

The Advantages of Commercial Satellites versus Military
Satellites

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Introduction

The ever-increasing demand for satellite communications has put a severe strain on the United States military over the past few years, necessitating the Department of Defense (DoD) to lease commercial satellite time in order to meet the U.S. military's increased requirement. During Operation Desert Storm in 1991, the military used 140 bits per second (bps) of satellite bandwidth per deployed person. That amount jumped to nearly 3,000 bps during Operation Noble Anvil, the U.S. component of NATO's Operation Allied Force in Kosovo in 1999. Bandwidth usage jumped again during Operation Enduring Freedom in Afghanistan, with bandwidth reaching 8,300 bps per deployed person during the operation, which began in 2001. By the launch of Operation Iraqi Freedom in 2004, the level escalated to 13,800 bps per person, an increase of 9,700 percent throughout the 13-year period.¹ Many U.S. senior military officials are demanding that new U.S. military satellites be developed and launched into orbit in order to meet these high demands. However, the U.S. military should continue to use commercial satellites

¹ Greg Berlocher, "Military Continues to Influence Commercial Operators", *Satellite Today*, 01 September 2008, <<http://www.satellitetoday.com/military/netwarfare/24295.html>> (23 December 2008)

because of their relatively low cost, availability, and efficiency.

Military Satellite Use Background

Satellites act as a force multiplier for the U.S. military by providing forward deployed units the following capabilities: intelligence, surveillance, reconnaissance, communications, navigation, weather data, and early missile warning. Without some of these capabilities, the U.S. military would not have such a distinct advantage over the adversary. For example, the U.S. military's ability to conduct aerial surveillance and reconnaissance against an adversary that is incapable of detecting such equipment gives the U.S. military an overwhelming advantage against its adversary and can easily exploit the enemy's vulnerability in such a situation. Nevertheless, according to John Edwards, "currently in the wars with Iraq and Afghanistan, approximately 80% of all the U.S. military's satellite communications are being transmitted by U.S. commercial satellites."² This percentage begs to ask the question why the U.S. military's reliance on commercial satellite communications is so high. One reason could be found in U.S. President George W. Bush's space policy,

² John Edwards, "Commercial Sat Market Stirs," *Aviation Week & Space Technology* 162 (Jan 17, 2005): 147.

"which directs the government to use commercial services to the maximum practical extent and cautions that the government should develop its own systems when there is no suitable, cost effective U.S. commercial system...that is, or will be, available when required."³ Another indicator that the U.S. military is relying on commercial satellites to provide services to its various armed forces is due to a decrease in the defense budget allocated for military satellite programs (Edwards).

One of the arguments for continuing to develop U.S. military satellites is the potential vulnerabilities that commercial satellites are exposed to, such as anti-satellite weapons, cyber or infrastructure attack, encryption, jamming, physical destruction, and its availability to anyone military or a terrorist.

An example of satellite was displayed when the Chinese shot down one of its aging FY-1C weather satellites in January 2007, demonstrating its anti-satellite capabilities to the rest of the world. The demonstration gained a lot of attention across the globe, especially from the United States. According to the Knight Ridder Tribune Business News,

³ Richard Dalbello, *OpEd: Milsat or Commercial Sat?*, 03 April 2007, <http://www.space.com/spacenews/archives07/dalbellooped_0402.html> (30 November 2008).

The U.S., which relies heavily on satellites for intelligence gathering, military communications and guiding of missiles as well as for commercial communication and other non-military purposes, lodged a formal protest with China.⁴ Nevertheless, "the U.S. military," according to Inmarsat Vice President Rebecca Cowen-Hirsch, "eventually realized that we can provide the assured access, encryption, and bandwidth they needed at lower cost."⁵

Another concern of the U.S. military are the easily accessible websites that provide anyone who knows how to use computers, imagery of any military installation, nuclear power plants, government buildings, etc. In January 2007, British troops confiscated images of their military base in Basra, Iraq, while conducting raids on various insurgents' homes.⁶ The images depicted Land Rovers, buildings, tents, and bathroom facilities inside the Basra military compound (Hearn). These images do not necessarily give sensitive information with regard to personnel numbers, fire power, types of equipment, or the Command Operations Center, but they provide information that could be used by the enemy to make some educated assumptions on command and control locations. Once the British troops complained to Google about the images,

⁴ "Arms Race in Space", *Knight Ridder Tribune Business News*, 24 Jan 2007, 1.

⁵ "U.S. Military Accepts Dependency on Commercial Satellite Operators," *Satellite News*, 22 Oct 2008, Vol. 31, Iss 42.

⁶ Kelly Hearn, "Terrorist Use of Google Earth Raises Security Fears", 12 March 2007 < <http://news.nationalgeographic.com/news/2007/03/070312-google-censor.html> > (28 November 2008)

Google went back and posted the images of Basra, Iraq, prior to the war in 2003 (Hearn).

According to William B. Scott and Michael J. Coumatos, many senior leaders with U.S. military space expertise had previously informed and warned senior ranking government officials that the U.S. had become over reliant on satellites and that this reliance could leave the U.S. susceptible to attacks potentially cripple the economy, severely degrade global military operations, and compromise national security.⁷ However, the U.S. is just as capable, if not more, than the Chinese in anti-satellite weapons. Recently, the U.S. Navy destroyed a nonfunctional intelligence satellite using a Standard Missile 3 (SM-3) shot from the Navy ballistic missile defense cruiser, the USS Lake Erie.⁸ This action was used as a deterrent to the Chinese government and military as well as any other nation that may have been inclined to demonstrate their anti-satellite weapons.

The Military's Use of Commercial Satellites

Due to the U.S. military's increasing requirements for satellite communications, the need for leasing commercial satellites is a constant. A primary reason why the U.S.

⁷ William B. Scott and Michael J. Coumatos, "Would China Start a War in Space?", *Aviation Week & Space Technology* 168 (07 January 2008) 62.

⁸ "Navy Uses Aegis/SM-3 To Take Down Dead Intel Satellite", *Space & Missile Defense Report*, 21 February 2008, Vol. 9, Iss 8.

military leases a majority of satellite requirements is the relatively low cost of commercial satellites. However, some "senior military officials have stated publicly that an investment in military broadband satellites is necessary to reduce reliance on costly commercial satellite systems (Dalbello)." These same senior military officials also state that the U.S. military should wean itself from commercial satellites completely by 2010 (Satellite News). However, some of these senior military officials are beginning to realize that commercial satellite communications is a vital part of U.S. day to day military operations and the success of missions (Satellite News). Despite the fact the U.S. military would like an independent and dedicated communications network, the realization has been made that they will need the assistance from the commercial sector currently and in the future because the requirements for satellite service is going to increase and U.S. military satellites will not be able to handle this requirement. According Cowen-Hirsch, the relationship between the U.S. military and the commercial satellite industry is like a "forced marriage", the result of a financial and technological understanding between the two sectors (Satellite News). Because the U.S. military does not know where the next conflict will take

them, they will require satellite service on a moments notice in austere environments and only the commercial sector can provide that flexibility.

On the other hand, recent reports have also stated that some DoD organizations are paying significantly less on commercial satellite bandwidth than the market price. "A Defense Information Systems Agency (DISA) report argues that its contracting system is operating efficiently and that DISA often pays 25% below the market rate for commercial bandwidth (Dalbello)."

In order for the U.S. to understand the high cost, we need to know what commercial satellite costs are being compared to. To help the U.S. understand this issue we have to look at how each armed force service budgets for these satellite services. However, the U.S. Navy is the only branch of service that actually allocates its annual funds towards satellite services. The reason for this is that "commercial satellite spending has never been included in the service budgets, and therefore does not rise to the level of other service requirements and does not compete with other priorities (Dabello)." In fact the wars in Iraq and Afghanistan have changed these priorities and have called for the DoD to re-evaluate the services budgets.

On the other hand, the United States Air Force has been delegated the armed forces branch accountable for developing, maintaining, and operating the majority of the military's satellites. Therefore, from the other armed services point of view, their satellite capabilities will be basically free. The issue is whether or not the armed services will pay for their satellite coverage using commercial service or get their satellite service for free using military satellites.

The availability of commercial satellites is what provides the U.S. military the flexibility and freedom to choose their next battlefield. Commercial satellites are everywhere and can be accessed in a moment's notice. To provide satellite availability to the U.S. military, commercial satellite companies use methods of redundancy, such as backup satellites and redundant features on those individual satellites to ensure military operations will not be interrupted.⁹

U.S. Military Satellite Market & Trends

The satellite communications market has become the focal point of military satellites over the past several years due to the multiple wars the U.S. has been fighting.

⁹ United States General Accounting Office, *Commercial Satellite Security Should Be More Fully Addressed*, 2002, 27.

This extra attention has prompted the U.S. to put military satellite communications to the forefront. The satellite production trends within the U.S. military market are expected to remain high, which is in sharp contrast to those in Europe throughout the decade (Edwards). As the U.S. continues to improve its military capabilities in space, other nations will attempt to build up and implement their military space programs to gain strategic, operational, and tactical advantages over their adversaries.

Conclusion

Overall, the DoD and U.S. military satellites have never been able to meet the demands for satellite communications and probably will not be able to do so any time in the near future. Until the DoD and U.S. military can develop and support their own satellite infrastructure to meet their demands they will have to continue to rely on developing and increasing their relationship with commercial satellite companies to ensure their satellite communications requirements continue to be met.

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