

AIR WAR COLLEGE

AIR UNIVERSITY

BUILDING PARTNER CAPACITY
WITH
OPERATIONALLY RESPONSIVE SPACE

by

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Biography

Lieutenant Colonel Damon S. Feltman is currently a student at Air War College, Maxwell Air Force Base, Alabama. Prior to this assignment, he served as Chief, Combat Air Forces, Space and Command and Control Branch, Tactics and Training Division, Air, Space and Information Operations Directorate, Headquarters Air Force Reserve Command, Robins Air Force Base, Georgia. He was also the Command Space and Unmanned Air Systems Operations Functional Manager. During this time he was responsible for operations and training oversight for Air Force Reserve Command's participation in 16 major air and space weapon systems.

Lieutenant Colonel Feltman attended Mississippi State University on an Air Force Reserve Officer Training Corps scholarship, graduated in 1991 with a bachelor's degree in business administration and was commissioned a second lieutenant. In 2001 he was awarded a Master of Science in Space Studies from the University of North Dakota.

Lieutenant Colonel Feltman's active and reserve military career includes a variety of space operations, staff and education positions. He has led operations crews for two different satellite programs, was the senior crew commander for an intercontinental ballistic missile squadron, and served as an instructor and flight commander for the Air and Space Basic Course at Air University. He has served as a staff officer at United States Strategic Command and been certified in several space operations positions within the Air Operations Center.

His civilian career is varied as well. He has been a program manager and marketing manager for an airborne remote sensing and engineering services company. In addition, Lieutenant Colonel Feltman has served as a Space Operations Analyst with both United States Strategic Command and United States Joint Forces Command.

Introduction

Observers of the U.S. Department of Defense (DoD) will note the recent emergence of the terms “contested domain” or “contested environment” regarding U.S. operations in space. The phrase “space is a contested domain” is almost always used in a context meant to evoke thoughts of adversaries actively struggling for superiority in an environment of military utility. This is natural as the appearance of the language occurred after notable recent hostile actions taken against various space assets, which include Iraq’s use of Global Positioning System jammers in 2003; the jamming of satellite communications by Iran and Libya in 2003 and 2005, respectively; and, most dramatically, the Chinese anti-satellite test in January 2007.¹ Although it is natural to focus on the militaristic “hard power” aspects of a contested space domain, it is equally important to note the presence of an existing “soft power” contest as well. While the U.S. and Russia accounted for nearly two-thirds of all orbital launches in 2008, the rest of the world has been increasing their share.² Similarly, most of the nine other largest space-faring nations have increased satellite manufacturing capability at a time when U.S. space manufacturing has seen a fairly steady decline.³ Finally, while ten nations accounted for almost all booster and spacecraft production in 2008, industry experts predict another five could soon emerge.⁴

While the U.S. must certainly address ways to mitigate or defeat threats to its space systems, it must also address its general space competitiveness, to include the cooperation and support it promotes with other nations. “Cooperation and support” actions should include efforts by the United States to use its current position as the world’s dominant space actor to influence the entry and growth of partner nations in space. As the DoD’s Executive Agent for Space⁵, the Air Force is ideally suited to take a prominent role in such an activity through two existing

initiatives – Operationally Responsive Space (ORS) and the *United States Air Force Global Partnership Strategy* (USAFGPS).

This paper will explore beneficial outcomes of including ORS as part of the Air Force’s *Building Partnerships* Core Function and in supporting the USAFGPS. While the vision for ORS and USAFGPS already includes consideration for international partnerships, predominately with existing space-faring allies, this paper will argue that there are additional benefits if the partnership concept is expanded to include growing space capabilities *with limited or non space-faring nations*. Section 1 will describe the objectives of ORS and USAFGPS, and will establish common themes used throughout the rest of the paper. Section 2 will expand on the goals of USAFGPS through illustration of a successful aviation-centric partnership program, the Air Advisor program in Iraq. This review will allow for presentation of a hypothetical ORS-derived partnership program in Section 3. Finally, Section 4 will attempt to identify doctrine, organization, training, materiel, leadership, personnel and facilities (DOTMLPF) changes required in order to enable a broad, flexible and responsive ORS/USAFGPS partnership.

Building Partnerships and the United States Air Force Global Partnership Strategy

The origin for the Air Force’s recent partnership effort can be traced to January 2008 when the Joint Requirements Oversight Council approved the *Building Partnerships* (BP) Joint Capabilities Area and defined BP as, “The ability to set the conditions for interaction with partner, competitor or adversary leaders, military forces, or relevant populations by developing and presenting information and conducting activities to affect their perceptions, will, behavior and capabilities.”⁶ A month later, the Office of the Deputy Under Secretary of the Air Force for International Affairs (SAF/IA) was designated as the lead organization for the Air Force’s contribution to *Building Partnerships*.⁷ The *United States Air Force Global Partnership*

Strategy was published in December 2008 and *Building Partnerships* was specified as one of 12 Air Force Core Functions in the *Air Force Posture Statement 2009*.⁸

USAFGPS defines the ends, ways and means by which the Air Force will support Combatant Commanders' (CCDR) partnership requirements. As the ends are the most important part of any strategy, they are worth highlighting:

- a. Establish, sustain and expand Global Partnerships that are mutually beneficial.
- b. Provide global partners the capability and capacity necessary to provide for their own security.
- c. Establish the capacity to train, advise, and assist foreign air forces, while conducting partnership activities using USAF Airmen with the appropriate language and cultural skills.
- d. Develop and enhance partnership capabilities to ensure interoperability, integration, and interdependence, as appropriate.⁹

It is also worthwhile to comment on the strategy's ways and means, as well as discuss four observations. First, the 10 ways and 17 means described in USAFGPS are so broad and encompassing that almost any Air Force activity could be viewed as supporting the strategy. Second, these ways and means are not new; the Air Force has employed many of them for years. Third, the ways and means are generally geared towards non-combat phases of operations. Finally, USAFGPS has a bias towards aviation and aviation-based means. A search of the terms "aviation" and "air" return 15 references where the intent is to build or expand a partner's air operations capability. Comparatively, there are only five similar references for space operations and four for cyberspace operations. While this may indicate a predisposition towards legacy partnership activities with which the Air Force has significant experience, it may also reflect the possibility the Air Force has not given as full a consideration to space (and cyber) partnership opportunities.

Operationally Responsive Space

ORS is intended to provide “assured space power focused on Joint Force Commander (JFC) needs.”¹⁰ It began with the Deputy Secretary of Defense’s formal establishment of the program in July 2007.¹¹ Unlike USAFGPS, which was able to draw on years of experience to shape its development, ORS does not have similar historical foundations. Furthermore, the space community actually lacks the methods necessary to achieve the desired end.¹² In other words, the space community will have to develop the capability to provide the ways and means of ORS. To enable a solution to this problem, the Secretary of the Air Force, using his authority as the DoD Executive Agent for Space, approved a three-tiered approach to developing ORS ways and means:

- Tier 1: Within minutes to hours, use existing deployed space assets in applications that may extend or expand their original purpose
- Tier 2: Within days to weeks, deploy new or additional space capabilities that are “field-ready” and already available
- Tier 3: Within months and less than one year, rapidly develop, deliver and employ new space capabilities¹³

ORS development has moved rapidly since 2007. Essential technologies are evolving, and several demonstration spacecraft have been, or soon will be, built and launched. Despite this, the Government Accountability Office (GAO) issued a critical assessment of ORS in July 2008. The GAO asserted that key elements of the ORS concept were not clearly defined, not clearly communicated with key stakeholders, and that the program may not meet warfighter needs.¹⁴ GAO criticisms notwithstanding, it is safe to say ORS is ambitious and programmatically risky. The DoD has identified a minimum of seven significant technical, procedural and bureaucratic enablers must be modified, developed and synchronized¹⁵ in such a

way as to build confidence with JFCs and CCDRs that ORS will deliver capabilities in a relevant, timely and affordable fashion.

Merging the Two

Just as the USAFGPS does not advocate one approach to support CCDR partnership requirements, the same can be said for ORS. Although parallels may not be obvious at first, similarities become clearer with the realization that, like the USAFGPS, ORS will use many ways and means to improve the responsiveness of space capabilities for CCDR objectives and requirements. In addition, the two programs are in fact complementary and can use each one's strengths to minimize the other's weaknesses. First, despite its bias towards historical aviation programs, USAFGPS is applicable to all Air Force mission areas; nothing in its text excludes any mission area. Therefore, space should be considered an inherent element of the strategy. Second, USAFGPS emphasizes non-combat operations opportunities. On the other hand, while space operations contribute across the spectrum of military activities, space superiority, as an Air Force Core Function, focuses on combat phases.¹⁶ In combining the two, ORS could bring distinct opportunities to phases of operations where space capabilities are otherwise less prominent. Finally, USAFGPS could provide a "development environment" against which ORS could reduce risk. By building capacity in nations with little or no space capability, the Air Force could create pathfinder events to develop the necessary technologies, procedures and policies required for broader ORS objectives.

To illustrate how ORS might become integral to *Building Partnerships* and USAFGPS, consider Air Force Aviation Advisor activities. Doing so will serve two purposes. First, it is an activity with which the Air Force has a great deal of experience, and provides applicable lessons learned for a space scenario. Second, and more importantly, it will show how a marginal

increase in a partner nation's (PN) air power, however minor relative to the U.S., can become a significant source of national pride to the PN, increase its capability, and support long-term American strategic goals.

Aviation Advisors as an Example of Building Partner Capacity

According to the *Air Advisor Handbook*, Aviation Advisors (AA) “assist a PN air force to develop infrastructure; organization; concepts; tactics, techniques and procedures; and training programs to promote interoperability with U.S. and Coalition air forces.”¹⁷ AAs are one of several *means* by which the Air Force may execute the many *ways* of the USAFGPS, and may also be combined with other *means* in order to achieve desired *ends*. AA programs can be initiated at the request of Department of State (DoS), DoD, or a CCDR.¹⁸

AA program execution can be extremely complex, especially if the PN has little or no existing capability. Advisor activities involve building capabilities the average Air Force Airman takes for granted: training and education; command and control; logistics and sustainment; budgets; and governing documents. The added challenge to U.S. Airmen is the contextual and cultural setting. PN airmen may have few immediately usable skills, and activities that would seem normal or self-evident to a USAF member may not be accepted in the PN's culture.¹⁹

One recent example of an AA program is the Iraq Coalition Air Force Transition Team (CAFTT), established in November 2005 and later organized as the 321st Air Expeditionary Wing (321 AEW).^{20,21} The CAFTT was tasked to re-build the Iraqi Air Force (IAF), decimated by war and years of neglect, to a point where the IAF could provide its own homeland defense.²² The first task for CAFTT was to train and develop IAF airmen so they could operate the 38 helicopters and fixed-wing aircraft provided by the U.S. government and neighboring

countries.^{23,24} However, numerous other problems required solutions before training could start. The most fundamental was a lack of airmen – officers, non-commissioned officers and enlisted – but the operational front also presented hurdles. None of the hold-over pilots from the old IAF were qualified in the donated aircraft; the aircraft were not well-suited for the harsh environment or assigned missions; there were no training programs for the aircraft; and technical orders and logistics support were minimal.^{25,26} The CAFTT also required support from Air Education and Training Command (AETC) to develop and execute numerous courses: flight screening and initial skills training; aircraft and mission-specific training; instructor qualification training; and mission support (aircraft maintenance, etc.) training programs.²⁷

The CAFTT has had significant success in building capacity for the IAF. By the end of 2007 the IAF was flying 300 sorties a week.²⁸ In February 2009, the IAF's equivalent of Undergraduate Pilot Training graduated its second class of new pilots and first class of instructor pilots, and by the end of 2009 the IAF was projected to have 6,000 airmen.²⁹ The IAF has also provided operational impact to economic reconstruction and counterinsurgency operations as well. IAF reconnaissance aircraft have been used to spot oil theft along pipelines and are routinely flying battlefield mobility missions.^{30,31} But arguably the most important benefit is what one former CAFTT commander described as the sense of pride among the Iraqi population that has come from having their new air force:

“Seeing one of their own [aircraft] with the Iraqi flag prominently displayed evokes an instant patriotic reaction...More than a largely regionalized army or police force, a credible air force serves as a source of national pride in people looking for something to unite them.”³²

In reviewing the CAFTT's actions, three observations are apparent. First, the challenges faced by an AA team can be fantastic and requires highly-skilled members. A report by the Office of Air Force Lessons Learned (AF/A9) noted that the Air Force's only permanent

AA squadron utilizes 38 different career-fields and requires up to 15 months to train a fully-qualified member.³³ Next, AA activities are time consuming and can take many years to execute. For example, the CAFTT plan for the IAF goes through 2015, 10 years after initiation.³⁴ Finally, the capabilities created within the IAF are not only significant in their military context, but also in their affect on the hearts and minds of the Iraqi people.

With a foundational knowledge of AA established and a real-world example shown, the next section will present a hypothetical situation in which a PN's space capabilities can be increased alongside air (and cyber) by using ORS enablers. Furthermore, the section will also attempt to define, albeit notionally and in an abbreviated manner, the supporting capabilities that would have to be developed in concert for a PN to build its space capability.

Building Partner Nation Space Capacity – A “Space Advisor” Example

A recent SAF/IA statement regarding its International Space Engagement Strategy and USAFGPS indicates the Air Force's future space partnerships will tend to focus on established space-faring nations perceived as “reliable partners.”³⁵ This position is supported in the *Air Force Posture Statement 2009* which highlights Australia's participation in the Wideband Global SATCOM program as an example of building partner space capacity.³⁶ However, an engagement strategy focused only on “reliable partners” (that is, core strategic allies who are also upper-tier space-faring nations) may be unnecessarily restrictive. Additional strategic and operational opportunities will present themselves if the Air Force adopts a broader view of space partnerships.

Consider how a CAFTT-like mission, with the addition of “space advisors” and ORS-provided capabilities, could create new competencies for a PN. Space advisors and PN space

forces would execute processes similar to their air counterparts. First, PN personnel would be screened and enter basic skills training. Advisors would supervise PN personnel as they gain experience on small, modestly-capable “trainer” spacecraft launched specifically to facilitate training and operational seasoning. Simultaneously, other PN personnel would train and gain experience through installation and maintenance of the ground architecture.

The next phase would be the introduction of more complex spacecraft that support broader PN requirements. For instance, a basic elliptical-orbit communication constellation could augment command and control (C2) of dispersed forces, provide secure diplomatic communications, and supply radio broadcasts for the general population. Similarly, a medium-resolution imaging system could support essential PN services such as border security, infrastructure planning and environmental monitoring. Operational C2 of space system(s), integration of space services into daily operations, and planning methods to support national security processes would be taught as well.

The final phase would be the transition to an even more capable space architecture supported by a professional space cadre and fully-integrated with PN government functions. Spacecraft would be more robust, potentially greater in number, and suited for use in coalition operations. PN space and maintenance personnel would manage their training programs, and the enterprise would be supported by policies and laws established by the PN. Finally, PN experiences in operations and maintenance, buttressed by other economic and social development, would enable additional international space partnerships, industrial development, or scientific research.

Currently, neither the Air Force nor the ORS program is postured for this notional scenario and the research for this paper indicates that such a scenario has not yet been

considered. Dialog with ORS and USAFGPS experts at OSD, SAF/IA, Air Force Space Command (AFSPC) and ORS Program Office identified two initial concerns worth discussing. The first is that a handful of small satellites would not add “real” capability to a PN. The counter-argument is that the USAFGPS is not about building immediate, robust partner capacity or U.S.-equivalent space services. Rather, it is a multi-year process that exemplifies a “crawl, walk, run” philosophy. For example, the IAF’s initial inventory of three C-130s came at a time when the Air Force had 189.³⁷ Comparatively, the IAFs capability was 1.6% of the Air Force, yet a multi-year plan was developed and executed.

The second concern is that it would cost too much to build and launch enough satellites to establish a desired capacity. There are three counters to this. First, while partnership programs work quickly, they are nonetheless executed over many years. Consequently, costs would be spread over multi-year periods. Second, consider the 10-year, \$3.6B AA budget for Afghanistan.³⁸ This illustrates that DoD is willing to spend large sums of money *if* it believes actions support objectives. So, if ORS can deliver capable systems at reasonable cost, then a partnership plan that includes space is not unfathomable. Finally, there are cost-sharing and foreign military sales opportunities where a coalition could donate funds or purchase equipment for a PN, just as other countries did for the IAF.

The benefits for adopting this approach are noteworthy. Strategically, while global market surveys show the U.S. is the dominant space-faring nation by every metric,³⁹ a “trend toward globalization of space” is underway⁴⁰ with economic and information soft power contests being fought. In some areas, such as small spacecraft and launchers, the U.S. is clearly behind.⁴¹ As the world’s overall space leader the U.S. has two choices. One is to adopt an engagement strategy that allows it to shape other nations’ use of the space domain. The second is to attempt

to maintain the status quo. Clearly, the better strategy is the former and not the latter. As one Air Force strategic planner noted, when the number of competitors is on the rise, the better strategic option is to try and manage the competition.⁴²

The programmatic benefits to ORS support this approach. A key feature of the ORS concept is use of common designs and interfaces to reduce costs.⁴³ It also depends on high-volume production and launch.⁴⁴ Despite these objectives, the designs chosen to date and projected launch rates appear to be well short of what is required by the ORS business case. Without adequate production it is unlikely ORS's touted economies of scale will come to fruition. Broadening the ORS mission to include building PN capacity will increase transaction rates in all key areas – spacecraft, payload and booster manufacturing – and spread program costs across more users.

To summarize, injecting ORS-derived capabilities into USAFGPS provides benefits to PNs and Air Force. For the PN, space systems and infrastructure can increase the capability to conduct essential activities. The addition of space forces not only adds depth to a PN's military and industry, it also distinguishes the PN from neighboring countries, and can become a source of national pride. The benefits are just as meaningful for the U.S. First, it creates a new strategic capability that enables the U.S. to influence other nations' use of the space domain. Next, it helps ensure PNs become responsible users of the space domain. Third, it enables the U.S. to build space partners who can be integrated in coalition operations. Fourth, it introduces much-needed transaction rates that will help ORS reduce fiscal and technology risks. Finally, it increases the overall robustness of the U.S. space architecture, which reduces the risk of a debilitating adversary attack and creates a deterrent effect.

The proposal to this point has focused on building a case for expanding the USAFGPS through space. What remains is identification of institutional changes required to execute the concept. The final section will define several DOTMLPF recommendations.

DOTMLPF Implications

This paper advocates that ORS can support Air Force *Building Partnerships* efforts and that doing so will provide tangible benefits to PNs, the ORS program, the Air Force, and national security. It has also shown that neither the ORS program nor Air Force is prepared for this task. Numerous DOTMLPF changes must occur in order to add space as an effective tool in the *Building Partnerships* toolbox.

Doctrine: This category also includes policy and law due to their great influence on space activities. Critical work is required here. Current references to space within *Building Partnerships* documents are in the generic context of “air and space” and do not push building analogous PN space capacities. While neither joint nor service doctrine prohibits building PN space capacity, the absence of direction has led to an absence of action. Specific inclusion of this task in key doctrine documents will push development of the capability. The same can be said for other key documents such as *Air Force Posture Statement*, *Air Force Global Partnership Strategy* and *Air Advisor Handbook*.

Necessary policy and law changes could be significant. An AF/A9 report on partnership activities for SOUTHCOM noted several general policy impediments to effective partnership execution.⁴⁵ In addition, one specific law that must be addressed is the Arms Export Control Act and its derived International Traffic in Arms Regulations (ITAR). While export controls are intended to keep military systems out of adversaries’ hands, ITAR and other export controls have negatively affected almost every major aspect of foreign space partnership activity.⁴⁶ While

ITAR is currently being reviewed by the administration⁴⁷, an ITAR mitigation plan for ORS should be developed to ensure partnership space activities are not negatively impacted.

Organization: The ORS Program Office must possess the capability to respond to partnership requirements. AFSPC, as the DoD's principle force provider and executing command for ORS, should organize its ORS squadrons so they, too, can support partnership requirements. Air Combat Command and Air Force Special Operations Command, as the principle force provider and execution commands for partnership activities, should include some organic space capability in their AA squadrons. Finally, the Air Reserve Component (ARC) may need to organize units to support partnership activities.

Training: Training includes that administered to U.S. Airmen and PN forces. The *Air Advisor Handbook* identifies general training and familiarization requirements for airmen⁴⁸ and it is reasonable to conclude that space personnel will require the same. Teams will rely heavily on AETC as training programs are established, and each PN will require development of numerous technical training courses. To facilitate space cadre professional development, instructor training programs and courses similar to the Air Force's Space 200 and Space 300 space professional development program will be required.

Materiel: The ORS Program Office will have to acquire equipment based on partnership requirements. Routine engagement with CCDRs could lead to development of standardized mission and capability requirements, which in turn would enable construction of modest stockpiles of equipment.

Materiel solutions should focus on two objectives. First, to minimize potential ITAR restrictions, solutions should rely on commercial technology. These should be what one ORS expert calls "State of the World" versus state of the art.⁴⁹ Second, solutions should focus on

systems with simple designs and shorter life-spans. This will enable higher equipment production runs and offer windows for technology updates, both of which enable favorable production costs. It would also mitigate risk should a PN unexpectedly grow into a regime not favorable to the United States, as the space capabilities provided by the U.S. would be of a limited lifespan and technological capability.

Leadership: OSD and Air Force senior leaders must decide if ORS should support partnership activities. If so, they must allocate resources to the role. Similarly, Component and Combatant Commanders must ensure space partnership activities are part of theater security cooperation and campaign plans.

Personnel: The addition of this capability may require the Air Force to reallocate manpower. The Air Force should consider ARC capabilities when it addresses personnel requirements. The ORS-USAFGPS merger is well-suited for a Total Force Initiative as it is training-intensive and fits nicely with the ARC's training-focused organization and culture. Additionally, training PN personnel is a competency within several states' Air National Guards through their State Partnership Programs.⁵⁰

Facilities: No new CONUS facility requirements are envisioned. PN facility requirements would become part of a partnership campaign plan.

Conclusion

The Air Force has an opportunity to expand its *Building Partnerships* Core Function by broadening its concept of how space is used with partner nations. The focus on "reliable partners" has benefit but development of new "reliable partners" can have value for both the PN and the U.S. As with the AA mission in Iraq, partnerships can increase a PN's ability to defend and govern, increase the professional depth of its air force, and become a source of national

pride. For the U.S., this can increase soft power projection, counter the space power projection of competitors, influence the growth of responsible space-faring nations, and increase space capability in future coalition operations.

ORS is a potential catalyst for such a new activity but numerous DOTMLPF issues must be resolved before the Air Force and ORS program take on this role. More detailed reviews are likely to reveal that benefits of building partner capacity through ORS will outweigh the costs. First, it will introduce risk-reduction opportunities for more complex ORS requirements. Next, the increased number of purchases for space components will introduce needed economies of scale across parts of the ORS program. Finally, it will increase the robustness and responsiveness of the U.S. space architecture against hostile and non-hostile contests.

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