Space Weapons Spending in the FY 2008 Defense Budget

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In the absence of a clear national consensus on military missions in space, the administration of 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 2008 (FY 08) Budget Request are:

- **Space Based Interceptor Test Bed:** "The Space Test Bed will investigate the potential utility and technical feasibility of a space-based defensive layer to complement the BMDS. This proof-of-concept activity will provide options to support future deployment decisions." While 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 asks for only $10 million. If approved and the program established, 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 by MDA and replaced with a German-built laser communications terminal. 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.

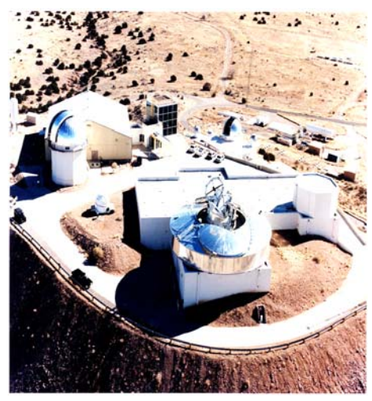
- **Experimental Spacecraft System (XSS):** Based on the old BMDO "Clementine 2" program, the first two microsatellites were launched in 2003 and 2005 to conduct "proximity operations" in Low Earth Orbit (LEO). In addition, USAF budget documents show that the XSS program is related to PE 0603605F Advanced Weapons Technology, which is dedicated to research on laser and microwave weapons. Thus, the XSS program could evolve into a space-based kinetic energy and/or a directed energy ASAT program. Although the second satellite in the series, XSS-11, was to have been de-orbited in 2006, as of February 2007 it remained on orbit. The FY 08 budget calls for a follow-on satellite demonstration in FY 09.

- **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 in Geosynchronous Orbit (GEO). The USAF budget line believed to represent ANGELS develops "high value space asset defensive capabilities," including "an active and/or passive threat warning sensor for detection of a direct ascent or co-orbital vehicle." The FY 08 request includes on-orbit testing, and schedules identification of "two technology options" for "incorporation" in GEO and LEO satellites for FY 09. The capabilities being developed could also have offensive applications.

- **Starfire Optical Range:** Experiments at USAF's Starfire Optical Range are funded under PE 0603605 Advanced Weapons Technology, which also includes development of solid-state lasers with "weapons-class power" for applications including a ground-based laser. Starfire experiments include "compensated beam propagation" to satellites, which raise concerns that applications may go beyond stated space surveillance activities. Indeed, the FY 07 request cited ASAT operations among the project's goals.

NFIRE

XSS-11



Starfire Optical Range

Selected Space Programs in the President's FY 08 Defense Budget Request

PE[1]	*R1*	*Program*	*Service*	*2006*	***2007***	***2008***	*+/-*	*Note*
06030401F	26	Advanced Spacecraft Technology	USAF	86.3	101.1	**78.7**	-22.4	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 08 request does not specifically mention using the microsats for "autonomous proximity operations," the FY 07 request does.
		Experimental Satellites Series (XSS)[2]		27.2	27.5	**28.9**	+1.4	
0602601F	11	Space Technology	USAF	103.6	103.5	**109.6**	+6.1	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."
		Spacecraft Protection Technology		2.1	1.9	**2.5**	+0.6	
0603438F	45	Space Control Technology	USAF	14.6	30.1	**37.6**	+7.5	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 *currently* (emphasis added) focus on negation technologies which have temporary, localized and reversible means."
		Space Range		4.5	5.8	**12.1**	+6.3	
		Defensive Counterspace		2.9	4.5	**9.2**	+4.7	
		Offensive Counterspace		1.9	2.6	**2.4**	-0.2	
0604857F	61	Operationally Responsive Space	USAF	-	35.4	**87.0**	+51.6	This program encompasses research and development on quick-reaction launch vehicles and satellites. This together with the Common Aero Vehicle (see below) constitutes the USAF contribution to DARPA's Falcon program.
0604856F	60	Common Aero Vehicle (CAV)/Hypersonic Technology Vehicle	USAF	26.5	33.2	**32.8**	-0.4	CAV is being designed as a hypersonic glide vehicle that will dispense conventional weapons, sensors and payloads worldwide from and through space within one hour of tasking. In 2004, Congress barred any work to "weaponize" the CAV, and as a result, the program was restructured and has been renamed Hypersonic Technology Vehicle.
0603287E	33	Falcon/Hypersonic Cruise Vehicle	DARPA	38.6	51.5	**50.0**	-1.5	
0604421F	76	Counterspace Systems	USAF	28.2	50.3	**53.4**	+3.1	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).
		Counter Satellite Communications System		6.0	16.0	**18.0**	+2.0	
		Rapid Identification Detection and Reporting System		17.5	22.1	**28.1**	+6.0	
		Offensive Counterspace Command and Control		4.7	12.3	**7.3**	-5.0	
0305173F	197	Space & Missile Test & Evaluation Center	USAF	-	4.7	**3.1**	-1.6	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 08 budget does not.
0603895C	85	BMD System Space Program	MDA	0	0[3]	**27.7**	+27.7	FY 2007 funding for NFIRE was "deemed insufficient for the current schedule"; the second mission has been delayed. According to MDA: "Near term funding for the space test bed program will be used to refine concepts and prepare to conduct focused experiments demonstrating the viability of the concepts."
		Near-Field Infrared Experiment[4]			36.0	**36.0**	0	
		Space Test Bed[5]		-	-	**10.0**	+10.0	
603894C	84	Multiple Kill Vehicles	MDA	48.4	144.4	**271.2**	126.8	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 has been cancelled for FY 08.
		Micro Satellite Experiments		-	-	**cancelled**		
0603287E	33	Tiny, Independent, Coordinating Spacecraft (TICS)	DARPA	-	4.8	**6.0**	+1.2	Will develop technologies to permit delivery of "small, hard-to-detect nanosatellites" into "any common operational orbit" with "little or no warning." "Such systems could perform rapid response reconnaissance on any spacecraft, with times to mission orbit measured in just hours." The nanosatellites, housed on a "mothership" would further employ "advanced robotics technologies to allow satellites to reconfigure on demand."
0603287E	33	Front-end Robotics Enabling Near-term Demonstration (FREND)	DARPA	9.1	13.2	**14.4**	+1.2	Designed to "autonomously grapple space objects not outfitted with custom Interfaces" in GEO. Provides "the potential for spacecraft salvage, repair, rescue, reposition, de-orbit and retirement, and debris removal."

[1] PE stands for Program Element number, which represents a discrete budget line item and pot of funding.
[2] 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."
[3] This figure is zero because NFIRE was not funded through this program element in FY 07.
[4] NFIRE has been shifted between program elements yet again this year, and for FY 08 is scheduled to receive funding from two programs: PE 0603175C (BMD Technology) and PE 0603893C (Space Tracking and Surveillance Program), total NFIRE funding for FY 08 is $36 million.
[5] 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 directed energy counterspace weapons.

Selected Directed Energy Programs in the FY 08 Budget Request

	R1	*Program*	*Service*	*2008*	*+/-*
0601108F	3	High Energy Laser Research Initiatives	USAF	12.6	+0.2
0602605F	13	Directed Energy Technology	USAF	54.9	+4.9
0602890F	16	High Energy Laser Research	USAF	50.3	-1.8
0603605F	30	Advanced Weapons Technology†	USAF	44.0	-32.7
0603924F	36	High Energy Laser Advanced Technology Program	USAF	3.8	+0.1
0605605A	133	DoD High Energy Laser Test Facility	Army	2.8	-13.6
		Mid-Infrared Advanced Chemical Laser			

† In the FY 07 budget, this program called for performing “experiments for application including antisatellite weapons” and a demonstration in FY 07 of “fully compensated beam propagation to Low-Earth orbit satellites.” These explicit references to ASAT applications are not present in the FY 08 request, though many of the program’s other details appear to have been retained.

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 budget request, these top line figures, too, are classified.

Selected Classified Program Accounts

	R1	*Program*	*Service*	*2008*	*+/-*
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	323.3	

The distribution of money within these classified budgets to space-related weaponry research is unknown.

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All figures in millions of U.S. dollars.

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