# Joint Space Doctrine: Catapulting into the Future

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> [Desert Storm] *was the first space war*
>
> —Merrill A. McPeak [1]

Space Shuttle *Discovery* soaring aloft with classified primary payload.

NASA

The end of the Cold War is forcing hard choices in every area of defense, including space architecture. Proponents of the civilian space program have been struggling since the moon race for a *raison d'être*, unable to identify one that is technologically feasible and politically marketable. They envied the end-all argument that national security policy justified the military space program, although that enviable position may be about to come to a dead halt. Declining defense budgets have left the military searching for a course to match an aging force structure with emerging national interests. Space systems have long been deemed desirable but protractible capabilities. There is a need for military space systems—as unequivocally proven by Desert Storm—but such programs now compete with traditional hardware and follow-on con-


## Summary

The defense community has been drawn into another, perhaps even tougher contest since the demise of the Soviet empire, namely, garnering resources in the face of increased claims by domestic priorities. But threats to national security have not vanished; they have just assumed less predictable traits. Despite the past vitality of the military space program, especially in contrast to civilian programs, fiscal realities may adversely impact on its future. But information from all sources—including space—may prove to be an effective weapon against new threats. Information dominance will provide the stimulus for the military space program in the near term. Maximizing the capabilities of the information weapon, however, requires formulating joint space doctrine that has broad support and applicability. This doctrine will provide a significant advantage for the United States over those nations which employ space assets in a piecemeal fashion.

# Report Documentation Page

*Form Approved*
*OMB No. 0704-0188*



| 1. REPORT DATE | 2. REPORT TYPE | 3. DATES COVERED |
|---|---|---|
| **1994** | | **00-00-1994 to 00-00-1994** |

| 4. TITLE AND SUBTITLE | 5a. CONTRACT NUMBER |
|---|---|
| **Joint Space Doctrine: Catapulting into the Future** | 5b. GRANT NUMBER |
| | 5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | 5d. PROJECT NUMBER |
| | 5e. TASK NUMBER |
| | 5f. WORK UNIT NUMBER |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br>**National Defense University,Institute for National Strategic Studies,Fort Lesley J. McNair,Washington,DC,20319** | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSOR/MONITOR'S ACRONYM(S) |
| | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) |

12. DISTRIBUTION/AVAILABILITY STATEMENT
**Approved for public release; distribution unlimited**

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT | b. ABSTRACT | c. THIS PAGE | | | |
| **unclassified** | **unclassified** | **unclassified** | **Same as Report (SAR)** | **6** | |

ventional weapons systems for the next century. The transition from an identifiable threat to what Les Aspin called several "largely undeterrable threats," coupled with the Clinton administration's emphasis on domestic issues, has caused DOD to consider cutting almost anything high-risk, which includes most space systems.

As a result requirements must be prioritized, then available funds maximized to meet them. Joint space doctrine can provide priorities by offering a coherent vision for employing space forces that significantly enhance national security. Clear goals will help in determining the requisite tools (force structure and equipment) for this task. Defining goals and then planning a procurement and deployment strategy is a keystone of rational decisionmaking.[2] Matching goals, plans, and tools is a framework well understood but not always fully utilized in the Pentagon.

Earth as seen through Clementine's one-pound visible light camera.

DOD

Clementine 1 being launched aboard Titan IIG in January 1994.

DOD

## Where No Doctrine Has Gone Before

Military doctrine has been traditionally developed retrospectively, by looking at mistakes or successes. Inexperience, however, necessitates a less traditional process concerning space. This fact does not detract from the need for a coherent space doctrine to determine future functions and force structure with which to carry them out. A first step in this process is to open a dialogue on the issue which forms the purpose of this article, namely, defining overall goals for military space programs and developing the operational doctrine to match.

Space activity was prompted initially by the desire to employ U.S. technological superiority and enhance national security, but there appear to be no clear goals to bring that about. A coherent doctrine for the near term should focus on information from space forces in support of terrestrial strategic deterrent options, as offensive space-based weapons are prohibited by treaty. So unless a determined effort is made to set complementary goals for military and civilian space efforts into the 21st century and develop the technology efficiently, there is a risk that the United States may face its next major conflict with only a slight improvement in the capabilities which it enjoyed in Desert Storm as well as see a major loss of civilian space momentum.

After the Gulf War there was near unanimous agreement that space-based systems greatly increased the overall effectiveness of coalition forces. Even so, the systems did not come close to achieving their full potential. The Armed Forces have systems that collect and relay data worldwide at speeds approaching real-time. The dissemination of this data, however, relies on an array of processing and communications equipment along with evaluation personnel in a less than optimum process. A way to improve on the Desert Storm experience is to introduce the concept of information dominance as the primary goal of

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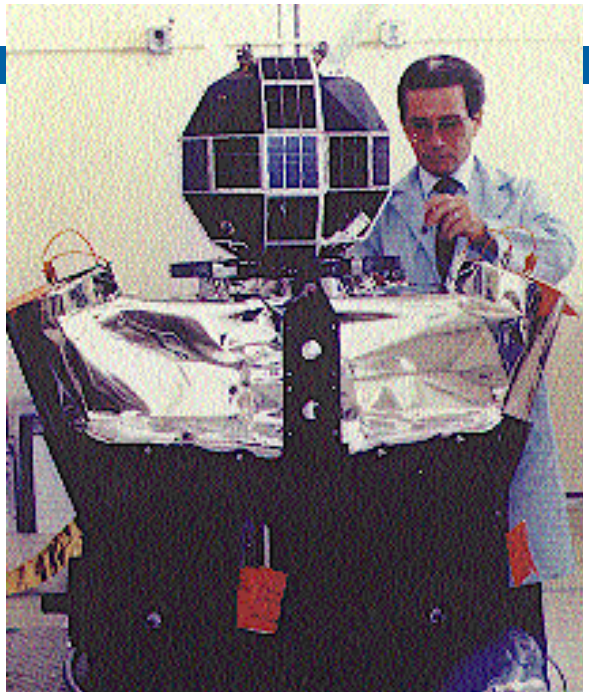
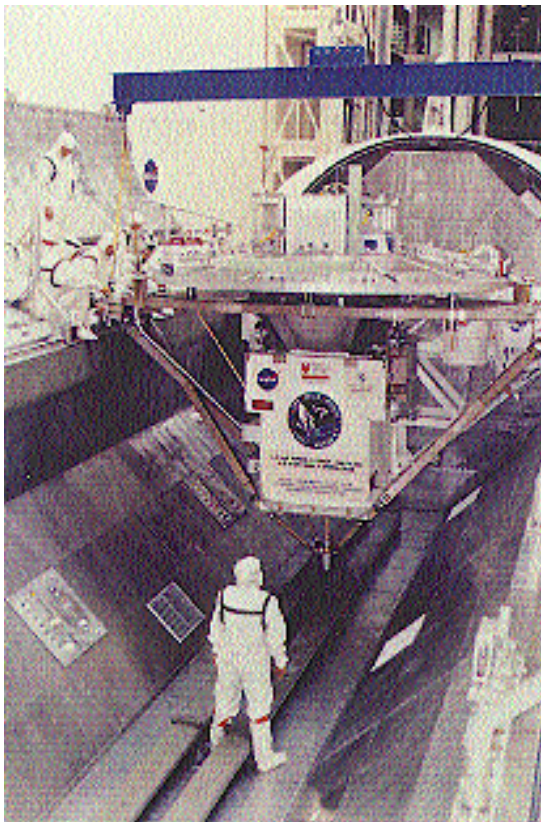


NASA

Navy experimental communications satellite for Pegasus launch vehicle.



NASA

Vertical Processing Facility.

joint space warfare doctrine.

Information dominance, namely, the ability to optimize surveillance, reconnaissance, and data correlation to determine illegal or belligerent intent on the part of an international actor, is an appropriate application of near-term space assets. This capability would provide the Nation with the closest thing to conventional deterrence across the operational spectrum, from competition in peacetime to open warfare, since the atomic bomb and would significantly enhance global stability in the face of many "largely undeterrable threats." In fact, information dominance has the potential of becoming the deterrence strategy of the future.

military space systems involve leading edge technology and are high-cost and high-risk

### Access to Space

The plain truth is that cost-control of critical national security space programs has not been a major factor. The resulting technology and hardware have therefore been far from cost-effective. With the exception of Saturn V and the Space Shuttle, civil launchers are examples of technology first developed for weapons programs. Subsequently, as budgets tighten, launchers increasingly seem dysfunctional in the civil sector, where the Federal Government is not the sole customer and profit is the principle motivator.

Military space systems involve leading edge technology and are high-cost and high-risk. If their output is quickly and accurately provided to decisionmakers and operating forces, the pay-off is extremely high. In the space arena, where $1 billion is normally the ante for a seat at the table, it is crucial to have a game plan to meet the multi-billion dollar requirements.

The cost of space launch requires a large share of annual military operating budgets. Multi-mission spacecraft optimize employment of today's expendable launch vehicles. Spacecraft size and weight limitations, and thus multi-functionality, are often determined by launch limitations. As one Air Force officer stated, "The shuttle program spends $5 billion a year to launch eight times. The military is spending the same amount on Atlas, Delta, and Titan. We are being bled to death by the shuttle and Titan."[3] This raises the critical question facing anyone attempting to develop a coherent space doctrine, military or civilian: When will we solve the dual issues of rapid access to space and reducing cost-per-pound-to-orbit? Indeed, this issue has three parts: cost, timely response, and sufficient volume to support national security requirements.

## Doctrine—Past and Present

Joint doctrine is authoritative, not directive. If joint doctrine conflicts with service doctrine, joint doctrine takes precedence unless the Chairman provides more current or specific guidance.[4] The history of early space doctrine reflects the growing appreciation of the functionality of space forces in modern conflict but is focused on the present rather than the future.

The initial discussion on anything resembling space doctrine took place in the Eisenhower administration when the Soviet Union and United States vied to be the first to launch an orbiting satellite. In August 1955 the Stewart Committee was tasked by DOD to choose a satellite program for use with Eisenhower's Open Skies space policy. The Naval Research Laboratory's Project Vanguard was chosen due to the nature of its scientific research and the fact that it would have no impact on military space efforts. On October 4, 1957 the Soviets stunned the world by launching Sputnik I with their new SS–6 intercontinental ballistic missile. The general consensus within the national security community was that Sputnik was not a military threat. Equally important, with the lack of worldwide objection to overflight, Sputnik I literally wrote overflight into international law. Because of American interest in monitoring Soviet military activity, the legality of satellite overflight was in fact as much or more a national concern as being the first in space. Americans perceived that they were behind the Soviets in missile technology; and Sputnik opened the door to the largest single burst of technological expansion this Nation had ever experienced. No price was too high to re-establish technological superiority. The age of the eye-in-the-sky was rushed into existence.

Like the right to conduct satellite overflights, a good deal of space law is construed either on convention, which remains unchallenged internationally, or treaties. The overarching principles come from the U.N. Charter. The United States operates on the premise that any activity pursued in the national interest is permitted save for those specifically prohibited by the U.N. Charter or the treaties to which it is a signatory such as the Antiballistic Missile Treaty of 1972.

Another significant factor in discussing joint space doctrine is its interaction with treaties and international law. Treaties, unless specifically stated otherwise, regulate peacetime interaction between the signatories. This is especially appropriate to the discussion of what technological and hardware capabilities are required for the spin-up phase of impending or suspected hostilities. Quick response, capable, multi-function systems are highly desirable in such situations.

Joint space doctrine is still being developed. A proposed document draws on lessons from Desert Storm, "the first space war." While no American weapons were employed in space during the Gulf War, information provided by and passed over space systems greatly contributed to the speedy and overwhelming success of coalition forces. Joint Pub 3–14 addresses the functions of military space capabilities: force enhancement, force application, space control, and space support. Each function is given equal time in the publication in order to explain its purpose, but all are directed toward supporting the terrestrial warfighting community.

Focusing on support for the warfighter can lead one to assume that the joint process has decided on force enhancement as the most politically acceptable and attainable function around which to structure space operations. In other words, because systems like antisatellite weapons or Brilliant Pebbles are not currently appropriate to the global threat, then space support (launch and satellite control) and force enhancement of terrestrial systems become the only true functions. This may be an appropriate approach to military space forces for the next few decades but at some point an enemy will develop technology to neutralize our space sensors. Now national security depends on having the technology to counter enemy countermeasures against deterrence. The continuation of a technological lead is essential to responding to, and controlling, the early stages of a conflict.

## Developing a New Joint Doctrine

There is a consensus among the services that space is important though it is not clear why. What can space do for the joint warfighter? The interesting dichotomy until


NASA

**Pegasus air-launch space booster on board NASA B–52 carrier aircraft.**

Desert Storm was that, in general, the Air Force and Navy manned systems while the Army and Marine Corps armed men. As lethality increased in the Gulf War with the M1–A1 Abrams tank and advanced helicopter armed with precision guided missiles able to kill armor and weapons systems outside engagement ranges, even the Army and Marine Corps found themselves manning systems of tremendous versatility and destructive power. Now the challenge is for joint forces to direct and focus this lethality with such precision that even the threat of its application serves as a real deterrent to all rational opponents.

how much one can do in space technically will be limited by access

More consideration must be given to what if any limitations are imposed on space doctrine. Such limitations are primarily technical and legal. How much one can do in space technically will be limited by access. But legally the United States cannot limit access to space by any nation, much as it cannot keep another country's ships off the seas or planes out of the air. In times of war such limitations succumb to national security imperatives; but in peace they are a real consideration. The exploration of technology to support space based weapons is prudent and necessary.

Given those limitations the only realistic near-term goal is deterrence. In a time of "largely undeterrable threats" and "fantastic opportunities, greatly disguised as unsolvable problems,"[5] space offers the best chance of beating the odds. The Armed Forces should have a goal of utilizing space to provide the best timely information on global events to prevent brush fires from becoming infernos. By definition irrational actors act irrationally and manipulation for advantageous position will always occur; but knowing that the United States can monitor and respond with immediate and lethal force will decrease the attractiveness of such actions. With a goal established in a joint space doctrine, a plan can be developed to achieve information dominance in any conflict situation.

In addition to documenting past experience, doctrine should also point to the future. A good example is the doctrine of daylight strategic bombing which developed ahead of its actual use in combat but drove technological developments that enabled the effective use of airpower during World War II. Likewise, we need joint doctrine that clearly defines space control and force application to support the evolution of space systems from a pure supporting role into a menu of joint space force options whose stated purpose is to ensure overall U.S. space superiority. All the services look to the near future when space systems will achieve information dominance over their respective battlespace. Information dominance goes a step beyond mere force enhancement of our capabilities since it implies some measure of control over an enemy's ability to use space systems to generate and transmit information to its national leadership.

Joint space doctrine should emphasize space power just as Joint Pub 3–05 stresses air and space power. For the first time the new National Military Strategy addresses space in terms of space power. This concept of power requires that joint doctrine go beyond force enhancement and space support to advocate doctrinal tenets that not only identify basic thoughts and operational concepts with respect to terrestrial and space warfare, but support multi-use military, commercial, scientific, and environmental research activities in space in the absence of conflict. Joint doctrine should avoid service roles and missions and establish doctrinal goals for future space forces.

## Dual Use

Developing joint doctrine must also consider those pragmatic realities to which the services may be driven by economic constraints. Hardware acquisition is a case in point. One way to keep acquisition costs down is to design dual-use (civilian and military) sensors among commercial and civilian research applications to meet everyday nonmilitary requirements and, at the same time, be ready with secure, highly capable, on-orbit general purpose sensors for military use in crises. This Civilian Orbiting Reserve Force (CORF) could well be made available under much the same criteria as the Civilian Reserve Air Fleet (CRAF). There are many studies on the shelf dealing with the use of commercial communications satellites (SATCOM) in this manner. In fact, DOD bought all the commercial SATCOM capacity available and used it in an ad hoc way to ramp up the through-put to support Desert Storm communications requirements. This was also true for weather support because the Defense Meteorological Satellite System (DMSP) and the National Oceanographic and Atmospheric Agency (NOAA) satellites are basically the same. In addition, the Global Positioning System (GPS) is viewed by many as a planetary utility rather than a predominantly U.S. military navigation system. This all points to the fact that the distinction between military and civilian space systems is rapidly disappearing and that structures and doctrines need to be adjusted.

The final ingredient of a true space doctrine is an explicit statement by the national leadership that space is no longer a sanctuary but rather the high ground of a global *infonet* which can be used for civil or military purposes. The disestablishment of the National Space Council has created a vacuum by removing a forum in which the national security community and the civil sector can discuss the space puzzle. Until this happens, a true joint space doctrine will not evolve since the requisite political support for successful implementation is not available.

Joint doctrine should blend force capabilities in a way that makes the whole larger than the sum of its parts. The elements of joint space doctrine are clear. Information dominance is essential to support deterrence and provide both a rationale and goal for a near-term military space program. Assured access to space is necessary for other activities. Just as we have placed more emphasis on CONUS-based forces and reserves, we must stress space transportation which supports a burst of activity when national security is threatened. The ability to develop and exploit space technology must also mature so that we can oppose countermeasures to the information dominance network. A realization of the impact of dual use of space technologies should drive decisions on what can be shared and what must remain exclusively in the military sphere. Finally, in the event that weapons in space are required to augment the sensor network for defense there must be doctrinal support and the political will for their development and deployment.

A joint space doctrine that considers these elements will not only direct the Armed Forces, it will also give the Nation a global advantage over countries which use space systems, military or civilian, on an ad hoc basis, without maximizing their efficiency or effectiveness. **JFQ**

### NOTES

[1] Craig Covault, "Desert Storm Reinforces Military Space Directions," *Aviation Week and Space Technology*, April 8, 1991, p. 42.

[2] Graham Allison, *The Essence of Decision: Explaining the Cuban Missile Crisis* (Boston: Little, Brown, 1971).

[3] Teresa Foley, "Science Office Steps into Tangled Launch Vehicle Policy Debate," *Space News*, December 13–19, 1993, p. 23.

[4] This or similar phraseology can be found in the preface of every joint publication.

[5] Jerry Tuttle, "Commentary," *Space News*, November 15–28, 1993, p. 18.