75.0	+21.6	This is the principal account for funding offensive and defensive counterspace systems and command and control. Efforts currently focus on two systems: 1) a ground-based mobile jammer (CCS) and 2) a method for detecting attacks on satellites (RAIDRS). The third budget line, Counterspace C2, in the FY 08 budget was called Offensive Counterspace C2. Congressional adds in the FY 08 budget will raise actual 08 spending to \$63.8 million.
		Counter Satellite Communications System		8.3	18.0	29.8	+11.8	
		Rapid Identification Detection and Reporting System		24.3	28.1	37.6	+9.5	
		Offensive Counterspace Command and Control		12.0	7.3	7.5	+0.2	
0305173F	197	Space & Missile Test & Evaluation Center	USAF	2.5	3.1	2.0	-1.1	This program began in FY 07. The main objective is to "transition R&D space vehicle technology with residual military utility to operational status for immediate real world support and to perform initial operational utility assessment for future acquisition programs." While the FY 07 request noted that the program would provide "rapid support of counterspace systems missions," the FY 09 budget does not.
0603895C	85	BMD System Space Program	MDA	0	0 ⁴	29.8	+2.1	For FY 09, NFIRE is also being portrayed as a way to "[c]ontinue to support, as requested by AFSPC and other agencies, Space Situational Awareness." According to MDA: "Near term funding for the space testbed program will be used to refine concepts and prepare to conduct focused experiments demonstrating the viability of the concepts."
		Near-Field Infrared Experiment ⁵			36.0	9.0	-27.0	
		Space Test Bed ⁶		0	10.0	10.0	0.0	
603894C	84	Multiple Kill Vehicles	MDA	133.6	229.9	354.5	+124.6	The MKV has been mentioned in the past as the preferred interceptor for a space-based missile defense.
0603175C	30	Ballistic Missile Defense (BMD) Technology	MDA	147.3	193.3	118.6	-74.7	"At the conclusion of FY 07, this task will have demonstrated the ability of domestic industry to design and develop components needed to support future space sensing and target capabilities using micro satellites." The program was cancelled in FY 08.
		Micro Satellite Experiments		-	-	cancelled		

¹ PE stands for Program Element number, which represents a discrete budget line item and pot of funding.

² 2007 figures reflect actual appropriations; 2008 and 2009 figures reflect the budget request. All figures are rounded.

³ Experimental Satellite Series is funded as "3834 Integrated Space Technology Demonstrations" with some elements, such as command and control software, contained within "2181 Spacecraft Payloads." The Spacecraft Payloads budget line explains that command and control, guidance and navigation capabilities being researched are to be applied both to space situational awareness and offensive/defensive counterspace missions.

⁴ This figure is zero because NFIRE was not funded through this program element in FY 07.

⁵ NFIRE was shuffled around various MDA programs during its first few years of existence. As MDA explains in the most recent budget justification documents, "In FY07, NFIRE was funded in the STSS PE (0603693C) and Advanced Technology PE (0603175C); in FY06 in PE 0603175C; and in FY05 in PE 0603884C. Beginning in FY08, the content for NFIRE, as a continuation of the efforts reported in Projects 0516 and 0812, is captured in Project WX16 in accordance with the MDA revised Block Structure."

⁶ The Space Test Bed and NFIRE, among others, will be managed by the Missile Defense Space Experiment Center (MDSEC).

Directed Energy Research

The defense budget contains a number of high energy laser research and development programs that are necessary precursors to space-based directed energy weapons.

Selected Directed Energy Programs in the FY 08 Budget Request

	<i>R1</i>	<i>Program</i>	<i>Service</i>	<i>2009</i>	<i>+/-</i>
0601108F	3	High Energy Laser Research Initiatives	USAF	13.4	+0.8
0602605F	13	Directed Energy Technology	USAF	62.9	+8.0
0602890F	16	High Energy Laser Research	USAF	49.4	-0.9
0603605F	30	Advanced Weapons Technology [†]	USAF	44.5	+0.5
0603924F	36	High Energy Laser Advanced Technology Program	USAF	4.0	+0.2
0605605A	133	DoD High Energy Laser Test Facility Mid-Infrared Advanced Chemical Laser	Army	2.8	0

[†] In the FY 07 budget, this program called for performing “experiments for application including antisatellite weapons.” These explicit references to ASAT applications are not present in the FY 09 request, though many of the program’s other details appear to have been retained. The request shows FY 09 activities to include the integration of “high efficiency adaptive optics system on a large aperture high resolution telescope.” Congressional adds in the FY 08 budget will increase actual 08 spending to an estimated \$74.4 million, with \$14.9 million earmarked for space situation awareness.

What We Don’t Know

Between FY 06 and FY 07, the unclassified top line budgets of some classified programs within MDA, Defense Advanced Research Project Agency (DARPA), and the Air Force increased almost 60 percent. In the FY 08 and FY 09 budget request, these top line figures, too, were classified.

Selected Classified Program Accounts

	<i>R1</i>	<i>Program</i>	<i>Service</i>	<i>2009</i>	<i>+/-</i>
0603801F	35	Special Programs	USAF	?	?
0101815F	125	Advanced Strategic Programs	USAF	?	?
0207248F	140	Special Evaluation Program	USAF	?	?
0207591F	159	Advanced Program Evaluation	USAF	?	?
0603891C	81	Special Programs (formally ACES)	MDA	288.3	-35.0

The distribution of money within these classified budgets to space-related weaponry research is unknown. In the FY 07 request, Special Programs was budgeted at \$299.0 million.

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The opinions of the authors are their own.
All figures in millions of U.S. dollars.

