Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	ET Docket No. 02-135
Spectrum Policy Task Force Seeks	)	
Public Comment on Issues Related to	)	
Commission's Spectrum Policies	)	

COMMENTS OF HUGHES NETWORK SYSTEMS, INC.

Gary M. Epstein
John P. Janka
Bart S. Epstein
LATHAM & WATKINS
Suite 1000
555 Eleventh Street
Washington, DC 20004
(202) 637-2200

July 8, 2002

Table of Contents

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	ET Docket No. 02-135
Spectrum Policy Task Force Seeks	)	
Public Comment on Issues Related to	)	
Commission's Spectrum Policies	)	

COMMENTS OF HUGHES NETWORK SYSTEMS, INC.

Hughes Network Systems, Inc. ("Hughes") submits these Comments in response to the Commission's Public Notice seeking input on current and future policies related to spectrum use and allocations. Hughes offers the following views from its perspective as a licensee of satellite networks in the Fixed Satellite Service (FSS), and as a leading manufacturer and operator of very small aperture earth terminal (VSAT) networks that operate in the FSS bands.

I. THE CURRENT U.S. SYSTEM OF ALLOCATING SATELLITE SPECTRUM AND ASSIGNING SATELLITE LICENSES HAS PRODUCED TREMENDOUS PUBLIC BENEFITS

Thanks in large part to sensible and predictable federal regulatory policies over the past three decades, the United States satellite industry has brought to market a dazzling array of products and services that have revolutionized one industry after another. Many of these products and services provide important and unique public welfare benefits that no terrestrial service could begin to provide.

Satellite technology touches all of our lives nearly every day. Whether it is beaming digital television signals into millions of homes, providing Internet access and other high-speed communications, enabling our military forces to communicate and transmit data in real time, transmitting newspapers for same-day distribution in distant areas, providing meteorologists with real-time images of weather patterns, or enabling gas stations, convenience stores, and automated teller cash machines to interact with our banking and credit card authorization systems in real time, satellite services are ubiquitous in American life.

There was a time when the concept of television signals coming from satellites was considered science fiction. Today, thanks to their efficient and effective use of spectrum and broad geographical coverage capabilities, satellites provide tens of millions of Americans with hundreds of channels of crystal-clear digital television service, regardless of whether those Americans live in the largest cities or on the most remote farms.

No longer do airplanes rely exclusively on a series of ground-based beacons to navigate from one point to another, rely exclusively on barometric pressure readings to estimate their altitude above mountains, or rely exclusively on million-dollar inertial navigation platforms for trans-oceanic air traffic control. Today, thanks to prudent past spectrum management decisions and creative use of the satellite spectrum, the global positioning satellite system equips tens of millions of flights each year with real-time, three-dimensional location information, that enables those flights to reach their destinations safer and faster, and more cost effectively than ever before.

Satellites offer a number of unique and important advantages over other means of communications. For example, by placing a single spacecraft into orbit above the equator, a satellite operator is able to instantly provide ubiquitous coverage over all of the United States (and other parts of the Americas) and extend this service on a distance-insensitive basis with respect to both cost and quality. Thus, by simply installing a small satellite antenna and a transceiver or receiver, a farmer in the most remote corner of rural America can be provided access to the same advanced services that urban residents take for granted, and that otherwise may never be provided in that part of rural America by terrestrial networks.

Additionally, satellite services are much less susceptible than terrestrial networks to disruption due to disasters on the ground (whether natural or man-made), or to physical tampering by those who would seek to disable communications networks. In times of crisis, satellite communications are uniquely suited to provide local, state and federal government and military leaders with crucial communications services, both here and abroad.

A full catalogue of the ways that satellites touch our lives would be staggeringly long. The one thing that is clear, however, is that each item on the list owes its success to the sensible and predictable U.S. regulatory policies with respect to spectrum allocation, license assignment and interference protection that have provided the foundation on which satellite technology has developed, taken root, and flourished to serve the American public. If these policies continue on course, there is every reason to believe that today's emerging technologies such as satellite broadband and satellite radio will also become widespread, as will the unforeseeable technologies of tomorrow.

II. UNIQUE CHARACTERISTICS OF SATELLITE SYSTEMS SHOULD BE TAKEN INTO ACCOUNT IN SPECTRUM POLICY DECISIONS

Along with many of the advantages of space-based services come a number of inherent technical, operational, and financial challenges. These challenges should continue to be taken into account in the Commission's spectrum management decisions to ensure that satellites remain able to provide important public interest benefits.

Deployment of satellite technology in a given frequency band has historically trailed behind terrestrial operation in that band because of the long lead time required to develop space-qualified hardware in new frequency bands. Although more limited in coverage, terrestrial networks have enjoyed some advantages over satellite networks relative to the deployment of new services and technology. Area-by-area deployment provides the ability for terrestrial users to employ frequency bands before satellite technology for that band has sufficiently developed. For example, a terrestrial network can be deployed over a limited geographic area with a few towers or rooftop mounted antennas and service can be initiated in a matter of months. Terrestrial networks also are able to use technology that is still in the early stages of development, because terrestrial transmitters readily can be tested, fixed and upgraded.

In order to provide their inherent wide area coverage capability, satellite networks, by comparison, must go through far more extensive technological development before they can be placed in service. Spacecraft must be designed and built to survive for 15 years or more in space, where they experience extreme daily temperature swings and are constantly bombarded by radiation. Satellites must self-contain sophisticated solar power generation systems that will operate continuously for a decade and a half. Spacecraft must also be painstakingly designed and tested, because once they are launched they either work or they fail. Spacecraft cannot be recalled once they reach GSO orbit, and spacecraft can generally not be fixed while they are in orbit 22,300 miles above the earth. Considering that a typical GSO FSS spacecraft costs hundreds of millions of dollars to construct, insure, and launch, it is clear why satellite operators must proceed carefully in the deployment of new technology in existing or new frequency bands.

The public interest is well served by ensuring that satellite spectrum remains available for new satellite services as new satellite technologies mature. The Ka band is a case in point. The Ka band was domestically allocated for the FSS in 1973 in order to address concerns that C-band spectrum would eventually become saturated by satellite users and would therefore become unable to accommodate further satellite operations.[1] Today, with the U.S. orbital arc essentially filled with C and Ku band spacecraft, and a great deal of technological innovation since 1973, operators are preparing to launch Ka band systems that will offer new and innovative high speed services and provide critical expansion spectrum for the satellite networks in the congested C and Ku bands. The Commission's foresight thirty years ago to set aside the Ka band for satellite services has facilitated the development of Hughes's revolutionary SPACEWAY satellite network, which is scheduled for launch next year. Like a well-thought-out master plan for growth of a municipality/population center, the Commission's table of frequency allocations provides the means to plan for spectrum uses that cannot adequately be defined today.

In summary, commercial terrestrial networks almost always are able to deploy in a given frequency band before commercial satellites are in a practical position to use the same band. Therefore, unless the Commission takes a policy stand and makes appropriate plans in its allocation decisions for continued satellite "operational" and "growth" bands, terrestrial uses will consume available spectrum before satellite networks are able to use it.

III. TO FULFILL THEIR ROLE, SATELLITE NETWORKS NEED ACCESS TO SUFFICIENT SPECTRUM, FREE FROM INTERFERENCE

For the reasons described above, satellite technology is particularly well suited to offer communications services of all kinds across America (as well as network redundancy), and is technologically capable of supporting a valuable competitive alternative to the offerings provided by terrestrial communications, such as fixed wireless service and cable broadband. To

---

[1] *See Establishment of Domestic Communication-Satellite Facilities by Non-Government Entities*, 25 FCC 2d 718, 1-5 (1970); *Amendment of Part 2 of the Commission's Rules to Conform with Space WARC* 1971, 39 FCC 2d 959 (1973).

facilitate such a competitive satellite-based alternative, it is critical that the Commission continue to provide uniform allocations and assignments of satellite spectrum across all of the United States, in rural, urban, and suburban areas alike. It is also critical that satellite networks have access to an adequate amount of spectrum that is free from interference on a broad geographical basis. Thus, Hughes urges the Commission to include long-range plans for satellite service in its decisions regarding spectrum allocation as well as those addressing interference protection and spectrum sharing.

Based on Hughes' experience, it is critical that satellite operators have access to the same spectrum in the urban and suburban areas where businesses operate, as well as in rural parts of America. Historically, Hughes has focused its satellite VSAT business on commercial (or enterprise) users, and Hughes' new SPACEWAY satellite system is similarly oriented toward business users. There are a number of reasons for this, including the fact that businesses are willing to embrace satellite services more quickly and are better able to bear the cost of acquiring satellite equipment. Moreover, focusing on businesses provides Hughes the ability to more quickly recover the enormous capital cost of deploying a satellite system.

It is important that satellite networks have access to spectrum in both urban and rural areas. Doing so ensures that a satellite service provider can serve its customers wherever they are located, and enables a customer to link all of its manufacturing, retail, or other sites through a single network. And, as noted above, satellites are uniquely suited to extend service to rural and remote customers who otherwise would be unserved or underserved by terrestrial networks.

Satellites use cutting-edge technology to support the growing need for bandwidth that is generated by today's high-data-rate services and new applications of technology. FSS satellite networks already employ very sophisticated methods for maximizing efficient use of the allocated spectrum—they fully reuse spectrum used by another spacecraft two degrees away in the geostationary orbit, they can employ dual polarization, and technology has finally developed to support widespread spot beam reuse on the earth's surface. FSS systems, however, cannot provide ubiquitous VSAT services if spectrum is shared with terrestrial users, whose service is often concentrated in urban/suburban areas. Such "sharing" would, as a practical matter, relegate satellites to serving only rural areas, a service that is unlikely to be economically viable.

Even with the use of today's advanced technologies, it is clear that satellites will require access to additional spectrum in order to bring future innovative services and capabilities to consumers and to remain competitive with terrestrial alternatives. In order to provide the promise of broadband service in the Ka band, satellite networks need access to a full 1000 MHz of spectrum in the 18/28 GHz bands for use by ubiquitously-deployed antennas. And future satellite networks will require access to the frequency bands above 40 GHz that are just coming into commercial service.

Hughes therefore urges the Commission to ensure that U.S. spectrum policies take into account both the current operational requirements and the expansion needs of the satellite industry. In particular, the Commission should never assume that a frequency band allocated for satellite services should be reallocated or designated solely for a terrestrial use simply because the satellite industry has not yet filed applications or begun to use that particular band. As noted above, there are a number of reasons why satellite technology for a given frequency band can develop less rapidly than technology for terrestrial use of the same band. Nor should the Commission's satellite spectrum allocation decisions be based on the fact that some satellite companies have tried and failed (as have many terrestrial operators) to establish successful telecommunications businesses. If these were the standards, (i) the Ku band would have been reallocated to the terrestrial fixed service in the mid-to-late 1980's after most (if not all) of the initial Ku band GSO FSS licensees were unable to implement their systems, and (ii) the Ku band VSAT networks that countless businesses, governments, and consumers rely on every day never would have had a chance to develop.

To fully support the deployment of ubiquitous VSAT services in the FSS, it is important that satellite networks be provided access to spectrum that does not require prior coordination with terrestrial users, and also is free from interference generated by terrestrial users, both licensed and unlicensed. It is simply not feasible to deploy a cost-effective satellite service on a nationwide basis if the satellite service needs to coordinate with terrestrial users before initiating service to each customer. The delay and cost associated with commissioning a coordination study and engaging in discussions with affected terrestrial users adversely affects the ability to respond quickly to customer needs. The cost associated with doing so increases the price to be charged to the customer, and may result in an offering that is not competitive with terrestrial alternatives. Even the requirement to share a band on a co-equal basis raises the untenable risk that the band may not be available at all in a given location to serve particular customers due to preexisting terrestrial uses. In the aggregate, these barriers would reduce the market potential for satellite networks and could reduce industry investment.

It is not sufficient that satellite users be relieved of the need to coordinate with terrestrial users. It is essential that FSS satellite operators have access to spectrum that is free of potentially interfering signals from terrestrial transmitters, again, whether licensed or unlicensed. As the Commission is aware, the signals transmitted by GSO satellites must travel 22,300 miles to reach their customers. Thus, the signals received at the earth's surface are necessarily far less powerful than those typically produced by a terrestrial transmitter, and satellite earth station receivers must be sensitive enough to receive these signals from outer space. Moreover, satellite systems need to be protected from much-lower-powered interfering signals than a similarly sited terrestrial receiver. Thus, it is critical that FSS satellite systems have access to sufficient amounts of spectrum ***unshared*** with terrestrial services in order to support the provision of competitive high-speed services, and the development of new satellite technologies.

IV. AUCTIONING SATELLITE SPECTRUM WOULD DEVASTATE THE SATELLITE INDUSTRY

Auctions may, at first blush, seem an attractive method of allocating scarce resources, and an appealing vehicle for bringing money into the U.S. Treasury. A closer look at how auctions would affect the satellite industry, however, demonstrates why auctions should not be applied to satellite licensing or spectrum allocation decisions.

A. *Satellite Licenses Should Not Be Awarded By Auction.*

Due the inherent ability to cover wide geographic areas, and the need to coordinate with the satellite networks of other nations, FSS satellites are inherently international in nature. A single FSS spacecraft that serves the U.S. typically is also able to serve Canada, Mexico, and other parts of the Americas. This capability is attractive to many users of satellite systems, because it allows them to use a single network to connect their facilities in many other countries. Such use of a U.S. licensed satellite typically requires not only the issuance of a license from the Commission, but also from other governments within the service area of the spacecraft. Additionally, there is often the requirement that the operator effect ITU coordination with the satellite networks licensed by other nations. Thus, the use of auctions to award a U.S. satellite license would create a number of problems.

First, other countries would likely follow the U.S. lead and employ auctions to extract huge sums of money from the worldwide satellite industry in the name of national market access. Knowing the importance of particular frequencies to regionwide service, foreign countries would necessarily employ sequential auctions and would extract further payments from U.S. satellite operators. Some 'key' countries within the service area of a satellite system could set very high reserve prices and also unnecessarily restrict the number of licenses they would issue for service within its country, resulting in high fees that could not be avoided if a satellite operator were to provide full connectivity within its coverage pattern. Auctions therefore could deter market entry and international service by companies that would have no practical way of knowing whether they would "win" sequential auctions outside the U.S. to gain access to the spectrum in those countries that they need to support their business plans.

Second, if the Commission were to auction "market access" to the U.S. by non-U.S.-licensed spacecraft, that would unquestionably invite retaliation by foreign governments. Conversely, if the U.S. were to maintain the current prohibition on auctioning licenses for global or international satellite systems, it is highly likely that the U.S. will convince other countries to follow suit.

Third, due to the delays in obtaining relevant information about the ITU's satellite network registration process, it is not always possible to determine with which networks from other countries a U.S.-licensed satellite network will be required to coordinate before the Commission issues a license. In certain cases, the problems created by ITU coordination are insurmountable, and a U.S. licensee needs to seek reassignment to another location. Under current licensing processes, the Commission accommodates this problem by treating orbital locations as fungible and allowing licensees to seek reassignments to other orbital locations. In an auction context, however, a potential bidder would have access to insufficient information to adequately assess this significant ITU risk, and even if there were an ability to seek a reassignment of an "auctioned" orbital location, there would be no realistic way to adjust the auction results for any different value of that other location.

Last, a general U.S. policy of auctions could affect existing satellite operations – ex post – as some countries may, as happened to PanAmSat in Guatemala, choose to auction spectrum already being used by an operational satellite.

Economic models that purport to demonstrate that auctions costs are not passed through to end-users of satellite services erroneously assume that satellite firms have limitless access to debt and equity capital. In reality, satellite firms would likely have to borrow much, if not all, of the money to pay governments around the world for the replicated right to use the same satellite spectrum, raising their cost of capital. The cost of servicing and eventually repaying these debts would either be passed on to consumers in the form of higher prices, or be borne by stockholders when firms enter bankruptcy, or result in the potential satellite operator abandoning its plans.

Furthermore, auctions in the satellite context would not solve any problems. As Hughes has indicated in the Commission's pending NPRM on satellite licensing reform, the Commission's current model for licensing satellite networks has served the public well and has facilitated the development of a vibrant U.S. satellite industry. Satellite companies need no further encouragement to use spectrum efficiently. The large capital expenditures required to launch a satellite network along with the limited number of orbital slots available provide strong incentives for efficiency: Satellites are designed and built with the best technology available at a given time to utilize spectrum as efficiently as possible, because only by doing so can their owners earn the maximum return.

B. *Spectrum Allocation Decisions Should Not Be Made By Auction*

Some proponents of auction theory may go beyond suggesting that certain orbital location and frequencies should be auctioned to determine which operator should have the right to operate there: Some might suggest that the entire radio spectrum should be allocated according to auctions that determine who the highest value users might be, and that radio services and technologies should be fully interchangeable.

Hughes strongly urges the Commission to avoid pursuing any such approach to spectrum planning. Such a "free-for-all" process for allocating spectrum without any long-term planning for different services would likely result in the entire spectrum being used for devices that can be rolled out in the short-term and without the need to develop complex technology, such as handheld CMRS devices and cordless landline telephones. Services that take more time to develop would be valued less in an auction, due to the need to take into account the present value of a particular spectrum use that may not be feasible for a number of years. Such services would implicitly be eliminated from a long-term policy perspective. While there certainly is a need to allocate spectrum for handheld CMRS devices and cordless landline telephones, society has also appropriately concluded that there are legitimate social benefits that are derived from other uses of the spectrum, including services such as public safety, radioastronomy, aviation navigation national security and a variety of satellite-based services. The lower technology risks that terrestrial users of spectrum face, and the inherent head start that simpler technology provides to terrestrial users, as described above, would likely skew a "free-for-all" spectrum or other auction in favor of terrestrial uses of spectrum.

Radio spectrum is a valuable natural resource that the government has an obligation to steward in the public interest – and without regard to what the highest bidder at any given time might be willing to pay. In order to allow satellite providers to bring to the public, business and government the valuable services and network redundancy described above, it is critical that the Commission take those benefits into account in its allocation decisions.

V. CONCLUSION

Because it values the many important and unique services that satellites provide, the Commission should take this opportunity to reaffirm its dedication to two core principles. First, the Commission should reaffirm the importance of protecting existing satellite services from growing problems of interference, and from the threat of untested schemes to "share" spectrum that could disrupt existing users of satellite spectrum and foreclose the development of future satellite services. Hughes therefore urges the Commission to provide the satellite industry with access to spectrum that is not shared with terrestrial services (licensed or unlicensed), both now and for the long run, to allow the development of competitive satellite services that can be deployed ubiquitously and have a chance to compete effectively with terrestrial services. When it is clear that existing licenses will be protected, future licensees will be far more likely to innovate and take risks. They will be confident that if they develop innovative space-based technology, the Commission will in turn protect the spectrum that technology requires.

Second, the Commission should take this opportunity to reject any proposal to auction licenses for orbital locations or satellite spectrum in any form. The U.S. should maintain its leadership in this area and vigorously oppose any plan to auction satellite licenses in other countries. Implementation of any such process would clearly devastate the entire future of the satellite industry and the continued provision of existing satellite services.

If the Commission reaffirms its intention to these core principles it can have every expectation that the U.S. satellite industry will continue to grow and provide outstanding and innovative services and service quality to American consumers, businesses, government agencies, and the U.S. military.

Respectfully submitted,

HUGHES NETWORK SYSTEMS, INC.

By: __/s/___Bart S. Epstein____

Gary M. Epstein
John P. Janka
Bart S. Epstein
LATHAM & WATKINS
Suite 1000
555 Eleventh Street
Washington, DC 20004
(202) 637-2200

July 8, 2002