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The Army in U.S. Strategic Command: Thinking Globally, Acting Jointly

by Charles Hornbostel

Space enables us to see and act more quickly, so that our responses to situations can now occur more rapidly and decisively. It also allows us to communicate securely when commanders on the ground absolutely have to talk and pass essential warfighter information. . . . The inextricable linkages between space and missile defense will continue to develop.

Lieutenant General Larry J. Dodgen
Commanding General
U.S. Army Space and Missile Defense Command[1]

Introduction

When the Soviet Union collapsed, U.S. policymakers realized the Cold War-era defense posture would soon be obsolete. With nuclear-armed long-range bombers standing down from their alert status, the Air Force's Strategic Air Command (SAC) became a part of American history. In its stead came a new unified command: United States Strategic Command (USSTRATCOM, or STRATCOM), established 1 June 1992. Headquartered in the old SAC headquarters building at Offutt Air Force Base, Nebraska, STRATCOM became the element of the U.S. armed forces dedicated to monitoring global strategic threats and providing command and control capabilities and options, including nuclear strikes, to the President of the United States and the Secretary of Defense. Moreover, in 2002 the U.S. Space Command was deactivated and its space mission assets were folded into STRATCOM, making it the chief unified command for both space operations and strategic threat management for the entire military. This was a significant shift; not only did STRATCOM acquire four previously unassigned mission areas—global strike, missile defense integration, information operations and C4ISR (command, control, computers, communications, intelligence, surveillance and reconnaissance)—but it also took on the responsibility to determine force requirements as a supported unified combatant command.[2]

What's Changed and Why

The 2002 Unified Command Plan (UCP) reorganized the existing command structure in conjunction with ongoing transformational efforts.[3] STRATCOM saw significant changes under the UCP, acquiring space assets along with the four mission areas introduced above. Since the UCP went into effect in January 2003, several more changes have occurred. Under the 2004 UCP (effective January 2005), the missions to combat weapons of mass destruction (WMD) and to provide global network operations were assigned to STRATCOM. The service branches were also directed to establish or designate component commands to support STRATCOM. The Army designated the Space and Missile Defense Command (SMDC) to be its Service Component Command (SCC) to STRATCOM, under the additional title Army Forces Strategic Command (ARSTRAT). At the same time, SMDC/ARSTRAT assumed responsibility for integrated missile defense under a Joint Functional Component Command (JFCC) for Integrated Missile Defense (IMD). These changes reflected a growing awareness of the need to restructure the relationships and lines of communication among the various strategic capabilities located in each service

branch to improve joint interoperability. By realigning each service's capabilities under specific mission areas, STRATCOM has become "more flexible and agile for the 21st century."[4]

STRATCOM Today: Organization and Missions

STRATCOM breaks its large mission requirements down into two main areas. The first is to provide the nation with global deterrence capabilities and synchronized Department of Defense (DoD) effects to combat adversary WMD worldwide, and the second is to enable decisive global kinetic and non-kinetic combat effects through the application and advocacy of integrated intelligence, surveillance and reconnaissance (ISR), space and global strike operations, information operations, integrated missile defense and robust command and control.[5] A number of JFCCs, SCCs and Joint Task Forces (JTFs) assist STRATCOM in fulfilling its missions (see figure 1):

- **JFCC-Global Strike and Integration (GSI).** Led by Commander, 8th Air Force, JFCC-GSI oversees efforts to deter attacks against all U.S. territory and overseas bases or employ appropriate force "should deterrence fail."
- **JFCC-Integrated Missile Defense (IMD).** Led by Commander, SMDC/ARSTRAT, JFCC-IMD serves as the lead command for "day-to-day operations of assigned forces" while coordinating global missile defense operations, including activities with "associated combatant commands, other STRATCOM [JFCCs], and the Missile Defense Agency."
- **JFCC-Intelligence, Surveillance and Reconnaissance (ISR).** Led by Director, Defense Intelligence Agency (DIA), JFCC-ISR coordinates "global intelligence collection to address DoD worldwide operations and national intelligence requirements" and serves as a "key enabler to achieving global situational awareness."
- **JFCC-Space.** Led by Commander, 14th Air Force, JFCC-Space coordinates, plans and conducts space operations.
- **JFCC-Network Warfare (NW).** Led by Director, National Security Agency (NSA), JFCC-NW coordinates activities related to "computer network defense and network warfare as part of the global information operations mission."
- **JTF-Global Network Operations (GNO).** Led by the Director of the Defense Information Systems Agency (DISA), JTF-GNO oversees the Global Information Grid (GIG).[6]
- **Joint Information Operations Warfare Command (JIOWC).** JIOWC is a subordinate command within STRATCOM and serves two functions: it supports the joint force commanders through planning, integrating and synchronizing information operations (IO), and it acts as the STRATCOM lead for "enhancing IO across DoD," in part by rapidly deploying IO planning teams when needed to support combatant commanders and JTFs.
- **STRATCOM Center for Combating Weapons of Mass Destruction (SCC-WMD).** Led by Director, Defense Threat Reduction Agency (DTRA), SCC-WMD focuses directly on STRATCOM's mission to "dissuade, deter and prevent the acquisition, development or use of WMD and associated technology."
- **Service Component Commands.** STRATCOM includes SCCs from all the military service branches: the Army's SMDC/ARSTRAT, Air Force Space Command (AFSPC), Marine Corps Forces, U.S. Strategic Command (MARFORSTRAT) and the Navy's Fleet Forces Command, which includes among its forces the U.S. Atlantic Fleet.
- **Task Forces.** In planning and executing its various global missions, STRATCOM uses a number of task forces centered on specific capabilities, including in-flight refueling (tanker aircraft); airborne communications (the Navy's E-6B Mercury, which serves as a command-and-control platform connecting the President of the United States to U.S. nuclear forces); the nuclear triad of submarine-launched ballistic missiles, long-range strategic bombers and land-based, intercontinental ballistic missiles; and reconnaissance aircraft, including the RC-135V/W "Rivet Joint" and the U-2S "Dragon Lady."[7]

Like theater armies within regional combatant commands, SMDC/ARSTRAT is dual-titled. Under the SMDC title, the commander carries out the Army's responsibilities under Title 10, U.S. Code, to organize,

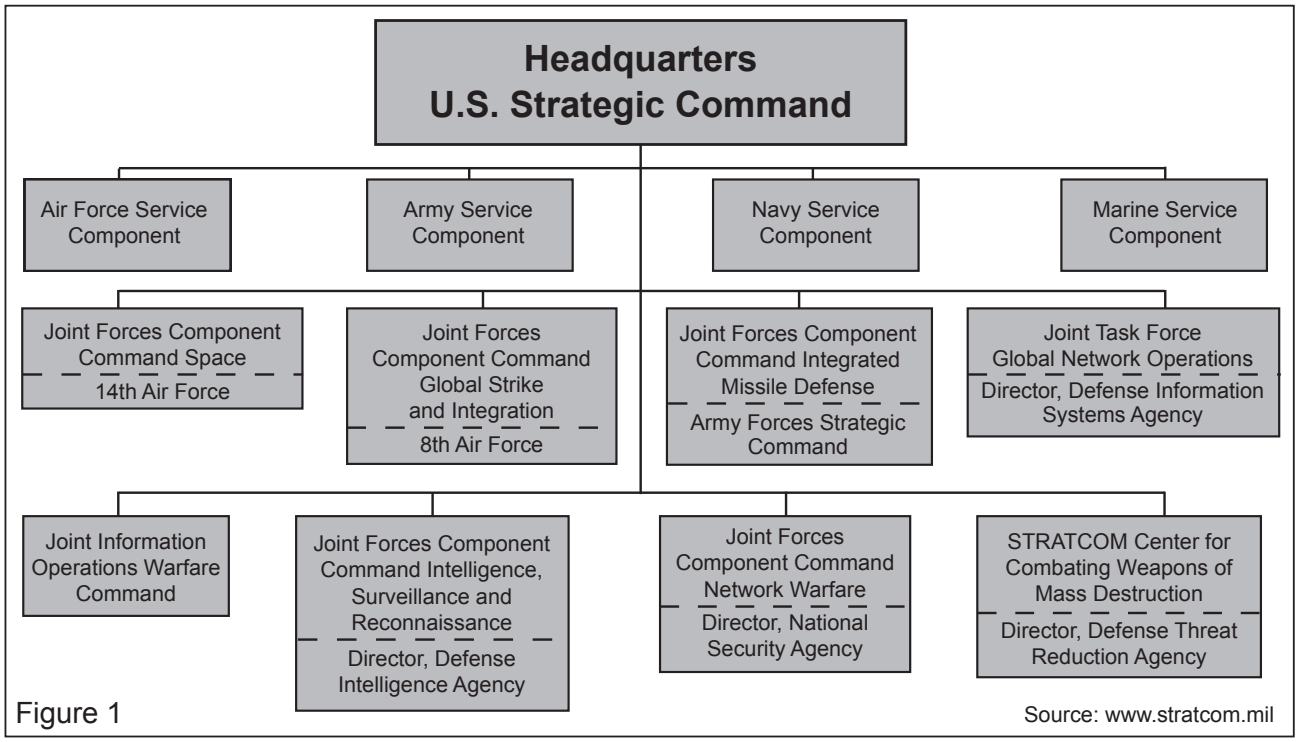

Figure 1

Source: www.stratcom.mil

train and equip Army forces, and in that capacity SMDC reports to Headquarters, Department of the Army. Under ARSTRAT, the same commander reports to STRATCOM and ensures that the Army is ready "to conduct space operations and provide planning, integration, control and coordination of Army forces and capabilities in support of STRATCOM's missions."[8] In addition to its space mission, SMDC oversees the Ground-based Midcourse Defense System and, as ARSTRAT commander, also heads the JFCC-IMD which links STRATCOM's missile defense assets to organic assets assigned to other unified combatant commands and to government agencies (e.g., the Missile Defense Agency).

Space and Missile Defense Command: Global Presence for the Army

As the Army Service Component Command to STRATCOM, SMDC provides planning, integration, coordination and control of Army space forces and capabilities to the unified command. SMDC is divided into three main branches, all reporting to the Commanding General (CG): Operations, under a brigadier general or colonel; the Space and Missile Defense Future Warfare Center (FWC), reporting directly to the CG; and Research, Development and Acquisition (RDA), under a civilian deputy (see figure 2). The Operations branch oversees the two titular missions of the command: space operations and missile defense activity, respectively falling under the 1st Space Brigade and the 100th Missile Brigade. The Army Astronaut Detachment also reports to the Deputy Commander for Operations.

As space capabilities move from being just a national, strategic tool to being used at the operational and tactical levels, SMDC is leading a significant evolution of Army space operations. The 1st Space Brigade provides critical space capabilities in support of the warfighter; specific functions include early warning of ballistic missile launches through Joint Tactical Ground Stations (JTAGS), analysis and dissemination of commercially-available satellite imagery through Commercial imagery Exploitation Teams (CETs), and deployment of Army Space Support Teams (ARSSTs, including six active and four reserve component teams). These new units are the vital link between STRATCOM and the regional combatant commands, serving as a critical enabler in full-spectrum operations with real-time communications, intelligence and global awareness not only to the Army, but also to other joint and interagency actors. Space capabilities also enhance homeland security capability—the Colorado Army National Guard Space Battalion provides critical space capabilities to the Army National Guard to support both worldwide and homeland security/homeland defense operations, including disaster relief.

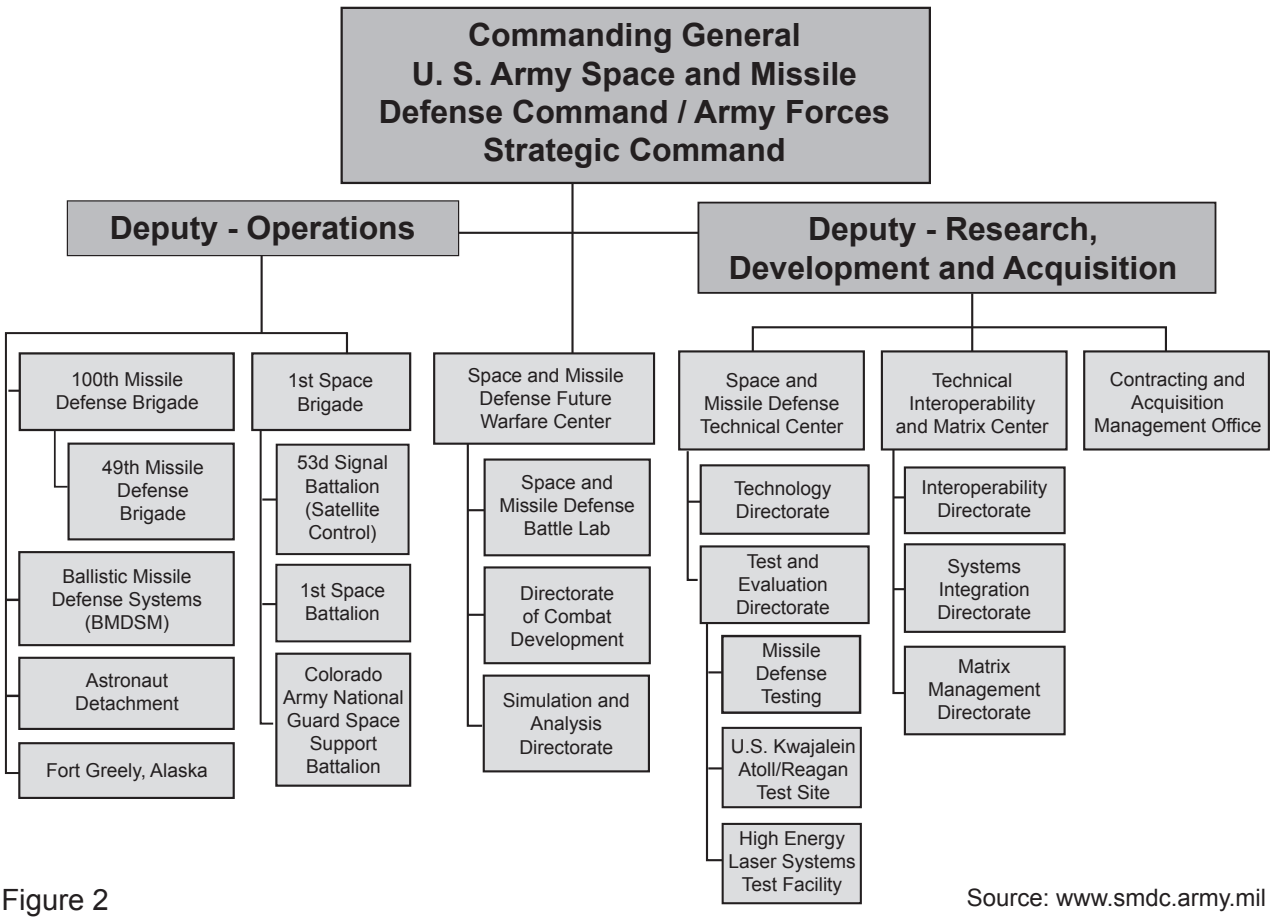

Figure 2 Source: www.smdc.army.mil

SMDC plays two critical roles in the national Ballistic Missile Defense System (BMDS). Within SMDC, the 100th Missile Defense Brigade (GMD) oversees the Ground-based Midcourse Defense system. The GMD mission refers both to the type of interceptor and the phase of the ballistic missile trajectory in which the interceptor targets the incoming ballistic missile—in this case, interceptors fired from ground stations in Alaska release "kill vehicles" to destroy a ballistic missile during the middle arc of its ballistic trajectory, outside Earth's atmosphere.[9] As ARSTRAT, the command is the lead integrator for the national BMDS within STRATCOM, and thus has overall responsibility within the joint community for the other components of the integrated missile defense system: interceptors and kill vehicles designed to target both theater and intercontinental ballistic missiles during the boost (post-launch) phase and the terminal (final descent) phase of the missile trajectory.[10] Under JFCC-IMD, SMDC/ARSTRAT coordinates its organic missile defense elements with those organic to theater armies in regional combatant commands (e.g., U.S. Army Europe in European Command [EUCOM], U.S. Army Pacific in Pacific Command [PACOM], etc.), including Patriot missile batteries, and partners with the Missile Defense Agency (MDA) in its integration of theater and global missile defense.[11]

While the Operations branch provides the Army with current capabilities in satellite technologies, battlespace situational awareness and missile defense systems to meet current threats, the FWC and RDA branches work to address and devise solutions to threats that exceed current capabilities. FWC includes the Space and Missile Defense Battle Lab, the Directorate of Combat Development, the Simulations and Analysis Directorate, the Innovative Ventures Office, the Operations Division and the Liaison Offices, all of which contribute to its key mission objectives:

- Improve "the business flow in the SMDC/ARSTRAT force development process."
- Build "operational architectures."
- Validate "science and technology."

- Optimize "linkages between concepts and analysis" and transition "technologies in STRATCOM mission areas."
- Facilitate "better technology transfer."
- Optimize "coordination with the U.S. Army Training and Doctrine Command Futures Center."[12]

RDA responsibilities within SMDC/ARSTRAT include "materiel development functions, test and evaluation activities, and simulations support."[13] The Deputy for RDA oversees the SMDC/ARSTRAT Technical Center, the U.S. Army Kwajalein Atoll/Ronald Reagan Ballistic Missile Defense Test Site in the Marshall Islands, the High Energy Laser Systems Test Facility at White Sands, New Mexico, the Contracting and Acquisition Management Office, and the Technical Interoperability and Matrix Center. Together with the FWC, the RDA directorate develops and delivers new capabilities to SMDC/ARSTRAT to ensure it can continue to provide relevant and ready landpower assets, including those that exploit space, to STRATCOM.

How SMDC/ARSTRAT Fits into STRATCOM

As previously stated, SMDC/ARSTRAT provides planning, integration, coordination and control of Army space forces and capabilities to the unified command. These activities fall into four main categories:

- planning for and providing *organic* SMDC/ARSTRAT capabilities to JFCCs (i.e., embedding unique Army capabilities within JFCCs on a permanent basis);
- supporting *organic forces on joint missions* to STRATCOM (i.e., providing essential support to Army forces assigned to other areas within STRATCOM);
- planning for and providing *other* Army capabilities to JFCCs (i.e., augmenting JFCCs with Army capabilities as needed); and
- supporting *Army forces on missions* to STRATCOM (i.e., augmenting other areas within STRATCOM with Army capabilities as needed).[14]

This is a profound change—the Army is now a full, joint partner in space operations and provides capabilities not found in other services. Examples include the Army's Commercial imagery Exploitation Teams and its Army Space Support Teams. CETs and ARSSTs deliver real-time, actionable intelligence in the form of topographic information, imagery of urban environments, joint "Blue Force" (friendly unit) situational awareness, and highly-networked tactical command and control. The Army also operates joint regional satellite communications (SATCOM) support centers, providing a "one-stop shop" for SATCOM support across a broad band of communications networks.[15]

SMDC/ARSTRAT is central to the ballistic missile defense mission within STRATCOM. STRATCOM acts as the global link within the BMDS for one central reason: land-based missiles launched against the United States will cross through several areas of responsibility (AORs), and STRATCOM serves as the connective tissue between the AOR from which a missile is launched and NORTHCOM, the AOR that includes the United States. An intricate network of relationships links SMDC/ARSTRAT, through STRATCOM, to NORTHCOM and PACOM for detecting, tracking, targeting and intercepting ballistic missiles launched from Northeast Asia.

The emerging missile defense system was put to the test in the summer of 2006, when North Korea engaged in its first ballistic missile tests since a self-imposed moratorium in 1998. According to Army Lieutenant General Joseph Inge, the deputy commander for U.S. Northern Command (NORTHCOM), key elements of the BMDS were ready before the test, including command and control, tactics, techniques and procedures (TTPs) and trained personnel. In May, U.S. satellites detected increased activity at the Taepo-Dong launch site, prompting the Secretary of Defense to place the BMDS on alert the following month. At the time, it was evident that North Korea intended to launch Taepo-Dong 1 (short-range) missiles; it had never launched a Taepo-Dong 2 (a medium-long range missile capable of reaching western parts of the United States). What was not known was whether the activity represented military testing or a space launch; according to Inge, "geopolitical conditions strongly suggested the payload was a satellite."[16]

This network was on high alert in the event North Korean missiles appeared to pose a threat to U.S. territory. In the end, North Korea successfully launched six Taepo-Dong 1s; the one launch of a Taepo-Dong 2 failed shortly after ignition. Although the BMDS did not fire any interceptors, land-, sea-, air- and space-based tracking and analysis yielded important information for modifying and enhancing the various components of the BMDS. As lead integrator, the Army is in charge of making these modifications.

Not only does SMDC/ARSTRAT serve as a key enabler for both space operations and missile defense, but it is also an important partner in all of STRATCOM's other varied missions, providing critical capabilities to the joint warfighting community in a number of ways. For example, SMDC/ARSTRAT provides measurement and signature intelligence (MASINT) and advanced geospatial intelligence (AGI) to unified combatant commands through its MASINT/AGI Node. MASINT/AGI includes airborne and space-based imagery collection, primarily from commercial/civil sources, as well as radar and spectral analysis, further increasing the situational awareness of battlespace commanders.[17]

Another program delivering vital awareness to land forces is the Overwatch Advanced Concept Technology Demonstration (ACTD), managed by SMDC/ARSTRAT's Technical Center. Overwatch ACTD is working with PACOM to demonstrate the capability to rapidly detect, classify and accurately locate weapons fire and transmit this information to land units in real-time. This additional level of awareness will enable quicker and better decisionmaking in a variety of contexts, including peacekeeping, counterterrorism, stability operations and military operations in urban terrain—in other words, environments in which force protection and protection of civilian populations require rapid judgment to avoid friendly fire and collateral damage.[18]

Recent Developments in Space and Missile Defense Capabilities

The existing Defense Satellite Communications System (DSCS, pronounced "discus") architecture has served its joint warfighting customers well, but sustained global operations with increasing C4ISR requirements have placed a significant strain on the bandwidth available through DSCS, forcing the military to augment its available bandwidth by purchasing additional bandwidth—an expensive commodity—commercially. Significant progress was made in 2006 on the Wideband Gapfiller Satellites (WGS) that will serve as a near-term, interim replacement for DSCS. The Air Force MILSATCOM (Military Satellite Communications) Systems Wing has a contract with Boeing for four to six WGS; the first launch is scheduled for mid-2007, with the second following later in the year. The final satellite of the first WGS block is scheduled for 2008, with the first WGS of the second block launching in early 2011. If MILSATCOM decides to order two additional satellites, they will launch in 2012 and 2013, respectively. When complete, the WGS constellation will be jointly operated and maintained by the U.S. Army and Air Force. As WGS takes over the DSCS mission, further programs, including the Advanced Extremely High Frequency (AEHF) satellite and the Transformation Satellite (TSAT), will provide additional bandwidth capability in the mid- to long-term to support the Modular Force and the Future Force.[19] Three AEHF satellites have already been ordered, with the first launch planned for April 2008.[20]

The capabilities provided by satellite-based communications were pivotal in 2005 when the aftermath of Hurricane Katrina demanded a robust disaster relief response. Using Joint Network Nodes (JNN) to set up a temporary telecommunications network, the Army restored radio and cellular telephone communications to areas where the civilian network had been washed away. The JNN network can connect to civilian networks and redirect communications traffic through its own net to bypass damaged or destroyed network infrastructure, and this capability allowed emergency operations centers and disaster relief workers to maintain contact throughout the relief operation. The critical enabler for this technology is satellite communications—each JNN connects to the GIG through satellite uplinks.[21]

Ballistic missile defense also saw much activity in 2006, beyond the incident with North Korea discussed previously. Testing on a number of systems moved IMD closer to full operational capacity, including demonstration of a sea-based terminal defense capability in May, successful testing of a multiple-kill vehicle in July, fleet certification of the Aegis Cruiser BMD Weapon System in September, successful integrated

ground testing in October, and full operational capability of the Combined Test Force in November.[22] IMD Development under "Block 2006," begun in 2006, will continue in 2007. SMDC/STRATCOM will receive up to ten additional ground-based interceptors added to the six already deployed at Fort Greely, Alaska, and the two located at Vandenburg Air Force Base, California, for a grand total of 18. Satellite detection will also advance with two low-Earth orbit demonstration satellites, carrying a test payload of target acquisition and tracking equipment, and two satellites carrying infrared sensors being placed in highly elliptical orbits. Improvements to the command and control systems for IMD will center on better forward sensors and better networking between sensors, allowing for quicker analysis and more decision time.[23] Much work remains before the IMD system will be certified as fully operational, but the establishment of the CTF demonstrates how far the various mission elements within IMD have progressed—the CTF will pursue "an integrated approach to testing and analysis of the entire BMDS, not just separate elements."[24]

Implications for U.S. National Security and Defense Policy

As defense transformation continues, space becomes increasingly indispensable for enhancing joint, interagency, intergovernmental and multinational interoperability. Real-time global communications are now possible via satellite, and battlespace situational awareness reduces the risk of friendly fire and civilian collateral damage while increasing the lethality of networked forces. Satellite tracking and imagery are a key component of integrated missile defense, augmenting force protection in the theater and, with time, homeland defense. The military is dependent on secure, robust satellite networks as never before.

A growing concern within the space community is the possibility that other nations might attempt to target U.S. satellites with anti-satellite weapons. These weapons may take the form of anti-satellite missiles to destroy the satellite outright (a capability the United States has already demonstrated) or ground-based lasers intended to disable or destroy the satellite.[25] If China or another country were to attempt to place weapons in space, or even show signs they were developing the capability to do so, the U.S. government and national security establishment might be tempted to respond in kind and place its own weapons in space. The alternative—reflecting the likelihood that even if China is pursuing such a capability, it is at a very rudimentary stage—is to engage China diplomatically and through cooperation between the two space programs.[26] It is a long-established international norm that outer space should be kept free of weapons, and in this case the United States would be well served by using diplomacy to protect its edge in satellite technology—it is the more cost-effective and sustainable of the two options.

The geopolitical implications of progress in missile defense are more subtle—the system is not yet capable of defeating a large-scale ballistic missile attack on the United States. However, the system *can* mitigate, or perhaps even eliminate, the threat from isolated ballistic missile launches, thus giving the United States more leverage over known ballistic missile proliferators at the negotiating table by strengthening the U.S. bargaining position. Progress in missile defense capabilities can in fact enhance other instruments of national power—in particular the diplomatic (in terms of improved position and increase leverage) and the informational (in terms of reducing U.S. public fear and increasing public doubt in the proliferating country).

The joint strategic environment continues to develop, and SMDC/ARSTRAT is a key partner in developing both space and missile defense capabilities for the warfighter and the United States. As satellite technology matures, the Army and its sister branches will see improvements in the speed and accuracy of information made available to the battlespace commander. Integrated missile defense moves ever closer to a functional capability, augmenting the other elements of national power the United States uses when confronting ballistic missile proliferators such as North Korea and Iran. For SMDC/ARSTRAT and STRATCOM, 2007 will be a dynamic year as new capabilities emerge to help the United States confront the new challenges of the 21st century security environment.

Endnotes

[1] LTG Larry J. Dodgen, "The Evolving View of Space: Leveraging Global Capabilities in Support of Joint Warfighters," *Space Vision 21: A Celebration of Spaceflight* (Clearwater, Fla.: Belmont International, 2006), p. 91.

[2] "U.S. Strategic Command History," last updated August 2006, available at http://www.stratcom.mil/about-ch.html.

[3] These changes are described in Peter Gillette, "The 2002 Unified Command Plan: Changes and Implications," *National Security Watch* 03-2 (Arlington, Va.: Association of the United States Army, 21 February 2003), available at http://www.ausa.org/PDFdocs/nsw03-2.pdf.

[4] Jim Garamone, "U.S. Strategic Command transforming, decentralizing," *U.S. Department of Defense Information*, 3 May 2005 [Lexis/Nexis].

[5] LTG Larry J. Dodgen, "Balancing Warfighter Needs and Future Force Capabilities in Support of Joint Warfighters," briefing given at AUSA's Greater Los Angeles Chapter Space Symposium and Exhibition, 1 June 2006.

[6] For information about the Global Information Grid, see AUSA's Torchbearer National Security Report "The U.S. Army's Information Revolution: Delivering Information Dominance to the Warfighter" (August 2006), available at http://www.ausa.org/PDFdocs/TBSecRpt/TBSecRepAug06.pdf.

[7] This list is based on various STRATCOM websites: information on Functional Components adapted from http://www.stratcom.mil/organization-fnc_comp.html; information on Service Components adapted from http://www.stratcom.mil/organization-svc_comp.html; information on Task Forces adapted from http://www.stratcom.mil/organization-tf.html. Note that, although the NSA and DIA directors also serve as JFCC commanders, this does not indicate that the agency itself controls the JFCC. Rather, it is an indication of further attention being paid to improving interagency cooperation in the intelligence community by creating linkages—as MG Kevin Campbell, STRATCOM Chief of Staff, says, "these are separate and distinct hats that those gents wear for us" (quoted in Garamone, "U.S. Strategic Command Transforming, Decentralizing").

[8] Dodgen, "The Evolving View of Space," p. 86.

[9] Ground-based Midcourse Missile Defense is described in detail in AUSA's Torchbearer National Security Report "Key Issues Relevant to The U.S. Army's Strategic Imperatives, Vol. II" (September 2002), available at http://www.ausa.org/webpub/DeptILW.nsf/byid/CCRN-6CCRM8.

[10] Elements of the Ballistic Missile Defense System are described in AUSA's Background Brief No. 94, "Toward Integrated Air and Missile Defense: Implications of the New Environment" (November 2002), available at http://www.ausa.org/PDFdocs/bb94.pdf.

[11] Theater ballistic missiles are those that target military assets or civilian population centers within a theater of combat (e.g., Iraqi Scuds during the first Gulf War); global ballistic missile defense is intended primarily to counter the threat posed by intercontinental ballistic missiles (ICBMs), which are assumed to carry nuclear warheads. Efforts to connect theater and global ballistic missile defense fall under the title "Integrated Missile Defense," or IMD, and this integration includes organic missile defense units within theater armies. The entire national system, to include other agencies (e.g., the Missile Defense Agency), is called the "Ballistic Missile Defense System," or BMDS.

[12] Adapted from SMDC/ARSTRAT, "Fact Sheet: Future Warfare Center," available at http://www.smdc.army.mil/FactSheets/FWC.pdf.

[13] SMDC/ARSTRAT, "Research, Development and Acquisition," available at http://www.smdc.army.mil/SMDC/RDA.html.

[14] COL(P) Roger Matthews, "Enhancing Strategic Capabilities in Support of the Warfighter," briefing given at AUSA's Annual Meeting, 10 October 2006.

[15] *Ibid.*

[16] LTG Joseph Inge, "Operations in the Homeland and Missile Defense from an Operational Perspective," briefing given at AUSA's Annual Meeting, 10 October 2006.

[17] Adapted from SMDC/ARSTRAT, "Fact Sheet: MASINT/AGI Node," available at http://www.smdc.army.mil/FactSheets/MASINTNode.pdf.

[18] Adapted from SMDC/ARSTRAT Technical Center, "Fact Sheet: Overwatch ACTD," available at http://www.smdc.army.mil/FactSheets/Overwatch.pdf.

[19] For a detailed description of the WGS program, see Defense Industry Daily, "America's Wideband Gapfiller Satellite Program," available at http://www.defenseindustrydaily.com/2006/11/americas-wideband-gapfiller-satellite-program/index.php (posted 6 November 2006).

[20] MILSATCOM, "Advanced Extremely High Frequency (AEHF) Satellite System," available at http://www.losangeles.af.mil/SMC/MC/aehf.htm.

[21] The JNN network and its use in Hurricane Katrina relief operations is described in more detail in AUSA's Torchbearer National Security Report "The U.S. Army's Information Revolution."

[22] Missile Defense Agency (MDA), "Missile Defense News" (online archive), available at http://www.mda.mil/mdalink/html/newsrel.html.

[23] MDA, "Fact Sheet: Block 2006 Development," released May 2006, available at http://www.mda.mil/mdalink/pdf/blk06.pdf.

[24] MDA, "Combined Test Force Achieves Full Operational Capability," 15 November 2006, available at http://www.mda.mil/mdalink/pdf/06fyi0088.pdf.

[25] Peter Spotts, "Alarm Over China's Arms Pursuit – In Space," *Christian Science Monitor*, 20 November 2006 [Early Bird News Service].

[26] *Ibid.*

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