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

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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. Figures provided to CRS show a total (classified and unclassified) DOD space budget of $19.4 billion for FY2003, $20 billion for FY2004, $19.8 billion for FY2005, and a request of $22.5 billion for FY2006. The actual FY2006 and proposed FY2007 budget figures are not yet available.

Two DOD space programs that have been particularly controversial are Space Radar (formerly Space-Based Radar — SBR) and TSAT (the transformational communications satellite program). The programs are controversial because their cost estimates are high, and Congress has been skeptical of those estimates and of DOD's ability to manage the programs successfully based on past program performance. Congress cut DOD's $226 million FY2006 request for Space Radar by $126 million and its $836 million FY2006 request for TSAT by $400 million. The FY2007 requests for those programs are $266 million for Space Radar and $867 million for TSAT. This report replaces part of CRS Issue Brief IB92011, *U.S. Space Programs: Civilian, Military, and Commercial*, originally written by Marcia S. Smith. It will be updated as events warrant.

Contents

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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.

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[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) to ban 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.

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.[5]

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[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] 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 (continued...)

According to the data provided by the DOD Office of the Comptroller in Spring 2005, DOD requested $22.5 billion for space programs for FY2006. Newer figures showing what Congress appropriated for FY2006 and the FY2007 request are not yet available.

FY2006 Authorization and Appropriations

The FY2006 authorization and appropriations bills, listed below, contain the authority and funding for DOD space activities, but, as mentioned, do not specify figures for those activities.

P.L. 109-148, H.R. 2863. FY2006 DOD appropriations bill. H.R. 2863 reported from House Appropriations Committee June 10, 2005 (H.Rept. 109-119); passed House June 20. Reported from Senate Appropriations Committee September 29 (S.Rept. 109-141); passed Senate October 7. Conference report (H.Rept. 109-359) passed House December 19. Signed into law (P.L. 109-148) December 30, 2005.

P.L. 109-163, H.R. 1815. FY2006 DOD authorization bill. H.R. 1815 reported from House Armed Services Committee May 20, 2005 (H.Rept. 109-89); passed House May 25. S. 1042 reported from Senate Armed Services Committee May 17 (S.Rept. 109-69); passed Senate November 15. Conference report (H.Rept. 109-360) passed House December 19, Senate December 21. Signed into law (P.L. 109-163) January 6, 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,[6] 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.

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[5] (...continued)
Congress by NASA. The most recent edition [http://history.nasa.gov/presrep2004.pdf] covers funding through FY2004.

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

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 increases in several programs; its May 2003 report was publicly released in September 2003.[7] 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.[8]

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.[9]

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), it has encountered significant schedule delays and cost growth, breaching "Nunn-McCurdy" cost-growth limits several times.[10] 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

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[7] 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].

[8] See, for example, Merle, Renae, "Report Says Air Force's Space Programs Improved," *The Washington Post*, August 25, 2004, E02.

[9] 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].

[10] 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.[11] An October 2003 GAO report[12] 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. DOD's Selected Acquisition Report for the quarter ending September 2005[13] showed the original cost estimate for SBIRS-High as $3.68 billion in FY1995 dollars (over $4 billion in current year dollars, i.e., adjusted for inflation), compared with a new estimate of $9.01 billion in FY1995 dollars (over $10 billion in current year dollars). The FY2007 request for SBIRS-High is $669 million.

Space Radar and TSAT

DOD's requests to initiate new programs, including a Space Radar program (previously called Space-Based Radar), and the Transformational Satellite (TSAT) communications satellite program, are controversial because of the potentially large costs involved, questions concerning whether the technologies they require are sufficiently mature, and issues regarding ways to avoid the cost growth and schedule delays experienced in other DOD space programs.

Space Radar. Space Radar 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 years. 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.

The FY2006 request for Space Radar was $226 million. Congress cut $126 million in both the FY2006 DOD authorization and appropriations acts. The Senate Armed Services Committee (SASC) and House Armed Services Committee (HASC) commented extensively on the program (pp. 200-201 of S.Rept. 109-69; pp. 214-216 of H.Rept. 109-89). Both discussed the need to integrate the Space Radar into a broader architecture of radar capabilities, including airborne radars. SASC also emphasized the need for a single space radar system to meet military and intelligence

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[11] 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].

[12] "Despite Restructuring, SBIRS High Program Remains at Risk of Cost and Schedule Overruns," GAO-04-48, October 2003.

[13] Selected Acquisition Report for Quarter ending September 2005, Office of the Secretary of Defense, online at [http://www.acq.osd.mil/ara/am/sar/2005-SEP-SST.pdf].

needs, and expressed concern about the lack of certainty about cost and other issues. HASC noted a number of concerns, including that the Air Force has not sufficiently emphasized affordability as a key objective or fully considered the requirements for a demonstration program. HASC provided specific direction as to what is needed for such a program, utilizing ground, airborne, and existing space assets.

TSAT. The TSAT 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.[14] 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.

The FY2006 request for TSAT was $836 million. Congress cut $400 million in the FY2006 DOD authorization and appropriations acts. In its report on the bill (S.Rept. 109-69), SASC expressed support for TSAT, but noted that GAO found that only one of its seven critical technologies is mature (p. 200). Thus, SASC recommended that a fourth AEHF satellite be procured (adding $100 million for that satellite) while the TSAT technologies are developed, and that some of those technologies could be incorporated into the fourth AEHF satellite if feasible. The Senate Appropriations Committee did not add funding for a fourth EHF satellite, but restricted the use of $150 million of the funds it provided for TSAT in order to fund a fourth EHF satellite if needed (S.Rept. 109-141, p. 218). HASC also supported the concept of TSAT, and commended the Air Force on its vision for revolutionary solutions (pp. 216-217). However, it cited the recent history of cost overruns and schedule growth associated with other Air Force space programs as cause for skepticism about the ability of the current acquisition system to accommodate the risks associated with revolutionary technologies. The HASC directed that the focus of the TSAT program shift to technology development rather than acquisition. It added that it did not believe additional funding for AEHF would be needed until FY2007.

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[14] 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].