

U.S. Government Resources on Space Warfare and
Defense

Federal Depository Library Conference
Kansas City, MO
April 2, 2008

Bert Chapman
Government Information & Political Science Librarian
Associate Professor of Library Science
Purdue University Libraries

Alexander Hamilton Insight

- “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 their operations; to provide for their support. These powers 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.” (*Federalist #23, 1787*).

Why Should I Care?

- Which of the following do you use, might use, or benefit from? All involve space-based technologies
- Cell phones, ecommerce, WWW, ATMs,
- International currency or stock market transactions
- Domestic or international news and sporting events
- Commercial airlines & container ships cargo

Why Should I Care?

- Police traffic, fire departments, ambulances, other emergency response personnel and activities
- Tracking storms like hurricanes
- Tracking criminals, lost children, relatives with Alzheimer's
- Detecting troop and ship movements
- Monitoring foreign govt. and terrorist communications

Why Should I Care?

- Monitoring and Verifying Arms Control Agreements
- Giving troops information on the physical terrain and environment they operate in
- Detecting and tracking incoming ballistic missiles flight paths while attempting to destroy such missiles
- Guiding precision guided weapons to targets
- Locating friendly or hostile ships at sea

- Proposed FY 2009 defense budget includes \$10.7 billion for space-based capabilities including communications & early warning satellites plus \$10.4 billion for ballistic missile defense systems.
- This does not include intelligence collection whose budget is classified
- Approximately 90% of U.S. military communication assets are space-based
- Imagine living without these technologies and services if space-based satellites and communications were disrupted by hostile military action or long-term technical failure.

Relevant Information Resource Producers

- Defense Department, including corporate publications and support offices e.g. Defense Science Board, DARPA
- Armed services branches and facilities e.g. Air Force Research Laboratory
- Military educational institutions e.g. Air University
- Intelligence agencies-e.g. National Reconnaissance Office

Relevant Information Resource Producers

- National Security Council
- NASA
- Congressional oversight committees
- Commissions

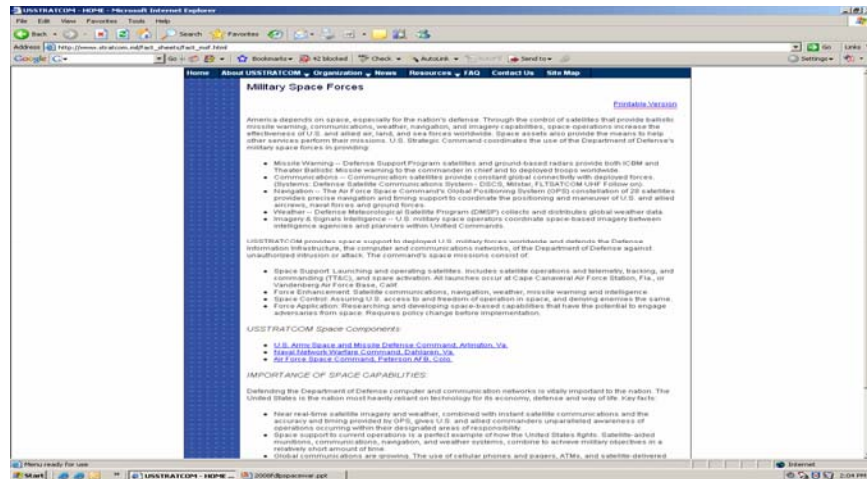
United States Strategic Command

Unified military command responsible for defending the U.S. against strategic global strikes including space operations.

- www.stratcom.mil/



Stratcom Activities-including missile warning, communications, navigation, weather, imagery, and signals intelligence



Missile Defense Agency www.mda.mil/

- Responsible for developing and deploying a ballistic missile defense system to defend the U.S., its military forces, and allies against hostile ballistic missile attacks.

Missile Defense Agency

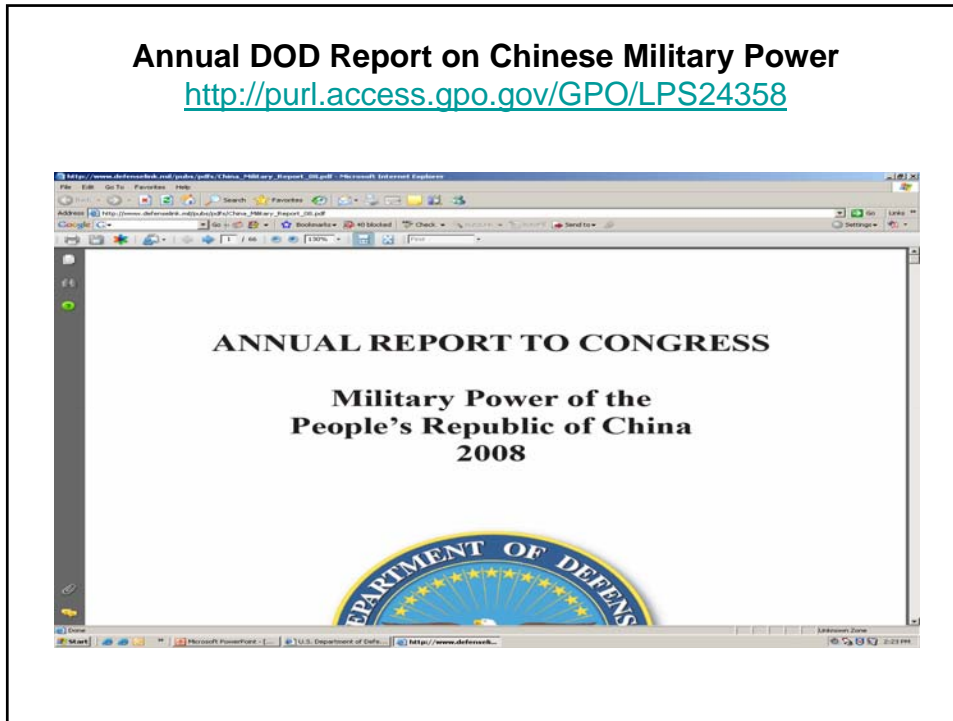


Ballistic Missile Defense System Factsheet

The image is a screenshot of a web browser displaying the MDA Fact Sheet. The browser window title is 'http://www.mda.mil/...'. The page header includes the MDA logo and the text 'MISSILE DEFENSE AGENCY Fact Sheet'. Contact information is provided: 'http://www.mda.mil/mda.info@mda.mil' and '7100 Defense Pentagon Washington, DC 20301-7100'. The main heading is 'The Ballistic Missile Defense System'. The text describes the threat of ballistic missiles and the development of the BMD system. A photograph shows a missile being launched from a ship. The text states: 'Ballistic missiles follow a three-phased trajectory path: boost phase, midcourse phase, and terminal phase.' The 'Boost Phase' section explains that this is the most difficult phase to intercept because the missile is bright and hot.

Annual DOD Report on Chinese Military Power

<http://purl.access.gpo.gov/GPO/LPS24358>



Space and Counterspace

China's space activities and capabilities, including satellite (SAT) programs, have significant implications for regional access/area denial in Taiwan Strait contingencies and beyond. China further views the development of space and counter-space capabilities as bolstering national prestige and, like nuclear weapons, demonstrating the attributes of a world power.

Reconnaissance. China is deploying advanced reconnaissance, and Earth resource systems with military applications. Examples include the Ziyuan-2 series, the Yaogan-1 and -2, Haiyang-1B, the CBERS-1 and -2 satellites, and Huanjing disaster/environmental monitoring satellite constellation. China is planning eleven satellites in the Huanjing program capable of visible, infrared, multi-spectral, and synthetic aperture radar imaging. In the next decade, Beijing most likely will develop space surveillance and high-resolution

2007-2012. China's goal is to have a manned station and conduct a lunar landing, both by 20

Communications. China increasingly uses satellites, including some obtained from foreign providers. INTELSAT and INMARSAT, for communications. China may be developing a system of data relay satellites to support global coverage, and has reportedly acquired mobile data reception equipment that support rapid data transmission to deployed military forces.

Small Satellites. Since 2000, China has launched a number of small satellites, including oceanographic research, imagery, and environmental reconnaissance satellites. China has also established dedicated small satellite design and production facilities. China is developing microsats – weighing less than 100 kilograms – for remote sensing, and networks of imagery and radar satellites. These developments could allow for a rapid reconstitution or expansion of China's satellite force in the event of

U.S. Air Force Space Command

www.afspc.af.mil/ Serves as the Air Force's principal space policy organization.



The Role of Space in Military Operations: Integrating and Synchronizing Space in Today's Fight

Lt Gen Gary L. North
Commander, 9th Air Force and
US Central Command Air Forces
Shaw AFB, South Carolina

Col John Riordan
Director of Space Forces
Combined Air Operations Center
US Central Command Air Forces, Southwest Asia

The practical application of space in air, ground, and maritime operations is frequently misunderstood. In many cases, it is taken for granted that space effects will be present when needed. In the worst cases, space effects are dismissed as too difficult to coordinate and not worth the effort. Space effects are available and will remain a key and critical element in the synchronization and integration of ongoing theater operations, in a wide range of applications, from humanitarian to major combat operations. Space planning and operations transcend the traditional strategic, operational, and tactical levels of war, enabling friendly forces to see, hear, know, and act first. Correctly integrating

order. This position, a one-year rotational remote deployment position, adds valuable continuity to the space planning efforts in theater. The CAOC combat operations division Space (COD Space) cell then uses a combination of in-theater space expertise and stateside capabilities to provide the required space effects during execution.



The US Army also has embedded space experts throughout the theater in both Army space support teams and space support elements. These teams and elements are fully involved in planning tactical Army and Marine operations and are producers of SSRs. The CENTAF space team works closely with Army space professionals to ensure the full spectrum of space effects is understood and incorporated into planning processes. In addition, the Air Force has strategically placed some of our most highly trained space experts—space warfare officers (SWO)—throughout the AOR. Five SWOs are currently in theater conducting space planning and operations, with two at the CAOC and one each at the Multi-National Force and Security Command - Afghanistan, the Multi-National

Air Force Research Laboratory www.afrl.af.mil/ Conducts scientific and technological research for Air Force aerospace and cyberspace forces





Innovative Space-based radar Antenna Technology (ISAT) Flight Demonstrator

www.vs.afri.af.mil
505.846.4704/4321

Administered by the Air Force Research Laboratory's Space Vehicles Directorate, Kirtland Air Force Base, N.M., the Innovative Space-based radar Antenna Technology (ISAT) program concentrates on developing systems to deploy extremely large (up to 300 yards) electronically scanning radar antennas flying 5,700 miles above the Earth's surface and providing ground target detection to the warfighter. When launched in 2010, the football field in length ISAT demonstrator, weighing over five tons, will serve as the forerunner for the future of America's intelligence, surveillance, reconnaissance (ISR) assets in space.

Initiated in 2002, and sponsored by the

operate the spacecraft from the Research, Development, Test and Evaluation (RDT&E) Support Complex at Kirtland AFB. Before the planned lift off occurs at Cape Canaveral, Fla., in four years, the ISAT spacecraft will be developed, integrated, and tested at the contractor facility with oversight provided by the Space Vehicles Directorate.



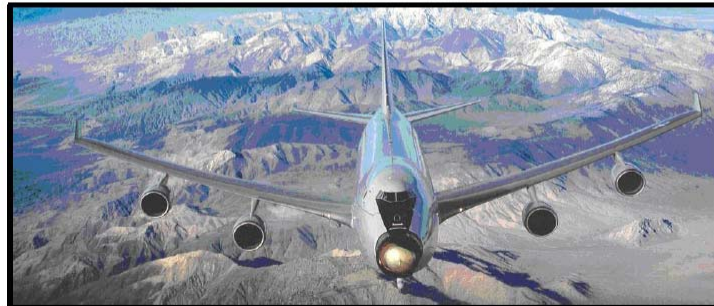
Technologies to be developed and demonstrated on the ISAT flight experiment include advanced antenna architectures and



UNITED STATES AIR FORCE

Airborne Laser System Program Office, Office of Public Affairs, 3300 Target Road, Building 760, Kirtland AFB, NM 87117-6612
(505) 846-7681; Fax (505) 853-3770
INTERNET: www.airbornelaser.com

TESTING: PAVING THE WAY TO MISSILE SHOOTDOWN



Now comes the fun part. After years of planning and organization, months of assembling and connecting hardware, and weeks of flying an almost empty airplane, Airborne Laser (ABL) developers are on the verge of proving that the revolutionary aircraft is capable of *destroying*

AFRL Webcast Videos

- [Directed Energy Video](#)
- Wallops Island [Satellite Launch Video](#)

Air University Center for Space Studies

<http://space.au.af.mil/>



Chapter 5

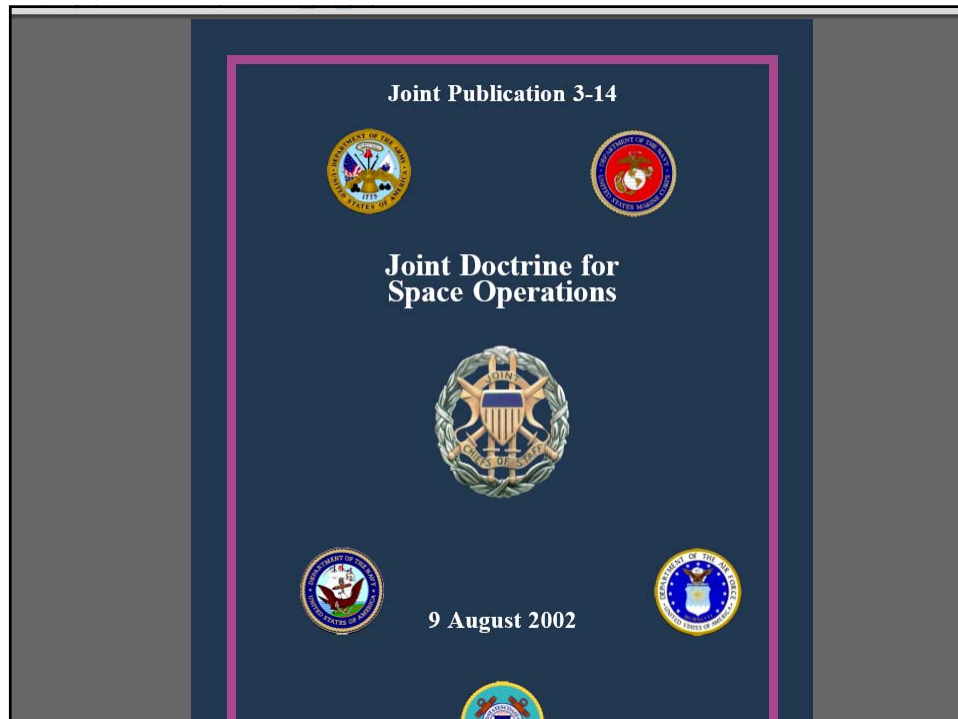
SPACE LAW, POLICY AND DOCTRINE

Space policy and doctrine define the overarching goals and principles of the US space program. International and domestic laws and regulations, national interests and security objectives shape the US space program. Furthermore, fiscal considerations both shape and constrain space policy. Space policy formulation is a critical element of the US national planning process, as it provides the framework for future system requirements. This chapter outlines the basic tenets of US space policy and examines the international and domestic legal parameters within which the US conducts its space programs. The chapter details Department of Defense (DOD) and Air Force space policies, derived from The National Space Policy. It concludes with an analysis of the doctrinal principles that guide the conduct of military space activities.

INTERNATIONAL SPACE LAW

The term *space law* refers to a body of law drawn from a variety of sources and consisting of two basic types of law: international and domestic. The former

1976, eight equatorial countries claimed sovereignty over the geostationary orbital arc above their territory. Most other countries, including all major space powers, rejected the claim.



CHAPTER III COMMAND AND CONTROL OF SPACE FORCES

"Know the enemy and know yourself, in a hundred battles you will never be in peril."

Sun Tzu, *The Art of War*
400-320 BC

Since space capabilities have global applications, space forces can potentially support military operations simultaneously in virtually any AOR. However, space systems and capabilities are not unlimited, and therefore must be prioritized, deconflicted, integrated, and synchronized across all joint operations.

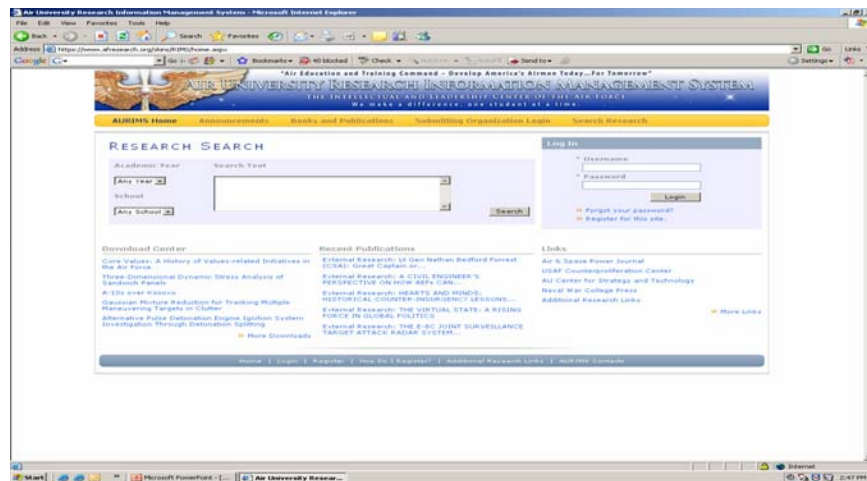
1. Command Relationships

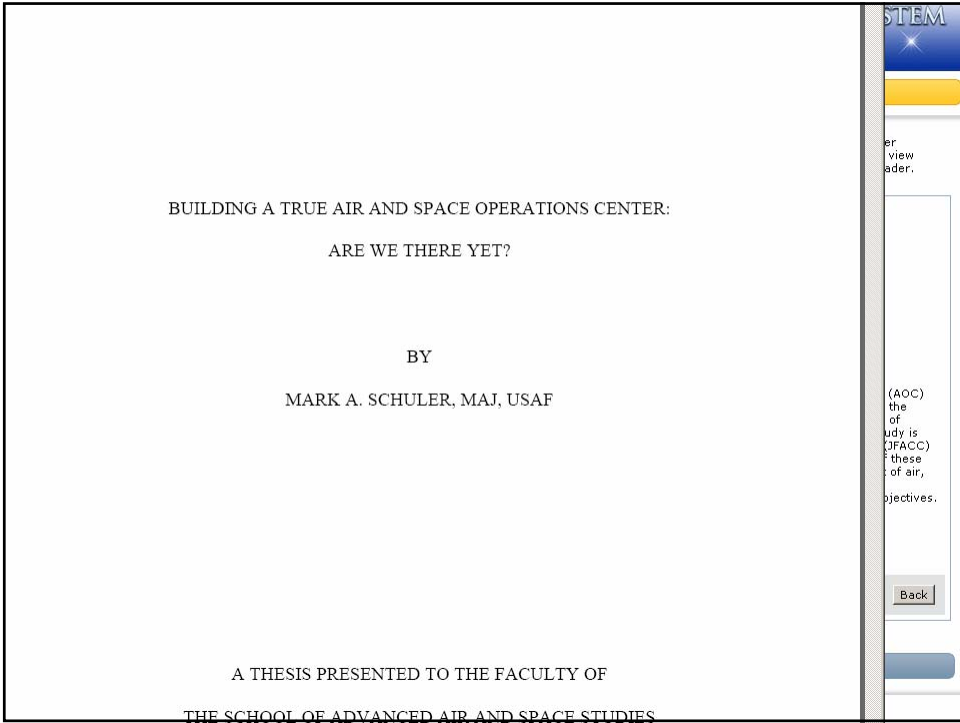
DOD space forces are an integral part of military operations. These forces are directed by USSPACECOM component commanders, consistent with Commander, USSPACECOM guidance to meet the requirements of the supported JFC, Commander, USSPACECOM, and the component commanders. During mission execution, Commander, USSPACECOM will normally retain OPCON of assigned military space forces through his component commanders. In most cases, space capabilities are available to the supported combatant commander, subordinate JFC, and/or subordinate commanders, but are not deployed to the JOA. At SecDef direction, Commander, USSPACECOM will transfer space forces or capabilities to the supported combatant commander, subordinate JFC, and/or subordinate commander, depending on the nature of the operation and the specific space capability to be employed. The appropriate command relationships (OPCON, tactical control [TACON], etc.) will then be established. As an example, Commander, USSPACECOM can deploy a JTAGS Detachment and transfer it (OPCON and/or TACON) to another combatant commander, subordinate JFC, and/or subordinate commander. Supported commanders requiring space forces and/or services must forward their requirements to the Chairman of the Joint Chiefs of Staff for approval by the Secretary of Defense.

2. Role of Non-Department of Defense Assets

a. The supporting commander can provide additional operational support by drawing on civil, commercial, national, and international space systems to augment military space capabilities. The use of non-US systems cannot be guaranteed, and may be used by the adversary as well.

Air University Research Information and Management System www.afresearch.org/





Ten Propositions Regarding Space Power

The Dawn of a Space Force

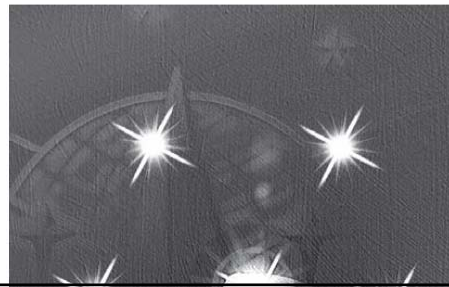
LT COL MARK E. HARTER, USAF

Editorial Abstract: Through an exhaustive historical review of space, multiple interviews with field professionals, and thorough examination of pertinent sources, Colonel Harter develops a list of fundamental propositions and keys to space power. From this discussion, he advocates that the logical consequence of these propositions for realizing the full potential of military space power is a separate and distinct space force, replete with its own doctrine, leadership, organization, and resources.

No one can predict with certainty what the ultimate meaning will be of mastery of space.

—Pres. John F. Kennedy, 1961

ON 4 OCTOBER 1957, the Soviet Union stunned the world by successfully launching the first artificial satellite, *Sputnik I*, into low Earth orbit (LEO). By repeating this feat within a month (*Sputnik II*), the Soviets made



U.S. Army Space & Missile Defense Command

www.smdc.army.mil/

(Serves as the Army's key space policy organization)

The screenshot shows the website for the U.S. Army Space & Missile Defense Command (SMDC/ABSTRAT). The page layout includes a header with the command's name and a navigation menu. A search bar is prominently displayed. The main content area features several news items, including a press release about the STS-127 mission and a mission statement. The mission statement describes the command's role in providing space and missile defense operations and intelligence. The website is viewed through a Microsoft Internet Explorer browser window.

Excerpt from 2006 Army Space Master Plan

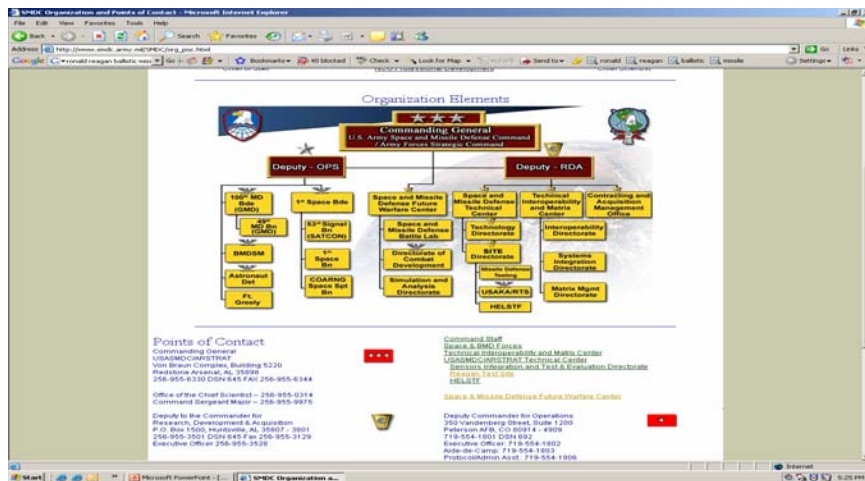
Future Scenario

In a future small, regional conflict (2020), a threat force launches a theater ballistic missile at US/coalition forces using a Transporter Erector Launch vehicle (TEL). The Space-Based Integrated Sensor (SEBIS) System detects the launch and tracks the missile through burn-out, providing data to the Joint Tactical Ground Station/Multi-Mission Mobile Processor (JTAGS/MMP). The JTAGS/MMP predicts the trajectory path from SEBIS data and passes that information to missile defense interceptors. It also provides missile warning messages to other appropriate theater network based on impact point predictions. SEBIS also provides a machine-to-machine cue, with the estimated launch point, to the Space Radar system. The Space Radar (SR) platform uses a real-time prioritizing algorithm (based on a priori rule sets) to re-track to collection order and repositions its antenna to provide radar moving target indicator coverage of the estimated launch point. The SR tracks the TEL when it begins to move to its hide site, and passes the track information through the Distributed Common Ground System to either the Joint Operations Center or the Joint Air Defense Operation Center for assigning a weapons platform to the TEL. Space Radar continues to provide track information to the assigned weapons platform while it is enroute, enabling the weapons platform to quickly locate and kill the target.

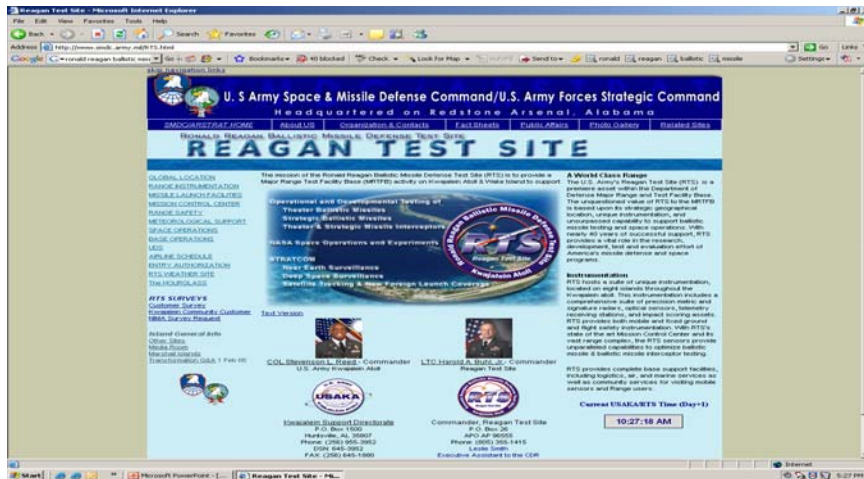
This scenario illustrates how space assets can be used to detect, track and assess ground threats/events and how that information can be used to support ground operations as described in the Joint Functional Concepts (EAB:space Awareness, C2, Force Application, and Protection). Space sensors, satellite communications and a position, velocity, navigation and timing system would each play a part in achieving the desired effects in this mission scenario.

Army Space Cadre complements traditional functional area experts in bringing space support to the Joint Functional Areas. This collective effort will enable scenarios like this

Army Space & Missile Defense Command Organizational Chart



Ronald Reagan Ballistic Missile Defense Test Site
www.smdc.army.mil/RTS.html



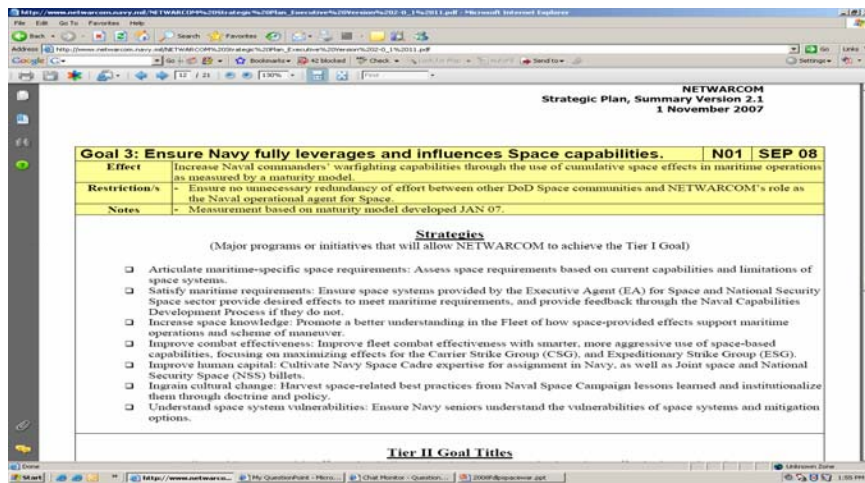
Reagan Site Central Pacific equatorial location ideal for tracking foreign launches and observing space satellites.



Netwarcom: Naval Network Warfare Command
www.netwarcom.navy.mil/
 (Serves as the Navy's key space policy organization)



Netwarcom Strategic Plan-Nov. 2007



Presidential Directives and National Security Council Documents (Courtesy: Federation of American Scientists)

www.fas.org/irp/offdocs/direct.html

The screenshot shows the website for the Federation of American Scientists' Intelligence Resource Program. The main heading is "Presidential Directives and Executive Orders". Below this is a table with three columns: "President", "Review Directive", and "Decision Directive".

President	Review Directive	Decision Directive
Truman		NSC
Eisenhower		NSC
Kennedy		NSAM
Johnson		NSAM
Nixon	NSRSM	NSDD
Ford	NSRSM	NSDD
Carter	PRM	PD
Reagan	NSRSM	NSDD
Bush	NSR	NSD
Clinton	PRD	PRD
GW Bush	NSDD	NSDD
VARIOUS		Executive Orders

Below the table, there is a paragraph explaining the role of the National Security Council (NSC) and a section for "Related Resources" with several links to external documents.

National Security Decision Memorandum 306 (U.S.-Japan Space Cooperation)-1975

The screenshot shows a scanned document titled "National Security Decision Memorandum 306, page 1 of 2". The document is dated September 24, 1975, and is addressed to the President. It discusses the U.S.-Japan Space Cooperation Agreement and the NSC's review of the agreement. The document includes a "SUMMARY" section and a "RECOMMENDATION" section.

SUMMARY: The President has reviewed the May 2, 1975, Under Secretaries Committee study of the U.S.-Japan Space Cooperation Agreement. He approved the recommendations of the NSC.

RECOMMENDATION: The NSC Agreement should be approved on the following basis:

- If requested by Japan and by U.S. industry, we would favorably consider the request, as consistent with national security requirements, including transfer of technology to the level of the 1953 Agreement, which was approved at the time the 1953 Agreement was concluded from the NSC's perspective and security technology would be included.
- We would seek to limit transfer of sensitive technology to the level of that in effect in 1953, except where appropriate technical criteria in paragraph 1 provide a basis for a transfer of more sensitive technology.
- Any transfer of sensitive technology to the level of technology to which in 1953 we provided space launching and technology assistance to other countries would be limited to the extent of a new agreement, which would be processed through NSC review procedures, and technology by Japan to third parties, and we would ensure that Japan not provide launch services to third parties without our approval. Any agreement for transfer of sensitive technology to the level of technology to which in 1953 we provided space launching and technology assistance to other countries would be processed through NSC review procedures, and we would ensure that Japan not provide launch services to third parties without our approval.

The document is marked "UNCLASSIFIED" at the bottom.

National Security Presidential Directive 49 (U.S. National Space Policy)-2006

The screenshot shows a Microsoft Internet Explorer browser window displaying the document titled "U.S. National Space Policy". The document is marked as "UNCLASSIFIED". It begins with a statement that the President authorized a new national space policy on August 31, 2006, which supersedes the 1966 policy. The document is divided into sections: "1. Background" and "2. Principles". The "Principles" section lists several key points, including the commitment to peaceful purposes, the rejection of claims of sovereignty, the goal of extending the benefits of space, the right of passage through space, and the protection of U.S. space capabilities.

U.S. National Space Policy

The President authorized a new national space policy on August 31, 2006 that establishes overarching national policy that governs the conduct of U.S. space activities. This policy supersedes [Presidential Decision Directive/Directive-4902/NSDD-9, National Space Policy](#), dated September 14, 1996.

1. Background

For five decades, the United States has led the world in space exploration and use and has developed a solid civil, commercial, and national security space foundation. Space activities have improved life in the United States and around the world, enhancing security, protecting lives and the environment, speeding information flow, serving as an engine for economic growth, and revolutionizing the way people view their place in the world and the cosmos. Space has become a place that is increasingly used by a host of nations, consortia, businesses, and entrepreneurs. In this new century, those who effectively utilize space will enjoy added prosperity and security and will hold a substantial advantage over those who do not. Freedom of action in space is as important to the United States as air power and sea power. In order to increase knowledge, discovery, economic prosperity, and to enhance the national security, the United States must have robust, effective, and efficient space capabilities.

2. Principles

The conduct of U.S. space programs and activities shall be a top priority, guided by the following principles:

- The United States is committed to the exploration and use of outer space by all nations for peaceful purposes, and for the benefit of all humanity. Consistent with this principle, "peaceful purposes" allow U.S. defense and intelligence-related activities in pursuit of national interests.
- The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right of the United States to operate in and acquire data from space.
- The United States will seek to cooperate with other nations in the peaceful use of outer space to extend the benefits of space, enhance space exploration, and to protect and promote freedom around the world.
- The United States considers space systems to have the right of passage through and operations in space without interference. Consistent with this principle, the United States will view purposeful interference with its space systems as an infringement on its rights.
- The United States considers space capabilities -- including the ground and space segments and supporting links -- vital to its national interests. Consistent with this policy, the United States will preserve its rights, capabilities, and freedom of action in space, dissuade or deter others from either impeding those rights or developing capabilities intended to do so, take those actions necessary to protect its space capabilities, respond to interference, and deny, if necessary, advances the use of space capabilities hostile to U.S. national interests.
- The United States will oppose the development of new legal regimes or other restrictions that seek to prohibit or limit U.S. access to or use of space. Proposed arms control agreements

NASA History Office Space Policy Documents

<http://hq.nasa.gov/office/pao/History/spdocs.html>

The screenshot shows the NASA History Office website page titled "Key Documents in the History of Space Policy". The page features a navigation menu on the left with options like "Home", "About", "History", and "Resources". The main content area lists key documents from the 1950s and 1960s. The 1950s section includes the National Aeronautics and Space Act of 1958, as amended, and recommendations regarding a national civil space program. The 1960s section includes a report on the Ad Hoc Panel on Man in Space, a report to the President's Ad Hoc Committee on Space, and President John F. Kennedy's Special Message to the Congress and his address at Rice University.

Key Documents in the History of Space Policy

1950s - 1960s - 1970s - 1980s - 1990s - 2000 and on

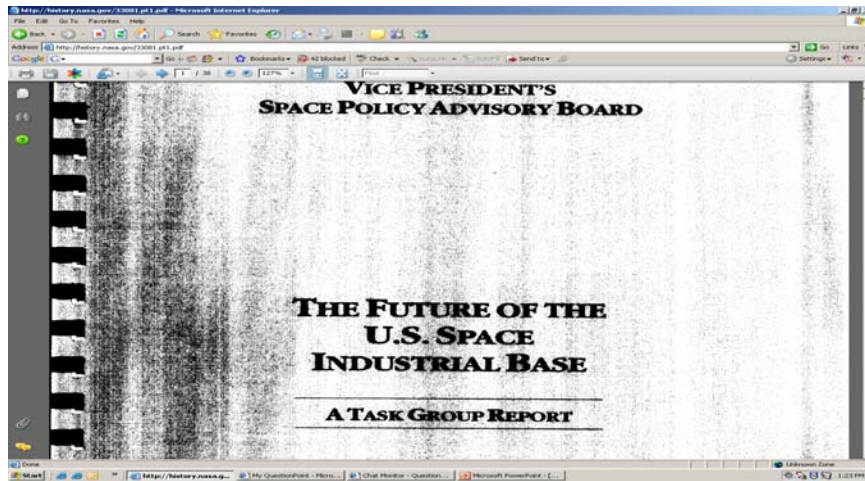
1950s

- National Aeronautics and Space Act of 1958, unamended
- National Aeronautics and Space Act of 1958, as amended
- National Aeronautics and Space Act of 1958, as amended with legislative history showing changes over time. The Office of General Counsel is currently updating this "codified" version.
- Recommendations to NASA Regarding a National Civil Space Program, October 1958
- Long Range Plan of the National Aeronautics and Space Administration, December 1958

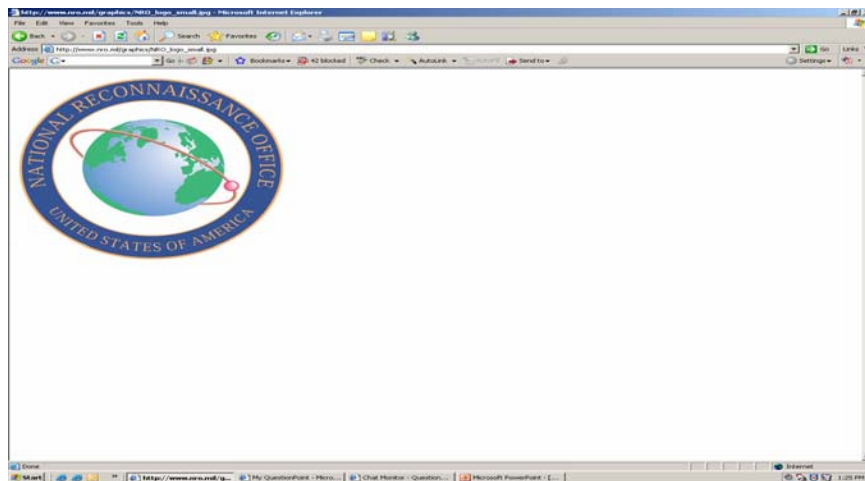
1960s

- Report of the Ad Hoc Panel on Man in Space, December 16, 1960
- Report to the President Elect of the Ad Hoc Committee on Space ("Winover Report"), January 10, 1961
- President John F. Kennedy's Special Message to the Congress on Urgent National Needs, May 25, 1961. In this famous speech, Kennedy proposed putting a human on the Moon by the end of the decade.
- President John F. Kennedy's Address at Rice University on the Nation's Space Effort, September 12, 1962. In this well-known speech, Kennedy stated that we explore space not because it is easy but because it is difficult.

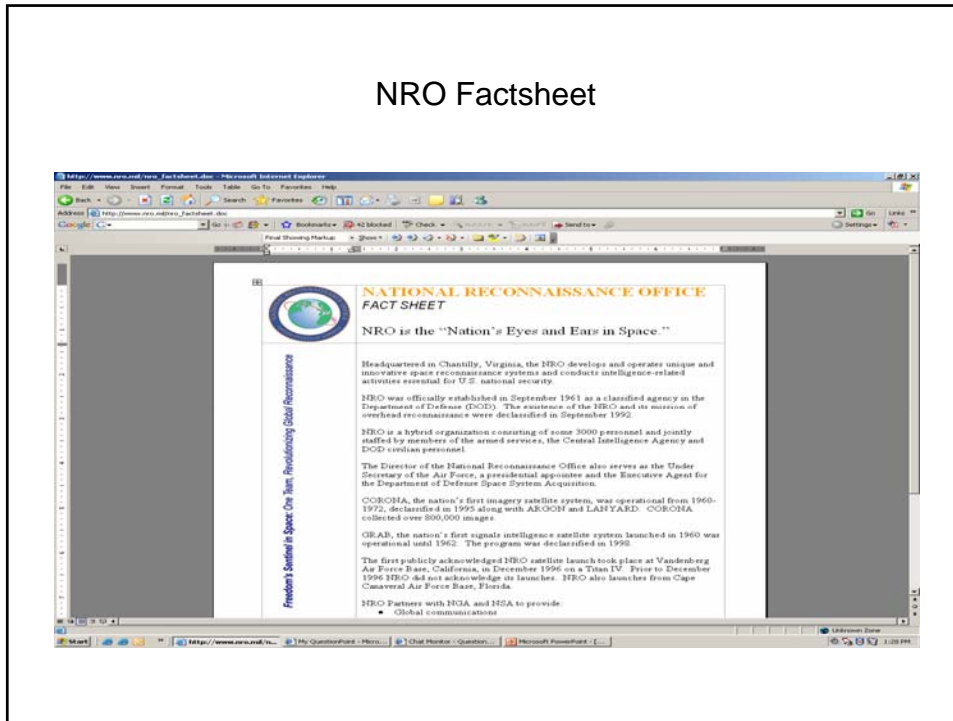
Future of U.S. Space Industrial Base (1992 report for
Vice President's Space Policy Advisory Board)



National Reconnaissance Office www.nro.mil/
Responsible for operating U.S. reconnaissance satellites for the CIA
and military



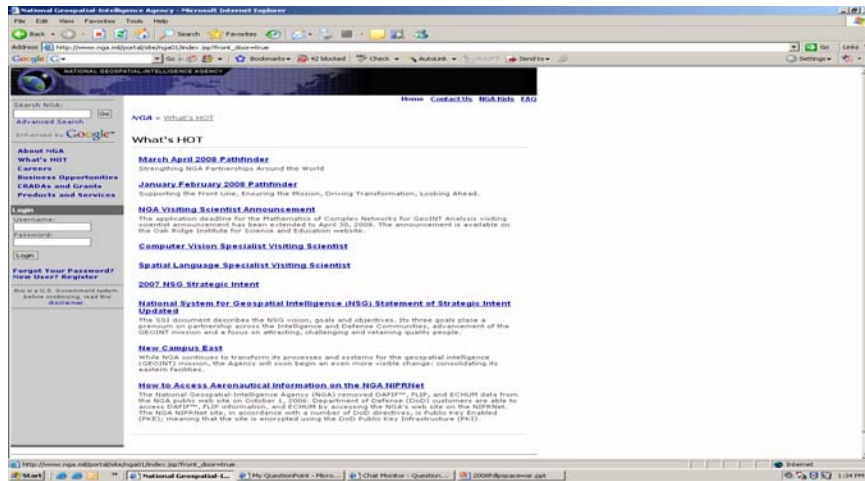
NRO Factsheet



Project Corona Imagery (Dolon Airfield, Soviet Union- Aug. 20, 1966)



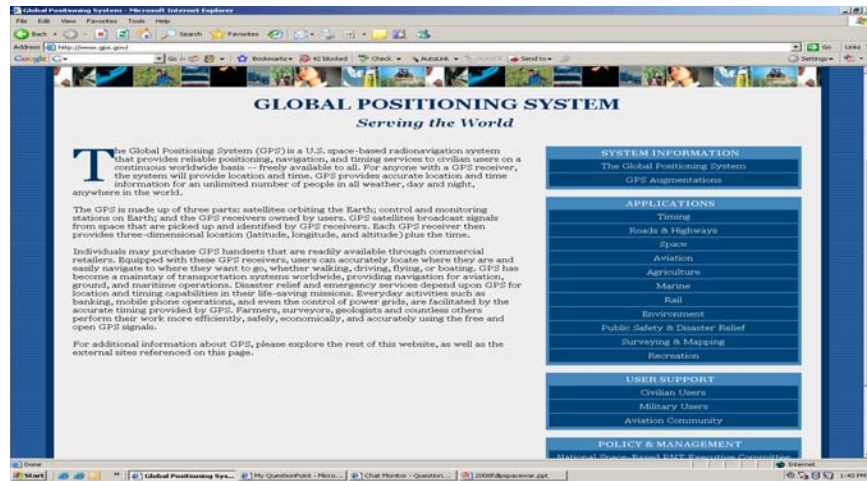
National Geospatial Intelligence Agency www.nga.mil/
 Responsible for providing timely, accurate, and responsive geospatial intelligence to support national security.



March/April 2008 issue of NGA Newsletter Pathfinder



Global Positioning System www.gps.gov/ Gateway for U.S. GPS activities

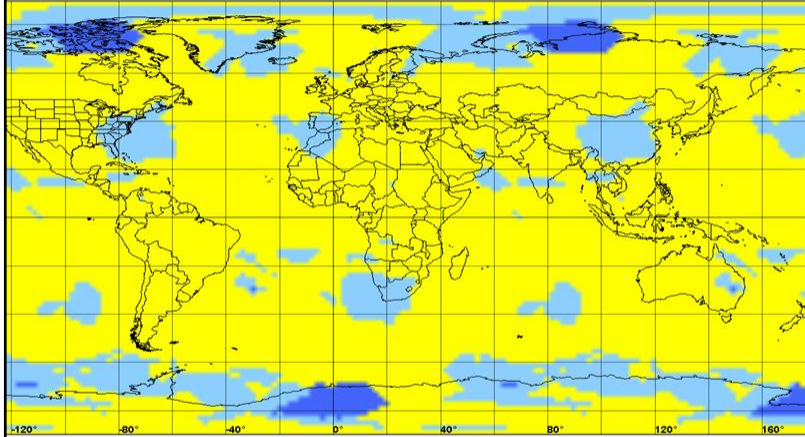


GPS Operations Center



World (Best 4) Max PDOP

UNCLASSIFIED



Start Time: 08 Mar 2008 00:00:00Z
 21:39:07 End Time: 08 Mar 2008 23:59:00Z
 Altitude: 0 ft HAE
 v02 Latitude Increment: 02° 00'
 v02 Longitude Increment: 002° 00'

Number of Channels: 4
 Mask Angle: 5°

■	> 12.0	□	0.0 - 2.0
■	9.0 - 12.0	■	6.0 - 9.0
■	4.0 - 6.0	■	2.0 - 4.0

ED

Academic

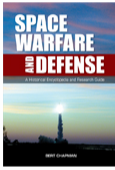
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[Online Catalog](#) > Space Warfare and Defense

Forthcoming

Space Warfare and Defense

A Historical Encyclopedia and Research Guide
 Bert Chapman



Publication Date	03/2008
Pages	360
Volumes	1
Size	7x10

Format	Price	ISBN	ISBN-13
Print	\$95.00	1-59884-006-1	978-1-59884-006-3
eBook	Call for price	1-59884-007-X	978-1-59884-007-0
Both	Call for price		

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Description

This timely resource provides a history of the development of space weapons and warfare strategies and a comprehensive reference guide to the growing literature on the subject.

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Concluding Quote

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