

## FY 2009 National Security Space Appropriations

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On September 30, 2008, the President signed into law \$487.7 billion in appropriations for the Department of Defense budget in 2009, not including supplementary spending for conducting the wars in Afghanistan and Iraq. The House of Representatives passed a defense bill on May 22, 2008, followed by the Senate Armed Services Committee in April. The full Senate delayed voting because of a full calendar; the Congressional recess in August added further delay.<sup>1</sup> The Senate passed a bill in early September and a House-Senate Conference Committee ironed out differences between the two bills. Finally, former President George W. Bush signed the defense appropriations as part of an omnibus package one day before the new fiscal year.

The defense budget included notable shifts in funding for major space programs within DoD; much of the former President's initial requests were retained, though skepticism towards missile defense programs, including some space-based missile defense programs, was apparent and might portend future appropriations fights. Democrats pushed a successful proviso mandating that the Secretary of Defense issue a review of U.S. missile defense policy by January 31, 2010.<sup>2</sup>

This memo briefly identifies appropriations for the major space programs within the FY 2009 Department of Defense budget, changes between the FY 2009 Presidential budget requests and the actual appropriations, and a comparison with FY 2008 appropriations.

### Transformational Satellite Communications (TSAT) Satellite System

TSAT is designed to enhance the Advanced Extremely High Frequency (AEHF) satellite constellation's ability to provide warfighters with more secure and effective communications. TSAT will enable global "net-centric" communications by extending the Global Information Grid (GIG) into space. Congress appropriated \$768 million solely for RDT&E in FY 2009, representing a \$75 million general program funding reduction from the President's FY 2009 request of \$843 million. The FY 2009 appropriation constitutes a decrease of \$36.7 million dollars (4.5%) below FY 2008 levels.<sup>3</sup> DoD reports funding for TSAT will continue the program's development and production of the space segment and the operation management system's network development. The first satellite is planned to launch in FY 2016.<sup>4</sup> According to *Defense News*, "some defense analysts predicted TSAT could be terminated by the next president to free up dollars for domestic spending."<sup>5</sup>

### Wideband Global SATCOM (WGS)

The Wideband Global SATCOM (WGS) is designed provide a substantial bandwidth increase over the DoD's current systems. WGS was originally called the Wideband Gapfiller System when the program began in the 1990s; the Air Force changed its name to Wideband Global SATCOM in January 2007. WGS consists of six satellites providing satellite bandwidth primarily for deployed forces and warfighter commu-

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nications. The system is currently working with, but will eventually replace, the Air Force's current satellite backbone, the Defense Satellite Communications System (DSCS).<sup>6</sup> Congress fully funded the President's request of \$34.9 million for the program; this amounts to a substantial decrease of \$307 million (90%) from FY 2008.<sup>7</sup> However, procurement costs have dropped dramatically after the first WGS launch occurred in October 2007 and a second in mid-2008. FY 2009 appropriations outline plans for the launch of satellite 3, continued production of satellites 4 and 5, and commencing production of satellite 6.

### **Evolved Expendable Launch Vehicle (EELV)**

The EELV program is intended to provide government and commercial launch services with affordable, reliable access to space for medium to heavy payloads, replacing the current Delta, Atlas, and Titan launch vehicle families. DoD hopes the EELV will supply both the government and commercial purchasers with low-cost, highly reliable access to space for medium to heavy lift satellites. Congress appropriated \$1.39 billion in FY 2009, increasing the total budget \$299 million (27%) over 2008 levels and marginally increasing the President's request by \$152 million.<sup>8</sup> RDT&E will receive \$33.7 million in 2009 after not getting any funding in 2008. Congress added \$157 million for procurement above the President's request by adding \$216 to launch capability and removing \$64 million from acquiring GPS components (GPS IIF). The total appropriations will be directed towards procuring four launch vehicles and associated launch services and activities.

### **Medium Launch Vehicle (MLV)**

The Delta II MLV is an expendable launch, medium-lift vehicle used to launch NAVSTAR Global Positioning System (GPS) satellites into orbit, providing navigational data to military users. The Congressional appropriation phases out MLV funding; Congress appropriated the \$5.8 million the President requested for FY

2009, a massive decrease from the \$117 million appropriations in 2008.<sup>9</sup> The decrease cuts the MLV budget by \$111 million (95%). The funding provides minimal launch and pad support as Delta II launch vehicles are eliminated.<sup>10</sup>

### **Space Based Infrared System (SBIRS)-High**

SBIRS-High is a missile launch detection constellation and a layer of the current U.S. ballistic missile defense program. Congress acknowledged the current Defense Support Program's (DSP) satellite constellation needs replacement and endorsed SBIRS. The appropriation for FY 2009 totaled \$2.34 billion, amounting to \$15 million more than the President requested.<sup>11</sup> The additional funds will be used to further ground integration and data exploitation.<sup>12</sup> The massive \$1.3 billion appropriations increase more than doubles SBIRS's FY 2008 budget. Procurement costs will more than quadruple in FY 2009, climbing to \$1.8 billion from just \$400 million in 2008, as DoD relies more heavily on SBIRS for future capabilities. In a report accompanying the appropriation, Congress praised SBIRS for providing extraordinary data and performing beyond expectations.<sup>13</sup> DoD wants appropriations to fund the first two Geosynchronous Earth Orbit (GEO) satellites, testing of the first Highly Elliptical Orbit (HEO) payload, and ground segment development. The first launch is expected in 2010.<sup>14</sup>

### **Space Radar (SR) – CANCELLED**

The Space Radar (SR) system was a proposed satellite constellation providing all-weather surveillance capabilities to mobile, worldwide targets. Beginning in 2008, funding for SR was transferred to the Defense Reconnaissance Support Activities Program to improve transparency and integration between DoD and the Intelligence Community.<sup>15</sup> Funding amounts were classified for the 2009 budget request because of the program's integration into the secretive National Intelligence Community. In March 2008, DoD cancelled the

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SR system after revealing that no money was requested for the program in FY 2009. The Defense and Intelligence communities stated SR will be restructured immediately.<sup>16</sup>

### **NAVSTAR Global Positioning System (NAVSTAR GPS)**

GPS is integral in U.S. military and civilian uses of navigation, positioning, and timing (NPT). The current satellite constellation is being upgraded to provide dual signals for both military and civilian uses. A fully operational GPS constellation consists of 24 satellites constantly in orbit. The next generation GPS III satellites are designed to withstand jamming and interference measures. Further RDT&E must be completed on countering measures designed to blind vulnerable GPS satellites. Congress appropriated \$1.06 billion for the program in FY 2009, around \$105 million more than the President's request of \$954.6 million.<sup>17</sup> This appropriation increases NAVSTAR's funding by \$237.8 million or 29% above 2008 levels. DoD says funding will go towards satellite launch and integration, as well as the continued development of the GPS III satellite variant.<sup>18</sup> Congress showed confidence in GPS III's potential viability by moving \$307 million in RDT&E funding from the traditional constellation to these newer satellites.<sup>19</sup>

### **Advanced Extremely High Frequency (AEHF) Satellites**

The AEHF program is a constellation of communications satellites that will replenish the current EHF system (MILSTAR) with higher capacity and data rate capabilities. AEHF is designed to provide the warfighter with secure, worldwide communications. Congress appropriated \$554.6 million in FY 2009, which is a \$177 million (24%) decrease from FY 2008's appropriations. The President only requested \$404.6 million with dramatically reduced procurement costs of \$16 million.<sup>20</sup> The program's procurement costs will decrease markedly as two of the four planned AEHF satellites are

scheduled for launch this fiscal year, Congress increased procurement appropriations by \$150 million over the President's request to ensure advanced procurement of satellites 3 and 4.<sup>21</sup> DoD wants appropriations to cover launching costs for satellites 1 and 2, continued assembly of satellite 3, acquisition of parts for satellite 4, and ground control system development.<sup>22</sup>

### **National Polar-Orbiting Operational Environmental Satellite System (NPOESS)**

The NPOESS satellite system is designed to monitor global environmental conditions through a highly technical collection and dissemination process. It is joint effort with DoD, Department of Commerce, and NASA participation. Consisting of a four satellite constellation, NPOESS will provide the warfighter with the necessary weather and atmospheric conditions in a timely, high-quality fashion. Congress matched the President's FY 2009 request of \$289.5 million solely for RDT&E purposes, representing a decrease of \$43 million (13%) from 2008.<sup>23</sup> DoD says the funding provides for continued system development and design for risk mitigation involving ground and space systems. The first NPOESS launch capability is planned for the second quarter of FY 2013.<sup>24</sup>

### **Mobile User Objective System (MUOS)**

The MUOS is the next generation advanced narrow-band communications satellite constellation, replacing the existing UHF Follow-On (UFO) constellation. Its implementation will satisfy UHF narrow-band communication requirements now demanded by the warfighter. Congress approved \$860.8 million for FY 2009, constituting a \$48.2 million (6%) increase over 2008 appropriations.<sup>25</sup> The President requested slightly more than \$1 billion for MUOS, but Congress explained it was informed in June 2008 that MUOS was encountering significant problems delaying scheduled satellite launches. These delays combined with the fact that the entire program is several years behind schedule

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informed Congress's decision to strip \$163.5 million from the President's request. However, Congress said it would consider additional funding in 2009 if DoD can demonstrate it needs to procure a launch vehicle.<sup>26</sup> The final appropriation comprises a balanced mix of procurement and RDT&E funding to continue development of the entire system, particularly procurement of a launch vehicle for satellite 2 (and potentially satellite 3) and "long lead items" for satellite 4. DoD plans the first satellite launch in FY2010.<sup>27</sup>

### Operationally Responsive Space (ORS)

Operationally Responsive Space (ORS) represents an effort to make space capabilities more dynamic and responsive under stressful situations. Officially, DoD has defined ORS as "assured space power focused on timely satisfaction of Joint Force Commanders' needs."<sup>28</sup> According to DoD, the central objective of the ORS initiative is:

"To create opportunities for integration and operational efficiencies needed to ensure affordable access to the space-based capabilities that are critical to fulfilling the full range of U.S. diplomatic, information, military, and economic needs."<sup>29</sup>

The ORS program has both "anticipatory" and "reactive" elements;<sup>30</sup> on a daily basis, ORS will identify emerging needs, plan to meet those needs, develop and test new space assets, and prepare to deploy new assets. For example, ORS might improve the "responsiveness" of an existing military satellite by developing a complementary smaller and cheaper satellite to serve emerging economic needs. Congress appropriated \$197.2 million for FY 2009, which slightly more than doubles 2008 levels of \$96.5 million. An additional \$87 million in RDT&E funding was added to the President's request for \$110 million.<sup>31</sup> \$75 million of this supplementary funding will go to the Infrared Sensor Payload's (ISP) development and demonstration.<sup>32</sup>

### Space Tracking and Surveillance System (STSS)

The Missile Defense Agency (MDA) is pursuing the Space Tracking and Surveillance System (STSS) program as a space-based sensor component of the Ballistic Missile Defense System. The program uses sensors capable of detecting visible and infrared light. STSS will become part of a constellation of land-, sea-, air-, and space-based Ballistic Missile Defense System sensors.<sup>33</sup> Congress appropriated \$209.6 million in FY 2009, representing a \$21.9 million (9.4%) decrease from 2008 appropriations. The President had requested \$242.4 million for FY 2009;<sup>34</sup> however, Congress said it would be premature for MDA to move forward with additions to the STSS constellation until after a successful launch and analysis of demonstrator data. Therefore, Congress refused to appropriate any RDT&E funds for a follow-on constellation, gap filler, space sensor, or any other space demonstration program.<sup>35</sup> The appropriations will go towards upgrading the ground station and operating the STSS satellites currently in orbit.

### Space Test Bed and Space-Based Interceptor Study

The Space Test Bed, under the MDA, would investigate the potential utility and technical feasibility of a space-based layer to complement the other missile defense programs. The President's budget included a modest \$10 million request for the FY 2009, but Congress did not appropriate any money for the program. This decision mirrors Congress's refusal to fund the same \$10 million Presidential request made in 2008.<sup>36</sup> However, Congress did authorize \$5 million for a Space-Based Interceptor study.<sup>37</sup> The appropriation allows the Pentagon to hire a private contractor to review the feasibility of adding space-based missile interceptors to the U.S.'s growing arsenal of land-based interceptor capabilities.<sup>38</sup> The authorization comes after a report commissioned by former Secretary of State Rice's International Security

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Advisory Board (ISAB) was leaked in October 2008. The ISAB concluded that “the United States must explore the potential that space provides for missile defenses across the spectrum of threats.”<sup>39</sup>

### Near Field Infrared Experiment (NFIRE)

The NFIRE program’s primary objective is to collect images of boosting rockets in to effort to better understand exhaust plume mechanics using a maneuvering satellite.<sup>40</sup> This information will then be used to update current modeling simulations in an attempt to improve missile defense applications. Congress met the President’s request for \$9 million in FY 2009, a decrease from the \$11.8 million appropriated in 2008.<sup>41</sup> NFIRE has successfully conducted two tracking tests, one in April 2007 and the second in September 2008. This is the last planned request for NFIRE.<sup>42</sup> Funding will continue throughout 2009 to operate the satellite and collect and analyze information from the second test.

### DARPA Space Programs and Technology

In FY 2009, Congress appropriated \$226.7 million for RDT&E over various space programs within DARPA, an increase of \$6.5 million (3%) from FY 2008.<sup>43</sup> In its statement accompanying appropriations figures, Congress noted its concern about the lack of detail provided by DARPA in justifying many of its projects’ scope, notional schedule and overall funding needs. Also, Congress said DARPA often adjusts funding requests from year-to-year without any justification and directed the agency to provide greater detail in its future budget requests.<sup>44</sup>

Congress trimmed \$60 million from the President’s request of \$287 million by severely cutting the Blackswift Test Bed program. This program would have developed an extended duration hypersonic test bed for the study of tactics for a hypersonic airplane that includes a runway take-off, Mach 6 cruise, and a runway landing.<sup>45</sup> The President requested

Blackswift’s budget double from \$35 million to \$75 million, but Congress demurred and cut the program back to \$15 million for FY 2009. Following the decision by Congress to slash the Blackswift budget, DARPA announced it was canceling the program.<sup>46</sup>

DARPA appropriations will cover relatively large increases for a number of programs, notably the Integrated Sensor is Structure (ISIS) and System F6 budgets. The ISIS program is developing a sensor of unprecedented proportions that is fully integrated into a stratospheric airship addressing the need for persistent wide-area surveillance for hundreds of time-critical air and ground targets. Congress approved an increase to \$44 million from \$29 million in 2008.<sup>47</sup> In FY 2009, DARPA plans to use appropriations to design and simulate new radar modes; track air and ground targets; improve the sensor’s detection and response to rockets, artillery, and mortars; and enhance “track-all-the-way” fire control.<sup>48</sup> The System F6 program received a boost in FY 2009 funding to \$37.27 million, which is around \$16 million (77%) more than 2008 levels. The goal of the System F6 program is to demonstrate a heterogeneous network of formation flying or loosely connected small satellite modules that will, working together, provide at least the same effective mission capability of a large monolithic satellite.<sup>49</sup> FY 2009’s appropriations will go towards performing component and subsystem ground tests and conducting Hardware-In-the-Loop (HIL) demonstrations of successively greater, among other things.<sup>50</sup>

### National Security Space Office (NSSO)

The National Security Space Office provides strategic focus and unity of effort across the National Space Security (NSS) enterprise and reports to the Undersecretary of the Air Force/DoD Executive Agent for Space and the Director of the National Reconnaissance Office (NRO). NSSO develops long-range strategic planning and mid- to long-term space architecture; assesses defense and intelligence space programs for

conformity with policies, planning guidance, and architectural decisions; and conducts analyses to help guide the activities of NSS organizations, among other tasks.<sup>51</sup> Congress appropriated \$7.8 million for FY 2009, reducing the President's request by \$3 million. The final appropriation was down \$2.9 million (28%) from 2008 levels.<sup>52</sup> Importantly, Congress said that NSSO lost the support of the NRO; the Air Force and other DoD organizations have used the NSSO as personal staff. Finally, Congress directed the Secretary of Defense and the Director of National Intelligence to assess NSSO's role and responsibilities and report to defense committees by May 15, 2009.<sup>53</sup>

### **Maui Space Surveillance System (MSSS)**

The MSSS is a state-of-the-art electro-optical facility combining operational satellite tracking facilities with a research and development facility, the only one of its kind in the world. The MSSS houses the largest telescope in DoD, the 3.67-meter Advanced Electro Optical System (AEOS), as well as several other telescopes ranging from 0.4 to 1.6 meters.<sup>54</sup> Congress appropriated \$36.4 million in FY 2009, constituting a \$5.8 million (13.7%) decrease from 2008 levels.<sup>55</sup> The President's request of about \$5 million sought to phase out many RDT&E activities, but Congress restored \$31 million in funding. In an explanatory statement, Congress said its appropriations should fund investment in new technologies and initiatives and research funds should be allocated by Air Force officials on-site to programs offering the greatest potential returns.<sup>56</sup>

### **Nuclear Detection System (NUDET) – Space Component**

The Nuclear Detonation (NUDET) Detection System (NDS) consists of space, control, and user equipment segments. The space segment consists of NUDET detection sensors on the GPS satellites. DoD and the Department of Energy (DoE) now have a full constellation of

24 GPS satellites in 10,900-nautical-mile orbits capable of detecting and locating nuclear detonations worldwide, 24 hours a day.<sup>57</sup> Congress appropriated \$70.3 million for the space component of NUDET in FY 2009, an increase of \$15.7 million (29%) from FY 2008 appropriations and slightly more than the President's request.<sup>58</sup> Procurement funding essentially doubled from \$16.3 to \$29 million as DoD spends appropriations on acquiring GPS satellite parts.

### **Spacelift Range System (SLRS)**

The Spacelift Range System (SLRS) consists of ground based surveillance, navigation, flight operations and analysis, communications and weather assets located at Patrick AFB, Fla., and Vandenberg AFB, Calif., used to support space missions. The mission is to provide DoD, NASA and commercial customers a highly reliable, integrated system to support spacecraft launch, ballistic missile and aeronautical testing.<sup>59</sup> Congress matched the President's budget request and appropriated \$114.4 million for FY 2009. This figure decreases SLRS funding by \$34 million (23%) from 2008 appropriations and reflects a \$19 million decrease in procurement funding.<sup>60</sup> In 2008, around \$121 million went to procurement, but that number was reduced to \$102 million for 2009.

### **Space Situational Awareness Systems (SSAS)**

Space Situational Awareness Systems (SSAS) has received increased attention in recent years. SSA refers to "understanding what objects are in space and what capabilities they have; accurate SSA is required to know for certain if a satellite's operations have been intentionally affected by an adversary."<sup>61</sup> Congress appropriated \$226.7 million for SSAS programs in 2009, matching the President's request and increasing the budget by \$6.5 million (3%) over 2008.<sup>62</sup> This appropriation will provide RDT&E funds for sensor network programs. In April 2008, the Air Force announced it will spend \$824 to launch

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the Space Based Space Surveillance system (SBSS) in early 2009. SBSS is regarded as SSA's most promising satellite program, but missed its scheduled launch in 2008. SBSS will allow airmen to monitor orbiting satellites 24 hours a day; currently the Air Force's Space Command can only monitor satellite movement from the ground when the sun reflects on targeted satellites.<sup>65</sup>

## Notes

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3. United States Congress, "Consolidated Security, Disaster Assistance, and Continuing Appropriations Act of 2009, Department of Defense (DoD) Appropriations Act of 2009, Public Law 110-329, September 2008, p. 373.
4. Department of Defense (DoD), "DoD FY 2009 Budget Request Summary Justification," February 2008, p. 210.
5. Bennett, "Calm Before the Storm?"
6. Ben Iannotta, "A Bigger Pipeline," *Defense News*, January 14, 2008.
7. DoD Appropriations 2009, pp. 288, 373, 383.
8. *Ibid.*, pp. 288, 290, 374.
9. DoD Appropriations 2009, p. 288.
10. Tamar A. Mehuron and Heather Lewis, "Defense Budget at a Glance," *Air Force Magazine*, April 2008, p. 60-62.
11. DoD Appropriations 2009, pp. 288, 373.
12. *Ibid.*, p. 384.
13. *Ibid.*, p. 388.
14. DoD, "Budget Summary Request Justification," p. 209.
15. "Fiscal Year 2008/2009 Budget Estimates," Department of the Air Force, February 2007. p. 761.
16. "Space Radar Program Cancelled," *Satellite Today*, 7 March 2008, <http://www.satellite-today.com/st/topnews/22370.html>.
17. DoD Appropriations 2009, pp. 288, 373, 377, 383, 386.
18. DoD, "Budget Summary Request Justification," p. 208.
19. DoD Appropriations 2009, pp. 383, 386.
20. *Ibid.*, pp. 288, 290, 373.
21. *Ibid.*, p. 290.
22. DoD, "Budget Summary Request Justification," p. 207.
23. DoD Appropriations 2009, p. 373.
24. DoD, "Budget Summary Request Justification," p. 209.
25. DoD Appropriations 2009, p. 255.
26. *Ibid.*
27. DoD, "Budget Summary Request Justification," p. 209.
28. DoD, *Plan for Operationally Responsive Space: A Report to Congressional Defense Committees*, April 2007, p. 2.
29. *Ibid.*
30. *Ibid.*, p. 3-4.
31. DoD Appropriations 2009, p. 373.
32. *Ibid.*, p. 383.
33. Missile Defense Agency (MDA), "Space Tracking and Surveillance System (STSS)," MDA Fact Sheet, July 2008.
34. DoD Appropriations 2009, p. 392.

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35. *Ibid.*, p. 414.
36. MDA, "FISCAL YEAR 2009 BUDGET ESTIMATES," January 2008 *Ibid.* p 22.
37. DoD Appropriations 2009, p. 416.
38. Jim Wolf, "U.S. to study possible space-based defense," Reuters, October 17, 2008. <http://www.reuters.com/article/scienceNews/idUSTRE49H05Y20081018>
39. *Ibid.*
40. MDA, "NFIRE Laser Communications Terminal Delivered to MDA," *For Your Information*, 18 December 2006.
41. While NFIRE funding is not explicitly listed as a line-item in the final budget, the NFIRE program was listed in the Missile Defense Agency's Budget Request. No changes were made to the NFIRE request, implying the program was fully funded because Congress notes changes between the President's request and actual appropriations. See, Missile Defense Agency, "FISCAL YEAR 2009 BUDGET ESTIMATES," January 2008. p. 36.
42. Hitchens and Samson, "Space Weapons Spending in the FY 2009 Budget."
43. DoD Appropriations 2009, p. 400.
44. *Ibid.*, p. 411.
45. Defense Advanced Research Projects Agency (DARPA), "RESEARCH, DEVELOPMENT, TEST AND EVALUATION," Volume 1, February 2008, p. 315.
46. Beau Rizzo, Fiscal Year 2009 (FY 09) Defense Budget: Programs of Interest, Center for Defense Information, p. 5, [www.cdi.org/pdfs/FY2009ChartFinal.pdf](http://www.cdi.org/pdfs/FY2009ChartFinal.pdf).
47. Like NFIRE, ISIS was not explicitly listed in the final budget; however the President's request was not altered by Congress, implying full funding of the program. See, DARPA, "RESEARCH, DEVELOPMENT, TEST AND EVALUATION," p. 311.
48. *Ibid.*
49. *Ibid.* p. 320.
50. *Ibid.* p. 321.
51. Department of the Air Force, "FY 2009 Budget Estimates: Research, Development, Test, and Evaluation," Volume 3, February 2008, p. 1855-1858.
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53. *Ibid.*, p. 389.
54. Program description provided by Air Force Maui Optical and Supercomputing (AMOS) website. <http://www.maui.afmc.af.mil/>
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56. *Ibid.*, p. 388.
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60. DoD Appropriations 2009, pp. 296, 377.
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## National Security Space Budget by Program FY08-09

National Security Space Program	Appropriations FY08 (\$ Millions) [1]			Presidential Request FY09 (\$ Millions) [1]			Appropriations FY09 (\$ Millions) [2]					
	Procurement #	R&D \$	Total	Procurement #	R&D \$	Total	Procurement #	R&D \$	Total			
Transformational SATCOM	(-)	-	804.7	804.7	(-)	-	843.0	843.0	(-)	-	768.0	768.0
Wideband Gapfiller Satellite (WPS)	(1)	322.9	19.1	342.0	(-)	22.5	12.4	34.9	(-)	22.5	12.4	34.9
Evolved Expendable Launch Vehicle (EELV)	(4)	1091.8	-	1091.8	(4)	1205.3	33.7	1239.0	(4)	1357.3	33.7	1391.0
Medium Launch Vehicle (MLV)	(-)	116.9	-	116.9	(-)	5.8	-	5.8	(-)	5.8	-	5.8
Space Based Infrared System (SBIRS)	(-)	399.3	583.3	982.6	(-)	1798.4	529.8	2328.2	(-)	1798.4	544.8	2343.2
Space Based Radar	(-)	**	**	**	(-)	##	##	##	(-)	##	##	##
NAVSTAR GPS	(-)	219.4	601.9	821.3	(-)	135.6	819.0	954.6	(-)	135.6	923.5	1059.1
Advanced Extremely High Frequency (AEHF)	(-)	132.1	599.4	731.5	(-)	16.6	388.0	404.6	(-)	166.6	388.0	554.6
NPOESS	-	-	332.5	332.5	-	-	289.5	289.5	-	-	289.5	289.5
Mobile User Objective System (MUOS)	(-)	214.4	598.2	812.6	(1)	507.5	516.8	1024.3	(1)	344	516.8	860.8
Operationally Responsive Space†	(-)	-	96.5	96.5	(-)	-	110.0	110.0	(-)	-	197.2	197.2
Space Tracking and Surveillance System (STSS) [3]	(-)	-	231.5	231.5	(-)	-	242.4	242.4	(-)	-	209.6	209.6
Near Field Infrared Experiment (NFIRE) [3]	(-)	-	11.8	11.8	(-)	-	9.0	9.0	(-)	-	9.0	9.0
Space Test Bed [3]	-	-	-	-	-	-	10.0	10.0	-	-	-	-
DARPA Space Programs and Technology [3]	-	-	216.4	216.4	-	-	287.0	287.0	-	-	227.0	227.0
National Security Space Office (NSSO)	-	-	10.7	10.7	-	-	10.8	10.8	-	-	7.8	7.8

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## National Security Space Budget by Program FY08-09

National Security Space Program	Appropriations FY08 (\$ Millions) [1]			Presidential Request FY09 (\$ Millions) [1]			Appropriations FY09 (\$ Millions) [2]					
	Procurement #	R&D \$	Total	Procurement #	R&D \$	Total	Procurement #	R&D \$	Total			
Maui Space Surveillance System (MSSS)	-	-	42.2	42.2	-	-	4.84	4.84	-	-	36.4	36.4
NUDET Detection System	-	16.3	38.3	54.6	-	28.3	41.3	69.6	-	29.0	41.3	70.3
Spacelift Range System (SLRS)	-	121.3	27.1	148.4	-	102.0	12.4	114.4	-	102.0	12.4	114.4
Space Situation Awareness Systems (SSAS)	-	-	220.2	220.2	-	-	226.7	226.7	-	-	226.7	226.7

[1] Department of Defense, "BUDGET REQUEST SUMMARY JUSTIFICATION" *Department of Defense Budget for Fiscal Year 2009*, February 2008.

[2] United States Congress, "Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009 – Division C: Department of Defense Appropriations Act, 2009," *Public Law 110-329*, September 2008.

[3] Missile Defense Agency (MDA), "FISCAL YEAR 2009 BUDGET ESTIMATES," January 2008. p. 22, 36.

† Combined program funding for Operationally Responsive Launch, Common Aero Vehicle, and Operationally Responsive Space

[4] Defense Advanced Research Projects Agency (DARPA), "RESEARCH, DEVELOPMENT, TEST AND EVALUATION," *Volume 1 – Defense Advanced Research Projects Agency Budget Justification*, February 2008, p. 307-329.

\*\* Classified

## Cancelled