A Day Without Space
Ensuring It Doesn't Happen

LTG Joseph M. Cosumano Jr., Commanding General, United States Army Space & Missile Defense Command/Commanding General United States Army Space Command.

By LTG Joseph M. Cosumano Jr.

"The United States is more dependent on Space than any other nation." This single sentence from the January 2001 Report of the Commission to Assess United States National Security Space Management and Organization succinctly states why effective Space Control capabilities (the principal subject of this issue) are so critical to our continued national and economic security. Our growing dependence on Space makes it a vulnerability that must be protected — but that is just one aspect of Space control. The other is having the ability to preclude, when directed, our adversaries from leveraging Space-based assets to our disadvantage.

Take a few moments with me now to sit back and think what a day without Space would mean to our nation, and to our military. First, most pagers, phones, personal data devices, radios and televisions would become silent because in one way or another they rely on satellites for the transmission of the information that flows to and from them. All land, sea and air vehicles leveraging the Global Positioning System for precise location and navigation would have to come up with another means to determine their exact location and navigate from where they are to where they want to go. Weather forecasters would not have access to satellite photos of current weather conditions around the world and in their local areas. Mapmakers wouldn't have current satellite images from which to update their products. And you might actually have to pay the cashier for your gas, instead of paying at the pump with your credit card. A lot of this may be construed as a great inconvenience to the lifestyle to which we have become accustomed, but in many cases it could mean the difference between life and death (e.g., if you cannot contact emergency responders such as the police, fire department and ambulance services in life threatening situations; if you cannot receive warnings of hurricanes, tornados, floods, and forest fires). Additionally, the impact to our nation's economy could be devastating, not only from business losses but also from the chaos resulting from disruption to international monetary transactions.

From a military perspective, a day without Space would mean we would have no effective long-haul communications, thus precluding direct command and control with our joint and coalition partners and ensuring a limited reach-back capability. Without Global Positioning Systems we would have no beyond-line-of-site Blue Force Tracking capability; we would have to manually survey in all our systems; we would have to navigate using maps and lensatic compasses; we would have a limited ability to do precision strikes and we would probably see increased collateral damage as we return to the days of "dumb" and laser-guided bombs. Our intelligence, surveillance and reconnaissance capabilities would be severely limited — impacting our ability to do effective intelligence preparation of the battlespace, select targets and do timely battle damage assessments. Our ability to do weather forecasting and trafficability predictions would also be severely hindered. Early warning of ballistic missile launches would be minimal and tracking of these missiles would be almost non-existent.

BOTTOM LINE: Effective Space control leads to Space superiority which, like air and information superiority, is critical to our success as a military force.

So, what should we be doing to ensure we never experience a day without Space?

First, we have to look at our Space systems and ensure all the various components (e.g., the satellites, our ground stations, the data links between our satellites and our ground stations, and the data links between satellites) are adequately protected. Today, the most vulnerable of these elements are our ground stations. They are susceptible to natural disasters, ground attacks, cruise and ballistic missile attacks, bombs and artillery, and sabotage. Our data links are probably the next most vulnerable to attack. Our satellites are probably the least vulnerable element at this time, but only because our adversaries have not yet devoted sufficient resources to this area of attack. Fact is, most satellites are susceptible to kinetic energy munitions, high-powered microwaves, blocking, dazzling, obscurants, and the electro-magnetic pulse released from the detonation of

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nuclear weapons. We must devote sufficient resources now to the protection of all components of our Space systems to ensure our continued access to them in the future.

Second, we must consider the other side of Space control — precluding our adversaries from leveraging Space assets to our detriment. This area requires much more attention than it has received in the past. It is paramount we attain accurate, timely "Space situational awareness." This requires the ability to detect, identify and track all man-made objects in Space, understand what they are capable of, and what they are doing at any given point in time. To do this, we must improve our Space surveillance capabilities, which are currently fragmented and sorely out of date in terms of technology. An effective Space surveillance network requires both ground and Space-based assets. Today we only have one Space-based surveillance sensor and our ground-based surveillance assets, such as the Kiernan Reentry Measurement Site located at the Ronald Reagan Ballistic Missile Defense Test Site at Kwajalein Atoll, need to be upgraded to allow U.S. Space Command to continue to effectively keep track of the nearly 9,000 objects orbiting the Earth.

Additionally, we need to design into U.S. and allied commercial satellites the ability to deny an adversary the use of these assets without impacting our ability to continue using them. Today many nations use the same satellites. It is not unusual for the U.S. or an ally to use one set of transponders and a potential adversary to use another set of transponders on the same satellite. After all, commercial satellite consortiums are in the business to make money and they will generally sell their services to anyone with the required capital. In times of increased tension, it is to our advantage that adversaries be precluded from retaining continued access to commercial satellite assets. We would prefer this be done voluntarily by the satellite owners, but, failing that, we may have to take unilateral action against the satellites, the ground stations, or the links between.

This leads to the final set of Space control capabilities we must develop — capabilities that will allow us to preclude an adversary from leveraging Space capabilities (both commercial and their own). We refer to this as "Space negation" and these capabilities range from the permanent and lethal (degrade and destroy) methods to reversible and non-lethal (deny, disrupt, and deceive) ones. Anti-satellite work actually dates back to the early 1950s, before the Soviets launched the first man-made Earth orbiting satellite — Sputnik I. Early programs focused on nuclear interceptors exploding in the proximity of the satellites. However, we learned through testing that the electromagnetic pulse resulting from the explosion of a nuclear device in Space had much more impact than on just the target satellite(s). In 1967, the Outer Space Treaty was signed prohibiting the placing and/or use of nuclear weapons in outer Space. Since then, our anti-satellite efforts have focused on non-nuclear means such as kinetic energy and directed energy. But these methods result in permanent destruction of the satellites and possibly large debris fields posing a potential hazard to other satellites, the International Space Station, and our Space shuttles, and therefore may not be the most desirable course of action to take. Because of this, we have increased our efforts to develop non-lethal means to temporarily preclude access by our adversaries to Space systems.

Space control, like airspace control, is a mission shared with the Air Force and the other services. The ultimate objective is to ensure freedom of action in Space for friendly forces while denying it to the enemy. The Army's role in this function is from the terrestrial perspective, such as attacking satellite control nodes and facilities from the ground, and operating ground-based Space control systems. As part of the joint team, Army Space control capabilities will facilitate freedom of action in the area of operations as well as in Space. The articles in this journal provide tremendous detail on the work that is being accomplished in the area of Space control. I encourage you to study the articles and share this information with those you support.

Secure the High Ground!