Issues of Military Use of Radio Frequency Spectrum

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Statements of Fact

1. Most modern military equipment relies on access to the RF spectrum
2. RF spectrum is the only medium that provides the flexibility and mobility that the military requires
3. Military bandwidth requirements have increased 5000% since the early 1990s
4. RF spectrum is managed at the international level by the ITU
5. US spectrum allocations are managed by the FCC and NTIA
6. The Department of Defense is the largest user of telecommunications in the US Government

Questions and Legal Issues

1. How can the US government fulfill its policy of emergency use of telecommunications systems?
2. What role does the INTELSAT agreement play in military communications?

Analysis

The radio frequency spectrum (the "spectrum") is a finite resource with record demands on its utilization. Commercial use for telecommunications and broadcasting is increasing rapidly. Military use of the radio frequency spectrum is vital to its warfighting capabilities. This paper will examine issues associated with use of commercial satellite systems to augment organic military communications.

The spectrum is managed by governments to ensure that this valuable resource is shared equitably. At the international level the spectrum is managed by the International Telecommunication Union (ITU). The ITU's Radiocommunication Sector (ITU-R) maintains and publishes a table of frequency allocation which divides the spectrum into bands for about 40 categories. The table divides the world into three regions – Europe and Africa (Region 1), North and South America (Region 2), and Asia and Australia (Region 3). Within these regions, countries are free to allocate frequencies as they see fit.

In the United States, the Federal Communications Commission (FCC) regulates all non-federal government spectrum use[1], while federal use of spectrum is managed by the Assistant Secretary of Commerce for Communications and Information, who serves as the administrator of the

[1] The Communications Act of 1934 created the FCC as an independent agency to manage non-federal use of the spectrum while preserving the President's authority to manage federal use.

National Telecommunications and Information Administration (NTIA). NTIA policy states that federal spectrum users use commercial service where possible and that any new federal systems only be developed when they are in the national interest[2] or meet a unique federal government need.

The US military has an ever-increasing need for telecommunications resources. In 2004 the data bandwidth requirements of military's Operation Iraqi Freedom alone were 2.4 Billion bits per second (Gbps)[3]. Clearly satellite communications are the only medium that can accommodate that level of traffic. Further, it is unlikely that the military's organic capabilities will expand fast enough to handle the continual growth in bandwidth requirements[4]. To make up for this shortfall, commercial satellite capacity has been and will continue to be leased.

There are several issues that arise from the use of commercial satellites for military telecommunications. The first is contained in article III of the INTELSAT Agreement. While regular "Public telecommunications services", such as telephone, data, and television are available for military use, "Specialized telecommunications services" are explicitly off-limits to the military[5]. This would include offensive information activities such as eavesdropping through INTELSAT facilities. Additionally offensive data uses, such as probing computer systems or outright cracking would also be prohibited. What could be allowable

[2] Department of Commerce, "Federal Long-Range Spectrum Plan", 2000
[3] Rayermann, "Exploiting Commercial SATCOM: A Better Way", 2004
[4] Ibid.
[5] Public and Specialized telecommunications services are defined in Article II(j) and II(l) respectively

however is a more passive type of operation such as activating a computer bot-net[6] as long as the actually infiltration was done by other routes[7] [8].

What this implies is that some military use of commercial spectrum would need to be segregated out from more typical uses. This, then, would mean that military ground stations would need to differentiate internally between allowable traffic and prohibited traffic and route accordingly. This might prove problematic in a tactical environment with limited ground facilities.

An additional issue related to military use of the spectrum is that of control. Many telecommunications satellite companies are international in nature with limited control in the US. However the policy of the NTIA[9] is that in time of national emergency all available communications systems would be available to the government. With much of the telecommunications infrastructure controlled by non-US companies or governments, it would be difficult to obtain full use of those assets. Further, the Outer Space Treaty[10] would seem to preclude any attempt to seize control of foreign owned or registered satellites.

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[6] A "bot-net" is a collection of computers infected with software that allows them to be controlled by one or more separate computers.
[7] Wingfield, "Legal Aspects of Offensive Information Operations in Space"
[8] This leads to another interesting concept – if offensive information operations are seen as a type of warfare, then satellite telecommunications systems become de facto weapons systems.
[9] Department of Commerce, "Manual of Regulations and Procedures for Federal Radio Frequency Management", 2005
[10] Article VIII of the OST states that the state of registry of a spacecraft retains jurisdiction over that object. US attempts at control of telecommunications satellites would violate this agreement.

Since satellite based communications is vital to military operations, especially in time of a national emergency, the federal government might be tempted to violate this provision, which would place the entire outer space regime in jeopardy.