

DEVELOPMENTS IN INTERNATIONAL SATELLITE COMMUNICATIONS IN THE INTERNATIONAL SPACE YEAR

Deemed the International Space Year,¹ 1992 continued to bring forth material developments in the rapidly expanding world of international satellite communications. Not only has the transmission of voice and data become competitive, but with the technological advances of direct broadcast services, video compression, high data rate computer services and high definition television, among others, the entire satellite market appears primed for a technological explosion.²

The development of such services and similar ones providing interactive capabilities will greatly increase choices in personal communications.³ The once futuristic concepts of telecommuting⁴ and virtual reality⁵ are fast becoming today's reality. Modern satellite technology enables the remote rancher in Australia or the climber in the Andes to be in touch with the outside world within seconds. This capability creates monumental opportunities for third world countries, where cable and fiber optic lines have yet to be laid. Indeed, it is quite possible persons will be able to communicate via satellite with virtually anyone in the world by the early twenty-first century.

The Communications Satellite Corporation

("Comsat") was created by Congress in the 1962 Communications Satellite Act ("CSA")⁶ and was authorized to serve as the United States private sector commercial participant in the International Telecommunications Satellite Organization ("INTELSAT").⁷ Comsat enjoyed a monopoly position over international satellite communications from the United States for nearly thirty years. Today, Comsat no longer stands alone as the sole provider of satellite communications services in the United States. Radical technological advances over the thirty years since the implementation of the CSA have enabled competitors to enter the satellite services market, a development consistent with the United States' policy "not . . . to preclude the creation of additional communications satellite systems"⁸

Congress created Comsat with the passage of the CSA.⁹ The goal was to create a commercial corporation which would operate as a part of the global communications network¹⁰ and serve as the United States' signatory to INTELSAT and the International Maritime Satellite Organization ("INMARSAT").¹¹ Since its inception, Comsat has been regulated as a common carrier by the Federal

¹ Lloyd Covens, *The Year Ahead: Satellite's Bright Vista*, SATELLITE COMM., Jan. 1992, at 17.

² *Id.*

³ The term "personal communications services" or "PCS" is a term used often in the arena of emerging technologies. PCS is a regulatory definition—a generic umbrella for a variety of mobile services. It does not define the various technologies involved. Margie Semilof, *Here Come the PCNs*, COMMUNICATIONS WEEK, Nov. 18, 1991, at 26.

⁴ "Telecommuting . . . [is] the use of telecommunications technology to partially or completely replace the commute to and from work." It is estimated that "the number of home based telecommuters in the United States has increased 2.5 times in the past four years, from 2.2 million in 1988 to 5.5 million [currently] (4.4 percent of the workforce)." Patricia L. Mokhtarian, *Telecommuting in the United States: Letting Our Fingers Do the Commuting*, TR NEWS, Jan.-Feb. 1992, at 2-3.

⁵ "Virtual reality architectures almost literally invite users to step into the world defined by the system. Sophisticated I/O [input/output] devices, such as touch screens, goggles, heads up displays and data gloves, enable users to view and manipulate electronic information and images in three dimensions." James

Kobielus, *Virtual Reality May Transform Future Multimedia Interfaces*, NETWORK WORLD, Feb. 25, 1991, at 33.

⁶ Communications Satellite Act, 47 U.S.C. §§ 701-744 (1991) [hereinafter CSA].

⁷ The United States entered into the INTELSAT Agreement on February 12, 1973. "INTELSAT is a cooperative whose members make capital contributions commensurate with their use of the system." Senior Interagency Group on International Communication and Information Policy White Paper on New International Satellite Systems, p.21 (Feb. 1985) [hereinafter SIG White Paper]; see CSA § 102(a), 47 U.S.C. § 701(a).

⁸ CSA § 102(d), 47 U.S.C. § 701(d).

⁹ The stated policy goal of the CSA is an "improved global communications network, which will be responsive to public needs and national objectives, which will serve the communication needs of the United States and other countries, and which will contribute to world peace and understanding." CSA § 102(a), 47 U.S.C. § 701(a).

¹⁰ *Id.*

¹¹ Congress passed the International Maritime Satellite Telecommunications Act designating Comsat the United States representative. "Such system shall have facilities and services

Communications Commission ("FCC" or "Commission")¹² under rate-of-return regulation. The rate-of-return model of regulation, or cost-of-service, is intended to prevent an entity with market power from exercising monopoly power over the marketplace.¹³

The arrival of competitors to the international satellite environment may induce the Commission to alter or abandon that regulatory model as competition grows. Today, there are a myriad of companies, such as AT&T, Columbia, Ellipsat, Loral-Qualcomm, Motorola, Orbital, PanAmSat, and TRW, vying for the international as well as domestic satellite communications market.¹⁴ As these and other firms enter the market and mature, regulators will be forced to consider whether the current activist economic regulation should be largely replaced by increased reliance on market forces.

This Comment focuses on several important and timely issues of international satellite communications law. Current international satellite issues can be divided between the fixed-satellite and mobile-satellite services. Those divisions correspond to the physical characteristics of the receiving station and the frequencies each type of system utilizes in transmitting messages over its facilities. In the fixed-satellite arena, Pan American Satellite's ("PanAmSat") relationship with both Comsat and INTELSAT and resulting industry ramifications are analyzed. Recent regulation of direct broadcast service ("DBS") and related technological issues are also examined. Next, this Comment studies the mobile-satellite service, particularly the frequency, technical, and political is-

issues surrounding low-earth orbiting ("LEO") satellites, including Motorola's IRIDIUM and INMARSAT's Project 21. Lastly, this Comment analyzes the direction in which technology and competition will drive regulation as the United States heads into the twenty-first century.

I. FIXED-SATELLITE SERVICE

A. Pan American Satellite: An Emerging Competitor

1. *PanAmSat's Judicial Attempt to Even the Playing Field*

PanAmSat has assumed the role of Comsat's principal rival in the newly competitive international satellite industry. Hoping to break Comsat's former monopoly over the domestic and international satellite communications market, it has repeatedly asserted, before both courts and regulators, that Comsat's conduct is monopolistic and predatory and that INTELSAT's treaty status is obsolete.¹⁵

On July 25, 1989, PanAmSat filed an antitrust complaint against Comsat in the United States District Court for the Southern District of New York.¹⁶ The complaint was dismissed¹⁷ on the ground that, as a signatory to INTELSAT, Comsat was immune from suit under Article XV of the INTELSAT agreement¹⁸ and the International Organizations Immunities Act.¹⁹ However, the court pointed out that antitrust prohibitions nevertheless related to Comsat's role as a common carrier because § 102 of the CSA contained an antitrust consistency clause.²⁰

which will serve maritime commercial and safety needs of the United States and foreign countries." International Maritime Satellite Communications Act, 47 U.S.C. §§ 751-57, at 751(a) (1988).

¹² CSA § 401, 47 U.S.C. § 741.

¹³ *In Re Policy and Rules Concerning Rates for Dominant Carriers, Notice of Proposed Rule Making*, 2 FCC Rcd. 5208, para. 17 (1987).

¹⁴ *Price, Schedule are Keys; Rocket Companies Gear Up For \$2 Billion in Satellite Launches*, COMM. DAILY, Nov. 28, 1988, at 2. Several of the traditional equipment suppliers of NASA, such as McDonnell Douglas, Martin Marietta and General Dynamics, have entered the competitive launch market as have some small start-up companies, like Orbital Sciences. Launches may also be provided by foreign entities, such as Europe's Arianespace.

¹⁵ *Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp.*, 89-CIV-5021, Complaint Jury Trial Demand (S.D.N.Y. filed July 25, 1989); Petition for Rulemaking of Pan American Satellite Petition to Modify Commission Policies Established in CC Docket No. 84-1299 Relating to Separate Satellite Systems, RM-7562; PanAmSat, White Paper, A

New, Private Enterprise INTELSAT, (Apr. 20, 1992) [hereinafter PanAmSat White Paper]; Petition to Reopen Proceeding in the Corporate Structure and Operations of the Communications Satellite Corporation, CC Docket No. 80-634, Rpt. No. I-6691 (May 12, 1992) (on file with *CommLaw Conspectus*).

¹⁶ See *Alpha Lyracom*, Complaint Jury Trial Demand, *supra* note 15.

¹⁷ *Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp.*, 68 Rad. Reg. 2d (P&F) 405 (1989) [hereinafter *Alpha Lyracom*].

¹⁸ "[E]ach Party shall grant to these individuals [Parties, representatives of parties, Signatories and representatives of signatories] immunity from legal process in respect of acts done and words written or spoken in the exercise of their functions and within the limits of their duties . . ." Article XV(c), Int'l Telecommunications Satellite Organization, Aug. 20, 1971, 23 U.S.T. 3813 [hereinafter INTELSAT Agreement].

¹⁹ *Alpha Lyracom*, 68 Rad. Reg. 2d (P&F), at 411. "International organizations . . . shall enjoy . . . immunity from suit and every form of judicial process as is enjoyed by foreign governments . . ." 22 U.S.C. § 288a (b) (1982 & Supp. V 1987).

²⁰ *Alpha Lyracom*, at 407.

On appeal, the United States Court of Appeals for the Second Circuit held the dismissal on immunity grounds was appropriate, but nonetheless reversed and remanded the case to allow PanAmSat to file an amended complaint in which conduct not shielded by immunity could be alleged—that is, conduct undertaken in Comsat's role as a common carrier.²¹ On November 13, 1991, PanAmSat filed its second amended complaint.²² In the complaint, PanAmSat again asserted that Comsat monopolized and participated in a conspiracy to monopolize the international satellite market.²³ However, PanAmSat emphasized Comsat's role as a common carrier and sole provider of access to INTELSAT. PanAmSat further maintained that Comsat engaged in preemptive conduct around the globe which resulted in damage to PanAmSat's business and reputation.²⁴

Shortly after the amended complaint was filed, PanAmSat filed a petition for writ of certiorari with the United States Supreme Court.²⁵ In its Brief for Respondent in Opposition, Comsat agreed with both the District Court and the Court of Appeals in their crafting of a "narrowly drawn immunity based, in part, upon the express immunity provisions in the INTELSAT Agreements."²⁶ Comsat contended that its primary role was that of signatory to INTELSAT, and that the purpose of that organization was to promote global satellite telecommunications efficiency and competition.²⁷ Comsat asked that the Court deny PanAmSat's petition,²⁸ and on February 24, 1992, PanAmSat's petition for certiorari was denied.²⁹ Oral argument on the second amended complaint took place in October 1992. On March 30, Comsat's Motion to Dismiss PanAmSat's Complaint

was denied and discovery was ordered to commence.

2. PanAmSat's Efforts to Remove the Ban on Separate Systems

As part of the INTELSAT Agreements, satellite service providers who were not INTELSAT signatories, so called "separate systems," were prohibited from interconnecting with the public switched telephone network.³⁰ Separate systems were, however, permitted to "establish, acquire or utilize space segment facilities separate from the INTELSAT space segment facilities [as long as these systems] furnish all relevant information to and . . . consult with the Assembly" prior to initiating action.³¹ The purpose of both policies was two-fold: (1) to protect the global satellite network from a technical perspective, and (2) to spare INTELSAT from significant economic harm.³²

In July 1990, PanAmSat asked the Commission to unilaterally remove the separate systems restrictions.³³ Comsat, in its opposition to PanAmSat's *Petition for Rulemaking*,³⁴ asserted that the Executive branch had jurisdiction over the INTELSAT Agreements and related separate systems matters.³⁵ Comsat further delineated the process through which the United States government had gone in order to outline its policy goals within the separate systems framework, citing an Executive branch letter ("Baker-Mosbacher Letter")³⁶ and a white paper prepared by the Senior Interagency Group on International Communications and Information Policy ("SIG White Paper").³⁷ Comsat argued that coordination of separate systems with 100 or fewer circuits

²¹ Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp., 946 F.2d 168, 176 (2d Cir. 1991).

²² Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp., 89-CIV-5021, Second Amended Complaint Jury Trial Demand (S.D.N.Y. filed Nov. 13, 1991) (on file with *CommLaw Conspectus*).

²³ *Id.* at 30.

²⁴ *Id.* at 24.

²⁵ Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp., *petition for cert. denied*, 112 S. Ct. 1174 (1992).

²⁶ Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp., Brief for Respondent in Opposition at 17, 112 S. Ct. 1174 (1992) (U.S. Jan 22, 1992) (No. 91-1038) (on file with *CommLaw Conspectus*).

²⁷ *Id.* at 18.

²⁸ *Id.* at 30.

²⁹ Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corp., 112 S. Ct. 1174 (1992).

³⁰ INTELSAT Agreement, *supra* note 18, art. XIV.

³¹ *Id.* In fact, Comsat is the vehicle by which those separate

systems pass through the consultation process. SIG White Paper, *supra* note 7.

³² INTELSAT Agreement, *supra* note 18, art. XIV.

³³ *Petition for Rule Making* of Pan American Satellite to Modify Commission Policies Established in CC Docket No. 84-1299 Relating to Separate Satellite Systems, RM-7562, 6 FCC Rcd. 5 (1990).

³⁴ *In re Pan American Satellite Petition for Rulemaking to Modify Commission Policies Established in CC Docket No. 84-1299 Relating to Separate Systems, Opposition of Comsat to Petition for Rule Making*, RM-7562, (Jan. 31, 1991) (on file with *CommLaw Conspectus*).

³⁵ *Id.* at 2.

³⁶ *Id.* at 3.

³⁷ The SIG White Paper on New International Satellite Systems examined the United States' policy objectives within the aegis of the Communications Act of 1934, the Communications Satellite Act of 1962 and the United States' participation in INTELSAT. *Id.* at 3-4. "The SIG is composed of representatives of the Departments of State, Justice, Defense and Commerce; the Offices of Management and Budget, Science and Technol-

interconnected with INTELSAT was a gradual and effective method of integrating separate systems into the global network.³⁸ It also suggested that any further lifting of the interconnection can be coordinated within the environs of INTELSAT.³⁹ Accordingly, the Commission routed PanAmSat's *Petition for Rulemaking* to the Executive Branch.

On November 27, 1991, in accordance with the Bush Administration's pro-competitive policy stance, Secretary of State James Baker and Secretary of Commerce Robert Mosbacher sent a joint letter to FCC Chairman Alfred Sikes outlining an incremental approach to integrating the separate systems.⁴⁰ PanAmSat subsequently withdrew its *Petition* in light of this letter realizing the mootness of its argument. In November of 1992, INTELSAT's Assembly of Parties met and determined that switched services up to the level of 1,250 equivalent circuits per satellite would not cause significant harm to INTELSAT.⁴¹ Accordingly, in a January 8, 1993 joint letter from the United States Coordinator for International Communication and Information Policy and the Assistant Secretary for Commerce and Information, to FCC Chairman Alfred Sikes, United States policy regarding separate systems was further modified to align it with the decision made by the INTELSAT Parties.⁴² That letter did not modify the Baker-Mosbacher Letter which asserted all separate systems interconnection restrictions would be lifted by 1997.⁴³

3. *PanAmSat's White Paper on INTELSAT Delivered to Congress*

On April 20, 1992, PanAmSat submitted a White Paper to Congress entitled *A New, Private Enter-*

prise INTELSAT.⁴⁴ PanAmSat claimed INTELSAT's immunity from suit conferred commercial benefits and therefore its immunity and treaty status must be stripped.⁴⁵ PanAmSat's White Paper contended it was inherently unfair that INTELSAT have it both ways by being "a specially privileged treaty organization, immune from any nation's competition laws and regulatory oversight, and a hard-driving commercial competitor . . ." ⁴⁶ However, opposition to PanAmSat's argument can be found in the SIG White Paper describing the Bush Administration's "separate systems" policy whereby change is facilitated by allowing INTELSAT to become competitive, rather than by allowing separate systems to enter the market.⁴⁷ As of April 1, 1993, neither INTELSAT nor Comsat had replied to the allegations made in PanAmSat's White Paper.

4. *PanAmSat's Petition to FCC to Reopen Structure Proceeding*

On May 12, 1992, PanAmSat filed a *Petition to Reopen Proceeding* with the Commission asking it to reexamine the corporate structure and operations of Comsat.⁴⁸ PanAmSat argued that the dual role of Comsat as common carrier and INTELSAT signatory was a conflict of interest and gave Comsat competitive advantages in violation of the Sherman Anti-Trust Act.⁴⁹ It further stated that the Commission should divide Comsat's services into monopoly and competitive baskets,⁵⁰ maintaining: (1) monopoly services were those services that separate systems did not, or could not, offer; (2) competitive services were those that separate systems did, or could, offer; and (3) fiber optic services should be excluded from both baskets.⁵¹

ogy, Policy, Policy Development, and the U.S. Trade Representative; the National Security Council; The Central Intelligence Agency; the U.S. Information Agency (USIA); the Board for International Broadcasting; the Agency for International Development; and the National Aeronautics and Space Administration." SIG White Paper, *supra* note 7, at 1 n.1.

³⁸ Opposition of Comsat to *Petition for Rule Making*, *supra* note 34, at 15 n.35.

³⁹ *Id.* at 16.

⁴⁰ Letter from the Honorable James Baker and the Honorable Robert Mosbacher to Chairman Alfred Sikes (Nov. 27, 1991) (on file with *CommLaw Conspectus*). PanAmSat withdrew its petition in light of this letter realizing the mootness of its argument.

⁴¹ *Slippery Slope?: Intelsat's 'Monopoly' Status Being Challenged Anew*, COMM. DAILY, Jan. 25, 1993, at 2.

⁴² Letter from the United States Coordinator for Int'l Communications and Information Policy, Dept. of State, Bradley P. Holmes and Assistant Secretary for Communications and Infor-

mation, Dept. of Commerce, Gregory F. Chapados to Chairman Alfred Sikes (Jan. 8, 1993) (on file with *CommLaw Conspectus*).

⁴³ Letter from the Honorable James Baker, *supra* note 40.

⁴⁴ PanAmSat White Paper, *supra* note 15.

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Petition to Reopen Proceeding in the Corporate Structure and Operations of the Communications Satellite Corporation*, CC Docket No. 80-634 at 1 (May 12, 1992) (on file with *CommLaw Conspectus*).

⁴⁹ Comsat had filed a petition previously with the Commission requesting that it implement incentive regulations for multi-year switched voice services based on the fact that competition was abundant in this service area. That petition is cited by PAS as evidence of Comsat's "changed circumstances." *Id.* at 13.

⁵⁰ *Id.*

⁵¹ *Id.* at 15.

In its reply, Comsat asserted two propositions. First, it maintained that the so-called monopoly services were not, in actuality, monopoly services because satellite service was competing with cable—a fact it claimed was ignored by PanAmSat. Second, assuming *arguendo* that monopoly services existed, lifting of interconnection restrictions on the separate systems would make those services satisfactorily competitive.⁵² Comsat's position was that its role as a common carrier was dependent upon its role as a signatory; that the essence of its signatory role was to pursue United States' interests; and that one of the United States' primary interests was global satellite competition.⁵³ If the task of signatory was not fulfilled adequately, the United States' alternative would be to find another signatory, an action which would be counter-productive to the goal of competition and the existence of Comsat.⁵⁴ In fact, because Comsat is regulated as a common carrier, on a rate-of-return basis, the argument could be made that it is actually at a competitive disadvantage.

B. Direct Broadcast Satellite Service

DBS is a programming delivery system which is beamed directly to a user's home via high power satellites and relatively small—eighteen inches to three feet—receive stations, or dishes.⁵⁵ Prior to the development of these high power satellites, it was necessary to utilize a very large and expensive dish—ten to twelve feet—to receive transmissions, because the size of the dish related inversely to the power of the satellite.⁵⁶ The new, smaller dishes should be more acceptable to the general public since they will be both less expensive and less unsightly than their larger predecessor's.⁵⁷ In *National Assoc. of Broadcasters v. FCC*,⁵⁸ the United States Court of

Appeals for the District of Columbia Circuit vacated a portion of the underlying Commission decision, which maintained that DBS providers were not engaged in broadcasting. The court's decision was based on the fact that the Commission had departed from its content-based approach of determining whether an activity constituted broadcasting. Prior to that decision, the Commission's test was to determine whether an intent for *public* distribution and programming of interest to the *general* audience had been provided.⁵⁹ In the years since the *NAB* decision, the Commission adopted new indicia of intent. Today, the Commission focuses on the transmission and receipt techniques to determine if an activity is broadcasting.⁶⁰ Those criteria were upheld by the United States Court of Appeals in 1988.⁶¹

Unlike cable service, DBS service subscribers will have a dish compatible with all other service providers.⁶² Even DBS service providers who intend to scramble their signals and operate on a pay-per-view basis could avail themselves of all subscribers.⁶³ Dishes will be addressable⁶⁴ and, through a tiny chip in the receiver, a subscriber's decoder will unscramble the signal and thus allow transmission.⁶⁵

To date, nine companies have been granted construction permits to provide DBS service.⁶⁶ USSB, Hughes, Advanced and Echostar have been assigned specific orbital positions and channels in accordance with international treaties and agreements.⁶⁷ The remaining companies await position and channel assignment. In order to receive and retain its permit, a DBS service company must operate with due diligence in two regards: (1) the DBS permittee must begin construction or complete contracting for the construction of its satellite(s) within one year of the grant of its construction permit; and (2) the permittee must begin operation of its satellite(s) within six

⁵² *Petition to Reopen Proceeding*, *supra* note 48; Opposition of Communications Satellite Corporation, CC Docket No. 80-634, at i (July 6, 1992) (on file with *CommLaw Conspectus*).

⁵³ See generally *Opposition of Comsat*, *supra* note 52.

⁵⁴ *Id.* at 14.

⁵⁵ Michelle Browne, *Bringing It All Home With Direct Broadcast Satellites*, NETWORK WORLD, Sept. 28, 1983, at 94.

⁵⁶ *Id.*

⁵⁷ FCC, DIRECT BROADCAST SATELLITE SERVICE (authored by Mark Solberg) (1992) (on file with *CommLaw Conspectus*).

⁵⁸ *National Ass'n of Broadcasters v. FCC*, 740 F.2d 1190 (D.C. Cir. 1984).

⁵⁹ *Id.* at 1201.

⁶⁰ *National Ass'n for Better Broadcasting v. FCC*, 849 F.2d 665, 674 (D.C. Cir. 1988).

⁶¹ *Id.*

⁶² Browne, *supra* note 55, at 94.

⁶³ *Id.*

⁶⁴ The term "addressable" means access to programming is restricted to subscribers only and the DBS system identifies subscribers by their actual location addresses.

⁶⁵ Browne, *supra* note 55, at 94.

⁶⁶ The companies who have been authorized by the FCC to provide DBS are: (1) United States Satellite Broadcasting Company, Inc. ("USSB"); (2) Hughes Communications Galaxy, Inc. ("Hughes"); (3) Advanced Communications Corporation ("Advanced"); (4) Echostar Satellite Corporation ("Echostar"); (5) Continental Satellite Corporation ("Continental"); (6) Directsat Corporation ("Directsat"); (7) Direct Broadcast Satellite Corporation ("DBSC"); (8) Tempo Satellite, Inc. ("Tempo"); (9) Dominion Video Satellite, Inc. ("Dominion"). FCC, DIRECT BROADCAST SATELLITE SERVICE, *supra* note 57.

⁶⁷ *Id.*

years of the grant of its construction permit.⁶⁸ These companies anticipate operation will commence in 1994-1995.⁶⁹

The Cable Television Consumer Protection and Competition Act of 1992 ("1992 Cable Act")⁷⁰ includes a section regarding DBS. It provides that the FCC must initiate a rulemaking to impose DBS public interest standards. In addition, it mandates as a condition for initial authorization or renewal that four to seven percent of DBS channel capacity be set aside for noncommercial educational programming.⁷¹ It has been speculated that the 1992 Cable Act "will ease DBS entry into the market because program access provisions require that the FCC ensure that programming be made available to satellite operators at reasonable prices."⁷²

Not only will DBS service compete with the more traditional modes of broadcasting, but audio, video, text and electronic mail services will be available to areas where television reception is non-existent because of both the ease of installation and the relatively low cost of the small dishes.⁷³ Use of DBS service can also be translated easily into the business sector. Reports, memoranda and other important business documents could be beamed from one end of the globe to the other in minutes. To say that DBS' global impact might be profound could turn out to be an understatement.

II. MOBILE-SATELLITE SERVICE

A. A Brief Overview

Mobile-Satellite Service ("MSS") is a demand-assigned communications service which is both distance and terrain insensitive. Those factors would enable

users to communicate from virtually anywhere on the globe. Thus, users would no longer be tied to regional transmission areas. MSS can be relayed over two types of satellites orbiting in various heights and inclinations—geostationary orbiting satellites ("GEOs") and low-earth orbiting satellites ("LEOs"). GEOs are located over the equatorial plane at approximately 22,000 miles above the earth and match the earth's orbit; LEOs, on the other hand, operate in a much lower orbit and pass over many countries as the earth rotates.⁷⁴ To provide continuous coverage, LEO satellites either hand off signals as one disappears over the horizon and another appears⁷⁵ or use more sophisticated, digital inter-satellite links.⁷⁶ LEOs' attractiveness lies in its lower cost, smaller size and easier launch capability than the traditional GEO.⁷⁷ In addition, LEOs can provide radiodetermination satellite service ("RDSS")⁷⁸ which can locate a mobile unit at any spot on the globe. RDSS transmits a signal from a small transceiver in the mobile unit to the satellite and then onward to a map that identifies each transceiver and its location.⁷⁹

The Commission divided LEO providers into two types—Large LEOs and Small LEOs—and allocated separate spectrums to each.⁸⁰ Large LEOs are capable of providing voice, data and other types of communications, whereas Small LEOs are data, message and RDSS capable only.⁸¹ Originally, the Commission deemed the LEO system technically infeasible for MSS because of both the large number of satellites required and the extreme difficulty in coordinating frequency allocations world-wide.⁸² However, when several corporations applied to the Commission for permission to offer LEO MSS, the

⁶⁸ 47 C.F.R. § 100.19 (1991).

⁶⁹ FCC, DIRECT BROADCAST SATELLITE SERVICE, *supra* note 57.

⁷⁰ Cable Television Consumer Protection and Competition Act of 1992, Pub. L. No. 102-385, 106 Stat. 1460 (1992).

⁷¹ H.R. CONF. REP. NO. 862, 102d Cong., 2d Sess. (1992).

⁷² *Satellite Finance Conference*, COMM. DAILY, Nov. 2, 1992, at 3; H.R. CONF. REP., *supra* note 71, § 628.

⁷³ It is estimated that two to three million farms and ranches receive no television signals due to remoteness or obstructive mountainous terrains. Browne, *supra* note 55, at 94.

⁷⁴ *In re* Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for and to Establish Other Rules and Policies Pertaining to the Mobile Satellite Service for the Provision of Various Common Carrier Services, *Tentative Decision*, 6 FCC Rcd. 4900, para. 57, n.88 (1991), *aff'd*, 70 Rad. Reg. 2d (P&F) 271 (1992).

⁷⁵ *Id.*

⁷⁶ Jim Foley, *Iridium: Key to Worldwide Cellular Commu-*

nications, TELECOMMUNICATIONS, Oct. 1991, at 23.

⁷⁷ See generally *In re* Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1625.5 MHz and the 2483.5-2500 MHz Bands for Use by the Mobile Satellite Service, Including Non-Geostationary Satellites, *Notice of Proposed Rule Making and Tentative Decision*, 7 FCC Rcd. 6414 (1992).

⁷⁸ *Id.* para. 13.

⁷⁹ Nordwall, *Mobile Satellite Firms Expect Strong Market Growth in 1990*, AVIATION WEEK AND SPACE TECH., Dec. 19, 1988, at 89.

⁸⁰ Commission Submits Advance Publication of LEOs to IRFB, *Public Notice*, 1991 FCC LEXIS 6698 (Dec. 17, 1991). The structure for licensing of LEOs is unclear at this point. The Commission will deal with the technical issues first. Rulemaking regarding licensing formats will be addressed at a later date. *In re* Amendment of Section 2.106, *supra* note 77, para. 19.

⁸¹ *Id.*

⁸² *In re* Amendment of Parts 2, 22 and 25, *supra* note 74, at paras. 57, 58, n.91.

Commission reconsidered its position.⁸³ Consequently, at the World Administrative Radio Conference held in Spain in February 1992 ("WARC 1992"), the allocation of spectrum for MSS was one of the most crucial issues on the agenda.

B. WARC Allocation of Frequency

WARC is the World Administrative Radio Conference organized by the International Telecommunications Union ("ITU"), an arm of the United Nations.⁸⁴ When WARC met in February 1992, it was scheduled to handle many MSS issues which had not been addressed during the service-specific WARC conferences held during the 1980s.⁸⁵ A major item on the agenda was the "need to co-ordinate allocation of frequencies that could affect other services."⁸⁶ As only a limited amount of spectrum is currently available because most of it is already occupied by users, the question of coordinated allocation with members of the ITU was of primary importance.

At WARC 1992, the United States proposed the allocation of 1610-1626.5 MHz of spectrum to MSS for use by either GEOs or other non-geostationary systems like LEOs.⁸⁷ The proposal was accepted by the attendees and, in addition, the 2483.5-2500 MHz band was also allocated to MSS.⁸⁸ These lower frequencies were preferred for both financial and technical reasons:⁸⁹ (1) in order to operate compatibly with cellular services, which currently utilize low frequencies; and (2) to allow the manufacture of dual capacity mobile telephones at a reasonable price.⁹⁰ While these newly allocated bands will not be included in the international frequency allocation chart until WARC's Final Acts are signed in October 1993,⁹¹ coordination of the spectrum allocations can begin immediately.⁹²

C. FCC Allocation of Frequency

Following the decisions of WARC, the Commission proposed frequency allocations for MSS, including LEOs "which would implement decisions made at [the] 1992 World Administrative Radio Conference"⁹³ The Commission maintained that "[t]his proposed new allocation would permit the provision of services by utilizing LEOs. It is expected that LEOs would accommodate demand for mobile communications services at low cost because of the low power requirements and simplified receiver technology that can be used with the low Earth orbiting satellites."⁹⁴ The FCC established an industry advisory committee to negotiate proposed regulations for the operation of GEOs and non-geostationary systems in the 1610-1625.5 MHz and 2483.5-2500 MHz bands.⁹⁵ Given the history of MSS and the Commission's initial reluctance to consider LEO systems, it is interesting to note that five out of the six applicants to construct and launch MSS ultimately proposed LEO systems.⁹⁶

D. Motorola's IRIDIUM System

"Named for the element with 77 electrons circling its nucleus,"⁹⁷ Motorola's IRIDIUM system offers the largest and most comprehensive LEO service. IRIDIUM was initially intended to be a 77-satellite system for global mobile communications operated by an international consortium.⁹⁸ On August 8, 1992, Motorola filed a *Minor Amendment* with the Commission decreasing the number of active space vehicles from seventy-seven to sixty-six.⁹⁹

It is Motorola's plan that the IRIDIUM system be both cellular and satellite capable. The system is described by management as being "consumer driven, [with] customers using pocket-size hand-held

⁸³ *Id.* para. 19.

⁸⁴ COMM. DAILY, Nov. 29, 1989, at 6.

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ FCC, SPECTRUM ALLOCATION PROPOSED FOR LOW EARTH ORBIT SATELLITES, NO PIONEER PREFERENCE AWARDED, Rpt. No. DC-2200, Action in Docket Case 92-28 (Aug. 5, 1992) [hereinafter FCC, Rpt. No. DC-2200].

⁸⁸ *Id.*

⁸⁹ INMARSAT Plans Global Mobile Telephone Service, FINTECH MOBILE COMM., Sept. 26, 1991.

⁹⁰ *Id.*

⁹¹ Vineeta Shetty, WARC: The Compromises and the Costs, COMM. INT'L., Apr. 1992, at 33.

⁹² *Id.*

⁹³ FCC, Rpt. No. DC-2200, *supra* note 87.

⁹⁴ *Id.*

⁹⁵ *In re* Amendment of Section 2.106, *supra* note 77.

⁹⁶ *Id.*

⁹⁷ Foley, *supra* note 76, at 23.

⁹⁸ A spokesman for Loral's Globalstar system indicated that global partnerships are the only viable alternative for LEO service because of multiple billing concerns and resulting consumer confusion. *Can Everyone Survive? With WARC Allocations, Mobile Fight Has Just Begun*, COMM. DAILY, Mar. 16, 1992, at 5, 6.

⁹⁹ *In re* Application of Motorola Satellite Communications, Inc. for Authority to Construct, Launch and Operate a Low Earth Orbit Satellite System in the RDSS Uplink Band, *Minor Amendment*, File No. 9-DSSP-91; CSS-91-010, (Aug. 8, 1992) (on file with *CommLaw Conspectus*).

phones compatible with existing cellular networks. [The] Iridium system would be activated only if [the] customer couldn't reach a cellular signal."¹⁰⁰ The satellite segment would operate as a mirror image of the cellular segment. Instead of a user moving through the cells, which occurs during cellular calling, the cells—using LEO technology—would move across the user.¹⁰¹

Usage costs could be a stumbling block to IRIDIUM's commercial success.¹⁰² Other providers of the LEO mobile satellite service in competition with IRIDIUM claim that LEO services must be priced in close proximity to cellular services,¹⁰³ otherwise it would be impossible to be competitive.¹⁰⁴ Motorola has had some difficulty enticing foreign firms and post, telegraph and telecommunications administrations ("PTTs") to invest in its system.¹⁰⁵ However, a January 27, 1993 announcement stated that a meeting of eighteen of twenty-one "intended investors" had been held in Geneva. Although the names of those investors were not released, Motorola maintained that all had either signed "subscription agreements or letters of intent."¹⁰⁶

E. INMARSAT's Project 21

Commonly seen and referred to as a potential contender to Motorola's IRIDIUM is INMARSAT's Project 21. Until recently, Project 21 was a think-tank/research project set up by INMARSAT to assess the technical and commercial viability of a global mobile telephone system.¹⁰⁷ The first real details of the project were revealed at the World Space Congress in September 1992 by project engineer Ahmad Ghais.¹⁰⁸ Mr. Ghais announced that "Pro-

ject 21 will incorporate existing Inmarsat-C portable mobile data service introduced in 1991, Inmarsat-M briefcase telephone to be introduced in late 1992,¹⁰⁹ global satellite paging system to be introduced in 1994, as well as [a] new system, Inmarsat-P, scheduled for implementation in 1998."¹¹⁰ In November 1992, at INMARSAT's 44th Council Session, the Council approved a schedule for further market and technical studies relating to the Inmarsat-P and Inmarsat-M programs.¹¹¹ The Council concluded that Inmarsat-P was technically feasible and subsequently set up studies to determine which satellite systems and orbital configurations would best suit the global hand-held satellite phone system.¹¹²

Motorola is taking INMARSAT's interest in global mobile telephony very seriously. Motorola claimed that any such system provided by INMARSAT "has the potential to create barriers to entry [into business] which could stifle private competitive initiatives."¹¹³ In letters to various governmental officials,¹¹⁴ Motorola has asked that INMARSAT's entry into the global mobile telephony market be restricted.¹¹⁵ Motorola claimed that INMARSAT's position "as [an] intergovernmental organization could lead to monopoly and could further narrow the spectrum available for private MSS/RDSS systems."¹¹⁶ The spectrum reserved for such services is narrow and competitors are concerned there will be insufficient spectrum for all players.¹¹⁷

In a related development, Motorola proposed to the Commission that it allocate two-thirds of the spectrum available for MSS/RDSS to its own IRIDIUM system. The remaining one-third, was to be split among the other four LEO applicants.¹¹⁸ Ironically, given Motorola's claim of monopolistic

¹⁰⁰ *Can Everyone Survive?*, *supra* note 98, at 6.

¹⁰¹ Foley, *supra* note 76, at 23.

¹⁰² *Can Everyone Survive?*, *supra* note 98, at 6.

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Motorola's Iridium Is Set On Collision Course With INMARSAT*, FINTECH MOBILE COMM., Jan 16, 1992; *Prospective Providers Disagree*, COMM. DAILY, Sept. 15, 1992, at 3. Motorola Chairman Robert Kinzie has said, "Motorola is committed to making Iridium happen . . ." *Can Everyone Survive*, *supra* note 98, at 5.

¹⁰⁶ COMM. DAILY, Feb. 1, 1993, at 5.

¹⁰⁷ *Iridium Takes On INMARSAT Motorola Urges Govt. To Ban INMARSAT From Global Cellular*, COMM. DAILY, July 13, 1992, at 1, 2.

¹⁰⁸ *Project 21: INMARSAT May Fight For Narrow MSS Spectrum Band — or May Not*, COMM. DAILY, Sept. 4, 1992, at 1.

¹⁰⁹ These briefcase satellite telephones were not commercially available as of April 1, 1993. *Id.* at 1.

¹¹⁰ Inmarsat-P is a global hand-held satellite phone system which is an integral part of Inmarsat's Project 21 strategy. *INMARSAT To Move Ahead Rapidly With Global Hand-Held Satellite Phone System*, INMARSAT News Release, Nov. 11, 1992 (on file with *CommLaw Conspectus*).

¹¹¹ Comsat Memorandum to Participants in the Open Meeting on INMARSAT Council 44, Nov. 18, 1992, at 3 (on file with *CommLaw Conspectus*).

¹¹² *INMARSAT To Move Ahead Rapidly*, *supra* note 110.

¹¹³ *Iridium Takes On INMARSAT*, *supra* note 107, at 1.

¹¹⁴ Letters were sent to Vice President Dan Quayle, Secretary of State James Baker, Asst. Secretary of State Lawrence Eagleburger, National Security Council Head Brent Scowcroft, Commerce Secretary Barbara Franklin, Council of Economic Advisers Head Michael Boskin and others. *Id.*

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Project 21*, *supra* note 108, at 1.

¹¹⁸ TRW, Loral-Qualcomm, Ellipsat and Constellation are the four competitors to IRIDIUM. *Iridium Takes On INMAR-*

conduct by INMARSAT, those objecting to the sharing idea alleged that Motorola's proposal was itself exclusionary.¹¹⁹ One Loral official, whose Globalstar LEO system is a competitor of Motorola, stated Motorola's position was akin to saying, "We take the good stuff, and we'll find you some left over clothes somewhere."¹²⁰ Recently, however, Motorola tempered its insistence on this spectrum sharing proposal. In early February 1993, Motorola promised to use less spectrum, which would not only reduce the number of potential users of its IRIDIUM system, but would also be a first step toward a final spectrum sharing arrangement.¹²¹

III. RESULTS OF TECHNOLOGICAL EXPLOSION

Current developments in available services and emerging technologies in today's satellite world are numerous and ongoing. Only a select few have been examined here. It is equally apparent that, in most respects, the Commission is managing to keep abreast of these rapid developments. The vast number of proposed rulemaking dockets in the recent past attest to that fact. Congress is also marching to the regulatory beat, as evidenced by the recent veto override of the Cable bill. It is quite possible that with competition becoming fierce, and new satellite services emerging, legislative as well as executive players will be involved in future regulatory processes.

The United States satellite regulatory scheme, as the world has known it in the past, contended with only one player—Comsat. PanAmSat's multiple efforts to shine light on what it considers a dimly lit playing field could result in changes in the direction of satellite regulation. If PanAmSat prevails in its antitrust suit over Comsat, it stands to receive damages and publicity worth millions of dollars. Although it is difficult to predict how the court will rule on PanAmSat's complaint, given the United States' pro-competitive stance regarding its obligations within the INTELSAT consortium, it is likely that PanAmSat's arguments will fail. In any event, PanAmSat's efforts and success in lifting the separate systems ban can be viewed as a victory, or alternatively, from Comsat's and the previous Administration's perspective, as a natural result of global

competition. From either viewpoint, the fact remains that the ultimate downfall of the separate systems ban has forever altered the picture of global satellite competition. Whatever the results in each of PanAmSat's attempts to open the way for competition, it appears that PanAmSat will be a major satellite competitor in the years to come. This factor alone will contribute to the approach taken by the Commission in formulating its regulatory framework into the 1990s.

DBS services, although not presently a high-demand service, may well give television and cable companies competition in the future. Indeed, Hubbard Broadcasting Chairman Stanley Hubbard predicted that subscribers to DBS will far outnumber cable subscribers by the year 2000.¹²² The Commission has adopted a relaxed regulatory stand with regard to DBS, and will likely continue in this mode at least until the implementation dates of DBS providers arrive. At that point, other related technologies, such as HDTV, will probably have matured to the point where the Commission will step in to guide the industry.

The new satellite services arriving in the marketplace may drastically alter the framework of the communications industry as it stands today. Portable hand-held telephones invisibly connected to LEO satellites could revolutionize the inter-personal communications world. Although there may arise some problems with regard to frequency allocation and orbital positioning when new competitors attempt to enter that market, it is likely that some sort of consortium will develop to avoid these types of technical difficulties.

IV. COMPETITION AND DEREGULATION IN THE TWENTY-FIRST CENTURY

The United States is about to enter a new era in satellite communications. Given the advances in satellite communications technology currently on the brink of commercial application, it is likely that a new or at least a modified regulatory scheme will be implemented as the United States enters the next century. FCC Commissioner James Quello, in a speech at the Michigan Public Service Commission's Policy Conference, said "Advanced technology often outstrips society's ability to integrate it into our al-

SAT, *supra* note 107, at 2.

¹¹⁹ *Spectrum Leftovers? LEO Competitors Object to Motorola Spectrum Sharing Proposal*, *COMM. DAILY*, June 16, 1992, at 2, 3.

¹²⁰ *Id.* at 3.

¹²¹ *COMM. DAILY*, Feb. 12, 1993, at 9.

¹²² *Answer the Unanswerable*, *COMM. DAILY*, Oct. 23, 1992, at 2, 3.

ready complex, sometimes expensive, communications systems."¹²³ Commissioner Quello proceeded to predict that by 2002, "most services now provided by wire 'will be provided over the air and vice versa.'"¹²⁴ While delivery systems "require orderly, prioritized spectrum allocations and interference control and, thus, continued regulations,"¹²⁵ broadcasting will be "substantially deregulated" in the years to come.¹²⁶

Regulation, or deregulation, depends largely on a particular Administration's or Congress' political

agenda. While it remains to be seen how the new Administration will affect the regulatory stand the Commission will take as we enter the twenty-first century, FCC Commissioner Duggan has predicted that the Clinton Administration will leave unchanged the direction in which the Commission is heading because "a bipartisan consensus has formed around the idea of competition rather than regulation."¹²⁷

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¹²³ *The FCC in the 21st Century*, SATELLITE NEWS, April 13, 1992, at 7.

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Answer, supra* note 122, at 3.