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Space Power in a National Context

To what ends does a nation wield “space power?” What specific benefits does a nation accrue from possessing and exploiting elements of “space power?”

At what levels does a nation exercise “space power?” What are the imaginable ranges of actions, from lowest to highest, for applying “space power?”

These fundamental questions can teach as a great deal about “space power” in the context of national power.

Simple and obvious answers often rely on circular definitions and self-evident truths. More profound and fundamental answers remain elusive. This remains a serious problem in developing a comprehensive theory of space power.

For example, the impressively insightful 1998 RAND report, *SPACE: Emerging Options for National Power*, describes what are called “space-related national security objectives.” They are:

- Preserving freedom of, access to, and use of space
- Maintaining the US economic, political, military, and technological position
- Deterring/defeating threats to US interests
- Preventing the spread of weapons of mass destruction to space
- Enhancing global partnerships with other spacefaring nations

But are these true “objectives” or only “strategies” aimed toward attaining unstated objectives? Can we peel the onion layer by layer

and recognize when we have reached the core? Each one will be examined to see if it reflects a true national objective.

The first item is certainly desirable, but only insofar as it makes other unspecified objectives possible. It enables the conduct of space operations whose nature is not defined here, so it is not an ultimate objective, only a means towards such objectives.

The second item appears to be a good end objective, but it is passive, conservative, and defensive. Experience with space operations shows this to be a shortsighted approach. Besides, the use of the word “position” still reeks of earthside analogies, which all too easily can mislead our thinking about space.

The third item is “obviously true,” but upon closer examination, is empty. It is a “self-defining requirement” that cannot be measured, since a “threat” is something to “deter,” but neither the concept of “threat” or of the value of “deterrence” is made clear.

The fourth item may be an objective based on personal philosophical or religious motivations, and it is explicitly called for in the 1967 Outer Space Treaty, but at best it is a temporary strategy toward some other unspecified end, not an end in itself.

The same is true for the fifth item. It may be “nice” to accomplish this goal, but unless this accomplishment contributes to genuine US national security concerns, it is at best merely one of many strategies, and at worst it is a distraction from the satisfaction of true objectives.

The RAND Report’s treatment of these five objectives indicates that the authors agree that they are intermediate steps toward final unstated goals. They are strategies, and may contribute to useful operational concepts. But they are not—nor are they presented as—the ultimate “WHY” of space power.

Why Exercise Space Power?

As the bulk of space activities shifts towards the commercial sector, the most obvious answer to the question of “Why?” is probably also the correct answer: nowadays most players in space are there to make money. They engage in activities to produce goods and services, which attract paying customers. They require a certain level of service

reliability in order to maintain market share and meet contractual obligations.

Meanwhile, national governments engage in space activities for other fundamental reasons. The first is certainly national security, which applies both to earthside security and also to protection of national assets anywhere. A second application is for traditional government support services that are depended on by other government agencies and by the private sector as well. A third application is the development, exploitation, and protection of advanced technologies that can be expected to provide significant enhancement of national military and industrial capabilities. Lastly, governments engage in space activities as expressions of national character and for the impression such projects make on their own population and on the world, impressions which often translate directly into measurable diplomatic and commercial advantages.

Even commercial entities sometimes perform space activities for public relations (several corporations have paid Russian cosmonauts to videotape themselves using specific products, or in one case, actually inflating and deploying a clearly trade-marked bottle-shaped balloon during a space walk). The same motivations could apply to other non-governmental players who would engage in space activities to “make a point” or just to show off their existence.

A country thus needs “space power” to protect existing national capabilities that involve space. This can involve physically protecting the resources which provide those services, either through negotiation, or through hardware features of the assets, or through preventative actions vis-a-vis potential threats. It also can involve assuring replacement capabilities, either through being able to reconstitute the threatened assets in a timely fashion, or through finding alternate means of performing the services.

The other side of the same coin is to use “space power” to be able to deny these kinds of space-related capabilities to other players, as needed, either temporarily or permanently. For example, discouraging other players from developing stand-alone capabilities by making them dependent on US capabilities is an effective means of ensuring that, at desired moments, the other players do not possess

those capabilities (navigation services come to mind, as well as communications and earth observation capabilities).

“Space power” also is intimately involved with national technological standing relative to other entities. The concept of “spin-off” has been advanced to explain the value of space technologies. Central to the argument is the assertion that moneys spent on developing space technologies tend to accelerate the progress of national technical capabilities, with wide-ranging industrial benefits. No matter how valid the concept of “spin off” may or may not be, it is widely accepted around the world that a certain level of space spending is a “good investment” in the nation’s (or even the corporation’s) future.

This power is thus exercised by the deliberate development of advanced space-related technologies, often without clear-cut, near-term applications. These technologies must then be protected in order to exclusively exploit the advantages accruing from possession of them. Lastly, as the technologies inevitably age, they can be shared with other players both as a reward system and also as a way to lock other research efforts into dependency on US leads.

The United States can exercise “space power” to influence research directions in other nations. A good example of this is the International Space Station project, which despite the controversy over delays (in particular, the failure of the Russians to deliver their promised contributions), has succeeded in creating an international space research and development effort which is channeled in directions advantageous to the United States. It has also been a diplomatic success, in that each of the partner nations has come to regard its role in the overall project, and its relationship with the United States, as more important than any other potential role with other players on other projects beyond the oversight of the United States.

To the degree that the entire world respects US science and technology in general, and its space capabilities in particular, the expenditures on interplanetary probes, space telescopes, and human space flight have also created international circumstances very much in favor of the United States. These directly translate into commercial and diplomatic benefits. “Space power” thus creates new opportunities for national power.

Continuums of the Application of Space Power

These strategies can be carried over a wide range of imaginable levels, from weakly to strongly, from narrowly to broadly. Theorists have usually treated the question of choosing space power options as if it were a continuum of degree of intensity, ranging from a very hands-off drift to a very activist interventionist imposition of US will. While this is initially simplistic (as we shall see, there are several variables whose “gain” can be adjusted to satisfy national goals), it does allow the creation of a range of scenarios for space power application. By examining several different approaches, perhaps we can better understand what value such analysis offers us in understanding the nature of space power in a national context.

In the previously mentioned 1998 RAND study (“Space: Emerging Options for National Power”), the continuum of strategy options for military space policy ranged from “Minimal” to “Enhanced” to “Aerospace Force.”²⁰ Differences were characterized primarily in organizational terms, not in terms of actual goals of the strategies, as follows: “In the Minimalist option, the military use of spacepower is highly dependent on external relationships and partnerships. Integration with other military operations depends on organizations outside the military chain of command. This strategy option is largely the outcome of budgetary constraints and technological advances in other sectors, thus leading to the US military owning only those systems that perform unique and/or time critical national security functions and leasing everything else from the commercial sector. In the Enhanced strategy option, the military use of space power is highly integrated with other forms of military power. External relationships and partnerships are important but are not critical to core military capabilities. In the Aerospace Force option, military space power is exercised separately from other military forces. Actual military operations are most likely joint and combined and may use external relationships, but this is not required.”

²⁰ Johnson, Dana J., Scott Pace, and C. Bryan Gabbard. 1998. *SPACE: Emerging Options for National Power*. RAND, United States.

The 1994 PhD. thesis by Major Peter Hays, "Struggling Towards Space Doctrine," described four "schools" of space doctrine, first described by Lupton in "On Space War." From least to most activist, they are labeled "Sanctuary," "Survivability," "Control," and "High Ground." In this continuum of doctrines, the primary value and functions of military space forces begins with the mere enhancement of strategic stability and the facilitation of arms control. Then limited force enhancement is added to make the next school. The control of space and the delivery of significant force enhancement to terrestrial forces follow that. The continuum culminates with systems for ballistic missile defense and other weapons systems which can have decisive impact on terrestrial conflicts.

In the Hays continuum, the characteristics of space systems begins with limited numbers of fragile systems in vulnerable orbits, optimized to serve as National Technical Means of Verification. The increasing presence of such features as redundancy, hardening, on-orbit spares, maneuver capabilities, less vulnerable orbits, stealth, robust reconstitution capability, defense, and convoy describes the progression up the other levels. The level of conflict capability also increases, from a very limited (or nonexistent) capability, to limited ground force enhancement with graceful degradation of in-space assets, to a level of defending friendly space systems and denying unfriendly use of space, to the highest level of decisive space-to-space and space-to-earth force application. In this analysis, location in the continuum depends on the degree of capability for force application.

Of course, other factors can be used to define a continuum. To understand the nature of this range of options better, let us consider in detail the following four possible scenarios, which range from most active to most passive. They were developed by Dr. Brian Sullivan²¹ and concentrate on diplomatic postures rather than actual operations. His four options can be referred to as "Strong Pursuit of Unilateral Advantage," "Sponsorship of Collective Agreement," "Expand Cold War Alliances," and "More of the Same Old Drift." In this continuum,

21 Sullivan, Dr. Brian R. March 1998. *Tomorrow the Stars*. (Working title of a draft for US Space Command.)

the intensity level starts at the top and then declines, a trend opposite to that in the RAND and Hays models.

Option One is a strong US Government pursuit of a vigorous set of unilateral national space policies of benefit to the United States. It is a “Go it alone” plan where the United States unabashedly acts as the world’s premier Space Player.

This option offers a number of attractions. With the end of the Cold War and the absence of any country or even any coalition that can rival American power—a situation almost certain to endure for at least a decade, perhaps much longer—the United States is largely free to focus its energies on pursuing goals based on purely national self-interest. Rather than rely on sentiment, tradition or outmoded national security constructs, the US Government and the American people could make an objective examination of national courses of action and choose the one judged best. Some choices could result in a radical break with previous defense and foreign policies, yet serve American interests very well indeed.

Such a policy would require close cooperation between industry and government and well-informed coordination of defense policy in support of the range of private and public goals being pursued. This policy would involve:

- A degree of increased government regulation
- An “industrial policy” and a national educational policy to promote the development of technologies deemed crucial to the national well-being and the supply of the necessary scientists, engineers, technicians and skilled labor
- The direct assistance of national intelligence agencies to private corporations
- A possible, although not large, increase in defense spending
- Far greater exchanges of information and coordination among government agencies, including United States Space Command and NASA

- And a frequent check by the national leadership to ensure that the “trinity” of government, military and people was holding firmly together in pursuit of national objectives

Certainly as a by-product of such efforts, the problem of the vulnerability of American space systems would be energetically addressed and solved by a variety of defensive and potentially offensive measures. For example, the United States could renegotiate the ABM Treaty to allow for the deployment of antiballistic missile weapons in space or, failing such diplomatic efforts, unilaterally abrogate the treaty and proceed on the basis of national self-interest.

Under this option, the government would supervise commercial space activities, and control scientific and military endeavors. But its policing and regulatory functions would be carried out along national, not international, lines. However, it's possible that the provisions of the Posse Comitatus Act might be understood to prohibit the US Air Force (specifically the Air Force Space Command, the largest service component of the United States Space Command) from policing space. Of course, Congress could amend the law or create a separate US Space Force, which would escape the law's strictures. (The law applies to the US Army and probably to its offspring, the US Air Force, but possibly not to the US Navy or Marine Corps, and arguably not to a unified command such as the United States Space Command.) However, for constitutional reasons, it would be far better to create the space equivalent of the US Coast Guard to enforce laws and promote safety in space.

The potential drawbacks of such a policy are fairly obvious. The United States might come to be perceived as a global menace and, as a result, encourage the formation of an anti-American alliance system. Conversely, isolationism, always a strong current in American thinking, might revive. This could bring with it all the attendant mistakes of American foreign policy practiced in the period between the two World Wars. Much of the world cultural influence the United States gains from presently pursuing a more idealistic set of policies would evaporate.

This could result not merely in the United States finding itself in a much more hostile international environment. The American

entertainment, broadcasting and communications industries could be dealt a heavy blow if the American way of life and its values came to be more widely regarded with disdain, contempt, or fear. There is no way to know for certain, but the immediate economic and national security gains derived from such a policy might be more than offset by the long-range global disabilities the United States could suffer.

Option Two would be American sponsorship of a collective agreement to assume responsibility for space activities. This group would represent an American-led “club” to enforce space control.

This policy would involve American sponsorship of an international treaty, a NATO initiative or an agreement among the members of the Western alliance to assume collective responsibility for certain space activities. American commercial space activities would not fall under additional national supervision.

US military space activities could remain entirely national or selected portions might come under NATO command and be NATO funded. A wider military space alliance seems implausible at present. Police and regulatory responsibilities in space could be assumed by some international agency for the reasons given above. The space coalition could develop a broad civil and criminal law code governing space activities. After approval and adoption by the alliance, adherence could be opened to any state wishing to accept the protections and obligations of the code. The burdens of policing space and of introducing police weapons into space and preventing illegal activities would fall on the group, not on the United States alone.

If nuclear-powered rockets proved the best method to explore the deeper reaches of the solar system, the group could share the responsibility and address the inevitable protests that such an innovation would entail. The United States might preserve NASA yet also sponsor an ESA-like agency based on far wider membership, whose members could share the burden of highly expensive space ventures.

Recall that the major reason President Bush’s 1989 proposal to establish a permanent base on the Moon, send an expedition to Mars and begin “the permanent settlement of space,” was rejected. The reason given for rejection was the Office of Management and Budget and the Government Accounting Office both estimated the combined

cost of such endeavors in the area of \$400–\$500 billion. These figures may have been vastly inflated by political opponents of such projects, since more reliable costing estimates put such projects much more on the scale of the 1960's Apollo program, or about \$80 billion in current dollars. But even NASA's later scaled-back plans for a manned expedition to Mars call for launching a minimum of one million pounds into space, and at present launch costs, the transportation price alone would fall in the range of \$10–\$20 billion. Despite the end to budget deficits and the prospect of surpluses, Congress has continued to refuse the approval of such expenditures.

Faced with the “sticker shock” of the more grandiose space projects, some observers have argued that only an international consortium—drawing on private as well as government contributions—might make such heroic endeavors politically and economically possible. But other observers, even those sympathetic to the diplomatic value of international space cooperation, have expressed skepticism about the alleged time and money savings of large international projects. Certainly the recent experience with the International Space Station shows that early promises of saving billions of dollars and gaining years of service were naive at best.

Since the United States adheres to the Outer Space Treaty, thus rejecting claims by any state or corporation to sovereignty or ownership of what lies beyond the Earth, the insistence on a purely national civil space program is an invitation to diplomatic disputes. So long as the American Government rejects the legitimacy of selling real estate on the Moon, mining Mars for private profit or claiming an asteroid Columbus-style, some observers argue that it seems increasingly pointless to continue NASA as a national institution. It has also been argued that with the end of the Cold War and the indisputable fact of American global predominance, the United States no longer has much need for the prestige of spectacular national feats in space. There certainly are many worthy endeavors to pursue in space. But even for the wealthy United States, the costs of some remain prohibitive, at least psychologically and politically. Certainly the United States can retain robust national space forces. But the responsibilities of policing orbital and, eventually, international space,

as well as the burdens and costs of exploring the solar system seem best assumed by one or another international body.

Option Three is to expand and enhance the Cold War alliance system to take control of space activities. This could occur in concert with greater political integration of the component nations, or conceivably as an independent trend.

The third alternative national policy lies near the opposite end of the spectrum of feasible national policies from unilateralism. In essence, it would involve a deliberate and carefully calibrated cession of some aspects of national sovereignty in the short term, with the expectation of gaining permanent superpower status in the long run. The preservation of such power, however, would be in the context of an international federation formed from the Western alliance in somewhat the manner that the European Union is being transformed into a European federation.

Historians note that alliances generally do not survive the threat that led to their creation. In that regard, the healthy endurance of the Western alliance formed in 1941–1942, revived as a result of the Soviet threat in 1949–1950 and preserved after the collapse of the USSR in 1989–1991, so far represents a striking historical anomaly. There are a few other examples of such a phenomenon, including the preservation of the anti-Persian alliance of the Greek city-states as the Delian League (or the Athenian Empire, if one prefers) in the fifth century BC. Other attempts, such as the effort to maintain the anti-Napoleonic alliance as the Congress System after 1815, have usually collapsed within a decade or less.

The enduring strength of the Western alliance is an asset too precious to squander. But for it to survive, many argue that the United States must reduce its leadership role to no more than “first among equals” now and gradually assume the position of a truly equal partner with the EU/European NATO group of nations and Japan over the next few decades.

Again, historians note that no superpower has survived as such forever. Nor can the United States expect to do so. But if the United States deliberately chooses to be “the last superpower” and slowly—perhaps over a century or even longer—coalesces with its allies into a great world federation, then its power could endure as long as the

human race does. Admittedly, American power would survive the way that of the Republic of Texas or the Republic of California has done. But this seems highly preferable to the fate of Athens, Rome, the Hapsburg Empire or the Soviet Union.

One great advantage of such a policy could emerge in its earliest stages. The West could form a Western space agency. If one adds together the present GDPs of the EU member states, the non-EU members of NATO, the three new NATO candidates (Poland, Hungary and the Czech Republic), Japan, South Korea, Australia and New Zealand—that is, the core members of the Western Cold War alliance and the recent additions—the total comes to about 180% of American GDP. Other states that might be considered reliable allies of the United States—Egypt, Israel, South Africa, Thailand, Singapore, the Philippines, Taiwan, Mexico and Argentina—have a combined GDP over 20% of that of the United States. If these countries combined an equivalent percentage of their national wealth that the United States devoted to NASA (a rather tiny .2%), it would come to about \$30 billion. If all the national space agencies of these countries received annual budgets equal to .2% of GDP and combined them with NASA's, it would total about \$45 billion. If such funds were focused annually on coordinated unitary programs of space exploration and scientific research, the results would probably be spectacular.

The same advantages would accrue in commercial, military and, especially, police-regulatory space activities. Space industries would not have to be overly regulated. But international mergers of companies within the alliance would produce great economies of scale, particularly in concentrated research and development. Common funding of a united military space program would make the alliance unchallengeable in space, in case of war. But perhaps the greatest benefit would come from the formation of an alliance police-regulatory organization. Treaties and laws are of little use without force backing them. Attempts by the United States to enforce treaties relating to space unilaterally and, even more so, to introduce weapons into space to carry out police duties would undoubtedly provoke widespread protests. This would be particularly true in cases when such American policing was aimed at the lunar or planetary endeavors or the space platforms of foreign companies. An

international force would not be subject to the same opprobrium. Furthermore, as another benefit of an international military space force, the problem of the vulnerability of satellites might be largely solved. An attack on any space platform of the alliance would be an attack on all. Active response or reprisal would not be seen as the bullying or irresponsible actions of the United States. Instead, it would be viewed as the legitimate and just reaction of most of the international spacefaring community.

The disadvantages of this policy option would arise mainly from the resistance of many Americans (as well as citizens of other nations) to such a surrender of national sovereignty. The political foundations for public acceptance of such a course would have to be laid carefully and long in advance. Even then, official suggestions that such a policy was under consideration would provoke widespread anger in many parts of American society. It may be that even if such an option could be logically demonstrated to be the best of those presented, it would remain impractical for nonrational reasons. Perhaps such a policy might be considered at some time in the future. But it does appear infeasible for at least the next several decades.

Option Four is to continue our present somewhat uncertain course, drifting with neither guide star nor rudder, carried by the winds and currents and by initiatives of non-governmental players. What decisions must we still make; what decisions can be deferred; what decisions will “make themselves” in the absence of deliberate choices?

With this policy option commercial space activities would be largely free from government control. However, the government would control scientific and military activities, while police-regulatory activities in space would largely be a responsibility of the space industry.

Thus, space platform vulnerability would become a problem for the American space industry to solve. One advantage of this approach is that the challenge might then be addressed in the most cost-effective manner possible, due to the functioning of free market forces. Presumably—and this is a big “if”—space firms would rapidly recognize the danger to their already great and rapidly growing investments and take vigorous measures to shield and harden the satellites they produce.

On a broader level, such corporations would function within the various treaties governing outer space in a pragmatic manner. Considering the huge costs of space systems, American and foreign companies would avoid actions that might damage each other's assets. Competition would be limited by mutually beneficial cooperation, with a certain degree of added supervision exercised by governments and possibly by the United Nations. The pressure of public opinion and the need to enjoy good public relations would be relied on to create additional motivations for good behavior.

At the same time, the American Government could continue a fairly ambitious civil space program through a NASA funded at far higher levels than any other national space agency. Given the increasing importance of space systems to national security, military space programs could expect annual budgets that might rise as high as \$40 billion in current dollars.

The disadvantages of this option would arise from a possible clash between private and public interests. For all the incentives to behave reasonably in space, the lure of profit or the temptation to do in a rival might prompt illegal or treaty-prohibited commercial activities in space. Such behavior could push the United States into an international dispute or even conflict in somewhat the same trivial way that Britain and Spain got entangled in the "War of Jenkin's Ear" in 1739. (A war caused by the popular belief in commercialism in both countries and fanned by religious hatred.) Brian Sullivan reminds us of the beginning day of the war. As British Prime Minister Robert Walpole commented when bellicose London crowds hailed the declaration of hostilities: "They are ringing the bells now, they will soon be wringing their hands.")

In addition, even a well-funded military space program might be hard pressed to defend a gigantic American-owned space network based on an architecture designed in ignorance or disregard of military considerations. More than the concerns of foreign governments, the pressure exerted by American space firms against the development, let alone the deployment, of even purely defensive weapons in space, could severely hobble American space forces. A truly nightmarish situation could arise in which every aspect of American life depended on space systems but the military found itself

stretched hopelessly beyond its capacity to defend them. The challenges the US armed forces faced in the Pacific in the December 1941–May 1942 period would seem trivial in comparison.

Discussion and Conclusion

The divergent appearances of these three continuums—and others—suggests that all of the constituent factors of “space power” have yet to be unambiguously defined. Clearly it is not a linear problem, but a multidimensional one, albeit a system of variables with an interconnecting pattern of binding constraints. Analysts must describe how these features are interrelated before they can produce a credible, useful model of “space power” in the national context.

Certainly there is a wide range of possible intensities in terms of implementing command structure (RAND), or of capability of force application (Hayes), or degree of international coordination (Sullivan). There are similar wide ranges in other aspects of space power. Examples of such range is the availability of high-resolution ground imagery, the degree of surveillance of other space assets matched with the degree of concealment of one’s own assets, or of the fraction of space effort to be spent on “show-off” projects such as exploration and human flight.

Because “space power” has so many dimensions, it is wielded piecemeal by a wide variety of domestic players. Their interplay—both alliances, dependencies, competitions, and even occasional antagonisms—has evolved through practice, relying on changing laws, personalities, and traditions. Since opportunities in space are so often unpredictable and uncontrollable, this chaotic (some would say anarchistic) arrangement has proven remarkably resilient and responsive. But it is too much to hope for that the United States can continue to rely on such accidental and uncoordinated applications of “Space Power” in the next century.