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14. ABSTRACT The technology of war has changed and joint force commanders must be prepared to fight symmetric and asymmetric threats. Within this context, the US has committed to developing/fielding space control weapon systems. This presents a new challenge for the commander; how to employ a key component of operational art, the principles of war, to best create and execute effective and integrated space control courses of action and Strategy. DESERT SHIELD demonstrated the need for a thought-out and documented concept of employment derived from sound operational art prior to hostilities. Armed with capable systems but lacking key OPART components, it took US/Coalition forces over six minutes to disseminate detection/warning of the first Iraqi Scud launch. Had a matured and documented OPART been developed using the principles the timeline would not have taken six minutes. All principles of war are applicable to space control operations. However, the principles of objective, offensive, and security serve as an optimal rallying point from which to create space control schema. Proponents of emerging concepts contend the principles are no longer valid, and in some cases applying the principles to space control may prove counterproductive to overarching objectives. The world has changed however the principles are still valid and effective in crafting space control COAs if considered within context of overarching objectives. Given the impending fielding/employment of space control weapon systems we must take time <i>now</i> to craft and document applicable OPART methods to ensure effective integration and employment of these capabilities.					
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**OPERATIONAL ART FOR SPACE CONTROL:
DO THE PRINCIPLES OF WAR APPLY?**

By

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A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract

The technology of war has changed and joint force commanders must be prepared to fight symmetric and asymmetric threats. Within this context, the US has committed to developing/fielding space control weapon systems. This presents a new challenge for the commander; how to employ a key component of operational art, the principles of war, to best create and execute effective and integrated space control courses of action and Strategy.

DESERT SHIELD demonstrated the need for a thought-out and documented concept of employment derived from sound operational art prior to hostilities. Armed with capable systems but lacking key OPART components, it took US/Coalition forces over six minutes to disseminate detection/warning of the first Iraqi Scud launch. Had a matured and documented OPART been developed using the principles the timeline would not have taken six minutes.

All principles of war are applicable to space control operations. However, the principles of objective, offensive, and security serve as an optimal rallying point from which to create space control schema.

Proponents of emerging concepts contend the principles are no longer valid, and in some cases applying the principles to space control may prove counterproductive to overarching objectives. The world has changed however the principles are still valid and effective in crafting space control COAs if considered within context of overarching objectives.

Given the impending fielding/employment of space control weapon systems we must take time *now* to craft and document applicable OPART methods to ensure effective integration and employment of these capabilities.

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Introduction

In itself, the deployment of forces at a certain point merely makes an engagement possible; it does not necessarily take place. Should one treat this possibility as a reality, as an actual occurrence? Certainly. It becomes real because of its consequences, and consequences of some kind will always follow.

- **Carl Von Clausewitz**

New Challenges:

In 2004 Undersecretary of the Air Force, Peter B. Teets stated it is “important for us now to focus some attention on this whole space control arena.”¹ Since then the Air Force has actively worked to procure, field and operate space control weapon systems like the Counter-Communication-System (CCS) and the Counter Surveillance and Reconnaissance System (CSRS).² So with regards to employment of space control weapons the question is no longer *if* but *when* and more importantly for the operational level commander, *how*?

Given the relative newness of a publicly stated plan to acquire, field and employ Space control systems, the existing anthology of space control thought is devoid of an operational art (OPART) perspective specifically developed for how to conduct combat operations in, through, or from space.³ All that is available off-the-shelf for the operational commander is broad Joint and individual service doctrines, and command relationship models.

Thesis:

The timeless and proven “Principles of War” provide a relevant and applicable starting point for planning and conducting future space control operations. The nine

¹ John A. Tirpak, “Securing the Space Arena.” *Air Force Magazine*, 87 (July 2004): 31.

² John A. Tirpak, “Securing the Space Arena.” *Air Force Magazine*, 87 (July 2004): 33.

³ Space Control (JP 3-14): “Ensures freedom of action in space for the United States and its allies, and when directed denies an adversary freedom of action in space.”

principles of Objective, Offensive, Mass, Economy of Force, Maneuver, Unity of Command, Security, Surprise, and Simplicity as defined by Joint Publication (JP) 3-0, “Doctrine for Joint Operations,” and 3-14, “Joint Doctrine for Space Operations,” and Air Force Doctrine Documents (AFDD) 1, “Air Force Basic Doctrine,” and 2-2, “Space Operations,” provide solid OPART foundations operational commanders and their space control planners and operators can and should use in developing concepts and schemes.⁴ This paper will consider *only* the principles of *objective*, *offensive*, and *security* in order to stay within the 17-page limit

Operational Impact:

Every Joint/Combined combat operation since DESERT STORM/SHIELD has relied heavily on space-based communications, navigation and intelligence – surveillance – reconnaissance (ISR) (i.e. Space Enhancement).⁵ As General Lord, Commander, Air Force Space Command, recently noted, the ability of the operational commander to gain and maintain these capabilities while denying the enemy the same has been and *will be* increasingly essential to the success of future combat operations.⁶ Without a methodology for applying the full spectrum of operational art to space control securing space superiority could prove problematic as operators and planners are be forced to reinvent the wheel with

⁴ Joint Chiefs of Staff, Doctrine for Joint Operations, Joint Pub 3-0 (Washington, DC: 10 September 2001), A1-A2.

Joint Chiefs of Staff, Joint Doctrine for Space Operations, Joint Pub 3-14 (Washington, DC: 09 August 2002), IV2-IV5.

Air Force Doctrine Center, Air Force Basic Doctrine, Air Force Doctrine Document 1, (Maxwell AFB, AL: 17 November 2003), 19-26.

⁵ Air Force Doctrine Center, Space Operations, Air Force Doctrine Document 2-2, (Maxwell AFB, AL: 27 November 2001), 3.

⁶ Adam J. Hebert, “High Anxiety,” Air Force Magazine, 89 (January 2006): 34-35.

each new contingency or crisis action planning drill.⁷ The resulting delay in development or implementation of an OPART derived scheme would place the entire operation in jeopardy.

Thesis Demonstration:

Given the timelessness and universality of the Principles of War this paper will focus specifically on their applicability in developing operational art and schemes for space control.

The principles of objective, offensive, and security were selected because of their primacy in applying operational art and developing operational schemes. Additionally, they are applicable across the full range of military operations (ROMO).⁸ Objective is the foundational OPART Principle of War to which primary focus is and must be given by the operational commander; without it there is no operation to apply operational art to. Offensive is often considered the most effective approach to retain or seize the objective. Finally, security will be analyzed because it is requisite in denying the enemy an advantage and the ability to achieve his objective.

Analysis

The “1st Space War”

Operation DESERT SHIELD/STORM demonstrated the significant positive contribution space-based capabilities make to the Joint/Combined operational level commander. However, initially problematic theater ballistic missile defense (TMD) also demonstrated what happens in a joint/combined environment when neither the supported nor

⁷ Space Superiority: ensures US and allied forces have the freedom to take advantage of the capabilities provided by space systems.

⁸Joint Chiefs of Staff, Joint Doctrine for Military Operations Other Than War, Joint Pub 3-07 (Washington, DC: 16 June 1995), III – II3.

the supporting operational commanders/commands employ the full spectrum of operational art to develop stratagem or courses of action (COAs) for space system employment.

On 02 December 1990 the Iraqis launched a small volley of SCUD missiles from near Basra which was not detected until over 6 minutes after launch.⁹ The nominal detection and warning time should have been less than two minutes from the time of launch.¹⁰ Fortunately the missiles impacted clear of coalition/Israeli population centers most likely because it was a “test firing” in response to a change in US forces alert conditions.¹¹

The potentially dangerous delay in notification was not due to a lack of capability; in theater were Airborne Warning and Control System aircraft (E-3A AWAC), ground-based radars (i.e. FPS-79), and PATRIOT batteries, not to mention space-based missile warning satellites (i.e. Defense Support Program (DSP)).¹² On their own these individual systems had the ability and their operators employed the appropriate Tactics, Techniques, and Procedures (TTP), to detect/report TMD events. Individually, they were tactically sound on their own merits.

So why did it take roughly six weeks for Israel, the United States, and the rest of the coalition to have an effective TMD system? Simply put, there was no effective development or application of operational art, to include the principles of war, to TMD at the Joint, Combatant Command (COCOM), or service level (i.e. Air Force Space Command and the Numbered Air Forces (NAFs)).

⁹ John Pike, “Defense Support Program.” Federation of American Scientists. 07 April 1997. <<http://www.fas.org/spp/military/docops/operate/ds/defensesupport.htm>> [07April 1997].

¹⁰ John Pike, “Defense Support Program.” Federation of American Scientists. 07 April 1997. <<http://www.fas.org/spp/military/docops/operate/ds/defensesupport.htm>> [07April 1997].

¹¹ Defense Intelligence Agency, Iraq Launches Multiple SRBM's 02 December 1990, DIA Iraq Regional Intelligence Task Force (December 3, 1990), 1

¹² John Pike, “Defense Support Program.” Federation of American Scientists. 07 April 1997. <<http://www.fas.org/spp/military/docops/operate/ds/defensesupport.htm>> [07April 1997].

As of 1990 there was no published Joint level theater missile defense doctrine. Ideally, this was the necessary starting point. From it individual service doctrines could/would have been developed. Collectively joint and service level TMD doctrine would have also served as reference material for combatant command operational planners crafting OPLANS for CENTCOM. To further compound matters CENTCOM had only just recently begun development of an OPLAN addressing the Iraqi threat and possible US/Coalition response(s).¹³

At the service and component level the Air Force was not in any better shape. Prior to DESERT SHIELD/STORM Air Force Space Command (AFSPACECOM) and its missile detection/warning systems had been focused on the national-strategic vice theater-strategic or operational threat.¹⁴ Additionally, AFSPACECOM had no operational level organization. It was a Major Command (MAJCOM) with two wings and no Numbered Air Force, the Air Force's operational level ("warfighting") organization. This meant that technically speaking, Gen. Horner, Commander 9th Air Force (CENTAF), had no AFSPACECOM space counterpart to coordinate/aide with development of a TMD operational scheme. To compound matters, according to AFSPACECOM's DESERT SHIELD/STORM hot wash the space bureaucracy CENTCOM and CENTAF had to navigate was nothing short of difficult.¹⁵

Aside from organizational issues there were others. Culturally, the command was largely disconnected from the Combat Air Force (CAF). The CAF's main vehicle for

¹³ Michael R. Gordon and Bernard E. Trainor, The General's War: the inside story of the conflict in the Gulf (Boston : Little, Brown, c1995).

¹⁴ Air University, "Desert Storm the First Space War," Air University Gray Space Web Page Project, 17 June 1997. <http://www.au.af.mil/au/awc/awcgate/grayspc/dstorm/dstorm.htm> [17 June 1997].

¹⁵ Air University, "Desert Storm the First Space War," Air University Gray Space Web Page Project, 17 June 1997. <http://www.au.af.mil/au/awc/awcgate/grayspc/dstorm/dstorm.htm> [17 June 1997].

growing operational and tactical talent, the US Air Force Weapons School, had no Space Division from which to build a cadre of air smart space experts capable of interweaving the complementary capabilities of ground-based radar, AWACS, fighter-bombers, and space enhancement/control capabilities in planning/executing TMD operations.¹⁶ Doctrine indicative of an understanding or consideration of operational art (specifically the principles of war) was equally lacking. Doctrinally, there was no official Air Force Doctrine Document (AFDD) written for space enhancement / control or TMD; the first publication of Air Force Space Doctrine didn't appear on the scene until 1998.¹⁷

Outside of AFSPACECOM, the rest of the Air Force was also lacking in the publication and employment of key components of operational art. Given that CENTCOM had only recently begun work on the OPLAN for Iraq, General Horner's 9th Air Force (CENTAF), the supporting operational level Air Force element, was not as well prepared as it could/would have been. This shortfall impacted CENTAF's ability to field a robust COA for TMD since it delayed their publication of the supporting Air component OPLAN that should/would have contained a section on TMD. Lastly, within the greater CAF TMD as an integrated operational concept or scheme along the lines of suppression/destruction of enemy integrated air defenses (IADS) (SEAD/DEAD) had not matured. In addition to a lack of Air Force Doctrine for space support to COCOMs or TMD no CAF TTPs were available either. As with AFDDs on the subject, TTPs were not developed or published until after the war.

In addition to doctrine, TTP, organization, and cultural short falls, operational commanders did not effectively apply the principles of objective, offensive, and security to

¹⁶ Space Enhancement (JP 3-14): "Enhancement operations multiply joint force effectiveness by enhancing battlespace awareness and providing needed warfighter support."

¹⁷ Air Force Doctrine Center, Information Brief on AFDD 2-2, Headquarters Air Force Doctrine Center, (Maxwell AFB, AL: December 2001), 4.

the TMD problem prior to hostilities. Had they done so they would have mustered a more integrated and capable counter to the threat than the one initially fielded.

Starting with the principle of objective, by identifying the neutralization/defeat of the TMD threat as an operational objective on its own it is more likely the appropriate attention, forces and systems would have focused on the problem. Additionally, as its own objective the neutralization/defeat of the TMD threat would have ensured better discussion and greater detail throughout the COA development, coordination and approval process.

If the principle of offensive was applied or adhered to appropriately coalition forces would have taken the initiative in fielding an integrated and timely system for detection and notification of TBM launches *prior* to the December 2nd launch; something they did not address until after the first launch. Also, had they acted *offensively* it is more likely they would have developed and executed schemes that neutralized/destroyed the TMD threat before Saddam had a chance to fire a single shot.

Finally, if operational commanders had effectively used the principle of security when addressing TMD initial coalition vulnerability to the threat and Saddam's chances for a surprise launch would have been more successfully mitigated. By allocating more ISR assets to find and fix the threat operational commanders would have skillfully applied security. Ultimately, effective employment of the principle of security in COA development would have yielded a more secure operating environment for coalition forces and Israel in the beginning stages of DESERT SHIELD/STORM than that on December 2, 1990.

Clearly US/Coalition forces did not apply the full spectrum of operational art to TMD as neither the supporting or supported operational commanders, staffs, and operators began the conflict with doctrine, TTPs, or an operational level scheme that effectively applied the

principles of war in order to tie in all these disparate weapon systems and organizations. Had this not been the case on 02 December, 1990 AWACS, ground-based radars, and DSP would have been operationally integrated and collectively focused simultaneously on the objective of providing timely and accurate theater ballistic missile warning in less than the six-plus minutes it took.¹⁸

This is not to say that operational art was never successfully applied to TMD. By most accounts six weeks after the December 2nd launch an operational plan for providing theater-wide missile warning had been matured and for the remainder of the war provided effective and timely warning.¹⁹

Over a decade later many of the organizational, operational, doctrinal, and TTP issues have been developed and documented for TMD. Unfortunately, the same cannot be said for space-control. This is a critical lapse given the stated need for, and planned development and fielding of counterspace capability both now and into the future.

As DESERT SHIELD/STORM demonstrated there is an absolute operational necessity to gain/maintain space superiority and need for application of all operational art components, especially the principles of war, *prior* to the onset of hostilities. The former Undersecretary of the Air Force for Space, Mr. Teets, summarized the situation best: “Our adversaries have taken note of the asymmetric advantage that we have in space today. “The success of our networking ability in the field, the success of our getting actionable

¹⁸ John Pike, “Defense Support Program.” Federation of American Scientists. 07 April 1997. <<http://www.fas.org/spp/military/docops/operate/ds/defensesupport.htm>> [07April 1997].

¹⁹ John Pike, “Defense Support Program.” Federation of American Scientists. 07 April 1997. <<http://www.fas.org/spp/military/docops/operate/ds/defensesupport.htm>> [07April 1997].

intelligence information to the warfighters hasn't gone unnoticed. Our adversaries are certainly thinking about how they could exploit whatever vulnerability we might have"²⁰

Emerging Concepts:

As demonstratively applicable as the Principles of War are, there are many advocates of *other* emerging OPART philosophies such as Effects Based Operations (EBO), Network Centric Warfare (NCW), and "Brilliant Tool Sets" that seek to either redefine or remove entirely their role in operational art.²¹ In addition to new challengers, there exists the potential for misapplication of the principles to space control, that could endanger the operational commander's overall objective(s).

Challengers to the relevance of the principles, like Vice Admiral James Stavridis, U.S. Navy, Senior Military Assistant to the Secretary of Defense, believe the Principles of War are no longer relevant to the modern age we live in (i.e. "satellite demolition"), or to the types of wars we fight and will fight in the future (i.e. asymmetric).²²

Admiral Stavridis believes "War is changing, and not for the better. Like much else in our world, it is essentially deconstructing and re-emerging as a changed enterprise."²³ He goes on to say that "The principles of war operate best in nation-on-nation war. That is the conflict for which they were developed. War has always been chaotic. Now it is pure chaos. Instead of fashioning a list of principles, we must think universally and holistically about how to control chaos."²⁴

Ultimately Admiral Stavridis' thesis is that "we must develop mechanisms that can morph instantly, getting inside the decision loop of whatever entity we must fight. The

²⁰ John A. Tirpak, "Securing the Space Arena." Air Force Magazine, 87 (July 2004): 31.

²¹ Vice Admiral James Stavridis, U.S. Navy, "Deconstructing War," Proceedings, (December 2005): 1-5.

²² Vice Admiral James Stavridis, U.S. Navy, "Deconstructing War," Proceedings, (December 2005): 1-5.

²³ Vice Admiral James Stavridis, U.S. Navy, "Deconstructing War," Proceedings, (December 2005): 1.

²⁴ Vice Admiral James Stavridis, U.S. Navy, "Deconstructing War," Proceedings, (December 2005): 2.

bottom line is: winning war will be about opening our minds and speeding change. We need an utterly open mindset and *brilliant tool sets* that can change instantly.”²⁵

Why They Are Wrong:

I would not counter the Admiral’s position that the world has changed dramatically from a technological standpoint. However, his contention that war itself has changed begs the question; has it really? Over 200 years ago the likes of Ethan Allen and the Green Mountain Boys, Sam Adams, and Nathaniel Greene fought asymmetrically against forces superior in number and technology. With the Civil War came president-to-field general telegraph lines and overhead intelligence. The Russo-Japanese war saw the employment of new machine guns, longer range artillery, better infantry rifles, and steam-driven battle-ships capable of longer range surface warfare.

History then clearly demonstrates that there *are* constants in war: 1) There will always be both symmetric and asymmetric warfare; 2) The technology available to operational commanders will always change. Given these two constants, in essence then war really hasn’t changed, and therefore the timelessness of the Principles of War are proven out. As the November 2003 Joint Publication, “Joint Operations Concepts,” states, “war will continue to be characterized by a violent clash of wills...the nature of warfare...remains unchanged.”²⁶ The beauty of the principles is in the constant proven ability to adapt them to any given operational reality.

The Danger of the Principles:

Even though the principles are clearly still relevant, applying them to space control could undermine an operation. Applying them in development or execution of space control

²⁵ Vice Admiral James Stavridis, U.S. Navy, “Deconstructing War,” Proceedings, (December 2005): 3.

²⁶ Joint Chiefs of Staff, Joint Operations Concepts, Department of Defense, (November 2003): 5.

COAs can present a very real risk to strategic or operational objectives, the commander's ability to seize/retain the offensive, and to his ability to maintain security.

By applying the operational *objective* of gaining maintaining space superiority commanders may develop/execute courses of action that deny the enemy's ability to communicate via satellite communication (SATCOM). Accomplishing this COA could negatively impact both the adversary and friendly forces. If the adversary is using the same commercial or consortium SATCOM services (i.e. INMARSAT) as friendly coalition forces the denial of these services could negate coalition command, control, communications, intelligence, surveillance, reconnaissance (C4ISR). Fratricide of coalition C4ISR in no way supports the principle of objective.

Applying the principle of offensive to space control operations can prove as damaging as objective. The norm of knocking out the eyes/ears of the enemy in order to seize/retain the initiative is easily supported by space control systems like the CCS. However, in applying a space control COA that denies enemy use of their SATCOM operational commanders would lose the opportunity to exploit and collect intelligence from them. The effect of this course of action not only unintentionally aids adversary freedom of movement and the ability to achieve surprise; it also undermines the operational commander's ability to employ the principle of security.

Filling the Void

Given the principles of war are still relevant to current and future wars the clear challenge then is developing a methodology in which to apply them to space control in a way that complements not threatens the operational commander's overall objectives. A discussion of using the Principles of War, as defined by joint and service doctrine, as part of

a space control COA decision process will demonstrate how the Principles of War are relevant and applicable for operational commanders, staffs, and operators drafting and executing space control concepts and schemes as part of operational art.

Objective:

Per Joint Doctrine operational objectives have the capacity to: focus operations; support political goals; contribute to the operation; and support strategic objectives.²⁷ Each of these readily applies to and is adaptable to developing space control employment concepts or schemes.

The primary function of objective, providing focus, has two applications for space control as it relates to space superiority. Space superiority can be either a supporting or supported operational objective. This dual nature may occur simultaneously or individually. In either case operational commanders must address and develop objectives and tasks for both.

As a supporting objective space superiority may support a traditional kinetic objective like the suppression/destruction of enemy air defenses (SEAD/DEAD). In this case it is imperative the supporting operational commander understand the objective, and then develop

²⁷ Joint Chiefs of Staff, Doctrine for Joint Operations, Joint Pub 3-0 (Washington, DC: 10 September 2001), A1-A2.

Objective: “The purpose of the objective is to direct every military operation toward a clearly defined, decisive, and attainable objective. The objective of military operations is to achieve the military objectives that support accomplishment of the overall political goals of the conflict. This frequently involves the destruction of the enemy armed forces’ capabilities and their will to fight. The objective of a MOOTW might be more difficult to define; nonetheless, it too must be clear from the beginning. Objectives must directly, quickly, and economically contribute to the purpose of the operation. Each operation must contribute to strategic objectives. JFCs should avoid actions that do not contribute directly to achieving the objective(s).”

actionable tasks for his/her space control units/assets (i.e. CCS). In conducting SEAD/DEAD against an adversary using SATCOM links for C2 of an IADS an example of a supporting space control task could be the disruption, denial, degradation or destruction of those SATCOM links. By developing tasks in support of the stated operational objective the supporting commander ensures the correct focus of resources and contribution to the operation.

As a supported objective space superiority may be supported by conventional forces and kinetic weapon systems (i.e. F-15E/SOF). A likely scenario would be gaining/maintaining space superiority over an adversary equipped with the ability to make satellite TV and radio PSYOP broadcasts throughout his/her country. In this case the supporting conventional forces commander must develop actionable tasks for his units that would render the enemy's satellite broadcast capability ineffective. By developing schema which focus more traditional forces on space control the operational commander better leverages all available resources in accomplishing operational and strategic objectives.

As evidenced by both the supported and supporting scenarios, objective must be the starting point in developing and executing space control operations.

Offensive:

Joint Doctrine emphasizes the principle of offensive as the best means to: seize/hold the initiative; attain objectives; and maintain freedom of action.²⁸ It is more than just initiative; it is a mindset that dictates anticipatory boldness and creativity in both action and

²⁸ Joint Chiefs of Staff, Doctrine for Joint Operations, Joint Pub 3-0 (Washington, DC: 10 September 2001), A1-A2.

Offensive: "The purpose of an offensive action is to seize, retain, and exploit the initiative. Offensive action is the most effective and decisive way to attain a clearly defined objective. Offensive operations are the means by which a military force seizes and holds the initiative while maintaining freedom of action and achieving decisive results. The importance of offensive action is fundamentally true across all levels of war. Commanders adopt the defensive only as a temporary expedient and must seek every opportunity to seize or re-seize the initiative. An offensive spirit must be inherent in the conduct of all defensive operations."

thought. Its application and impact on space control operations is most assuredly applicable, but also challenging.

In Operation DESERT STORM the US was able to deny Iraqi leadership and forces space capabilities available on the open market (i.e. commercial imaging) not through coalition employment of space control weapon systems but through proactive diplomatic influence with its coalition partners. This was and is seizing the initiative. It had the affect of putting Saddam in the blind so that he could not get a clear picture of the battlespace or communicate effectively with his commanders. This effectively ceded the initiative to US/coalition forces and ensured the required freedom of action for the famous “Left Hook” operational maneuver. Inarguably the cumulative affect of these actions and effects contributed directly to attainment of operational objectives.

Future scenarios may not produce the same decisive space control effects via diplomatic efforts and may require actual employment of counter-communication and/or counter-ISR space control systems. However, the space control lessons of DESERT SHIELD/STORM still apply; both the supported and supporting commanders must be offensive-minded when developing operational schemes for space control.

When facing an adversary employing or reliant on space systems commanders must evaluate the advantages and disadvantages to the operation of disrupting, degrading, denying, destroying or deceiving (the five Ds of space control) adversary space capabilities.²⁹ They must answer the questions of: will space control actions allow seizure of the initiative; enable freedom of action; support attainment of operational objectives? The answers to these questions will not always be yes. For example, strategic or operational important ISR

²⁹ Air Force Doctrine Center, Counterspace Operations, Air Force Doctrine Document 2-2-1, (Maxwell AFB, AL: 02 August 2004), 2-3.

collection activities against an exploited enemy SATCOM node may trump the need to deny service. In which case, the operational commander would take the offensive by not executing one of the five Ds against the link.

Both DESERT SHIELD/STORM and the aforementioned scenario demonstrate not only the applicability but also the necessity of using the principle of offensive when developing or determining space control courses of action. By doing so, both the supported and supporting operational commanders will ensure the most effective and appropriate schema for space control operations.

Security:

Per doctrine, security, as a principle of war, is best summarized as: denying the enemy unexpected advantage; reducing vulnerability to hostile actions; enhancing/preserving freedom of action.³⁰ The current global threat environment is dynamic and shifting, and requires planning for and executing combat operations against both state and non-state actors. Given this reality, the principle of security assumes heightened importance, and is no less applicable to developing/prosecuting space control operations than the previous two principles.

The ready-fit nature of security to space control is quickly apparent when looking at the exponential growth in commercial satellite imaging and mapping. Armed with nothing more than a laptop or Palm Pilot and a GPS receiver any potential adversary can quickly and cheaply mensurate target coordinates for something as sophisticated as a remote controlled airplane laden with chemical or biological hazard, or as simple as a Ryder truck loaded with

³⁰ Joint Chiefs of Staff, Doctrine for Joint Operations, Joint Pub 3-0 (Washington, DC: 10 September 2001), A1-A2.

high explosives. It means that an adversary could have access to near-real-time imagery of US bases of operations, lines of communication, or lines of operations.

In order to deny unexpected advantage commanders must know what space capability is available to, (commercial, civil, consortium) is available to and exploitable by the enemy. This is a task for the Joint / Air Component intelligence staff (J2/A2), and one that has only recently begun to mature. There must be no surprises. Only after commanders have this information can they craft and execute options for space control operations that will reduce vulnerabilities and preserve freedom of action.

Employing counter-ISR space control systems is one way to obviate advantages gained from ready access to overhead imagery. On its own merits this course would certainly aid in applying the principle of security. However, coupled with other capabilities it can act as an even more powerful security force multiplier. For example, conducting a deception/IO campaign using decoys and mock-ups while selectively denying imagery collection over sensitive areas enables the commander to portray to the enemy what he wants to and conceal everything else.

By knowing the enemy's available space assets and by using his own space control assets to shape the battlespace and the enemy's perceptions the operational commander can more effectively reduce vulnerability and preserve freedom of action. The success in developing a space control scheme that effectively accomplishes/aids force security requires actual application of the security principle.

Conclusion

Since the 18th century the principles of war have guided many successful military operations and are still an important component of operational art today. However, the

technology of war has changed and joint force commanders must be prepared to combat both symmetric and asymmetric threats. Against that backdrop, the US has committed to developing and employing space control weapon systems. One challenge now for the operational commander is how to use the principles of war, a component of sound operational art, to best craft and execute effective and integrated courses of action and schemes for space control.

DESERT SHIELD/STORM demonstrated the precise need for thought-out and documented employment concepts based upon sound operational art, to include the principles of war, prior to commencement of hostilities. Armed with capable systems but without established TMD doctrine, TTPs, or operational schema based on the principles of war US/Coalition forces took over six minutes to disseminate detection/warning of the first Iraqi Scud launch of the war. Had the Scuds impacted Israeli population centers the implications could have been disastrous. If the full spectrum of operational art, including the principles of war, had been applied prior to commencement of hostilities the timeline for TMD detection/notification would have been well under six minutes.

Proponents of emerging operational art concepts, like Vice Admiral Stavridis, contend the principles of war are no longer valid given the advanced technological world we operate in and the asymmetric threats we face and will face. While the world has changed the principles are no less valid. However, while the principles may be valid there is a risk that application of them to space control could come at the expense of the greater operation.

Even with challenges to their relevance, and the potential threat they can pose to a successful operation when misapplied to space control, the principles are still essential to the development and execution of effective strategy and operational schema. By utilizing an

employment matrix based on the principles of objective, offensive, and security commanders, planners and operators can ensure the proper selection and execution of integrated and complimentary space control COAs. Development and execution in this manner will also ensure the accomplishment of operational objectives and achievement of strategic goals.

Given the inevitability and requirement for fielding and employing space control weapon systems operational commanders must take time *now* to craft and document operationally-relevant schemes and courses of action. By executing this exercise with aid from the principles of war commanders will ensure application of the full spectrum of operational art and maximize the capabilities these systems offer from beginning to cessation of future wars.

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