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Timothy K. Roberts
USAF

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A New Fundamental Mission for the US Space Program

Timothy K. Roberts, Lt Col, USAF

Introduction

The first thirty seven years of American exploration and exploitation of space has been marked by two fundamental things - the forcing function of the Cold War and the resulting relative abundance of funding for space activities. In the public's mind, the Cold War ended six years ago. They and their representatives in Congress have been waiting for the Executive Branch to see this "fact" for some time and have become increasingly impatient with a lack of "appropriate" response. Frankly, they have been promised a peace dividend and they want it - NOW. Since the Executive Branch has been unable to deliver it as desired, Congress has been in the process of taking it. The immediate consequences of these actions are the precipitous drops in space funding for DoD and NASA in the Fiscal Year 1995 budgets. A clear example has been the signal inability of the DoD and NASA to get Congressional support - and therefore funding - for new spacelift and satellite systems. The successive fates of the Advanced Launch System, the National Launch System, Spacelifter, and various Single-Stage-to-Orbit programs are instructive. One reason for this failure is the lack of a generally accepted reason for being in space and therefore needing more cost-effective systems.

As far as can be seen, the public no longer accepts the old, Cold War answers for being in space. A fundamental truth that we are being faced with is that the American people, in the guide of their representatives in Congress, demand a clear rationale for spending public monies. We're finding out that pure science and Cold War national security requirements as arguments for space spending are failing in the face of National health care or environmental clean-up, for example. To at least maintain our share of the Federal budget, and, incidentally, continue to perform those space missions we feel are essential, we are going to have to provide an obvious, unarguable reason to spend \$14 billion a year in space. What is necessary, then, is a new reason for America to be in space. As the Air Force Association's Advisory Group on Military Roles and Missions states in their 1994 report, "There is little to be gained by arguing the need for increased space budgets. Rather, we must look toward achieving improved efficiency by eliminating areas of duplication and redundancy." (1:51)

Proposed New Mission Areas

Six new national space mission areas are proposed that truly meet public perceptions of public need. These new mission areas meet emerging public desires for responsible stewardship of the planet and for supporting the public good. Frankly, they attempt to answer the layman's question, "Why are we spending billions in space when people are starving in the cities?"

WEATHERMAN: Global Monitoring. This mission area consolidates NASA's Mission to Planet Earth and the DoD and national remote sensing missions. It recognizes that the technologies, platforms, and data produced are similar (if not identical, in some cases). Some mission subsets are:

- *Global Environmental Monitoring.* This is a public utility and includes:

Identification of global climatological trends
Pinpointing high-risk environmental activities
Establishment of a global environmental database.

- *Global Weather.* This mission subset collects and disseminates global weather and other surface data to a wide variety of users. Users include military services, the National Oceanographic and Atmospheric Agency, and private and commercial users. This mission subset is also a public utility in the spirit of the National Weather Service. It recognizes the convergence of the Defense Meteorological Satellite Program and the Geostationary Orbit Environmental Satellite into the National Polar Orbiting Environmental Sensing Satellite (NPOESS). Thanks to DoD and NOAA efforts, this mission subset is effectively already in operation. An interesting side note is that NPOESS already addresses the distinction between military and civil data collection and dissemination on the same satellite bus and over the same satellite control network.
- *Military Remote Sensing.* This mission subset consolidates all military and national remote sensing and surveillance missions. Users of this data are exclusively military forces and other Government agencies. Establishment of this mission subset allows "compartmentalization" of sensitive remote sensing capabilities and data.

SHIELD: Ballistic Missile Defense. This mission area consolidates Army, Navy, Air Force, and Ballistic Missile Defense Organization programs into one operational mission area. It addresses the pressing need to be able to identify, track, warn, and possibly defend against hostile ballistic missiles launched against the US, its forces, and its allies. It is presented as a separate mission area in recognition of the high political sensitivity of ballistic missile defense. Exclusion of SHIELD won't cripple other US space efforts. Mission subsets of SHIELD are:

- Warning of ballistic missile launch from anywhere in the world
- Identification of the source and threat level to the US, its forces, and allies
- Continuous tracking and impact prediction
- Negation of in-flight ballistic missiles

SENTRY: Space Surveillance and Protection. This mission area performs space surveillance, tracking, and negation of space threats to the US. These threats are both man-made and natural. However, this mission is separate from SHIELD because SENTRY functions can be performed with or without ballistic missile defense resources. In essence, SENTRY is DoD's space control mission with planetary defense added. Mission subsets include:

- *Space Surveillance.* This mission subset uses the DoD Space Surveillance Network and NASA's Deep Space Network to detect, identify, and track objects in space. The combined network virtually exists now but needs improved sensors and command and control to make it truly effective. Objects of interest include natural objects such as Earth-grazing asteroids,

comets, and meteorites and man-made objects such as active and derelict satellites and debris.

- **Protection.** This mission subset provides for protection of US space assets from natural and man-made threat objects through a variety of means.
- **Negation.** This mission subset negates space threat objects through a variety of means. Negation can be as mundane as military action against an enemy satellite in support of US combat operations. It can also be as exotic as deflecting an asteroid, comet, or meteorite from striking the Earth.

CENTURION: Military Support. This mission area captures the traditional direct support to US combat operations. This is a critically important mission area, as evidenced by statements made by several senior Department of Defense officials. Gen Merrill A. McPeak, recent Air Force Chief of Staff, was quoted as saying "I'm convinced that tomorrow we will judge a nation's power status by its relative position in space." (2:2) There are many examples of CENTURION. One is the use of national intelligence capabilities to support combat operations. TALON SWORD and RADIANT OAK, two experiments in combining space capabilities to support air attacks on targets beyond the horizon. (3:28-29). USSPACECOM Space Support Teams are an integral part of providing space support to military operations and will be a highly visible part of CENTURION.

FIREMAN: Civil Emergency Support. This mission area is the civil equivalent of military support. It focuses the entire suite of national space assets on high-priority civil needs, primarily in support of disaster response. This mission area is the best example of harnessing US space systems to the service of the well-being and security of American citizens. A very visible portion of FIREMAN would be Fast Response Space Support Teams (FRSST) providing communications, weather, and imagery products to disaster response teams. Current DoD programs that could support FIREMAN include the Defense Communications Satellite System, the National Polar Orbiting Environmental Sensing Satellite, the Global Positioning System, the Defense Support Program (for forest fire or pipeline fire detection), and national systems. FIREMAN and the associated FRSST teams would be most visible to the American public and could garner a lot of good will through use of existing DoD, national, and civil space assets to help Americans in trouble.

COVERED WAGON: Space Exploration and Exploitation. This mission area continues the exploratory and scientific work the US has done for the past thirty seven years as well as including appropriate Government support for private sector exploitation of space and space resources. A key part of making COVERED WAGON work is developing a long-range approach to Government-funded space research. While the shape and direction of such a plan is beyond the scope of this paper, a key piece must be cost-efficiency and dual use of existing and planned space programs. A fundamental problem American space scientists now face is that "... Congress will not fund parallel programs [so] federal agencies [must look] seriously at consolidation and dual use" of space assets (2:28). There are two mission subsets:

- **Space Exploration.** This mission subset continues the grand tradition of American space exploration and space science. NASA's current emphasis on "smaller, faster, and cheaper" missions to achieve specific scientific objectives is appropriate for the current budget regime. However, America must never give up the vision of extending the human presence into space. A deliberately

planned and executed space science program is perhaps the best way to guarantee achieving this glorious goal.

Space Exploitation. This mission subset contains all the support the US Government provides to private and commercial entities seeking to derive profit from space and space services. This can range from flying appropriate experiments aboard Government vehicles to being an "anchor tenant" to emerging space industries. There is a very important dynamic in this mission subset. On one hand, commercial space exploitation is not a Government function. The Government should not put itself in the position of guaranteeing either a market or critical pieces of services and products for private profit. On the other hand, the last great expansion in America occurred in large part because of Government support. The American West was opened because Federal support of railroads made service for profit feasible. This is a fine line and will be one of the greatest policy decisions of the twenty-first century.

Implications and Consequences

These new fundamental missions for the US space program have several significant implications and consequences that must be illuminated. Such a far-reaching restructure clearly impacts - and in some cases may well eliminate - missions that the US space community is currently performing.

Space Science. The COVERED WAGON mission area deliberately doesn't speak to large science programs. This is deliberate. Today's national mood seems to be rejecting large science programs regardless of what they do. Large science programs are seen as relics of the Cold War and the pervasive competition between the US and the USSR. An excellent example is the fate of the Super-Conducting Super Collider. Once supported as critical to unlocking key questions about the subatomic structure of matter, it is now considered unaffordable and has been summarily canceled. Space Station is facing the same pressures and may suffer the same fate. It must be remembered that Americans don't appear to be willing to fund large space science projects merely because they're performed in space.

Commercial Space. Government support of private and commercial space industries is a very thorny issue. Recent history abounds with examples of industries that eventually failed due to excessive Government support, the railroads being one example. However, those same railroads ushered in an era of prosperity based on Government support in opening the American West in the form of land for rights-of-way and in "anchor tenancy". Space is certainly in the same position - much promise but a tenuous business foundation without significant support from the Government. As noted above, choosing the correct approach to nurturing space industries of many types will be one of the crucial policy decisions made in the early twenty-first century. The "correct approach" is defined as the one which empowers American industry to open space as it once opened the West and create an entirely new set of opportunities for a new breed of American pioneers. Unfortunately, the "correct approach" can only be identified in retrospect.

Focus. This entire proposal is about focusing the American space program. The withering of support for space is a direct consequence of a lack of consensus about what space does for Americans. This proposal addresses the issue by focusing our space efforts on our core business in space - things that either directly benefit Americans now or things that enhance American prestige by providing services to

the world at large. Other efforts simply aren't funded by the Government. Focus is applied by proposing six mission areas. The consequence is that if a project doesn't fit within one of the six mission areas, it won't be performed by the Government. While this may well eliminate such programs as flying educational payloads, it will maintain a broad base of public support for space. This is crucial if America is to retain its position as the premier space-faring nation in the world.

International Cooperation. The face of international cooperation will change under this proposal. The fate of large space science programs is problematic; therefore, continued existing international partnerships may be at risk. However, there will be opportunities for new kinds of cooperation. SHIELD could easily include international partners, perhaps using proposed US-Russian Early Warning Sharing as a prototype. WEATHERMAN can clearly accept international partners- the more so since what is being shared is data, not hardware. SENTRY could evolve into a service provided to the world at large with appropriate contributions. The new mission area that could reap the greatest reward in international goodwill is FIREMAN. Extending its benefits to international partners can garner us immensely valuable public relations.

Public Access to Military Systems and Data. FIREMAN requires that the American public receive extensive access to systems and data that heretofore have been the sole province of the military and national security establishment. To cite an inflammatory example, high resolution imagery of disaster sites can be invaluable in assessing the scope of the disaster and directing aid to the hardest-hit places. However, the current capability is highly classified and dissemination of its products is tightly controlled - even to the military today! (1:52) Using all available US space assets for emergency support will require a drastic rethinking of this approach. Similar problems will arise in allocating communications between military and civil emergency users. Full implementation of FIREMAN will require that we change the way we control and operate military and national space systems.

Supporting Missions. Little has been said in this proposal about the supporting missions that are needed to "make space happen." Examples are spacelift, satellite control, and range operations. These are missions that traditionally fare poorly over time when attempting to modernize. However, expanded public support for the six core missions proposed will inevitably garner greatly increased support for these supporting missions. As with other aspects of this proposal, there are benefits and disadvantages. One clear disadvantage is that as the Government space program becomes more broadly based, individual users lose a degree of influence over aspects of it. For example, the Air Force has long wanted a responsive spacelift vehicle. Under this proposal, the Air Force will have to "sell" its requirement to a wider audience than it does now, including entities that have little interest in military requirements. A contrasting advantage has been cited above several times - the broadening of the support base. As the number of users increases, the amount of support for hudget and focused goals increases, making it easier to keep the space program overall on course. Everybody wins.

Organizational Strategies.

"Fragmented leadership is the most prominent feature of American space activities." (1:50)

"Costs are too high and space capabilities too important to accommodate single-service space systems." (1:53)

As the quotes above illustrate, the US Government is currently not organizationally structured to perform the kinds of integrated missions proposed. We have three Government space programs that compete for resources to do their jobs. The four space sectors - defense, intelligence, civil, and commercial - have a difficult time cooperating simply because the organizations set up to execute their responsibilities have differing purposes and are now self-perpetuating (1:51). There are many potential organizational strategies that might be used to meet this challenge, but they all need to meet certain criteria:

- There should be clear policy focus on what space can do for Americans. Space policy should be at a level that permits consideration of all national needs on an equal footing.
- Space funding should be managed in such a way that all national needs are considered in developing budgets and priorities.
- Space operations should be conducted so that all national needs are serviced according to their priority.

There are many studies that propose solutions to the problem. Some focus solely on military and national security needs (4); some take a broader view, anticipating this consolidated approach (5). Whether space activities are combined into one agency or are coordinated among many agencies in different departments, the criteria listed above must be met to properly bring American space assets to bear on national needs.

Summary

Focusing on America's core business in space will make current and future programs more relevant to Congress and the American public. Increasing relevance will increase support and will broaden the support base to include a much wider variety of users. Our ability to control and exploit space is a touchstone of our national power. To remain the world's premier space-faring nation, we must regain control of our own space program. WEATHERMAN, SHIELD, SENTRY, CENTURION, FIREMAN, and COVERED WAGON give us that control.

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