Chinese, Russian, and U.S. Space Warfare and Defense Developments

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Chinese, Russian, and U.S. Space Warfare and Defense Developments

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HIST 387 History of the Space Age
April 21, 2015
Key Chinese Developments

• 1956-China acquires two Soviet R-1 missiles; clones of German V-2 liquid-propellant missiles

• 1957-China acquires more advanced R-2 missiles from Soviet Union with greater payloads and range.

• Qian Xuesen (1911-2009): Father of Chinese military space programs.Received degrees from MIT and Cal Tech. Worked at Jet Propulsion Lab and Army Air Force, but was expelled from U.S. in 1955 and returned to China
Qian Xuesen
Xuesen Accomplishments

• Became chief project manager in all Chinese ballistic missile programs
• Served as lead designer for the CSS-4 nuclear ICBM targeted at the U.S.
• Served as first director for Chinese aeronautics and missile development research for what is now the China Aerospace Corporation.
• Helped develop the Dong Fang Hong-1 satellite which was the first Chinese satellite launched. Occurred in 1970, weighed 380 pounds, stayed in orbit for 26 days.
Other Chinese accomplishments

• Develops Long March Rocket in 1977 for launching communication satellites into geosynchronous orbit.
• Nuclear capabilities expand in 1980 when it successfully tests DF-5 ICBM with range capable of hitting continental U.S.
• This period see Beijing enter commercial space launch industry.
• 1990s-present see Beijing launch concerted plans against U.S. missile defense
• 1999 Cox Committee (U.S. Congress) charges Chinese espionage at Energy Dept. national laboratories and thefts of sensitive space, missile, and nuclear technologies from firms such as Loral and Hughes.
• Cox report also says China proliferates missile and space technology to countries such as Iran, North Korea, Pakistan, and Saudi Arabia.
More Chinese developments

- Oct. 2003 China’s first manned spaceflight occurs on Shenzhou 5 rocket. Flight lasts 21 hours and 14 orbits, may have deployed a military intelligence satellite.
- Subsequent manned space flights have occurred including in 2013.
- Hopes to launch a space station in 2020.
- Destroyed an obsolete satellite in 2007 by earth launched missile prompting widespread international concern.
- Annual Pentagon reports on Chinese military power note Beijing’s military space developments including 8 space launches in 2013 to expand its space-based ISR capabilities; use of space-based assets to develop its Anti-Access Aerial Denial (A2AD) capabilities against U.S. and allied forces in Western Pacific.
- December 14, 2013: Unmanned Chang’e 3 Lunar rover lands on moon.
- Considerable debate over whether China will attempt a manned moon landing.
Chinese space launch sites. Hainan Island site is becoming particularly important due to Chinese aggressiveness in South China Sea.
Post-1985 Russian Space War and Defense Developments

• 1991 DOD Assessment of Moscow’s military capabilities acknowledged in 1989-1990 that Soviet space launch rates were 15% below what they were between 1980-1988.

• Between 1990-1995 Russian civilian space programs experienced 80% budget reductions and military space programs 90% reductions.

• These budget reductions also produced significant workforce reductions.

• Soviet Union’s disintegration saw Russian space launch facilities placed in countries like Azerbaijan and Kazakhstan compelling Moscow to seek agreements with these countries to maintain these sites.
Russian Developments

- Russian Space Forces created in 2001 to increase space use for military information gathering requirements.
- 2001-U.S. notifies Russia of withdrawal from 1972 Antiballistic Missile (ABM) Treaty
- In 2004, Russian Space Forces Commander says Russia has approximately 60 military satellites in orbit.
- Imagery reconnaissance satellites include Kometa, Kobalt, Yenisey, Araks, and Neman.
- Military communication satellites include Strela-3, Molniya-3K, Geizer, and Raduga.
- Russia provides military space launch services for U.S. and other countries
- Cooperates with China on military space matters.
- Russian nuclear ICBM’s include SS-24, RSM-56 Bulava, Topol, and others which can be delivered by land, air, and submarine launched platforms.
- April 12, 2013-Vladimir Putin says Russia will launch manned flights from Russia in 2018.
- See next slide for Russian space launch facilities
U.S. Space War and Defense Developments

• Strategic Defense Initiative Organization (SDIO) created by Reagan Admin.
• This becomes Ballistic Missile Defense Organization (BMDO) during Clinton Admin. (1994)
• All armed service branches have military space programs; these also involves R&D efforts of military research labs, Defense Science Board, Defense Advanced Research Projects Agency (DARPA), and other DOD policymaking components.
U.S. Military Space Program Problems and Challenges

• Declining budgets; particularly during Obama Administration
• Costly acquisition and program failures such as National Reconnaissance Office’s Future Imagery Architecture Program and Space-Based Infrared System (SBIRS) ballistic missile early warning program
• Potential increased vulnerability of U.S. forces deployed to Asia-Pacific large areas of coverage and Chinese technological advances and A2AD programs
• Vulnerability to jamming, missile attacks, blinding, electromagnetic pulse, and absence of effective international legal enforcement mechanisms
• Crowding of civilian and military satellites in earth orbit
• These vulnerabilities also apply to civilian technologies e.g. cell phones, ATMs etc.
U.S. Military Dependence on Space Assets

• Nearly total and indispensable
• Space-based imagery & signals intelligence
• Verifying compliance with arms control agreements
• Positioning, navigation, timing of GPS satellites in delivering precision-guided munitions (PGM)
• Total reliance on communication satellites for global command & control of military forces
• Extensive use of high resolution satellites for intelligence preparation; mapping, battlefield surveillance; & battle damage assessment
• Meteorological and environmental remote sensing systems determine military force planning and deployment in varying locations
SDIO and MDA Historical Funding FY 85-15

### Historical Funding for MDA FY85-15*

**Fiscal Year (FY) S in Billions**

| FY | FY91 | FY92 | FY93 | FY94 | FY95 | FY96 | FY97 | FY98 | FY99 | FY00 | FY01 | FY02 | FY03 | FY04 | FY05 | FY06 | FY07 | FY08 | FY09 | FY10 | FY11 | FY12 | FY13 | FY14 | FY15 |
|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0  | 4.5  | 5.2  | 5.4  | 3.8  | 3.2  | 2.9  | 2.8  | 2.6  | 3.6  | 3.3  | 4.5  | 8.3  | 6.7  | 7.7  | 9.2  | 7.8  | 9.3  | 8.9  | 9.3  | 7.8  | 8.4  | 8.6  | 7.8  | 7.7  |
| 1  | 2.3  | 3.5  | 4.3  | 2.7  | 2.8  | 3.5  | 3.5  | 3.8  | 3.7  | 3.7  | 5.2  | 7.9  | 6.9  | 7.8  | 8.9  | 7.9  | 9.1  | 8.3  | 8.6  | 7.8  | 8.6  | 8.9  | 9.1  | 8.1  | 7.9  |
| 2  | 3.6  | 4.6  | 4.3  | 2.8  | 2.8  | 3.4  | 3.7  | 3.6  | 3.5  | 3.7  | 4.7  | 5.8  | 5.9  | 8.2  | 9.0  | 7.8  | 9.4  | 8.6  | 8.9  | 7.8  | 8.6  | 8.4  | 8.2  | 7.6  |
| 3  | 2.3  | 3.5  | 4.3  | 2.8  | 2.8  | 3.5  | 3.5  | 3.7  | 3.4  | 3.6  | 4.6  | 7.9  | 7.4  | 7.5  | 8.7  | 7.6  | 8.9  | 8.6  | 8.4  | 7.8  | 8.6  | 8.6  | 8.4  | 8  | 7.7  |
| 4  | 3.6  | 4.6  | 3.8  | 2.8  | 2.8  | 3.4  | 3.7  | 3.6  | 3.4  | 3.9  | 4.8  | 6.3  | 6.2  | 8.2  | 9.2  | 7.9  | 9.4  | 8.7  | 9.0  | 7.8  | 8.4  | 8.3  | 7.8  | 7.6  |
| 5  | 2.0  | 4.1  | 4.1  | 2.8  | 2.8  | 3.5  | 3.7  | 3.7  | 3.5  | 3.7  | 4.8  | 8.4  | 6.6  | 7.7  | 8.9  | 7.8  | 8.3  | 8.5  | 8.9  | 7.8  | 8.5  | 8.2  | 8.1  | 7.8  |
| 6  | 2.9  | 4.1  | 3.8  | 2.8  | 2.8  | 3.4  | 3.7  | 3.8  | 3.5  | 3.6  | 4.8  | 7.8  | 7.4  | 7.7  | 9.0  | 7.8  | 9.4  | 8.7  | 9.0  | 7.9  | 8.5  | 8.4  | 8.3  | 7.8  | 7.8  |

**Total to date -- $173.4B**

*Department-wide sequestration cut the 9% across the board. The Department cut $668M, leaving $7.6 billion for FY13 funding.*
Proposed FY 2016 Presidential Budget for MDA programs

### PB 2016 Summary

($ in Millions)

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National Missile Defense Independent Review Team (NMD IRT)
Executive Summary
13 June 2000

Charter
At the direction of the Secretary of Defense, the Ballistic Missile Defense Organization (BMDO) chartered the NMD IRT. The IRT was to examine the progress being made toward the Deployment Readiness Review (DRR) and towards the planned Initial Operating Capability (IOC) of 2005 for a limited system (C1 system). The IRT did not examine cost or funding issues.

Program Planning
Recognizing that the 3 + 3 plan to deploy a limited system as early as 2003 was not achievable, the program was restructured in January 1999 to provide for phased program decisions with a most likely IOC of 2005. The phased key program decisions are:

1. a feasibility assessment -- the DRR scheduled in the summer of 2000. The programmatic issues are whether we know how to develop and field the limited system and whether a 2005 IOC is a reasonable expectation. If the DRR criteria are met, the decision could be to begin X-Band radar site construction and purchase long lead items.
2. the decision to purchase -- a Defense Acquisition Board (DAB) in the summer of 2001 to consider readiness to purchase elements of the deployable system and,
3. the decision to deploy -- a DAB early in 2003 to consider readiness to build
Space Based Infrared System

Published November 09, 2010

Mission
The Space-Based Infrared System, or SBIRS, will be a key part of North America's missile early warning and defense systems. SBIRS will provide critical functions for protecting the United States and its allies by supporting four mission areas: missile warning, missile defense, battlepace awareness and technical intelligence.

Features
The SBIRS constellation will consist of infrared sensor, or IR, payloads on host satellites in highly elliptical orbit, or HEO, and two IR sensors each on dedicated SBIRS satellites in geosynchronous earth orbit, or GEO. The HEO sensor detects the launch of Submarine-Launched Ballistic Missiles from the North Polar Region and can be tasked to perform other IR detection missions as well. The GEO scanning sensor performs the strategic missile warning mission, the global technical intelligence, as well as the initial phase of the strategic missile defense mission.

It provides a shorter revisit time and greater sensitivity than the Defense Support Program, or DSP, satellite sensor over its full field of view. The GEO staring sensor performs the theater missile warning and defense missions, the battlepace awareness mission, the technical intelligence mission in focus areas, and the final phase of the strategic missile defense mission. It provides step-stare or dedicated stare operations over smaller geographic regions than the scanning sensor.

Ground control and mission data analysis for the new SBIRS GEO satellites and HEO payloads will be performed by the 2nd Space Warning Squadron in the Mission Control Station at Buckley Air Force Base, Colo., as it currently conducts for the DSP satellites.

Ground control of the HEO sensors is currently performed by the 11th SWS in the Mission Control Station Backup at Schriever AFB, Colo. The ground architecture also consists of the Interim Mission Control Station Backup in Boulder, Colo., relay ground stations located around the world and a mobile ground system.

The SBIRS Survivable Endurable Evolution will replace the mobile ground system. The U.S. Army's in-theater Joint Tactical Ground Stations units, which currently receive and process DSP data, will be transitioned to receive and process SBIRS sensor data.
Defense Support Program Satellites

Mission
Air Force Space Command-operated Defense Support Program satellites are a key part of North America’s early warning systems. In their 22,300 mile geosynchronous orbits, DSP satellites help protect the United States and its allies by detecting missile launches, space launches and nuclear detonations.

Features
DSP satellites use an infrared sensor to detect heat from missile and booster plumes against the earth's background. In 1995, technological advancements were made to ground processing systems, enhancing detection capability of smaller missiles to improve the overall accuracy of early warning systems.
Terminal High Altitude Area Defense

The Terminal High Altitude Area Defense (THAAD) element provides the Ballistic Missile Defense System (BMDS) with a globally transportable, rapidly deployable capability to intercept and destroy ballistic missiles inside or outside the atmosphere during their final, or terminal, phase of flight.

Overview

- Land-based element capable of shooting down a ballistic missile both inside and just outside the atmosphere.
- Highly effective against the asymmetric ballistic missile threats.
- Uses hit-to-kill technology whereby kinetic energy destroys the incoming warhead.
- The high-altitude intercept mitigates effects of enemy weapons of mass destruction before they reach the ground.

Details

- A THAAD battery consists of four main components:
  - Launcher: Truck-mounted, highly-mobile, able to be stored; interceptors can be fired and rapidly reloaded
  - Interceptors: Eight per launcher.
THE BALLISTIC MISSILE DEFENSE SYSTEM (BMDS)

It is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate) with funding subject to the annual authorization of appropriations and the annual appropriation of funds for National Missile Defense.

National Missile Defense Act of 1999 (Public Law 106-38)
Domestic and International Locations and partners include Colorado Springs, CO; Fort Greely, AK; Vandenburg AFB, CA; sea and space-based assets; Kwajalein Atoll Pacific Ocean, selected North Atlantic Treaty Organization (NATO) countries, Australia, Japan, and South Korea.
Missile Defense Assets are Space, Land, and Sea-Based

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**Sea-Based X-Band Radar**

The Sea-Based X-Band (SBX) Radar acquires, tracks and discriminates the flight characteristics of ballistic missiles. The SBX provides an advanced capability to the Ballistic Missile Defense System (BMDS), increasing the Missile Defense Agency’s ability to conduct operational and realistic testing of the BMDS, while providing an operational capability to the Combatant Commands.

**Overview**

- The SBX is an advanced X-Band radar mounted on a mobile, semi-submersible platform that provides the BMDS with an extremely powerful and capable radar that can be positioned to cover any region of the globe. Its ocean-spanning mobility allows the radar to be repositioned as needed to support the various BMDS test scenarios.
- The vessel is based on a fifth-generation semi-submersible oil drilling platform. It is twin-hulled, self-propelled, and stable in high winds and turbulent sea conditions.
- Operationally, the SBX provides an advanced radar capability to obtain missile tracking information while an incoming threat missile is in flight, discriminates between the hostile missile warhead and any decoys, and provides...
The Advent of the National Geospatial-Intelligence Agency
Office of the NGA Historian
September 2011
National Reconnaissance Office (NRO)-Responsible for intelligence-gathering satellites (eyes and ears)
NRO History Materials
U.S. Strategic Command (STRATCOM)—Responsible for deterring & detecting strategic attacks against the U.S. and allies and defeating such attacks if deterrence fails. Mission areas include strategic deterrence, space operations, cyber operations, joint electronic warfare, global strike, missile defense, intelligence, surveillance & reconnaissance (ISR), combating weapons of mass destruction, and analysis and targeting.
Joint Functional Component Command for Space (JFCC)
Air Force Space Command—Providing resilient and affordable space & cyberspace capabilities for joint military forces and the nation.
In the aftermath of the 9-11 terrorist attacks on the US, the President declared a Global War on Terrorism. In conjunction with this declaration, the US initiated Operation ENDURING FREEDOM and Operation IRAQI FREEDOM to identify and destroy terrorist strongholds in Afghanistan and Iraq. US and coalition warriors made extensive use of space-based communications, GPS, meteorological, and imagery to effectively prosecute their military operations. ENDURING FREEDOM was the first counterinsurgency war during which Afghan forces attempted to disrupt GPS signals while the US destroyed a ground-based satellite communications site. During Operation NOBLE EAGLE, AFSPC space-based systems were used to support the US homeland defense mission.

In October 2001, in response to the Space Commission report, Air Force Material Command transferred its Space and Missile Systems Center at Los Angeles AFB to AFSPC. This organizational move brought to the command responsibility for the development and acquisition of space and missile systems, thus merging operations and acquisitions functions within a single organization.

In April 2002, the triple-hatting of the AFSPC commander as US Space Command and NORAD Commander ended. AFSPC became a separate four-star Air Force major command. As part of the ongoing initiative to transform the US military into a 21st century fighting force, DoD disestablished US Space Command and transferred its mission to US Strategic Command. This organizational action was designed to improve effectiveness and speed up information collection and assessment required for strategic decision-making. US Strategic Command was now responsible for early warning and defense against missile attack and long-range strategic attacks.

AFSPC personnel and military space-based systems have also been used to support humanitarian relief efforts, the most recent example being hurricane Katrina. AFSPC deployed helicopters to the Gulf Coast region to deliver meals, water, and medical supplies, and to conduct search and rescue operations. During the hurricane, Hurricane Hunters used GPS to track the hurricane’s path and speed and Defense Meteorological Program System satellites provided forecast data to defense and federal disaster planners. Additionally, military satellite communications systems played a key role in coordinating pre- and post-disaster activities.

AFSPC provides a significant portion of US Strategic Command’s warfighting capabilities, to include missile warning, the ICBM leg of strategic deterrence, and space-based intelligence, surveillance, and reconnaissance capabilities. Additionally, AFSPC is the sole provider of positioning, navigation, and timing, as well as the bulk of satellite communications to the warfighting community. Lastly, AFSPC serves as the Air Force’s Executive Agent for space. In this role, AFSPC is the advocate for space capabilities and systems for all unified commands and military services, and collectively provides space capabilities the US needs today and in the future.
Space and Naval Warfare Systems Command (Navy)-Developing, delivering, and sustaining warfighter communication and information capabilities to keep them connected anytime and anywhere.
U.S. Army Space & Missile Defense Command- Conducting army space and missile defense operations and providing planning, information, control, & coordination of Army forces and capabilities to support STRATCOM.
Chapter 5
New Ideas about Space and Missile Defense After the War, 1991-1997

ARSPACE After The Gulf War

As the president unveiled a new SDI and the Soviet Union began to wither and disappear, American forces were engaged in conflicts in Southwest Asia that underscored the utility of space-based systems. ARSPACE and ASI both passed the tests presented by the Gulf War and Somalia, although this success may have sealed the fate of the latter organization. ARSPACE thrived because Desert Storm provided a real test for the command…ARSPACE didn’t fight the war in the traditional Army sense of fighting and we sure didn’t win the war. However, we believe we exposed the Army to the potential of space applications early on, prior to the war, and that exposure assisted the fighters to do their jobs better and easier.¹

The challenge ARSPACE then faced was using space-related systems and products in later operations and weaving space into the Army’s consciousness. Otherwise, old difficulties would re-emerge and the Army would again “have a problem getting back into space [because] not many of our people understand space assets and what we can do.”² The need to meet this challenge and fix the shortcomings exposed by the test of combat in the Gulf War led to creating two new organizations: the Army Space Support Team (ARSST) and the Joint Tactical Ground Station (JTAGS).

As with the end of every major conflict, the end of the Gulf War saw a renewal of the role...
GPS.gov (Administers U.S. global positioning satellite policy)
House Armed Services Committee-Conducts oversight of U.S. military space programs
Strategic Forces Subcommittee

About the Subcommittee
The Strategic Forces Subcommittee oversees our nation's strategic weapons, ballistic missile defense, space programs, and Department of Energy national security programs (excluding nonproliferation programs). It makes sure our nation is properly prepared for any missile or nuclear attacks.

Members of the Subcommittee

Republicans
- Mike Rogers, Alabama
  - Chairman
  - Visit Site
- Trent Franks, Arizona
  - Visit Site
- Doug Lamborn, Colorado
  - Visit Site

Democrats
- Jim Cooper, Tennessee
  - Ranking Member
  - Visit Site
- Loretta Sanchez, California
  - Visit Site
- Rick Larsen, Washington
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- Readiness
- Seapower & Projection Forces
- Strategic Forces
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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2014
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRTEENTH CONGRESS
FIRST SESSION
____________________
SUBCOMMITTEE ON STRATEGIC FORCES HEARING
ON
BUDGET REQUEST FOR NATIONAL SECURITY SPACE ACTIVITIES
____________________
HEARING HELD
APRIL 25, 2013
HOUSE ARMED SERVICES COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

SUBJECT: FISCAL YEAR 2014 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR NATIONAL SECURITY SPACE ACTIVITIES

STATEMENT OF: GENERAL WILLIAM L. SHELTON COMMANDER, AIR FORCE SPACE COMMAND

April 25, 2013

NOT FOR PUBLICATION UNTIL RELEASED BY THE ARMED SERVICES COMMITTEE SUBCOMMITTEE ON STRATEGIC FORCES
U.S. HOUSE OF REPRESENTATIVES
Senate Armed Services Committee- Conducts oversight of U.S. military space programs
Subcommittee on Strategic Forces
HEARINGS
BEFORE THE
COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE
ONE HUNDRED THIRTEENTH CONGRESS
SECOND SESSION
ON
S. 2410
TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2015 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE MILITARY PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR, AND FOR OTHER PURPOSES

PART 7
STRATEGIC FORCES

MARCH 5, 12; APRIL 2, 9, 10, 2014

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DEPARTMENT OF DEFENSE AUTHORIZATION OF APPROPRIATIONS FOR FISCAL YEAR 2015 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, MARCH 12, 2014

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

MILITARY SPACE PROGRAMS

The subcommittee met, pursuant to notice, at 3:07 p.m. in room SR–222, Russell Senate Office Building, Senator Mark Udall (chairman of the subcommittee) presiding.

Committee members present: Senators Udall, Donnelly, King, and Sessions.

OPENING STATEMENT OF SENATOR MARK UDALL, CHAIRMAN

Senator Udall. Let me bring today's hearing of the Strategic Forces Subcommittee to order.

I want to thank our witnesses for your patience. I know Senator Sessions will be here shortly. I would like to deliver my opening statement, and then when Senator Sessions arrives, I know he will have some remarks as well.

This afternoon, we will receive testimony regarding the Department of Defense (DOD) military space programs for fiscal year 2015.

As I said, I want to thank all of you for taking your valuable time to be here today.

On February 11, Director of National Intelligence (DNI), James R. Clapper, testified to the full committee that “threats to U.S.
The House and Senate Appropriations Committees Defense Subcommittees are also involved in funding military space programs.
Air University Center for Strategy & Technology (CSAT)-Long range thinking and technological forecasting. Air University is the Air Force’s graduate school.
Space Operations

Air Force Doctrine Document 3-14
19 June 2012
2014 article on space combat for *Air & Space Power Journal* (Air Force’s principal professional journal). It and other Air University publications frequently discuss and debate military space operations.

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**Space Combat Capability . . . Do We Have It?**

Capt Adam P. Jodice, USAF  
Lt Col Mark R. Guerber, USAF

Space is a foundational capability for all military operations, yet we don’t really plan for anything but success.

—Gen William Shelton  
Commander, Air Force Space Command  
Atlantic Council, July 2014

When General Welsh took the reins as the USAF chief of staff, he acknowledged the nation’s dependence upon the space domain as it relates to our national security. In an interview published in *Strategic Studies Quarterly*, he highlights several asymmetric advantages: “Only the Air Force gives our decision makers the capability and capacity they need for air superiority, nuclear and global strike forces, ISR [intelligence, surveillance, and reconnaissance], rapid global mobility, and command and control operations, all enabled by space and cyber forces. I truly believe that . . . those are the areas where we must continue to focus. But also [they] belong in the air, space.
National Air & Space Intelligence Center (NASIC) ballistic & cruise missile threat report
KEY FINDINGS

Many countries view ballistic and cruise missile systems as cost-effective weapons and symbols of national power. In addition, they present an asymmetric threat to US airpower. Many ballistic and cruise missiles are armed with weapons of mass destruction.

North Korea has unveiled the new road-mobile Hwasong-13 intercontinental ballistic missile (ICBM) while continuing to develop the Taepo Dong-2 (TD-2), which placed a satellite in orbit for the first time in December 2012. An intermediate-range ballistic missile (IRBM) and a new solid-propellant short-range ballistic missile (SRBM) are also being developed.

Iran could develop and test an ICBM capable of reaching the United States by 2015. Since 2008, Iran has conducted multiple successful launches of the two-stage Safir space launch vehicle (SLV) and has also revealed the larger two-stage Simorgh SLV, which could serve as a test bed for developing ICBM technologies. Since 2010, Iran has revealed the Qiam-1 SRBM, the fourth-generation Fateh-110 SRBM, and claims to be an anti-ship ballistic missile (ASBM). Iran has modified its Shahab 3 medium-range ballistic missile (MRBM) to extend its range and effectiveness and also claims to have deployed the two-stage, solid-propellant Shahab MRBM.

China has the most active and diverse ballistic missile development program in the world. It is developing and testing offensive missiles, forming additional missile units, qualitatively upgrading missile systems, and developing methods to counter ballistic missile defenses. The Chinese ballistic missile force is expanding in both size and types of missiles. China continues to field conventionally armed SRBMs opposite Taiwan, and is developing a number of new mobile, conventionally armed MRBMs. Missiles such as the CSS-5 ASBM are key components of the Chinese military modernization program, specifically designed to prevent adversary military forces’ access to regional conflicts. China is adding the CSS-10 Mod 2 (DF-31A) to the ICBM force and future ICBMs could utilize multiple independently-targetable reentry vehicles (MIRVs). The number of Chinese ICBM nuclear warheads capable of reaching the United States could expand to well over 100 within the next 15 years. The new JL-2 submarine-launched ballistic missile (SLBM) is also under development.
The authorities essential to the common defense are these: to raise armies; to build and equip fleets; to prescribe rules for the government of both; to direct operations; to provide for their support. These power ought to exist without limitation, *because it is impossible to foresee or define the extent and variety of national exigencies, or the correspondent extent and variety of the means which may be necessary to satisfy them*. The circumstances that endanger the safety of nations are infinite, and for this reason no constitutional shackles can wisely be imposed on the power to which the care of it is committed. (Alexander Hamilton-*Federalist Paper 23*, 1787)

...while some might view that space can be kept a weapons-free sanctuary free of military systems, *history tells us that each new time technological opportunities present themselves, nations invariably employ them to avoid being placed in an inferior defense position*. (Secretary of the Air Force, Verne Orr, 1984).