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United States—Masters of Space?

The US Space Command's "Vision for 2020"

Thoughts by Jonathan Granoff, President, Global Security Institute,
and Craig Eisendrath, Senior Fellow, Center for International Policy

December, 2005

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The US Space Command's glossy advocacy pamphlet "Vision for 2020" calls for the US to become "stewards for military space." Its premises are consistent with policies set forth by Secretary Rumsfeld as Chair of the Commission to Assess US National Security Space Management and Organization, issued January ll, 2002. "Vision 2020" sets out two principle themes:

- Dominating the space dimension of military operations to protect US interests and investment;
- Integrating space forces into warfighting capabilities across the full spectrum of conflict.

The vision of US "Full Spectrum Dominance" requires:

- Control of space
- Global engagement (world-wide situational awareness; defense against ballistic and cruise missiles, and the capability to hold at risk from space a small number of high value targets)
- Full force integration (the integration of space forces with air, land, and sea forces, enabling warfighters to take full advantage of space capabilities as an integral part of special, joint and combined warfare)

First Steps toward US Space Dominance
The value of outer space in future battle management in wartime for intelligence gathering, targeting, and weapons guidance, was lauded during the 2003 Iraq War. The US military makes no secret of its goal to become "Masters of Space." It is clearly stated in the "Long Range Plan" (LRP) of the US Space Command[1].

The US has recently deployed ground-based missile defense systems in Alaska and California, which are designed to impact missiles in outer space. Meanwhile, it is spending billions of dollars to research and eventually deploy anti-satellite and bombardments weapons in space. In addition to aspirations to explore innovations and extend defense planning horizons, as stated in the Plan, another justification for this expansion – Secretary of Defense Donald Rumsfeld's invocation of a "space Pearl Harbor" – appears a thin argument for such expenditures of treasure and good will. This exceedingly fearful posture ignores the fact that the US has more than sufficient force to dissuade any nation, including China and Russia, from attempting such an attack. It also ignores multilateral efforts, strongly supported by China and Russia and by virtually all US allies and friends, to pass a treaty outlawing space weaponization. U.S. opposition to treaty based approaches to outer space was reiterated in the 2006 National Space Policy[2]. Nor does the threat of terrorism justify the full weaponization of space, as terrorists have access to only the most primitive means of obstructing outer space activities.

Yet US plans for space dominance through weaponization are moving forward and advocates of the US weaponizing outer space appear to be succeeding. Today, the US accounts for over 90 percent of total global military space expenditures and maintains approximately 135 operational military-related satellites – over half of all military satellites in orbit. The Russians have approximately 60 in orbit[3], although today between 70 and 80% of these satellites have passed their effective life span. The Chinese are just beginning to use military satellites.[4] Theresa Hitchens, Vice President of the Center for Defense Information, estimates that total Department of Defense spending in space – both classified and unclassified – is about $22.5 billion in FY 2006, and is expected to increase by at least $1 billion a year over the next six years.[5]

Missile Defense and Space Weaponization

The ground-based system of missile defense in Alaska and California has yet to pass realistic battlefield tests, and has not overcome the problem of distinguishing between decoys and warheads. No expansion of this system is being planned. Rather, the US is moving ahead with its plans to use outer space as the venue for missile defense. One system – the Space-Based Laser – if deployed, would operate in low-earth orbit and would seek to destroy hostile ballistic missiles during their boost phase.[6] The US Missile Defense Agency is also developing an experimental constellation of space-based missile interceptors that it plans to launch in 2012, which would seek to destroy their targets through kinetic contact.[7] Another system, under consideration, would create a constellation of orbiting, kinetic kill microvehicles designed to destroy enemy intercontinental ballistic missiles in their boost phase. The Space-Based Infrared System, which is to be used to guide all ballistic missile defense projects including all types of interception – boost-phase, mid-course, and terminal-phase – will begin to be launched in 2006, and the full constellation of about thirty satellites is expected to be in orbit by 2011.[8]

All of these systems, including the deployment of ground-based missile defenses in Alaska and California, have been made possible by the US withdrawing from the Anti-Ballistic Missile (ABM) Treaty of 1972, first announced by President Bush in December of 2001, and effective six months later. This was the first arms treaty which had been canceled through presidential action.

Anti-Satellite Weapons

The US is developing the Near-Field Infra Red Experiment, or NFIRE satellite, which seeks to track and kill missiles and satellites.[9] Longer-term US plans include deployment of a test-bed of three to six space-based interceptors by 2011-2012.[10]

Bombardment Satellites

Although no direct strike weapons have been tested or deployed, one system being researched is the long-rod penetrator, or "Rods from God." This system would dispatch orbital tungsten or uranium rods that would enter the earth's atmosphere at a speed of 7,200 miles per hour to penetrate bunkers and heavily reinforced facilities.[11] Still another system, the Evolutionary Air and Space Global Laser Engagement, or EAGLE, is being designed to put mirrors underneath a huge airship. Lasers, fired from the ground, the air, or from space, would bounce off these blimp-borne mirrors to track or destroy enemy missiles.[12] The US is also considering bombardment satellites using a range of explosive systems which could hit targets on earth from low earth orbit.

Use of Commercial Satellites for Military Purposes
Most commercial satellites can be used for both military and civilian purposes. These include satellites in the Global Positioning System, which is designed and controlled by the US Department of Defense. This system in wartime is used to identify targets and provide the basis for guiding weapons to hit their targets with pinpoint accuracy, as it was in Iraq with devastating effect. Given US military control of this system, both the European Union and Russia have developed positioning systems of their own. In addition, civilian satellites are used to map the world, chart and predict weather, and effect communications from telephoning to virtual conferences to international broadcasting. These satellites are also subject to military uses, and were used extensively during the Iraq wars. Given the growing use of outer space for military uses, international tension has developed over the appropriation of scarce orbital slots and radio frequency bands for military satellites.

The Militarization of Space
Since the beginning of the space age, positioning, communication and weather satellites have worked effectively to knit the planet together. Information is immediately exchanged; areas hitherto out of communication with the rest of the world are now in the global communication system. Weather prediction and world mapping have increased factorially in accuracy. Scientific exploration of the solar system, our galaxy and the universe can now proceed with space-based equipment and sometimes space-based scientists. In addition, there is close cooperation between the eleven space launching nations and over fifty other states which use their launching facilities. World income from outer space is today in the hundreds of billions of dollars. All this is at risk should space be weaponized, and should it become the venue for battle. Not only would all satellites be vulnerable because of their dual-use, but also the orbital debris caused by military actions would jeopardize the operation of all satellites, particularly in low-earth orbit.

Toward an Open Debate on Cooperation as a Course
Weaponization could encourage a costly and dangerous arms race in outer space. Responses will be assured since others will not want to be dominated. Nearly every country in the world but the US supports the preservation of space from weaponization. This is consistent with the aspirations contained in the Outer Space Treaty. Is it not time to codify these aspirations in a formal legal regime? How can we call for effective cooperation in addressing protection of the environment, fighting terrorism, eliminating gross disparities of wealth, controlling the spread of weapons of mass destruction, while pursuing unilateral “full spectrum dominance?” Can we truly expect cooperation in non-proliferation efforts while flaunting cooperative security as a principle so brazenly? What message does America want to send as we promote the rule of law?

It is obviously time to take this issue out of stealth and into the sunshine of public discourse and analysis. A cooperative approach to space security is preferred. Should we not seek to create an enforcement system which could provide adequate assurances and security for all parties, and avoid an expensive and highly dangerous arms race in outer space?

[1] See: http://www.fas.org/spp/military/docops/usspac/lrp/toc.htm

[2] See: http://www.ostp.gov/html/US%20National%20Space%20Policy.pdf

[3] See: http://cns.miis.edu/research/space/russia/mil.htm

[4] Simon Collard-Wexler, Jessy Cowan-Sharp, Sarah Estabrooks, Ambassador Thomas Graham Jr., Dr. Robert Lawson, Dr. William Marshall, Space Security 2004, Northview Press, Ltd., p. xv.

[5] Report on e-Parliament Conference on Space Security, September 14, 2005, 2105 Rayburn House Office Building, Washington, D.C., p. 16.

[6] Theresa Hitchens, "Weapons in Space: Silver Bullet or Russian Roulette?", Center for Defense Information, April 18, 2002.

[7] Jeremy Singer, Space News, April 18, 2005.

[8] See "Space-Based Laser Put on Hold," *Arms Control Today* News Briefs, December 2002, cited in Space Security 2004, p. 129.

[9] David Barton et al., "Report of the APS Study Group on Boost-Phase Intercept Systems for National Missile Defense," American Physical Society, July 15, 2003, cited in Space Security 2004, p. 144.

[10] Space Security 2004, p. 140.

[11] Theresa Hitchens, "Weapons in Space: Silver Bullet or Russian Roulette," Center for Defense Information," p. 7

[12] Noah Schachtman, "Pentagon Preps for War in Space," February 20, 2004, http://www.wired.com/news/technology/0,1282,62358,00/html.

13 PRACTICAL STEPS
EXCERPTED FROM THE FINAL DOCUMENT OF THE NPT 2000 REVIEW CONFERENCE

The Conference agrees on the following practical steps for the systematic and progressive efforts to implement Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons and paragraphs 3 and 4 (c) of the 1995 Decision on "Principles and Objectives for Nuclear Non-Proliferation and Disarmament":

1. The importance and urgency of signatures and ratifications, without delay and without conditions and in accordance with constitutional processes, to achieve the early entry into force of the Comprehensive Nuclear-Test-Ban Treaty.

2. A moratorium on nuclear-weapon-test explosions or any other nuclear explosions pending entry into force of that Treaty.

3. The necessity of negotiations in the Conference on Disarmament on a non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices in accordance with the statement of the Special Coordinator in 1995 and the mandate contained therein, taking into consideration both nuclear disarmament and nuclear non-proliferation objectives. The Conference on Disarmament is urged to agree on a programme of work which includes the immediate commencement of negotiations on such a treaty with a view to their conclusion within five years.

4. The necessity of establishing in the Conference on Disarmament an appropriate subsidiary body with a mandate to deal with nuclear disarmament. The Conference on Disarmament is urged to agree on a programme of work which includes the immediate establishment of such a body.

5. The principle of irreversibility to apply to nuclear disarmament, nuclear and other related arms control and reduction measures.

6. An unequivocal undertaking by the nuclear-weapon States to accomplish the total elimination of their nuclear arsenals leading to nuclear disarmament to which all States parties are committed under Article VI.

7. The early entry into force and full implementation of START II and the conclusion of START III as soon as possible while preserving and strengthening the ABM Treaty as a cornerstone of strategic stability and as a basis for further reductions of strategic offensive weapons, in accordance with its provisions.

8. The completion and implementation of the Trilateral Initiative between the United States of America, the Russian Federation and the International Atomic Energy Agency.

9. Steps by all the nuclear-weapon States leading to nuclear disarmament in a way that promotes international stability, and based on the principle of undiminished security for all:
   * Further efforts by the nuclear-weapon States to reduce their nuclear arsenals unilaterally.
   * Increased transparency by the nuclear-weapon States with regard to the nuclear weapons capabilities and the implementation of agreements pursuant to Article VI and as a voluntary confidence-building measure to support further progress on nuclear disarmament.
   * The further reduction of non-strategic nuclear weapons, based on unilateral initiatives and as an integral part of the nuclear arms reduction and disarmament process.
   * Concrete agreed measures to further reduce the operational status of nuclear weapons systems.
   * A diminishing role for nuclear weapons in security policies to minimize the risk that these weapons ever be used and to facilitate the process of their total elimination.
   * The engagement as soon as appropriate of all the nuclear-weapon States in the process leading to the total elimination of their nuclear weapons.

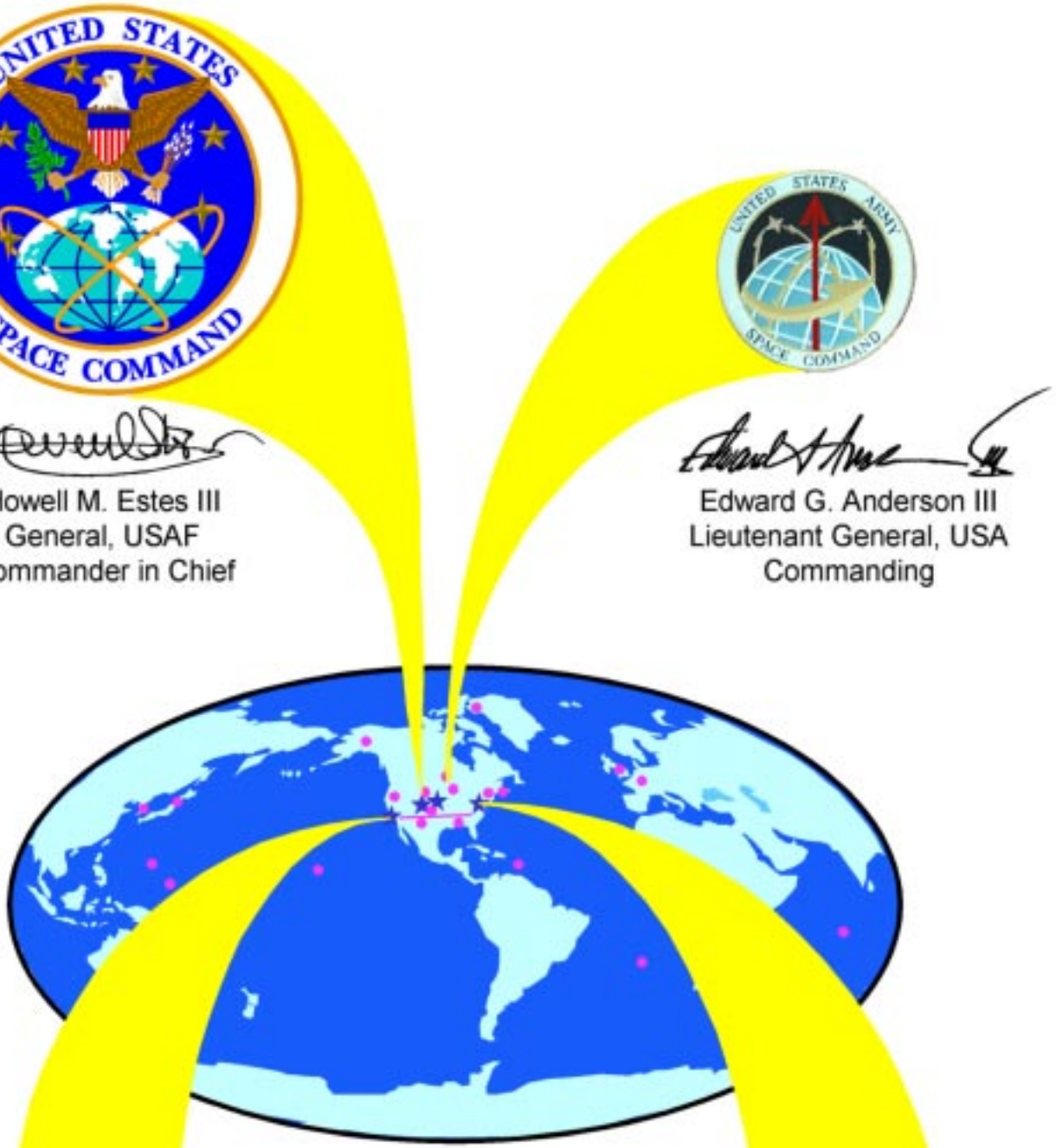
10. Arrangements by all nuclear-weapon States to place, as soon as practicable, fissile material designated by each of them as no longer required for military purposes under IAEA or other relevant international verification and arrangements for the disposition of such material for peaceful purposes, to ensure that such material remains permanently outside of military programmes.

11. Reaffirmation that the ultimate objective of the efforts of States in the disarmament process is general and complete disarmament under effective international control.

12. Regular reports, within the framework of the NPT strengthened review process, by all States parties on the implementation of Article VI and paragraph 4 (c) of the 1995 Decision on "Principles and Objectives for Nuclear Non-Proliferation and Disarmament", and recalling the Advisory Opinion of the International Court of Justice of 8 July 1996.

13. The further development of the verification capabilities that will be required to provide assurance of compliance with nuclear disarmament agreements for the achievement and maintenance of a nuclear-weapon-free world.


United States Space Command
VISION
FOR
2020



Howell M. Estes III
General, USAF
Commander in Chief

Edward G. Anderson III
Lieutenant General, USA
Commanding

David L. Vesely
Major General, USAF
Commander

K. A. Laughton
Rear Admiral, USN
Commander

Feb 1997

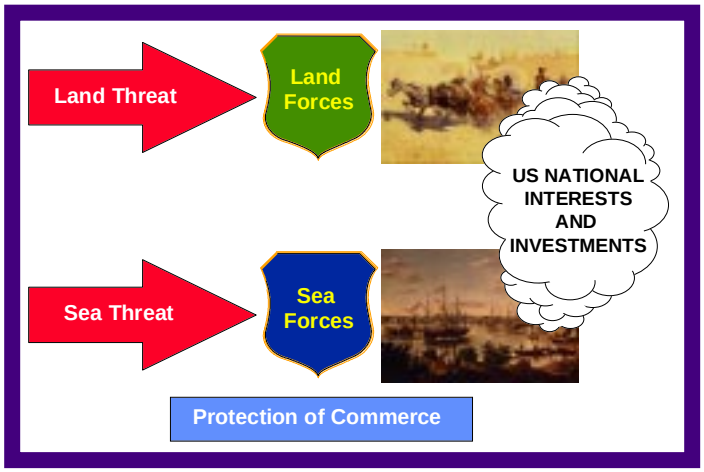
GENERAL HOWELL M. ESTES III

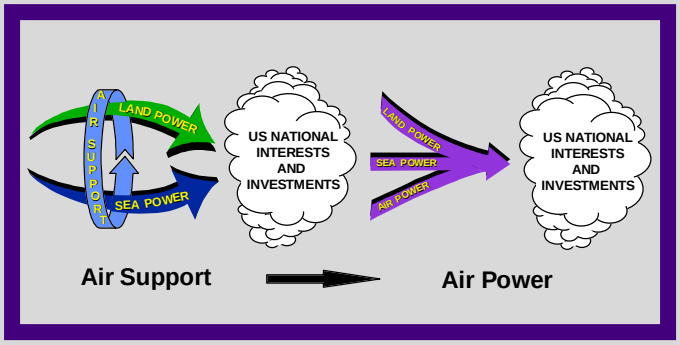
"The increasing reliance of US military forces upon space power combined with the explosive proliferation of global space capabilities makes a space vision essential. As stewards for military space, we must be prepared to exploit the advantages of the space medium. This Vision serves as a bridge in the evolution of military space into the 21st century and is the standard by which United States Space Command and its Components will measure progress into the future."

US Space Command--*dominating* the space dimension of *military operations* to protect US interests and *investment.* Integrating Space Forces *into warfighting* capabilities across the *full spectrum* of conflict.

A Historic Perspective—the Evolution of Space

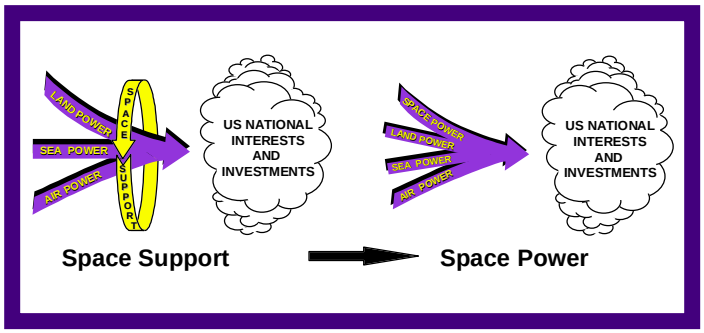
Historically, military forces have evolved to protect national interests and investments -- both military and economic. During the rise of sea commerce, nations built navies to protect and enhance their commercial interests. During the westward expansion of the continental United States, military outposts and the cavalry emerged to protect our wagon trains, settlements, and railroads.





As air power developed, its primary purpose was to support and enhance land and sea operations. However, over time, air power evolved into a separate and equal medium of warfare.

The emergence of space power follows both of these models. Over the past several decades, space power has primarily supported land, sea, and air operations--strategically and operationally. During the early portion of the 21st century, space power will also evolve into a separate and equal medium of warfare. Likewise, space forces will emerge to protect military and commercial national interests and investment in the space medium due to their increasing importance.



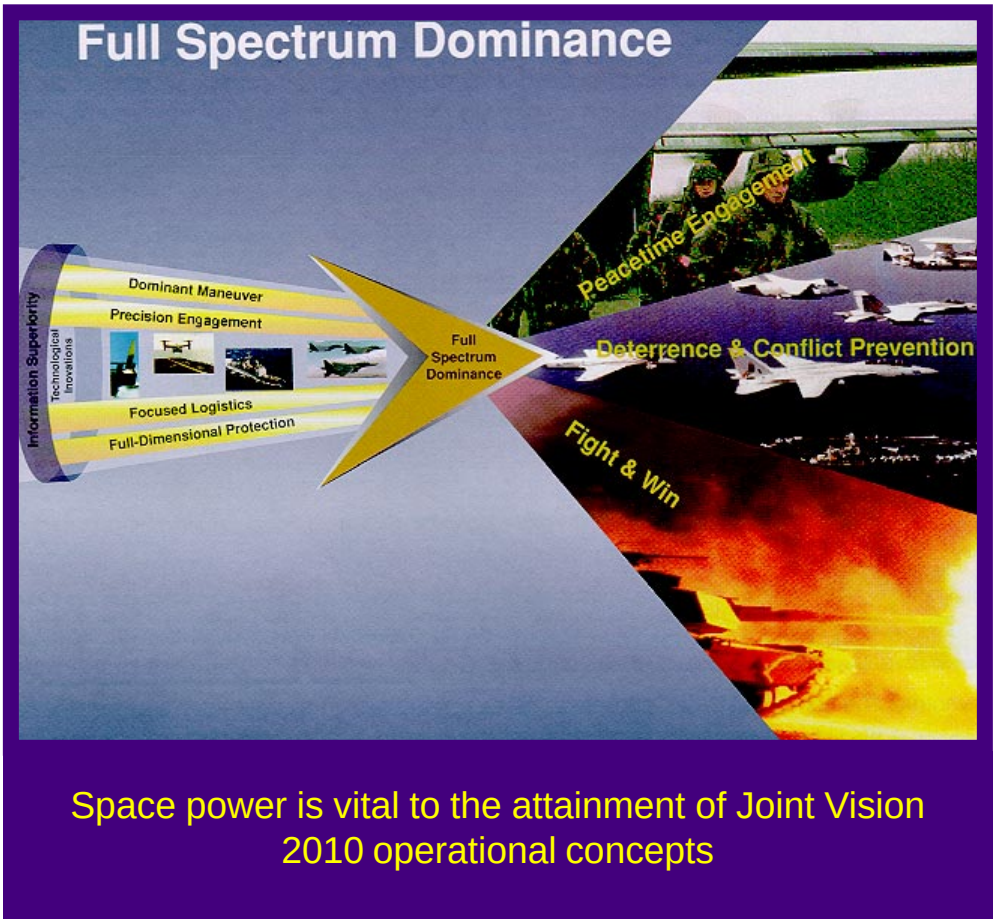
"Joint Vision 2010 provides an operationally based template for the evolution of the Armed Forces for a challenging and uncertain future. It must become a benchmark for Service and Unified Command visions."

GEN John M. Shalikashvili
Chairman of the Joint Chiefs of Staff

Joint Vision 2010

The medium of space is the fourth medium of warfare--along with land, sea, and air. Space power (systems, capabilities, and forces) will be increasingly leveraged to close the ever-widening gap between diminishing resources and increasing military commitments.

The Joint Vision 2010 operational concepts of **dominant maneuver, precision engagement, full-dimensional protection, and focused logistics** are enabled by information superiority and technological innovation. The end result of these enablers and concepts is **Full Spectrum Dominance. Information superiority** relies heavily upon space capabilities to collect, process, and disseminate an uninterrupted flow of information while denying an adversary's ability to fully leverage the same.



Space power is vital to the attainment of Joint Vision 2010 operational concepts

The emerging synergy of space superiority with land, sea, and air superiority, will lead to Full Spectrum Dominance. Space forces play an increasingly critical role in providing situational awareness (e.g., global communications; precise navigation; timely and accurate missile warning and weather; and intelligence, surveillance, and reconnaissance [ISR]) to US forces.

Space doctrine, organizations, training, materiel, leadership, and personnel will evolve to fully realize the potential of space power. Space power is a vital element in moving towards the Joint Vision goal of being **persuasive in peace, decisive in war, and preeminent in any form of conflict.**

Information superiority relies heavily upon space capabilities

Future Trends

Although unlikely to be challenged by a global peer competitor, the United States will continue to be challenged regionally. The globalization of the world economy will also continue, with a widening between "haves" and "have-nots." Accelerating rates of technological development will be increasingly driven by the commercial sector -- not the military. Increased weapons lethality and precision will lead to new operational doctrine. Information-intensive military force structures will lead to a highly dynamic operations tempo.

Accelerating rates of change will create challenges

The challenge extends to space

Space Trends

Space systems, commercial and military, are proliferating throughout the world. Space commerce is becoming increasingly important to the global economy. Likewise, the importance of space capabilities to military operations is being widely embraced by many nations.

Indeed, so important are space systems to military operations that it is unrealistic to imagine that they will never become targets. Just as land dominance, sea control, and air superiority have become critical elements of current military strategy, space superiority is emerging as an essential element of battlefield success and future warfare.

Implications for US Space Command

The political, economic, technological, and military trends hold significant implications for USSPACECOM. An increased dependence upon space capabilities may lead to increased vulnerabilities. As space systems become lucrative military targets, there will be a critical need to control the space medium to ensure US dominance on future battlefields. Robust capabilities to ensure space superiority must be developed--just as they have been for land, sea, and air.

Our adversaries can be expected to attain ready access to space-derived information through the proliferation of space systems. Turnkey space systems are available to nations with the necessary resources allowing for significant increases in capabilities in a relatively short time. Military use of civil, commercial, and international space systems will continue to increase. However, the military must preserve certain core space capabilities, e.g., missile warning, assured space communications, and large portions of ISR. Other space capabilities, once the domain of the military, can reasonably migrate to the civil and commercial sectors, e.g., weather, GPS, and multispectral imagery.

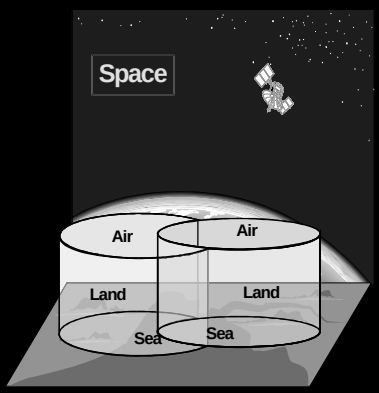
Space systems will be targets

Space superiority is essential

Space operations must be fully integrated with land, sea, and air operations. USSPACECOM must assume a dynamic role in planning and executing joint military operations. Included in that planning should be the prospects for space defense and even space warfare.

Development of ballistic missile defenses using space systems and planning for precision strike from space offers a counter to the worldwide proliferation of WMD.

Space as an Area of Responsibility (AOR)



Space is a region with increasing commercial, civil, international, and military interests and investments. The threat to these vital systems is also increasing. The space AOR is global and requires a combatant commander with a global perspective to conduct military operations and support regional warfighting CINCs. USSPACECOM is the only military organization with operational forces in space. Establishing space as an AOR merely states an operational reality.

USSPACEC

Vision

Just as land, sea, and air warfare has evolved, USSPACECOM, operating in the space medium, will evolve to perform the missions required by the future environment foreseen in the trends and implications on the preceding pages. This Vision charts a course to purposeful and orderly change.

The two principal themes of the USSPACECOM Vision are **dominating the space medium** and **integrating space power** throughout military operations. Today, the United States is the preeminent military space power. Our Vision is one of maintaining that preeminence -- providing a solid foundation for our national security.

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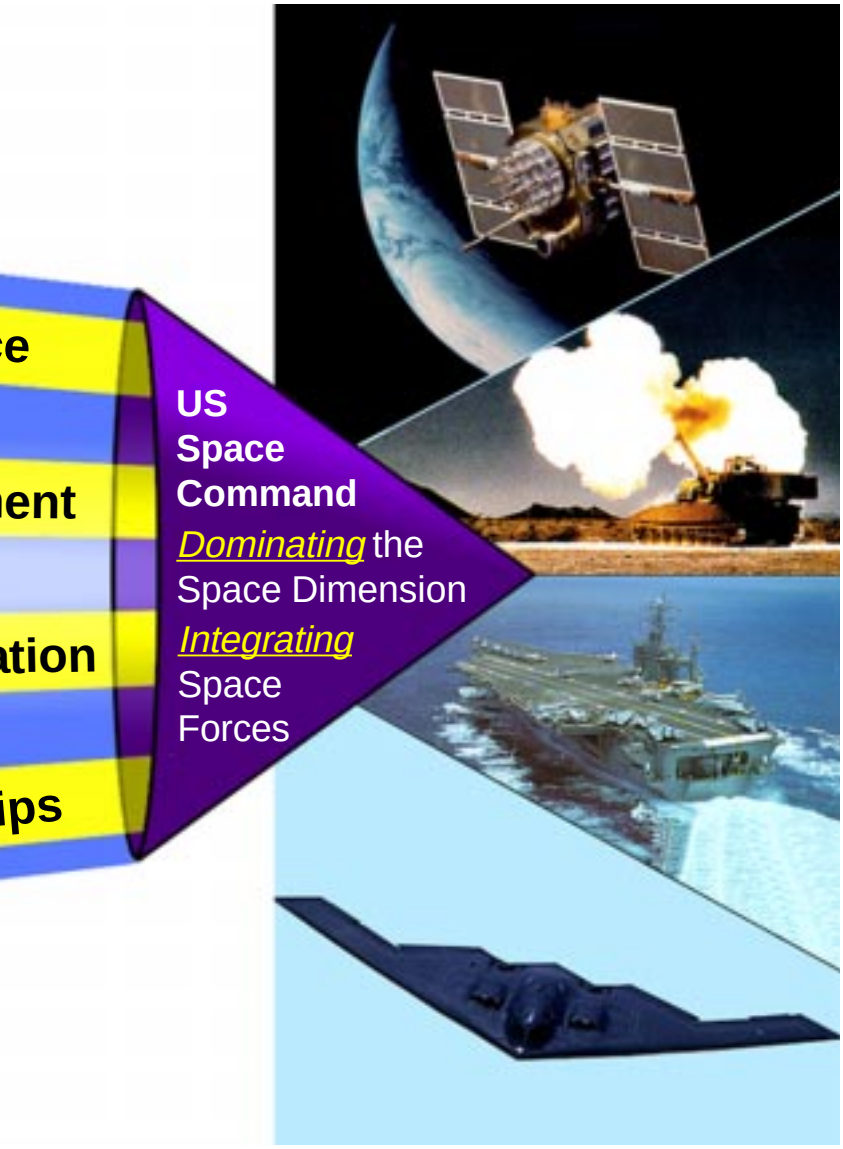

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Operational Concepts

To move towards the attainment of our Vision, we have adopted four operational concepts:

- **Control of Space**
- **Global Engagement**
- **Full Force Integration**
- **Global Partnerships**

These operational concepts provide the conceptual framework to transform the Vision into capabilities.

US Space
Dominating the space dimension of military operations
Integrating Space Forces into warfighting

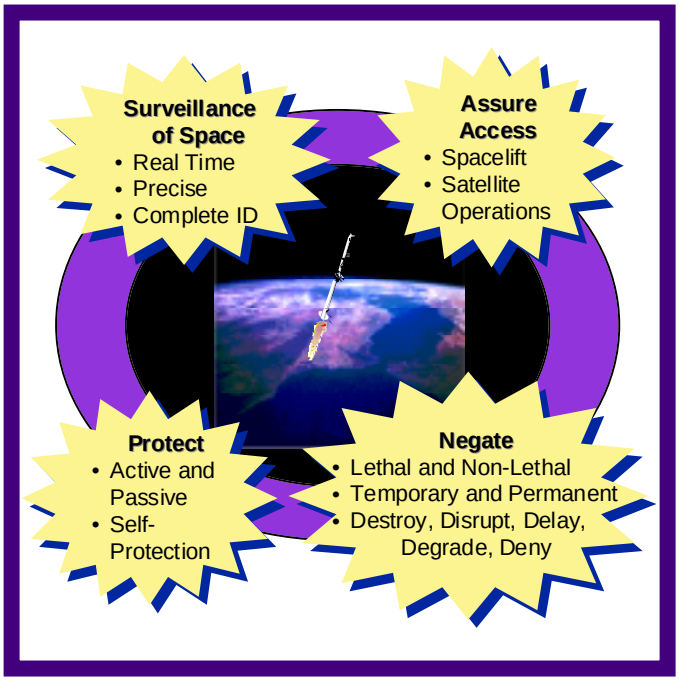
Control of Space

Control of Space is the ability to assure access to space, freedom of operations within the space medium, and an ability to deny others the use of space, if required.

The medium of space is recognized as the fourth medium of warfare. Joint operations require the **Control of Space** to achieve overall campaign objectives. The **Control of Space** will encompass protecting US military, civil, and commercial investments in space.

As commercial space systems provide global information and nations tap into this source for military purposes, protecting (as well as negating) these non-military space systems will become more difficult. Due to the importance of commerce and its effects on national security, the United States may evolve into the guardian of space commerce--similar to the historical example of navies protecting sea commerce.

Control of Space is a complex mission that casts USCINCSPACE in a classic warfighter role and mandates an established AOR.



The ability to dominate space

Control of Space Capabilities

- **Real-time space surveillance**
- **Timely and responsive spacelift**
- **Enhanced protection (military and commercial systems)**
- **Robust negation systems**

Command
to protect US national interests and investment.
capabilities across the full spectrum of conflict.

Global Engagement

Global Engagement is the application of precision force from, to, and through space. USSPACECOM will have a greatly expanded role as an active warfighter in the years ahead as the combatant command responsible for National Missile Defense (NMD) and space force application. **Global Engagement** combines global surveillance with the potential for a space-based global precision strike capability.

The requirement for **Global Engagement** is based upon the increasing proliferation of missile systems, the requirement for precision strike, and the need for effective forward presence with reduced forward basing.

The proliferation of missiles and weapons of mass destruction (WMD) requires an NMD. NMD will evolve into a mix of ground and space sensors and weapons.

Existing land, sea, and air missions will be enhanced by space systems. Current sea and air strategic attack missions will be augmented by the deployment of space force application systems. Likewise, surface and air surveillance systems (e.g., AWACS and JSTARS) will be augmented by space-based surveillance systems.

Strategic Deterrent and Precision Strike

Global Engagement Capabilities

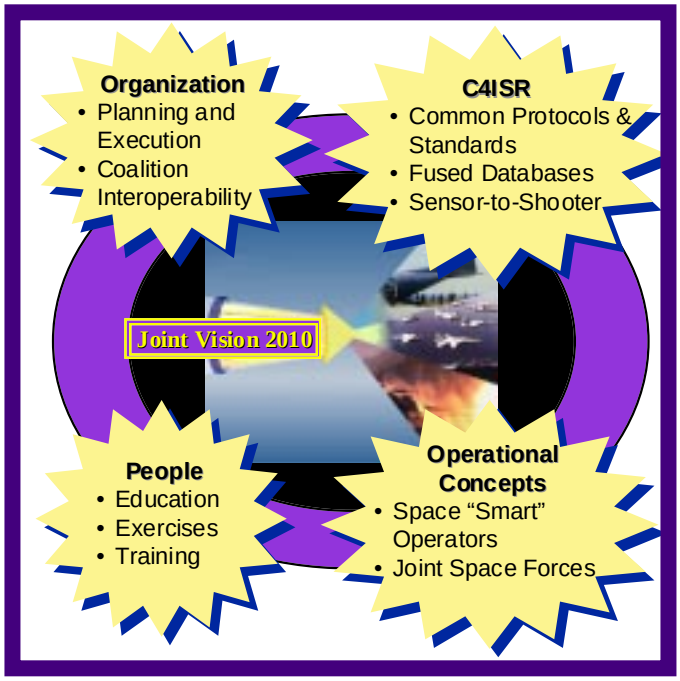
- **Non-intrusive global surveillance**
- **Key to National Missile Defense**
- **Enhanced C2**
- **Space-based strike weapons**

US Space
Dominating the space dimension of military operations
Integrating Space Forces into warfighting

Full Force Integration

Full Force Integration is the integration of space forces and space-derived information with land, sea, and air forces and their information. The bottom line is that space power will contribute to getting the right military capability and information to the right people, at the right place, at the right time.

Space forces must be fully integrated in all planning, training, exercises, and operations. **Full Force Integration** includes the merging of information and information systems into a "system of systems" approach. The goal is to achieve the same level of joint operations between space and the other mediums of war-fighting as land, sea, and air currently enjoy today. Innovative organizations, operational concepts, information flows, and people are key elements of **Full Force Integration**. Of these, the dedicated professionals that fill our ranks are our most indispensable assets.



Truly joint military forces require fully integrated space power

Full Force Integration Capabilities

- **Enhanced "sensor-to-shooter"**
- **Common protocols, communications standards, and fused databases**
- **Precise modeling and simulation**
- **"One-stop shop" for space support**

Command
to protect US national interests and investment.
capabilities across the full spectrum of conflict.

Global Partnerships

Global Partnerships augments military space capabilities through the leveraging of civil, commercial, and international space systems. The growth of non-US military space systems provides the opportunity for the United States to gain increased battlespace awareness and information connectivity in a cost-effective manner. These partnerships provide shared costs, shared risks, and increased opportunities.

Global Partnerships is based upon these factors:

- Dramatic growth in commercial and international space-based capabilities. The development of advanced space systems will be primarily driven by the commercial sector
- Constrained military spending
- Growth in multi-national operations and alliances

A fundamental change in space operations

The most evident benefit of **Global Partnerships** will be decreased pressure on existing military infrastructure and operations, and reduced maintenance costs by off loading functions to civil and commercial providers. The military can no longer rely solely upon DoD owned and operated capabilities.

Global Partnerships--a fundamental change in providing military space support to the warfighter.

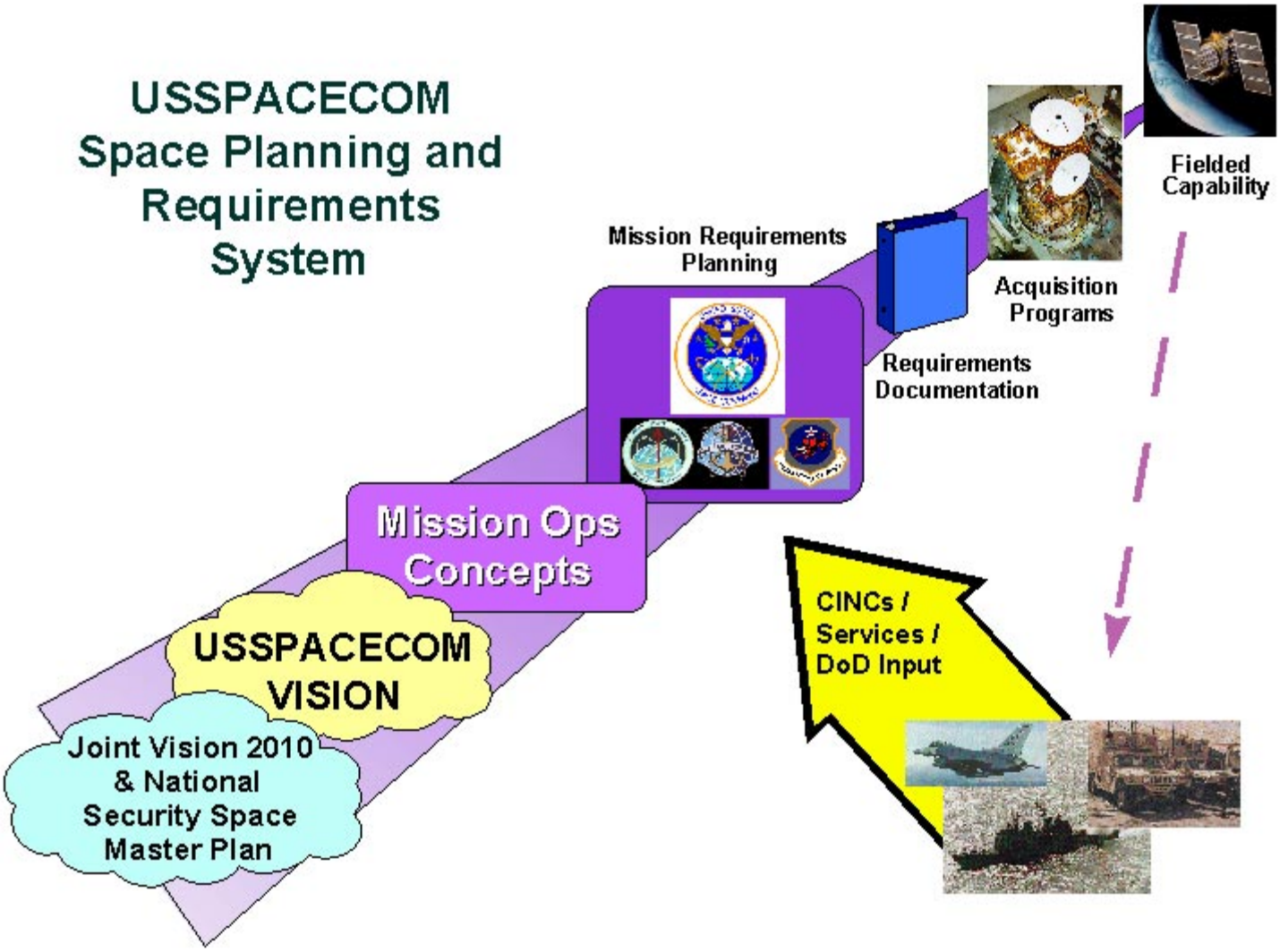
Global Partnerships Concepts

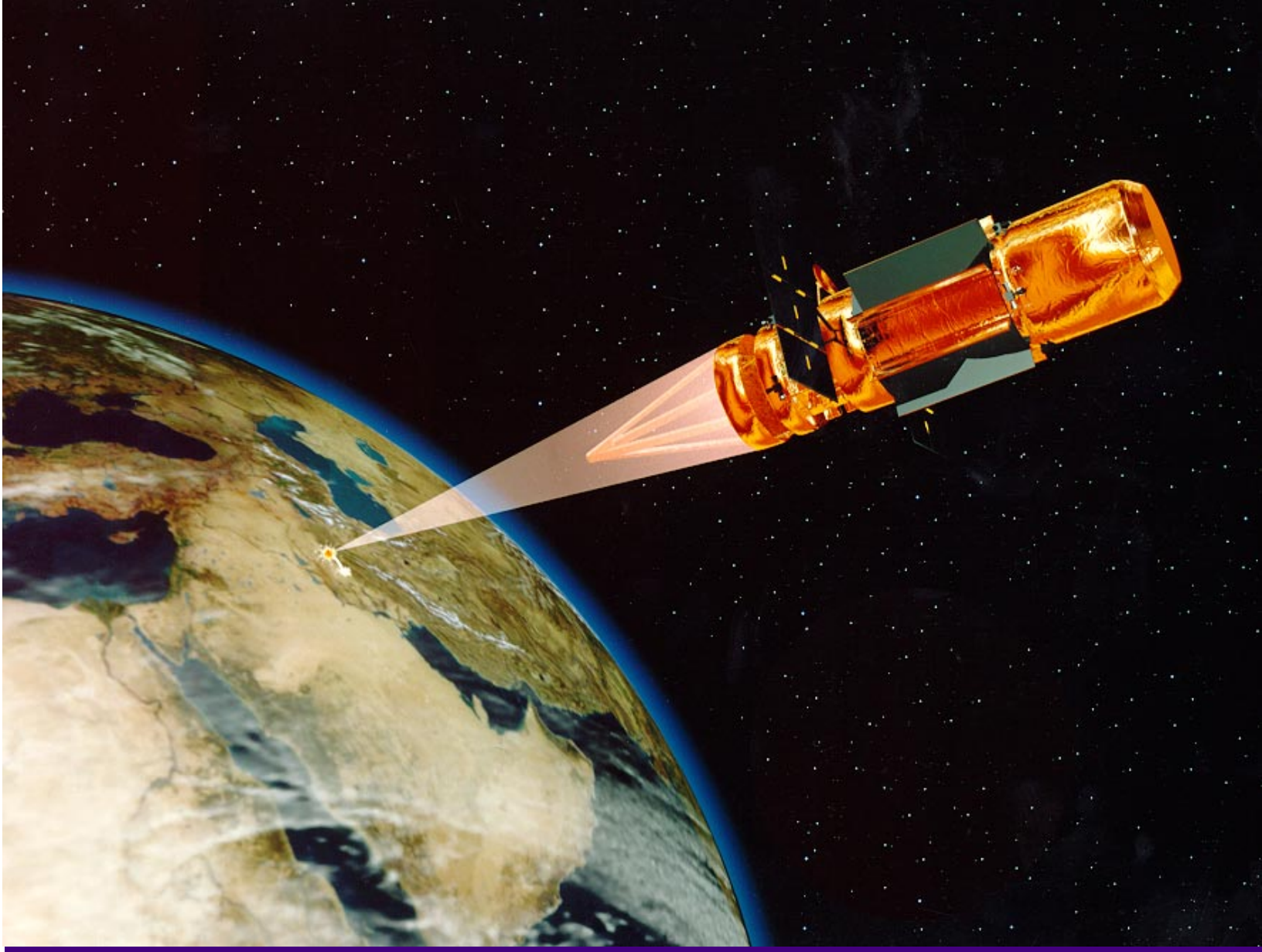
- **Sharing of space-based information**
- **Influencing space system designs**
- **Satellite sharing**
- **Space system architectures to facilitate rapid flow of information**
- **International standardization**

Implementation

The United States Space Command's Space Planning and Requirements System (SPRS) is the established process that will be used to implement this Vision. This end-to-end planning system uses Joint Vision 2010, the National Security Space Master Plan, and the United States Space Command Vision as overarching guidance.

Annually, we assess current and future space requirements, capabilities, and shortfalls in support of all warfighters. With our Vision, we will extend our time horizons from the Future Years Defense Plan to 2020. External organizations (e.g., CINCs, Services, National and Defense organizations) provide valuable input throughout the SPRS process. We fully expect that our Vision and SPRS will drive long-term changes in space doctrine, organizations, training, materiel, leadership, and personnel.





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