

CRS Report for Congress

U.S. Military Space Programs

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Summary

The 1958 National Aeronautics and Space Act specified that military space activities be conducted by the Department of Defense (DOD). DOD and the intelligence community manage a broad array of space activities, including launch vehicle development, communications satellites, navigation satellites (the Global Positioning System — GPS), early warning satellites to alert the United States to foreign missile launches, weather satellites, reconnaissance satellites, and developing capabilities to protect U.S. satellite systems and to deny the use of space to adversaries (called “space control” or “counterspace systems”). The 1990-1991 Persian Gulf War is dubbed by some as the first “space war” because support from space displayed great improvement over what was available during the previous major conflict, Vietnam. These systems continue to play significant roles in U.S. military operations. How to organize DOD and the intelligence community to work effectively on space programs has been an issue for many years.

Tracking the DOD space budget is extremely difficult since space is not identified as a separate line item in the DOD budget. Additionally, DOD sometimes releases only partial information (omitting funding for classified programs) or will suddenly release without explanation new figures for prior years that are quite different from what was previously reported.

The FY2007 authorization and appropriations bills contain the authority and funding for DOD space activities, but, as mentioned, do not specify figures for those activities. The House and Senate passed conference agreements on both the FY2007 national defense authorization bill, H.R. 5122, and the FY2007 defense appropriations bill, H.R. 5631. The President signed the appropriations bill into law, P.L. 109-289, (H.Rept. 109-504; S.Rept. 109-292; H.Rept. 109-676: in Congressional Record H6996-7309) on September 29, 2006, and he signed the authorization bill into law, P.L. 109-364, (H.Rept. 109-452; H.Rept. 109-702: in Congressional Record H8061-8540) on October 17, 2006. Figures for the programs included in this report are contained in those sections.

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U.S. Military Space Programs: An Overview of Appropriations and Current Issues

Background

The 1958 National Aeronautics and Space Act specified that military space activities be conducted by the Department of Defense (DOD). The Undersecretary of the Air Force is DOD's executive agent for space. The intelligence community makes significant use of space-based intelligence collection capabilities. The National Reconnaissance Office (NRO), an agency within DOD, builds and operates intelligence-collection satellites and collects and processes the resulting data, which are provided to users such as the National Geospatial-Intelligence Agency (NGA) and the National Security Agency (NSA). NRO, NGA, and NSA are all under the oversight of the new Director of National Intelligence (DNI).¹

DOD and the intelligence community manage a broad array of space activities, including launch vehicle development, communications satellites, navigation satellites (the Global Positioning System — GPS),² early warning satellites to alert the United States to foreign missile launches, weather satellites, reconnaissance satellites, and developing capabilities to protect U.S. satellite systems and to deny the use of space to adversaries (called “space control” or “counterspace systems”). The 1990-1991 Persian Gulf War is dubbed by some as the first “space war” because support from space displayed great improvement over what was available during the previous major conflict, Vietnam. These systems continue to play significant roles in U.S. military operations.

How to organize DOD and the intelligence community to work effectively on space programs has been an issue for many years. Congress established commissions to review the NRO in the FY2000 intelligence authorization act, P.L. 106-120; NGA (then called NIMA, the National Imagery and Mapping Agency) in the classified annex to the FY2000 DOD appropriations act, P.L. 106-79; and overall U.S. national security space management and organization in the FY2000 DOD authorization act, P.L. 106-65. The NRO, NGA/NIMA, and “Rumsfeld Space Commission” reports are discussed below.

¹ See CRS Report RL32515, *Intelligence Community Reorganization: Potential Effects on DOD Intelligence Agencies*, by Richard A. Best, Jr., for more on the DNI and potential effects for DOD intelligence agencies, including NRO, NGA, and NSA.

² For additional information on GPS, see “The Future of the Global Positioning System,” Defense Science Board, October 2005, online at [http://www.acq.osd.mil/dsb/reports/2005-10-GPS_Report_Final.pdf].

Although U.S. military and civilian space programs are separated organizationally, the functions performed by satellites and the vehicles that launch them are not easily divided. Both sectors use communications, navigation, weather, and remote sensing/reconnaissance satellites, which may operate at different frequencies or have different capabilities, but have similar technology. The same launch vehicles can be used to launch any type of military, civilian, or commercial satellite. DOD uses some civilian satellites and vice versa.

After the Cold War, interest in space weapons to attack satellites (antisatellite, or ASAT, weapons) or ballistic missiles declined initially, but was rekindled beginning with the 104th Congress. Using satellites to attack ballistic missiles has been controversial since President Reagan's 1983 announcement of a Strategic Defense Initiative to study the viability of building a ballistic missile defense system to protect the United States and its allies. The Clinton Administration changed the name of the Strategic Defense Initiative Organization to the Ballistic Missile Defense Organization to reflect a new focus on theater missile defense in the wake of the Persian Gulf War, rather than national missile defense. The George W. Bush Administration changed the name to the Missile Defense Agency (MDA) to reflect its interest in broad missile defense goals.³

The concept of placing weapons in space, as part of a missile defense system or otherwise, remains controversial. A May 18, 2005, *New York Times* article reported that the new national space policy being developed by the Bush Administration would "move the United States closer to fielding offensive and defensive space weapons."⁴ Then-White House Press Secretary Scott McClellan, responding to questions at a White House press briefing, stressed that the new policy, still being developed, does not represent a substantial shift in U.S. policy. The same day, Representative Kucinich introduced a bill (H.R. 2420) that would have banned weapons in space and the use of such weapons to damage or destroy objects in orbit. The House rejected (124-302) a Kucinich amendment to the Foreign Relations Authorization Act (H.R. 2601) on July 20, 2005, that was similar to his bill.

The issue of using weapons to destroy satellites has received renewed attention after the Chinese successfully destroyed a defunct weather satellite on January 11, 2007. Since the orbit of that satellite was approximately where the United States has many of its reconnaissance satellites, China's actions have caused a great deal of concern.⁵

³ See CRS Report RL31111, *Missile Defense: The Current Debate*, coordinated by Steven A. Hildreth.

⁴ Weiner, Tim, "Air Force Seeks Bush's Approval for Space Arms," *The New York Times*, May 18, 2005, p1.

⁵ Liu, Melinda and John Barry, "Sat Wars?," *Newsweek* (Online Only), January 25, 2007, [<http://www.msnbc.msn.com/id/16810197/site/newsweek/>].

DOD Space Budget

Space is not a line item in the DOD budget and DOD's annual budget justifications do not include a figure for "space activities"; therefore, DOD funding figures must be used cautiously. DOD sometimes releases only partial information or will release without explanation new figures for prior years that are quite different from what was previously reported.⁶

FY2007 Authorization and Appropriations

The FY2007 authorization and appropriations bills contain the authority and funding for DOD space activities, but, as mentioned, do not specify figures for those activities. The House and Senate passed conference agreements on both the FY2007 national defense authorization bill, H.R. 5122, and the FY2007 defense appropriations bill, H.R. 5631. The President signed the appropriations bill into law, P.L. 109-289,⁷ on September 29, 2006, and he signed the authorization bill into law, P.L. 109-364,⁸ on October 17, 2006.

Military Space Program Issues

For many years, questions have arisen about whether DOD effectively manages its space activities, and several commissions and task forces have studied the issue. Congress created a commission in the FY2000 DOD authorization bill to make recommendations on the overall management of national security space programs. Chaired by Donald Rumsfeld, the commission released its report on January 11, 2001, shortly after Mr. Rumsfeld became Secretary of Defense. The "Rumsfeld Space Commission" made sweeping recommendations for management of DOD and intelligence community space programs. According to two GAO reports, DOD intended to implement 10 of the 13 organizational recommendations,⁹ although no additional updates have been provided.

Several DOD space programs have experienced significant cost overruns and schedule delays, raising concerns about DOD's acquisition process for space systems. The Defense Science Board (DSB) and Air Force Scientific Advisory Board (AFSAB) commissioned a task force chaired by retired Lockheed Martin executive Tom Young to review DOD space program acquisition because of significant cost

⁶ Space spending by all federal government agencies, by year since FY1959, is provided in Appendix E of the annual Aeronautics and Space Report of the President, submitted to Congress by NASA. The most recent edition [<http://history.nasa.gov/presrep2004.pdf>] covers funding through FY2004.

⁷ See H. Rep.: 109-504; S. Rep. 109-292; Conf. Rep.: 109-676 (in Congressional Record H6996-7309).

⁸ See H. Rep. 109-452; Conf. Rep. 109-702 (in Congressional Record H8061-8540).

⁹ "Defense Space Activities: Status of Reorganization," GAO-02-772, June 2002, and "Defense Space Activities: Organizational Changes Initiated, but Further Management Actions Needed," GAO-03-379, April 2003.

increases in several programs; its May 2003 report was publicly released in September 2003.¹⁰ Four key findings of the report were that cost has replaced mission success as the primary driver in managing acquisition processes, creating excessive technical and schedule risk; the space acquisition system is strongly biased to produce unrealistically low cost estimates; government capabilities to lead and manage the acquisition process have seriously eroded; and there are long term concerns about the space industrial base. According to press reports, the task force produced an update in August 2004 that concluded that some of the space programs it criticized were making progress but still required close review, and that better coordination is needed between the military and intelligence agencies in setting requirements.¹¹

On April 6, 2006, the Senate Committee on Armed Forces held a hearing on space acquisitions. At that hearing, Cristina T. Chaplain, GAO's Acting Director of Acquisition and Sourcing, testified that DOD's space acquisition programs continue to face substantial cost and schedule overruns. In some cases, according to Ms. Chaplain, cost growth has come close to or exceeded 100%, causing DOD to nearly double its investment with no corresponding increase in functionality. Additionally, many programs have experienced significant schedule delays — as much as six years — postponing delivery of promised capabilities to the warfighter.¹²

SBIRS-High

DOD is developing a new satellite system to replace its Defense Support Program series of early warning satellites that alert the National Command Authority to foreign missile launches. Called SBIRS-High (Space-Based Infrared System-High),¹³ it has encountered significant schedule delays and cost growth, breaching “Nunn-McCurdy” cost-growth limits several times.¹⁴ The May 2003 report of the Defense Science Board and Air Force Scientific Advisory Board criticized early program management of SBIRS-High, and took a cautious attitude concerning

¹⁰ Report of the Defense Science Board/Air Force Scientific Advisory Board Joint Task Force on Acquisition of National Security Space Programs, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, May 2003, online at [<http://www.acq.osd.mil/dsb/reports/space.pdf>].

¹¹ See, for example, Merle, Renae, “Report Says Air Force’s Space Programs Improved,” *The Washington Post*, August 25, 2004, E02.

¹² Ms. Chaplain’s full testimony is available online at [http://armed-services.senate.gov/e_witnesslist.cfm?id=1823]. Additional written comments submitted in response to specific questions from the committee are available online at [<http://www.gao.gov/new.items/d06776r.pdf>].

¹³ An overview of this program is available online at [<http://www.globalsecurity.org/space/library/report/1998/sbirs-brochure/part07.htm>].

¹⁴ 10 U.S.C § 2433, commonly referred to as the “Nunn-McCurdy” provisions, requires the Pentagon to justify continuation of a program whose costs have grown by 25% or cancel the project.

whether the restructured program would succeed.¹⁵ An October 2003 GAO report¹⁶ concluded the program remained at “substantial risk of cost and schedule increases.”

SBIRS-High was designed as a constellation of five satellites above the equator in geostationary orbit (GEO) plus sensors on two other satellites in highly-elliptical orbits (HEO). DOD still plans to launch the sensors on the two HEO satellites, but will procure, at most, three of the GEO satellites. The funds that would have been spent for the fourth and fifth GEO satellites reportedly will be used instead to design an alternative system using state-of-the-art technologies. Launch is scheduled for 2009.

Even though test delays and technical difficulties have become commonplace within SBIRS-High, Congress has continued to acknowledge the program’s importance, and has therefore maintained high levels of funding. For FY2007, Congress accepted the President’s request of \$688.9 million, a decrease of \$27.7 million from FY2006.

Transformational Communications Satellite (TSAT)

The Transformational Communications Satellite¹⁷ program would be a follow-on to the Advanced Extremely High Frequency (AEHF) program, which, in turn, is a follow-on to the current series of Milstar satellites. AEHF itself is controversial because of cost overruns, and, in 2002, DOD decided to procure only three instead of five AEHF satellites. The first AEHF launch is scheduled for 2008. TSAT is expected to “transform” DOD communications by providing vastly greater capacity than is available today by operating at much higher (optical) frequencies. If TSAT is delayed, some observers suggest that additional AEHF satellites may be needed.

In May 2006, GAO released a report outlining the ongoing issues and problems, in the development and deployment of the TSAT system.¹⁸ Specifically, GAO stated that DOD was not meeting original cost, schedule, and performance goals established for the TSAT program. However, GAO noted that DOD is taking positive steps to lower risk in the TSAT program so it can enter the product development phase with greater chance of success.

¹⁵ Report of the Defense Science Board/Air Force Scientific Advisory Board Joint Task Force on Acquisition of National Security Space Programs, Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, May 2003, online at [<http://www.acq.osd.mil/dsb/reports/space.pdf>].

¹⁶ “Despite Restructuring, SBIRS High Program Remains at Risk of Cost and Schedule Overruns,” GAO-04-48, October 2003.

¹⁷ An overview of this program is available online at [<http://www.globalsecurity.org/space/systems/tsat.htm>].

¹⁸ Space Acquisitions: DOD Needs Additional Knowledge as it Embarks on a New Approach for Transformational Satellite Communications System, GAO, May 2006, available online at [<http://www.gao.gov/new.items/d06537.pdf>].

The FY2007 appropriation for TSAT is \$737.1 million, \$130 million below the \$867 million budget request. The conferees also directed the Secretary of the Air Force to submit a report to the congressional defense committees by February 15, 2007, explaining what actions the Air Force has taken to address the remaining concerns raised by the TSAT Program Review Group and the GAO, including —

- the need to significantly refine requirements so that program content can be matched to budget constraints, and how the Department plans to control requirements to prevent problems associated with 'requirements creep'
- the need to adequately staff the TSAT program office with experienced space acquisition professionals
- the status of refining key performance parameters so they provide specificity and validation metrics
- the implications for other programs, such as Space Radar and Future Combat System, of a less capable initial block of TSAT satellites.

Space Radar

Space Radar¹⁹ would be a system of many satellites (the exact number has not been determined) that would track mobile targets (as opposed to fixed targets) on the ground. The House Appropriations Committee has sharply criticized the program for the past several years²⁰ due to ongoing cost overruns and missed R&D milestones.

For FY2007, Congress has appropriated \$186.4 million for the Space Radar program, \$80 million less than the \$266.4 million requested by the President, but nearly twice the FY2006 budget of \$98.3 million. Congress recommended that funds be directed toward technology development, system engineering, and concept definition. In the conference report, members noted that they were aware that the Space Radar program was being restructured and suggested that it might benefit from an incremental, block approach similar to that chosen for the TSAT program. Further, the conferees noted that until more a thorough definition of the program was provided, they did not believe it prudent to move beyond technology development, systems engineering, and concept definition activities.

Congress has also directed the Secretary of Defense and the Director of National Intelligence (DNI) to submit a joint report to the congressional defense and intelligence committees by March 1, 2007, containing the following elements —

¹⁹ An overview of this program is available online at [<http://www.globalsecurity.org/space/systems/sr.htm>].

²⁰ For example, in its 2004 report on the FY2005 DOD appropriations bill (H.Rept. 108-557), the committee noted that the estimated cost for a nine-satellite constellation was \$34 billion, and the Air Force considers nine satellites to be less than half the number required. The committee expressed skepticism about the \$34 billion estimate, as well.

- a description of the respective roles and responsibilities of the intelligence community and the DOD with respect to the development of the Space Radar program, including an updated Memorandum of Agreement between the Secretary and the DNI
- the process by which the intelligence community and the DOD coordinate joint development efforts and requirements definition
- the plans for achieving a cost-share agreement between the intelligence community and the Department for the development and acquisition of a Space Radar capability
- a commitment from the Secretary and the DNI that Space Radar will be a single system responsive to the requirements of each organization.