

Outer Space Warfare Challenges: Theory, Doctrine, Strategies and Tactics - Summary - Paul S. Szymanski

Abstract—The importance of outer space satellites and their supporting systems cannot be overstated. Their use in the civil and commercial world to provide communications, weather, navigation, timing and Earth resources monitoring provides major advantages to those who employ the information generated by these systems. However, due to the global reach of these space systems, advantages are provided to both friendly and adversary militaries. Beginning with the use of space systems to support military operations during the Arab-Israeli conflicts, and in Desert Storm, both major and minor players are considering how denial of space capabilities to their adversaries will be a force multiplier on terrestrial battlefields.

Based on the author's extensive experience in this theoretical area, he has developed essential theory, rules, doctrine, strategies and tactics by which he feels the next space war will be conducted. These are based on his unclassified analyses of past military history, and of classical Military Principles of War ^[2] and Sun Tzu's Art of War ^[1] applicability to Space Warfare (see author's additional papers). Since a full-up space war has not yet occurred, all of these concepts are notional and unproven, much like air warfare doctrine was only theoretically understood prior to World War Two. Nonetheless, it is very important to better understand how a future space war might be conducted to ensure favorable outcomes for the more prepared country, and for better outcomes for the world, in general, post space conflict.

Keywords—Outer space military warfare theory, outer space military doctrine, space policy, military space warfare, how to fight and win the next space war.

I. INTRODUCTION

The future of outer space warfare is rapidly approaching. There is significant buildup of space warfare capabilities by some major countries who rely on space systems for their defense or perceive that their potential adversaries depend too much on space capabilities to conduct terrestrial warfare. Because of the lack of significant experience by countries in this new military domain, it is difficult to fully understand what the best doctrine, strategies and tactics are to win the next space war. Based on the author's study of military history for the past 50 years, and his direct involvement with space warfare programs for the past 41 years, he has developed general rules and doctrine by which the next space war will be conducted. These rules, doctrine, strategies and tactics are an extrapolation of well-established Principles of War and other terrestrial military doctrine for terrestrial conflicts applied to the unique outer space environment where orbital dynamics restrict what is possible for Anti-Satellite (ASAT) weapon systems attack profiles.

Due to the large distances (tens of thousands of kilometers) between the Earth and military satellites, it is difficult to track and fully image these systems to assess their abilities as potential threats to national security. In addition, very few countries possess the world-wide space surveillance assets to track movements of suspicious space objects that may be maneuvering towards critical national assets. Even for those

few countries that possess significant space sensor systems, it is very difficult to continuously track satellites that initiate their maneuvers in areas with no sensor coverage (such as Antarctica). A recent computer simulation by the author showed that 95% of possible space attacks could be completed within 24 hours, which is before any reactions on the ground can be contemplated, approved or executed. Thus, one of the conclusions of these outer space warfare studies is that space warfare favors the offense. Another conclusion of this paper is that, due to the remoteness of space, countries that take actions against an adversary's satellites can do so under a cloud of secrecy, without the general population of the World becoming aware of these aggressive actions. Thus, space warfare adds new, and subtler rungs on the conflict escalation ladder, where countries can express intent and resolve to their adversaries without necessarily inducing terrestrial conflict.

II. TOPICS TO BE DISCUSSED DURING TUTORIAL

1. *Space Doctrine:*

How countries with limited space capabilities can achieve localized space dominance through superior doctrine.

2. *Satellite Warfare Situation Maps:*

Unique visualization techniques to better detect, understand and respond to space attacks.

3. *Principle of Space Warfare and Sun Tzu:*

How classical terrestrial Principles of War and the teachings of Sun Tzu are still applicable to space warfare.

4. *Space Conflict Escalation Ladder:*

Techniques to monitor and control conflict escalation of space warfare linked to terrestrial conflicts.

5. *Space Centers of Gravity (COG):*

What are the unique orbital locations and commander perceptions that evolve into critical points requiring understanding and defense?

6. *Example Space Course of Action (COA's):*

Terrestrial strategies and tactics that are applicable to outer space warfare.

7. *Intelligence Indicators for Future Space Attacks:*

What indicators may inform defense planners that a space war is imminent.

8. *Fundamental Space Command Decisions:*

Examples of some of the decisions required to effectively execute, terminate and win space wars.

9. *"Top 40 Rules" for Space Warfare:*

Based on the author's extensive experience in this mission area, he presents what are the top conditions and issues surround outer space warfare.

ACKNOWLEDGMENT

I would like to acknowledge the great military thinkers of the last few thousand years, from ancient Greek and Roman generals, to ancient Chinese military philosophers such as Sun Tzu^{[1],[2]}, for their continuing philosophies that inspired me to translate these concepts into theories and doctrine impacting present and future outer space warfare.

REFERENCES

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BIOGRAPHY



Paul S. Szymanski (B.S. Physics, Mathematics & Logic '73 – M.S. Experimental Physics, '74; Carnegie-Mellon University) has been conducting military operations research analyses for 44 years for the United States Air Force, Navy, Army and Marines.

The last 41 years have been exclusively in outer space program analysis, management and development of space warfare theory, policy, doctrine, strategies, tactics and techniques. He has worked with the Air Staff at the Pentagon (Secretary of the Air Force), the Space and Missiles Systems Center (SMC) in Los Angeles, and the Air Force Research Labs (AFRL) in Albuquerque, New Mexico, Rome, New York, and Dayton, Ohio along with experience in operational field testing of missile systems at China Lake, California.

He currently manages a private discussion group consisting of 4,250 hand-picked members on LinkedIn with experience in Space Control and Space Situational Awareness (SSA), or at least have expressed an interest in these topics, and includes: 142 members from military colleges, 201 from private and Government think tanks, 68 from public universities, 28 from government intelligence agencies (including the NASIC Chief Scientist), 75 from the Joint Chiefs of Staff, 63 from NATO, 39 from NORAD-USSTRATCOM, 254 General officers, Admirals or equivalents (one to four stars, including former: Secretary of the Army, Supreme Allied Commander in Europe, Commander of US Army in Europe, Commander of U.S. Air Force in Europe, NATO Commander, Director of the National Security Space Office, Commander of the Space and Missile Systems Center, Commander of the Air Force Special Operations Command; also current: Commander U.S. Army Europe, Commander of the U.S. Sixth Fleet, Commander of U.S. Army Space and Missile Defense, Commander of AFMC, Director of DISA, Marine Corps Commandant and now Chairman of the Joint Chiefs of Staff, also one former Chairman of the Joint Chiefs of Staff), 104 from the Secretary of Defense office (including one former Secretary of Defense and 23 current and former Under/Assistant Secretaries of Defense), 2 former Secretaries of the Air Force, 7 Under/Assistant Secretaries of the Air Force, 9 Under/Assistant Secretaries of the Army, 3 Assistant Secretaries of the Navy, past and current Commanders of the 4th, 6th, Pacific, and Korea Naval fleets, 2 Assistant Secretaries of the Treasury, 1 from the National Military Command Center, 190 Congressional House & Senate staffers, 515 from specific military space agencies, 248 from various other military services, 36 diplomats, 55 from the State Department (including 6 Assistant Secretaries of State), 598 from various space-related defense contractors, 46 from the White House and National Security Council staffs, and 15 astronauts, among others.