Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
2003		**00-00-2003 to 00-00-2003**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Space Exploitation. Making Space technology matter	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Army Space & Missile Defense Command,Army Forces Strategic Command,Redstone Arsenal,AL,35809**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**2**	

Space Exploitation

Making Space technology matter

MG John M. Urias, Deputy Commanding General for Research, Development and Acquisition, United States Army Space & Missile Defense Command and Program Executive Officer for Air, Space and Missile Defense

By MG John M.Urias

"Space … the final frontier." So began a popular TV series of several years ago. As our military transforms into smaller, lighter, more agile units with more responsive capabilities to address global uncertainty, the necessity of harnessing and exploiting this "final frontier" is quickly becoming one of the most important enablers for Army transformation.

We have long relied on Space as a means of extending reliable communications beyond line-of-sight and over-the-horizon, for providing early warning of enemy missile launch, identification of military and military-related construction, and detection of major military movements. It's important to additionally note Space as a provider of products to support position, location, navigation, weather, terrain, and environmental monitoring.

Traditionally, the exploitation of Space has primarily supported strategic concerns, but our recent campaigns in Southwest Asia and other hot spots around the world have increasingly shown the importance of Space support to warfighters at operational and tactical levels of warfare. Fluidity and flexibility are required to win on future battlefields, therefore, extending Space support as a complementary enabler to Intelligence, Surveillance and Reconnaissance (ISR) support across all levels of warfare is critical as it relates to real-time decision support and battlefield situational awareness.

Our involvement in Space is divided into four functional domains: Space support, Force enhancements, Space control and Space applications. The U.S. Army Space and Missile Defense Command (SMDC) has a proud lineage of supporting the development of Space systems, products, and services to support the warfighter across all four of these domains. SMDC is unique in that it not only develops requirements, but also sees these requirements through to fielding and operational use.

The Army has not had a research and development entity as a single agency focused on Space, as have the other military services. SMDC's science and technology (S&T) research, development, and acquisition (RDA) efforts have supported a wide range of Army customers with diverse views on the importance of exploiting Space services and products. Recently, this changed however, as the Program Executive Office (PEO) for Air and Missile Defense (AMD) was redesignated as the PEO for Air, Space, and Missile Defense (ASMD). Several of the Space research and development efforts of SMDC are being transferred to the PEO ASMD, and the PEO ASMD is realigning internally to provide for integration of Space into the system-of-systems concepts that are emerging to support Army transformation.

An exciting aspect of Space exploitation is the multi-dimensional and multi-mission applications of its technologies and products. For example, in our efforts to develop a Single Integrated Space Picture (SISP), we are exploring applications of volumetric displays, immersion technologies, biometrics, man-machine interface techniques, and information technology advances.

When applied across the entire family of interoperable pictures, these applications will enhance situational awareness and understanding, and support intuitive and timely decision-making. Other technologies initially developed with a primary focus on supporting Space systems have shown tremendous

The U.S. Army Space and Missile Defense Command (SMDC) has a proud lineage of supporting the development of Space systems, products, and services to support the warfighter across all four of these domains. SMDC is unique in that it not only develops requirements, but also sees these requirements through to fielding and operational use.

potential for supporting atmospheric systems in both military and commercial functions. One such example is Micro-Electro-Mechanical Systems (MEMS), which promises tremendous volumetric decreases, while at the same time, increases reliability in accomplishing critical functions within a system application.

As we look to Space, and the harnessing and exploitation of this "final frontier," we must leverage Joint and other Service activities through interoperability and common or standardized approaches. However, just one Service cannot provide the resources necessary to harness Space for the warfighter. The Department of Defense is not the sole activity involved in Space. We must therefore leverage commercial Space technologies and ventures to round out military capabilities to ensure our warfighters have the best products and services available to them. Commercial ventures in Space may be both a boon and a curse.

Not only can the U.S. military leverage commercial Space efforts, but our future adversaries can as well. In the past, Space control involved concepts for the destruction of enemy military capabilities in Space. Now, with the introduction of so many commercial ventures into Space, Space control must consider denial of Space services to an enemy without destruction of "neutral" Space platforms.

As we rely more and more on Space and Space products to support our warfighters, we also introduce vulnerabilities to our warfighters. For example, if a future adversary had a capability of denying Global Positioning System (GPS) support to our precision targeting functions, we would be denied a powerful technological advantage our warfighters currently employ. Therefore, as we look to Space, we must also look to how the technologies we are developing to support our warfighter can be made more secure and reliable.

One aspect of reliability is replication or duplication. To that extent, SMDC is exploring techniques and technologies for duplicating Space capabilities, by regionally focusing capabilities using within atmosphere platforms. Using Unmanned Aerial Vehicles (UAV), and an ultra-wideband signal transmitter, GPS functionality can be duplicated within a theater of deployment to ensure GPS functionality remains available to a warfighter, even if services from the GPS satellites in Space is denied them. High Altitude Airships (HAA) may provide an extended duration platform capability to replicate many of the Space-based sensor functionalities in supporting ISR and extended range communications within the deployed theater.

As you can see, we have our work cut out for us if we are to effectively embrace "the final frontier." The articles in this edition of the Army Space Journal will more fully develop how the Army is involved in harnessing and exploiting Space to support our warfighters. Space and Space products are essential enablers of Army transformation.

The Army has recognized the importance of Space and has reorganized within its development community to ensure that a focused effort achieves the integration of these essential products into our future forces, even as we improve the efficiency and effectiveness of delivering needed Space-based services to our current Force.