# TRANSFORMING ARMY SPACE

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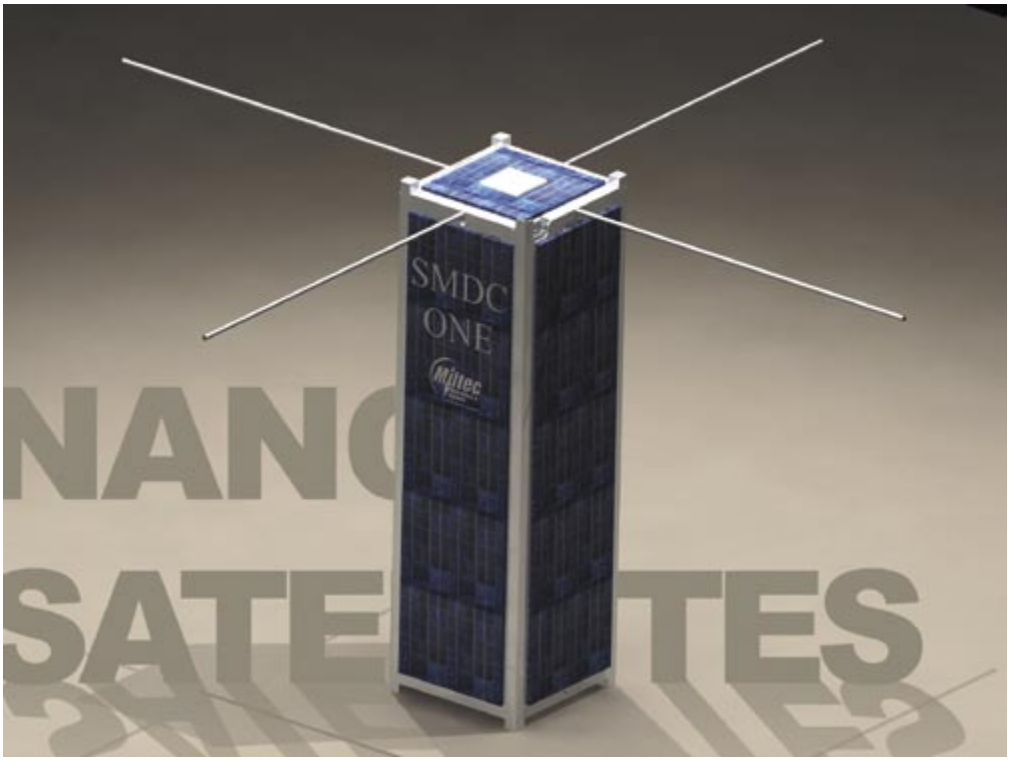
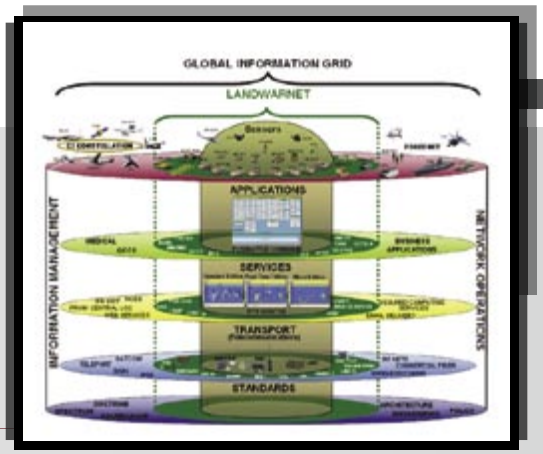



Between World War I and World War II the Germans transformed their military doctrine and strategy leading to a revolutionary approach to war. "Blitzkrieg" emphasized speed and maneuver warfare as a means to escape and overcome the static defense strategies that led to the stalemate of trench warfare and their defeat in 1918. France and Britain on the other hand, deceived by their victory, overlooked the lessons of that war and operational implications of Blitzkrieg. By dogmatically clinging to the strategy they perceived as successful in the last war, France and Britain had clouded their strategic vision and consequently suffered defeat in the great battles that occurred in May 1940.[1]

Today, the U.S. Army is engaging in both conducting war and, unlike pre-war France and Britain, transforming itself to meet the challenges of future warfare. Central to the Army's transformation strategy is the Future Combat System. This system and the future force are enabled by and will rely on net-centric services with the creation and dissemination of operationally and tactically relevant information to achieve decision and maneuver dominance, and to promote and enhance precision and lethal effects on the battlefield. Central to Army transformation and Future Combat System is the Brigade Combat Team and the warfighting echelons at battalion and below. These are the tactical warfighters and Soldiers who will rely on information and net-centric

# FUTURE COMBAT SYSTEMS NETWORK




The Soldier is the integral element of the FCS (BCT). The Soldier is connected and integrated to the FCS Network and Battle Command. This connectivity provides the Soldier superior situational awareness mounted and dismounted, enabling them to effectively perform Battle Command functions while maximizing Soldier and Force lethality and survivability.

The Future Combat System (Brigade Combat Team) Network is a layered system of computers and software, radios, and sensors all interconnected with each variant in the FCS (BCT). There are currently many radio and computer systems all using various different software, which makes it difficult to communicate. Communication is very important on the battlefield, and the FCS Network makes good communication possible. The Network enables leaders at all levels to see first, understand first, act first, and finish decisively. It connects FCS platforms to the Soldier at every echelon and gives the ability to integrate our communications with other Department of Defense Agencies and with our allies.

Network connectivity also enables the Soldier to more effectively employ and control FCS unmanned ground and aerial systems, and to take full advantage of embedded training, logistics and medical functions. These network-enabled capabilities are executed when mounted via the Manned Ground Vehicle Common Crew Station, and when dismounted via the Centralized Controller.

## Manned Ground Vehicles

- Reconnaissance and Surveillance Vehicle ( RSV) XM1201
- Mounted Combat System (MCS) XM1202
- Non-Line of Sight Cannon (NLOS-C) XM1203
- Non-Line of Sight Mortar (NLOS-M) XM1204
- Field Recovery and Maintenance Vehicle (FRMV) XM1205
- Infantry Combat Vehicle (ICV) XM1206
- Medical Vehicle Evacuation ( MV-E) XM1207
- Medical Vehicle Treatment ( MV-T) XM1208
- Command and Control Vehicle (C2V) XM1209

## Unattended Ground Sensors (UGS)

**Tactical and Urban Unattended Ground Sensors**

- **T-UGS (AN/GSR-10(T))**
- **U-UGS (AN/GSR-10(U))**

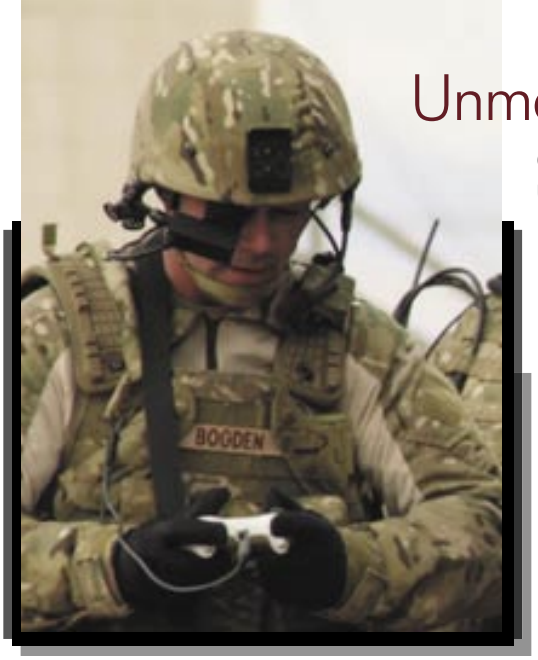
**Non-Line of Sight Launch System (NLOS-LS) XM 501**

The Future Combat System (Brigade Combat Team) Unattended Ground Sensors (UGS) program is divided into two major subgroups of sensing systems: AN/GSR-9 (V) 1 Tactical-UGS (T-UGS), which includes Intelligence, Surveillance and Reconnaissance – UGS and Chemical, Radiological and Nuclear – UGS; and AN/GSR-10 (V) 1 Urban – UGS, also known as Urban Military Operations in Urban Terrain Advanced Sensor System.

A UGS field will include multimode sensors for target detection, location and classification, and an imaging capability for target identification. A sensor field also includes a gateway node to provide sensor fusion and a long-haul interoperable communications capability for transmitting target or Situational Awareness information to a remote operator, or the common operating picture through the FCS (BCT) Joint Tactical Radio System Network.

The XM501 Non-Line of Sight-Launch System consists of a platform-independent Container Launch Unit with self-contained tactical fire control electronics and software for remote and unmanned operations. Each Container Launch Unit consists of a computer and communications system and 15 Precision Attack Missiles. The Non-Line of Sight-Launch System provides a rapidly deployable and network-linked precision guided munitions launch capability that is currently not available within the Army.

# Unmanned Aircraft Systems (UAS)




**Class I**
**Unmanned Air Vehicle (UAV)**
**XM 156**

**Class IV**
**Unmanned Air Vehicle (UAV)**
**XM 157**

The XM157 Class IV Unmanned Aerial Vehicle has a range and endurance appropriate for the brigade mission. It supports the Brigade Combat Team Commander with communications relay, long endurance persistent stare, and wide area surveillance.

The XM156 Class I Unmanned Aerial Vehicle is a platoon level asset that provides the dismounted Soldier with reconnaissance, surveillance, and target acquisition, and laser designation. Total system weight, which includes the air vehicle, a control device, and ground support equipment is less than 51 pounds and is back-packable in two custom Modular Lightweight Load-carrying Equipment-type carriers.

# Unmanned Ground Vehicles (UGV)

**Armed Robotic Vehicle**
**Assault Light (ARV-AL)**
**XM 1219**

The ARV-A-L MULE Vehicle (XM1219) is a mobility platform with an integrated weapons and reconnaissance, surveillance, and target acquisition package to support the dismounted infantry's efforts to locate and destroy enemy platforms and positions. As the program's centerpiece, the Common Mobility Platform provides superior mobility built around an advanced propulsion and articulated suspension system. This system gives Soldiers vehicles in which to negotiate complex terrain, obstacles, and gaps that a dismounted squad will encounter.

The XM1217 Transport MULE Vehicle (MULE-T) carries 1,900-2,400 pounds of equipment and rucksacks for dismounted infantry squads. The rugged vehicle relieves Soldiers of heavy equipment and packs while following them through complex terrain.

**Small Unmanned**
**Ground Vehicle (SUGV)**
**XM 1216**

The XM1216 Small Unmanned Ground Vehicle (SUGV) is a lightweight, manportable Unmanned Ground Vehicle capable of conducting military operations in urban terrain, tunnels, sewers, and caves. The vehicle aids in the performance of manpower-intensive or high-risk functions (i.e. urban Intelligence, Surveillance, and Reconnaissance missions, chemical/Toxic Industrial Chemicals, Toxic Industrial Materials, reconnaissance, etc.).

**Multifunctional Utility/ Logistics and Equipment**
**Countermine and Transport**
**MULE-T XM 1217**
**MULE-C XM 1218**

The Countermine MULE Vehicle (MULE-CM) (XM1218) will provide the capability to detect, mark, and neutralize anti-tank mines. The vehicle is equipped with an integrated mine detection mission equipment package from the Ground Standoff Mine Detection System (GSTAMIDS).

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effects for the situational cognition to plan, decide, act and react. The Global Information Grid (GIG) net-centric services will be built upon capabilities deployed across the entire vertical domain and Space-based systems and Space-derived effects are critical capabilities underpinning the information engine that will drive the Army and the future force. It would follow that the strategies guiding the transformation of National Security Space are high interest items as they relate to the U.S. Army and the future force. Because Soldiers and tactical warfighters are heavily reliant on net-centric information distribution services, the Army's dependence on Space-based capabilities and Space-derived effects will continue to expand and the Army will arguably remain the largest service user of Space capabilities and effects. U.S. Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT) as the Army specified proponent for Space, is responsible for being the focal point to provide for a strong Army voice in the combat and material development process leading the advocacy, development, and fielding of Space capabilities to satisfy validated Army Capability Gaps.

Over the last fifteen years USASMDC/ARSTRAT has been up front as Army divisions evolved from having no satellite communications, no Global Positioning System/Blue Force Tracking, no missile warning, and no Tactical Exploitation of National Capabilities/Intelligence, Surveillance and Reconnaissance to the present "Modular/Digital Division" fully enabled by Space capabilities and effects. Today there are approximately 110 military Space professionals deployed to the Central Command area of responsibility and over 70 percent of these are Army Space personnel.

The U.S. is entering a time of political, strategic, economic, and technological uncertainty where the threats seem more indeterminate. For the Army, the linear battlefield and the strategies and operational concepts that resulted in past successes are giving way to technology enabled non-linear/non-contiguous operations in response to the irregular/hybrid warfare situations it is involved with today. On Apr. 6, Secretary of Defense Robert Gates, in response to these uncertainties, announced key decisions to move the Department of Defense, and the Army in a different strategic direction. One objective of this strategic shift is to "rebalance the department's programs in order to institutionalize and enhance our capabilities to fight the wars we are in today, and the scenarios we are most likely to face in the years ahead, while at the same time providing a hedge against other risks and contingencies."

The intent and focus of this strategic shift is clear: to shift resources and institutional weight toward supporting the current wars and other potential irregular campaigns. One consequence of this strategic shift is the proposed termination of the Transformational Satellite (T-Sat) communications system. When implemented, this decision will inevitably delay the communications-on-the-move capability the future force requires and lingering issues regarding how the demand for communications will be addressed given the proposal to procure existing Advanced Extremely High Frequency and Wideband Global SATCOM satellites will come up short.

Indeed, the Army and USASMDC/ARSTRAT are at a crossroads for Space. If the Army Space community stands firm on legacy while clinging to past success and overlooking past failures they risk doctrine, strategies, and operational concepts becoming outdated dogma as France and Britain did in 1940. They must step up, and push the envelope to innovate, adapt, and overcome institutional, organizational, and cultural barriers to move into the next level. Seamless, responsive, and integrated Space effects must reach down to the lowest tactical warfighting levels to provide our Soldiers the net-centric applications to plan and execute operations across the full spectrum or war. As USASMDC/ARSTRAT moves forward as a proponent of the Army there are four cornerstones of Army Space Strategy for consideration.

## Focus on the tactical warfighter

On the surface this may be a statement of the obvious, however for this discussion consider the tactical warfighter to be the Army echelon at the Brigade Combat Team level and below. These are the warfighters that often find themselves in the "trade Space" when it comes down to Space effects such as bandwidth; tagging, tracking, and targeting; or intelligence, surveillance and reconnaissance information. The Army Space Support Elements and Army Space Support Teams are doing yeoman work at the Corps and Division level integrating effects created by national security Space capabilities for the theater strategic and strategic operations. While this level of support must continue, within the paradigm of irregular/hybrid warfare, non-linear/non-contiguous operations place the spotlight on the warfighters at the Brigade Combat Team level and below. In fact, current Army transformation strategies and the Future Combat System concept of operations hold that the Army will fight at or below that level. In deference to current doctrine and this strategic shift, the Army Space strategies must place a priority and focus on the tactical warfighters.

## Think effects

As the Army's specified proponent for Space, USASMDC/ARSTRAT must completely understand the focus of current Army problem sets and future requirements in the context of the effects the tactical warfighter seeks to achieve in the course of operations. Although USASMDC/ARSTRAT is fully engaged with U.S. Training and Doctrine Command developing the Capabilities Needs Analysis, these gaps often address capabilities at the macro level and fall short informing the proponents on the nature of the desired effects. For example, a gap in situational awareness could lead to an assumption that there is a lack of intelligence, surveillance and reconnaissance, when in reality it could be the inability to communicate beyond-line-of-sight. The Army must continue to inform its proponency through continued coordination with U.S. Training and Doctrine Command and by forging and strengthening relationships with the Army Asymmetric Warfare Group and the Future Force Integration Division and others. With respects to research and development and science and technology, the Army Space community must ensure its science and technology activities line up with the problem sets and priorities established in the Army science and technology master plan, and that they are consistent with its core competencies.

## Reassess Army cultural perspectives on Space roles and missions

Within the U.S. Department of Defense, the Army is arguably the largest user of U.S. Space capabilities and is highly dependent on National Security Space capabilities. In fact, the Army's Space Operations Concepts Capability Plan states: "Commanders and future Modular Force organizations at each echelon will depend upon and leverage the power of Space in order to achieve the Army's seven key operational ideas."[2] The traditional and current Army approach to utilizing Space capabilities has been to exploit National Security Space and commercial Space assets in support of the expeditionary Land Force missions. In essence, Army tactical applications are being "piggybacked" on National Security Space assets and the Army works to develop unique means to maximize its utilization of on-orbit strategic capabilities such as Global Positioning System, Joint Tactical Ground Stations, Overhead Non-Imagining Infrared data, and Tactical Exploitation of National Capability systems.[3] Recent acquisitions of major National Security Space capabilities such as T-Sat have experienced cost and schedule difficulties and pending termination leaving significant capability gaps. It can be argued that the current Army Space strategy of leveraging others programs and capabilities has resulted in significant capability gaps and hence, a shift in Army Space strategy is needed. They cannot continue to rely on others to provide critical Space capabilities; the best way to address Army gaps is through indigenous Army solutions. We must change our culture to accept Space as an Army core competency in order to develop and field indigenous capabilities. Yet we cannot recast Army Space in the mold of the U.S. Air Force. Rather they have to find their niche and define a unique model for Army Space.

## Pursue innovative approaches

As the Army moves toward the age of the small, the fast, and the many, it is time to start applying these precepts to Army Space.[4] Today, large, exquisite, and expensive Space programs provide the majority of Space capabilities. USASMDC/ARSTRAT must lead the effort to develop and use military Space capabilities to enable applications for tactical-level commanders and embrace these commanders as the new class of customers. Today's commander requires applications enabled by capabilities that are horizontally networked, accessible, flexible, interoperable, and joint down to the tactical level. Concepts such as dedicated nano-satellite constellations and air-based platforms linked into a network of disbursed nano-routers and hand-held devices could provide multiple paths beyond-line-of-sight communications that are rapidly deployable, cost-effective, and terrain independent. Increasing the speed of command, which proved so vital in recent combat operations, requires high transaction rates, increased information rates, and a tolerance of ambiguity based on unpredictable demand.[5] When Space is accessible to the tactical warfighters it can change the manner in which relationships occur and the way that organizations will act.

USASMDC/ARSTRAT must lead the development and advocacy for desired Army Space capabilities to satisfy warfighter needs. The Army leadership has demonstrated a perceptive appreciation of future national security needs and has taken encouraging steps to restructure transformation programs, but additional initiatives such as integrated tactically responsive Space are required. Army forces will play a major role in a wide range of missions during the era of persistent conflict.[6] To successfully conduct operations across the spectrum of conflict, anytime, anywhere, the Army must adopt a new comprehensive strategy for Army Space and a mindset that recognizes Space combat development as an Army core competency. The Army must ensure their forces have more than residual capabilities leftover from other Service or Agency efforts. The Army owes it to its Soldiers conducting combat operations worldwide, a cohesive near, mid, and long-term strategy to develop and deliver innovative Space capabilities ensuring their success, survival, and advantage over their adversaries.

### Footnotes

[1] Williamson Murray and Allen R. Millet, Military Innovation in the Interwar Period, New York, NY: Cambridge University Press, 1998, 448.

[2] TRADOC Pamphlet 525-7-4-, Military Operations Army Space Operations Concept Capability Plan. Nov. 15, 2006, 10.

[3] Ibid, 9-10.

[4] Arthur K. Cebrowski and John W. Raymond, "Operationally Responsive Space: A New Defense Business Model," Parameters Vol. XXXV, No. 2, Summer 2005. 67-74.

[5] Ibid, 67-74.

[6] Briefing, Presidential Transition Paper on Army Force Generation, Nov. 7, 2008.