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HIGH FRONTIER

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SCHRIEVER V WARGAME

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Ambassador Lincoln P. Bloomfield, Jr.
Chairman, The Henry L. Stimson Center
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Introduction: From the Iron Age to the Info Age in Ten Short Years

A decade ago, the dot-com revolution was in full swing, signaling the arrival of the 21st century, the end of the industrial age, and a growing reliance on information technology. The Pentagon, although busy addressing security challenges in Rwanda, the Balkans, the Taiwan Straits, Haiti, and elsewhere, was nevertheless living more frugally under post-Cold War budgets. President Bill Clinton claimed a 'peace dividend' after the fall of the Soviet Union. Vice President Al Gore promoted greater use by Department of Defense (DoD) of commercial off-the-shelf (COTS) products to avoid, where practicable, the long lead-times and high unit costs of items built to military specifications.

The US defense establishment energetically embraced the information technology revolution, and the military enhanced the performance of military specifications weapons and infrastructure with COTS equipment and services to achieve advances in intelligence, command and control, precision targeting, logistics management, and many other areas. Information carried on satellites—whether dedicated US government satellites or capacity contracted from commercial satellite providers—became a major enabler of US military operations. Policy and doctrine in the late 1990s began explicitly to acknowledge the importance, and vulnerability, of military equities in space.

With the initiation of post-9/11 operations in Afghanistan and Iraq, space-enabled military operations reached a new level of robust real time connectivity across long distances. Where 10 years earlier the defense policy concern was that impairment of its access to space communications could cause important but discrete disruptions in military operations, a mere decade later the recognition was already widespread that major functional capabilities in today's military exist only by virtue of continuous full-fidelity utilization of space.

The Benefits of Wargaming

An astute adversary, observing the quantum improvement in the effectiveness of America's global information technology-based military operations, and reading in US military journals about the revolution in military affairs and the transformation in warfighting, would naturally look to the informational backbone that made it possible. That backbone runs through space.

Among the earliest signals to the policy community that space was becoming more militarily significant occurred at the first major "Army After Next" wargame in January 1997, a 25-year look-ahead involving several hundred participants and commissioned by Army Chief of Staff, General Dennis Reimer. The "red" adversary team, finding itself hopelessly overmatched, detonated a nuclear device in low Earth orbit, destroying the space infrastructure on which the Army of the future would substantially rely.

The move was invalidated by the control team so as to permit the warfighting concepts in the game design to be tested through several moves. However, the acting US president at that game, then-senior DoD official Richard L. Armitage, in the executive out-brief, compared space to an exquisite crystal goblet, noting that technological infrastructure in space was at once fragile and empowering. In a National Defense Panel Report to the secretary of defense in December 1997, he and his co-panelists wrote, "If we do not control the military utility of space, the advantages we now hold in information operations and more traditional military operations could be put at risk.… [W]e must protect our space assets to include our commercial assets and deny our enemies the opportunity to gain military advantages through the use of space."[1]

Two seminal space wargames in 1998 and 1999, co-hosted by the Army Space and Missile Defense Command, the National Reconnaissance Office, and what was then US Space Command (prior to being merged with US Strategic Command [USSTRATCOM]) gave the undersigned and a policy "blue" team two rich, albeit artificial, week-long experiences set in the future. Our task as National Command Authority was to manage an escalating conflict and prevail, in a scenario where the US and its principal adversaries had fielded a range of destructive and disruptive space capabilities, and developed a suite of deceptive tactics to go with them.

That experience yielded the important recognition that space conflict featured characteristics that utterly defied the crisis management logic and protocols of past conventional or nuclear confrontation. The absence of warning, immediacy of adverse consequences, and complexity of tactical gameplay all pointed to a different paradigm than participants had ever encountered in the national security realm. Two of us published our insights, believing that these unique national-level policy issues needed

"… [W]e must protect our space assets to include our commercial assets and deny our enemies the opportunity to gain military advantages through the use of space."

~ National Defense Panel Report, December 1997

to be examined in detail given that the world was increasingly likely to view the US military's reliance on space-based assets as a lucrative target in a future war.[2]

Schriever V – A Civilian's Policy Perspective

As a participant on the US policy team at the Schriever V wargame, held at Nellis AFB, Nevada from 14-20 March 2009, the author was able to take stock of contemporary planning, concepts under development, and key questions of interest to the US Air Force in particular as the military proponent for the space domain. Informed by the gaming experiences of a decade earlier, this observer found that many of the fundamental dynamics perceived at that time regarding the military's equities in space had been validated in the intervening years. In particular:

- The severe degradation or loss of space-based communications and intelligence would have a major and growing impact on global US capabilities and operations, making the prevention of such an occurrence an ever more urgent priority;
- The speed with which harm could potentially be inflicted upon critical space infrastructure used by the US military places a premium on the ability to know, fast, exactly what is occurring in such a scenario—the capability known as space situational awareness (SSA).
- Related to the very compressed timelines of an attack on US space-based capabilities is the military's concern that rules of engagement (ROE) permit timely response, a concern that has, from the beginning, led many to posit the necessity of pre-delegated authority to a US commander already conversant with the space environment and the tactical dimensions of hostilities in space.

What Schriever V brought out, from a policy perspective, that had not been as evident in the earlier years of space wargaming, was a greater sensibility about terrestrial interests unrelated to the conflict that could be affected by escalation of hostilities into the space domain. The unfiltered participation of some allied experts brought to the policy discussion a rich appreciation that other governments and their populations have very substantial economic, scientific, and social interests in the uninterrupted benefits enabled by space-based transmission of communications.

Allied players were impressively conversant with norms of international law and policy pertaining to the world's access to space. Whatever latitude for US action in space American legal advisors may determine to be permissible under the accumulated body of international norms, recent real-world experience has shown that the US will underappreciate the views of other countries on issues of war at its peril, particularly when key democratic allies hold contrary views to the US on the necessity, hence legitimacy, of the use of force.

The central focus in Schriever V was not national policy but Air Force business: to examine whether the capabilities it had previously deemed essential proved in a simulated future operation to be useful and relevant to the mission of defending US space assets; to gauge how dependent on space our warfighting capacity has become, by simulating a sudden loss of space-based communications; and to probe the dynamics of an unfolding crisis through several moves to look for what worked well and to identify gaps in the US warfighter's ability to operate successfully.

It is a core responsibility of the US Air Force Space Command, working with USSTRATCOM and other combatant commands, to ensure that the military is ready, if directed by the president in a future crisis, to provide operational capabilities able to counter potential threats to US interests in space. The Schriever wargaming franchise has proved to be a valuable tool for experimentation, challenging a sizable community of experts to focus on the direction and adequacy of the organizations, capabilities and doctrine aimed at fulfilling that responsibility.

What a Military Game Will Not Try to Answer

If there is a risk emanating from a major exercise such as Schriever V, it is the possibility that some in Congress and the national security community at large may conclude that all the truly important national questions about future conflict in space have been touched and dealt with in such an exercise, when the reality is that they have not. This is no shortcoming on the Air Force's part: indeed, Schriever V stayed very properly within the boundaries of the defense mission.

As with so many well-organized, well-led, well-resourced DoD planning activities, we find there is no parallel civilian planning mechanism for policy and doctrine at the national level—no non-military franchise to focus on the decisions that our elected leaders will face, even though these are the most consequential questions of all. America's future civilian leaders will face more than military questions should a conflict scenario arise in space—questions appropriately left outside the parameters of the Schriever V exercise. They include:

- Will there ever be a situation in which the US interest is best served by conducting destructive actions against space assets, either to deny capability to an adversary, to deter further conflict escalation, or to retaliate for comparable acts of aggression against the US?
- Is the US intelligence community prepared to estimate, for the president, the potential worldwide collateral impacts of military actions taken to compel an adversary which could result in degrading or eliminating space-based communications for substantial geographic areas of the world?
- Do legal counsels from outside DoD, for example, at the White House, State Department and the Justice Department, have jurisdiction to advise the president on whether and how US military actions in space comport with international treaty obligations and generally-observed norms? And, what weight should be assigned to the views of other countries when the US is considering military options potentially detrimental to the future space environment and the global interests it serves?
- Can the decision to take destructive actions in the space domain be made by anyone other than the president, notwithstanding the forbidding time constraints and daunting (for all but space 'professionals') complexity of the space systems environment?

These are among the issues that officials in Washington need to consider and address so as to ensure that prudent military planning will rest on a coherent foundation of national policy and strategy—a foundation that can come only from the president and Congress. Not to provide such a foundation would be a disservice to our military.

To Militarize or Not to Militarize – That is Not the Question

Almost from the start of DoD's embrace of the information revolution, civilian defense planners and the senior military leadership have warned that military dependence on unimpeded use of space is so critical, and irreversible, as to warrant hardening of space assets and fielding of the capability to defend the space 'domain.' During this same time, other constituencies have viewed with mounting concern the prospect that space could become a theater of hostilities, given the physical risks that destructive activities in orbit could pose to satellites and activities supporting scientific inquiry and commerce, including manned space flight. This latter perspective has given voice to calls to keep space from being 'militarized.'

The conundrum for US policymakers is that both perspectives have a valid point: the US military and its alliance and coalition partners are correct that their operations are highly vulnerable, and their capabilities susceptible to unacceptable degradation, if space communications are disrupted; and the scientific community is no less right that a significant increase of space debris, or other forms of impairment, could be devastating to the peaceful use of space, collaterally affecting broad interests worldwide for potentially a very long time.

Has space been militarized? Yes and no. If, by "militarized," one means that the effective conduct of significant US military operations fundamentally relies on access to and use of space, then space has been militarized for many years. On the other hand, with the exception of the 2007 anti-satellite test by China (followed in February 2008 by the US Navy shootdown of a failed and de-orbiting satellite), space has not been a locus of destructive acts by any state. So, while we are decades past the point that space could be regarded as separate from the national security interest, it remains accessible to all, including precious human and scientific cargoes that must traverse low-earth orbit. While the earth's exoatmosphere is perhaps not pristine in terms of man-made debris, it remains as yet not devastated by the detritus of space warfare.

There is a divergence of views between the military who stand to lose so much from being targeted in space, and others who fear the deepening military dependence upon space could lead to an arms race in space and, eventually, destructive hostilities in space. Yet the interests of both, far from being divergent, are aligned, indeed inseparable. Both should be able to embrace the proposition that most closely reflects the true situation and the corresponding US interest. That is: the US needs to keep any aggressor from degrading or destroying space assets on which the US military depends, and at the same time it must seek to deter or prevent any erosion to the accessibility and fidelity of the space domain for technological utilization by all of humankind in perpetuity.

The National Interest in Space – Is Military Necessity Always Paramount?

Not just one, but two national interest goals present themselves as the proper object of US policy, doctrine, programs, and actions: preserving the US military's equities in space, and taking care to preserve the rest of the world's equities in space, including for future generations. If one were uncertain about the importance of this second goal, the reader is invited to consider what would happen if any party engaged in destructive acts in space.

Consider the implications for satellite manufacturers, insurance companies, the launch industry, and bandwidth providers. Imagine if low Earth orbit became sufficiently congested with debris that satellites were frequently at risk of catastrophic collision with very high-speed objects, or if some other impairment such as electromagnetic pulse in orbit were to inflict permanent damage on space-based electronics. Consider the reaction of governments and their citizens if the International Space Station became unsafe for habitation, and if manned and unmanned space travel alike were deemed too risky to justify the effort and investment. Now consider their perspectives if some of these adverse conditions were expected to persist for a generation, a century, or longer.

The world at large—the scientific community, the globalized private sector including financial markets as well as international traders in goods and services, and millions of ordinary people whose jobs and lifestyles rely upon space-enabled information services—would be justified in feeling that a part of their lives, and indeed their future, had been taken from them. The prestige, respect, and influence won by the country that landed men on the moon and exploratory unmanned missions on Mars would be forfeited if the US were seen to have had a role in so damaging the global economy and denying these scientific and aspirational horizons to others, never mind that the US likely would have acted in self-defense against a very threatening adversary.

The prospect of such a development has given rise to recommendations and proposals for multilateral prohibitions on such destructive acts.[3] Yet, as this is written, neither the US nor countries that might hold at risk its space capabilities appear inclined to adopt common restraints on their freedom of action in space. One reason is that potential adversaries of the US do not appear to be suitably impressed or deterred by a recognition of the profoundly grave effects of hostilities in space. That being so, even the expectation of severe collateral damage that would be global in scope and generational in duration might be deemed a high but necessary price for the US president to prevail in a conflict with a future adversary. Such is the ultimate priority that war imposes on political leaders, and the burden war can impose on civil life.

What the US requires is a security doctrine that sacrifices neither the future of space as a permissive domain nor the ability of the American President to seek leverage and even dominance over an adversary in an escalating crisis. The beginning of wisdom in contemplating this doctrine is to recognize that among

the principal casualties of a destructive conflict in space—regardless of who 'wins'—will likely be US military space-enabled capabilities. In other words, war in space is almost certainly not the optimal way to secure the national security domain of space.

The Warfighter's Takeaways from Schriever V, Reexamined

If there is one theme that consistently emerges from the insights of participants in space wargames, it is that timelines for decision and action are radically compressed in comparison to past real-world experience with miltary conflict. As one senior mentor put it, in a space conflict events unfold at "net speed."

Because of the physics of space orbit, entire constellations of critically-important space assets orbiting over hostile territory could potentially be destroyed in the time it would take to communicate effectively with the president and key cabinet advisors, and reach a decision on a military response. It is unarguable that with US space assets under attack, rapid action could spell the difference between preserving and losing capability, to say nothing of limiting the destructive consequences of the event. Figure 1 portrays this imperative.

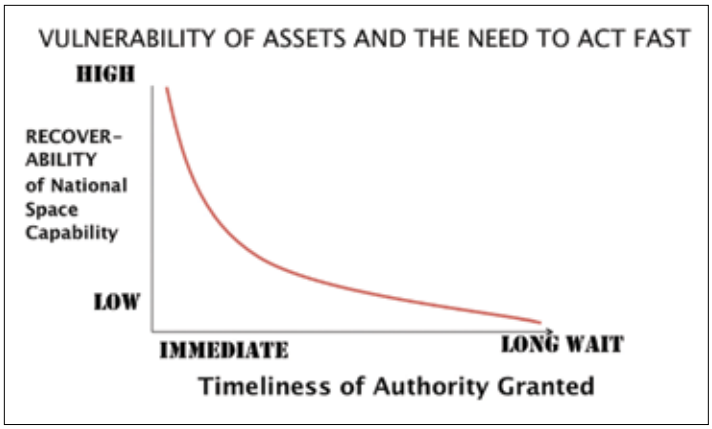


Figure 1. Vulnerability of Assets and the Need to Act Fast.

This concern understandably leads many to conclude that authority to use force against an adversary posing a grave risk to the military's utilization of space, must be pre-delegated by the president to a military commander well-versed on this unique set of operational issues. The unstated corollary is that the US response to such an adversary would likely occur in space, against the adversary's space infrastructure.

There are several reasons why pre-delegating authority to a military commander for the use of force in the space domain may not best serve the national interest.

1. ***Presidential Responsibility.*** Pre-delegation does not change the fact that the authority to use force is and remains presidential, once delegated. Therefore, any future warplans related to space contingencies are very likely to contain tight rules of engagement and precise 'withholds' specifically approved by the incumbent president—not a broad dispensation akin to a traditional executive order governing hostilities in a politically-confined geographic battlespace. As explained below, this is as much to protect military commanders as to satisfy a president's penchant for control.
2. ***Presidential Knowledge.*** The common but unstated assumption is that because there is no time to brief the president on the complexities of defending space, he or she must pass the baton in advance to a knowledgeable military commander. Waiting for a presidential decision, it seems, would be tantamount to ceding the loss of America's space assets. Yet this problem is not so easily solved. As the author has posited repeatedly in the wargaming arena with scenarios involving potentially severe consequences, a president will not authorize any course of action whose implications he or she does not understand. In other words, either in advance of a military crisis involving space, or at its outset, the president will have to be informed, educated, and advised to a level sufficient to support a decision to use force. Further, it is hard to conceive that once such a decision is taken, the president will not stay intimately engaged in managing the crisis.
3. ***The Political Dimension of Controlling Escalation.*** A crisis in space would presumably start with an adversary taking hostile action against militarily-important US space assets. In considering what happens next, one is drawn to the worst-case possibility that a rapid destruction of US space capability is underway. This compels the US Air Force to develop, and be prepared to execute, immediate counter-actions to deter, dissuade, and prevent such an outcome. The question for the National Command Authority is, what if the worst-case characterization of the threat is incorrect? What if the first destructive action was an accident? Or a one-off demonstration intended as a political warning to the US relating to broader issues between the two adversaries? What if the attribution to a particular adversary was incorrect—perhaps even manipulated through offensive cyber operations by a third party *provocateur*? The point here is two-fold. As with any escalating crisis, the protagonists in a conflict are political actors, and the issues being contested are geopolitical; and thus the US management of the crisis must of necessity include the civilian as well as military leadership. Second, a hair-trigger kinetic response in space by the US confers

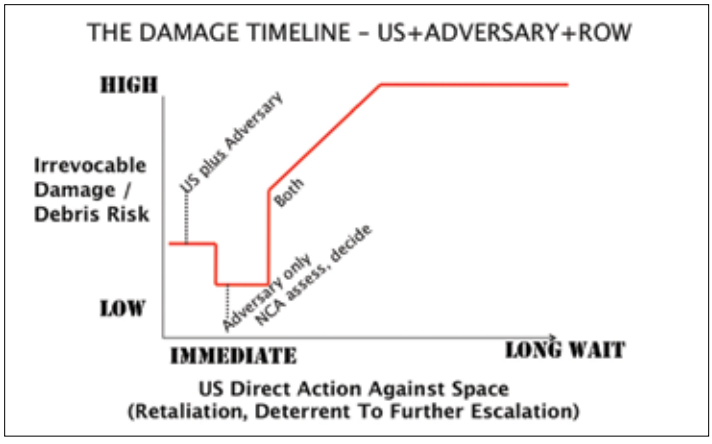


Figure 2. The Damage Timeline.

more risk than advantage, and should be avoided as a matter of operational tradecraft, to allow a discrete period for better characterization of the intent of the adversary before irrevocably harmful escalation is undertaken. Figure 2 depicts the advantage of such an approach.

4. ***The Moral Burden.*** Imagine if a US military commander in August 1945, exercising his own discretion, had ordered the use of two atomic weapons against Japan, without a specific pre-approval from President Harry S. Truman. Or consider the decision calculus facing a contemporary US commander if he or she knew that a tactical course of action, in order to achieve its coercive effect, would at the same time raise the global temperature by two to three degrees Fahrenheit, or reduce the world's potable water supply by over 50 percent. Would such a decision appropriately rest with that commander? The consequences of an escalation to conflict in space, should there be either a substantial loss of service to the civil sector or persistent degradation of the space environment, or both, would place a profound moral burden on the individual whose decision produced such an outcome. The authority to take such an action would, as noted, be the president's alone, irrespective of pre-delegated ROE. Given the moral gravity of military decisions with such broad and enduring collateral consequences, this observer anticipates that any future decision to employ force in space will be withheld and exercised only by the president. The author's prediction does not have to be correct more than once for a military space doctrine relying on the expectation of broad pre-delegated authority to fail.

The Reality of Space Security Today, and its Implications

For all the participants' appreciation of "net speed" in the Schriever V wargame, today there are but two militarily significant developments that would have any prospect of occurring at net speed: an adversary could commit wholesale aggression and substantially destroy space assets used by the US military; and the US could do much the same against space assets used by an adversary.

What the US military has no prospect of doing today at "net speed" is acquiring real-time knowledge that its systems are confirmed to be under attack by an identified adversary. We might know quickly that data has ceased to be transmitted; after a period we would know that specific satellites were not following their anticipated trajectories; and there could be terrestrial indicators of hostile actions aimed at the space domain. However, the hard fact is that the US is years from having a level of SSA to support a timely assessment and reliable characterization of an adversary's rapid escalation to hostilities in space.

Not only does this remove the strongest rationale for pre-delegating authority to respond with force in defense of US space assets—the presumption that the warfighter will know substantially more about the unfolding attack than the president, and in time to do something about it; but it means that until further notice, there may be no way for the US to know enough to act

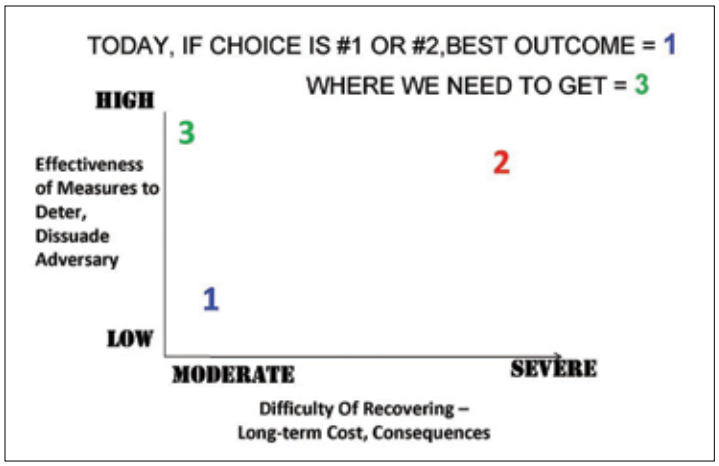


Figure 3. Where We Need to Get.

in time to prevent destruction of our space-based infrastructure. Lacking such knowledge, the utility of coercive response options is correspondingly diminished, as illustrated in figure 3.

The implications of a future space crisis, drawing further from the simulated test-bed of the Schriever V Wargame, are several:

First, while the US military must plan to defend US interests in space if and as directed by the president, the notion that threats to US space-based assets would best be countered by US military responses in space is highly questionable. Indeed, should US actions ever cause severe disruption or destruction in the space environment, it will bear responsibility for the collateral effects of those actions, and its posture as global champion of preserving space for all users and for all time, will be lost.

Moreover, hostilities in space will be nothing more, or less, than the extension into the space domain of a traditional conflict with an adversary country. The goal of any coercive US military actions against such an adversary will be the same, whether employed on land or in space. Having considered the nature of such a crisis for over a decade, this observer is not only prepared to consider the use of force against territorial targets in response to an adversary's aggression in space: but the requirements of the national interest, fully defined, point US military response options decisively away from space and, by default, toward terrestrial targets. As counter-intuitive as it may seem to some, it will be better to bomb an adversary's counter-space weapons in his homeland than to join him in causing the irrevocable degradation of space.

This has implications for command arrangements in a future conflict where threats are posed to US space-based assets. By remembering that "it's the adversary, stupid," the US will better focus on the decision calculus of that government and its own political-economic-security centers of gravity, which may not assign a comparatively high value to its own access to space. The US will identify options for holding at risk equities that government holds dear in any theater or domain, with an eye to minimizing collateral impacts on third-party countries and populations. Because the protection of space as a permanent preserve for one and all is the objective, the use of force by the US in a non-symmetrical fashion against the terrestrial interests of

an adversary who was threatening the world's interests in space would be defensible.

What the US Needs – A Doctrine to Keep the War Away from Space

While the US Air Force, and DoD more generally, are continuing to examine and address the military dimensions of America's growing security vulnerability in space, there are further steps that the senior civilian leadership should consider to ensure that the US has the full benefit of a space security strategy commensurate with the profoundly broad interests involved. Here are five recommendations:

1. ***Invest Urgently in SSA.*** The path away from extreme vulnerability begins with improving our ability to know what is occurring in space. Only when the US has sufficient warning indicators and near-real-time ability to perceive and attribute causes to anomalies in its space systems will it be in a position to exercise effective tactical responses to an adversary bent on degrading or destroying those systems.
2. ***Draw a New Red Line in Space.*** An action by any party to degrade or destroy space-based assets on which the US military depends would surely be, and therefore must be treated as, a hostile attack on the US Armed Forces. The president should declare this as the core of a new space security doctrine whose over-arching purpose encompasses both the military's equities and the other fundamental US interest in space: its preservation for the benefit of all mankind, undisturbed by destructive or disruptive acts, for all time. By taking this step, the rest of the world will be on notice that by projecting hostilities into space, they risk war with no geographic constraints.
3. ***Identify the Countries of Primary Concern.*** No security purpose is served by pretending that we do not know who the countries are with potentially destabilizing military capabilities in the space domain. Russia and China see themselves as major powers; they merit special policy treatment for the purpose of ensuring that future disagreements do not escalate to the point of threatening US or global interests in space. Handled right, a country-specific focus, with serious dialogue between respective policy officials, could be a positive enterprise, reducing the potential for miscalculation on all sides.
4. ***Let the Warfighters Meet and Talk—in Parallel with the Politicians.*** Experience shows that senior military commanders from potentially adversarial camps, if they know each other and have a reliable channel of communications, may be able to defuse rising tensions when their political leaders cannot. In the interest of preventing escalating tensions from leading to hostile actions and permanent destruction in space, DoD should seek to establish regular bilateral US-Russia and US-China contacts between the senior military commanders responsible for space operations.
5. ***While Planning for a Future Crisis, Be Prepared for One Today.*** To simulate future conflict is to escape some of the constraints of the day. Activities such as the Schriever V wargame properly focus a community of expert players on the parameters of an effective defense posture not far into the future, and their insights can point current officials toward some programs and initiatives and away from others. But what happens if a threat is posed against US space assets two years from now? There may be merit in conducting a wargame based on current capabilities, resource availability, and global conditions.

The US military may face troubling vulnerabilities in space, but as yet it has lost nothing. Space systems continue to empower the national defense and thus America's security. The domain of space is still preserved for present and future generations, with large and growing benefits to people everywhere. Scientific exploration of space continues apace, led as always by the US. Given the alternatives, the goal of perpetuating these favorable conditions is worthy of a comprehensive national policy commitment that clearly supports them all.

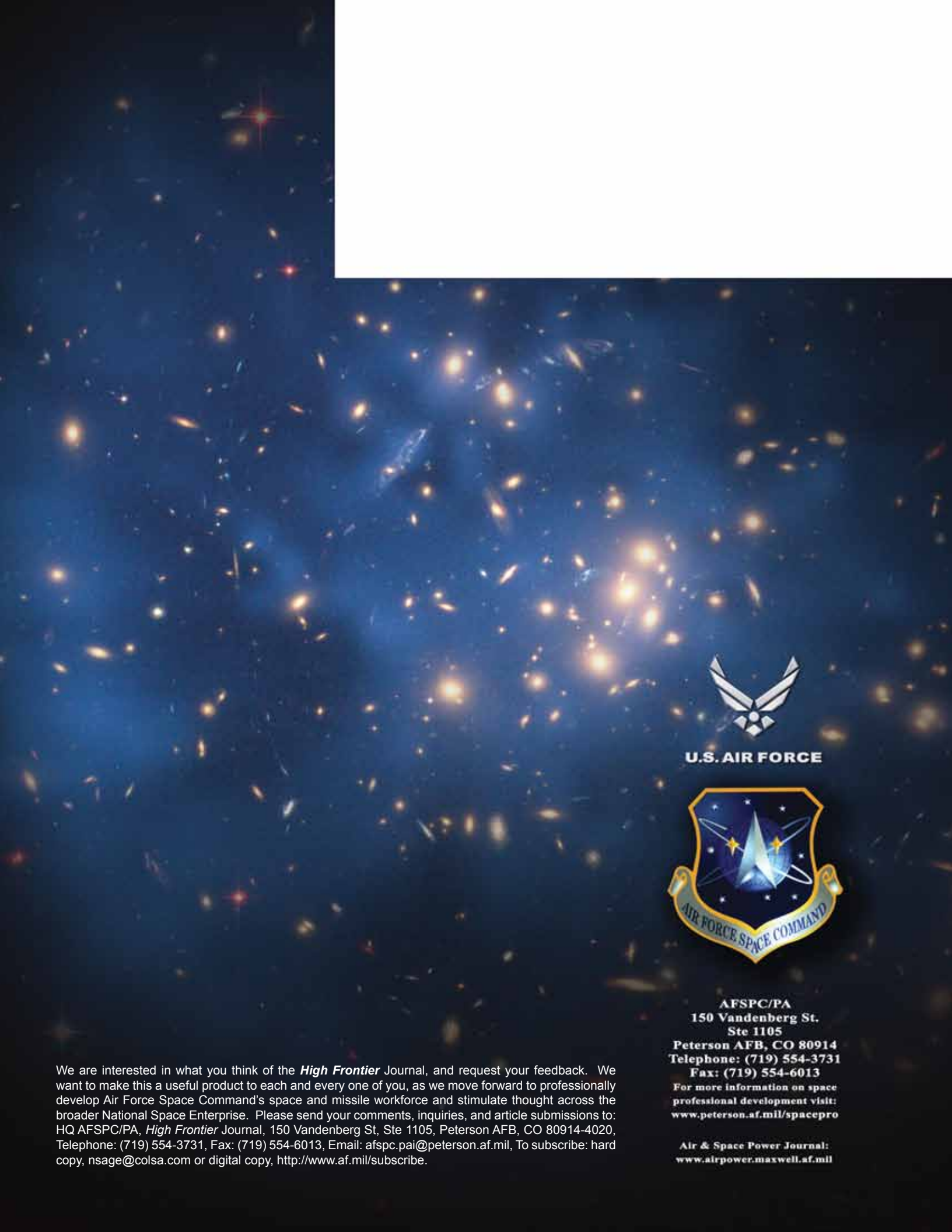
Notes:

[1] Transforming Defense – National Security in the 21st Century: Report of the National Defense Panel, December 1997.

[2] Lincoln P. Bloomfield, Jr. and Richard Hart Sinnreich, "Space: A Military Far Frontier No More," *The Army Space Journal* 1, no. 2 (Spring 2002).

[3] The Stimson Center in Washington, DC, through its program on Space Security, provides a useful resource on potential measures to protect the domain of space. See: http://www.stimson.org/space/program-home.cfm.

Ambassador Lincoln P. Bloomfield, Jr. (Harvard, a.b., cum laude, Government, 1974; Fletcher School, M.A.L.D., 1980) was the president's special envoy for Man-Portable Air Defense System (MANPADS) Threat Reduction from 2008-09; from 2001-2005 he was assistant secretary of state for political military affairs and the special representative of the president and secretary of state for Humanitarian Mine Action. He previously served as deputy assistant secretary of state for Near Eastern Affairs (1992-93), deputy assistant to the vice president for National Security Affairs (1991-02), member, US Delegation to Philippine Bases Negotiations (1990-91), member, US Water Mediation in the Middle East (1989-90), and principal deputy assistant secretary of defense for International Security Affairs (1988-89), among other positions in the Department of Defense (OSD/ISA) beginning in 1981. He is chairman of the board of the Henry L. Stimson Center, a founding board member of Survivor Corps (formerly Landmine Survivors Network), and is affiliated with the Center for Strategic and International Studies and the Bipartisan Policy Center.



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