$27 million[23]—a number consistent with the company's same-period video growth rate of 127 percent for the first two quarters of 1995 and 1996.[24] Orion also has extended its service area into Latin America by forging strategic relationships with Latin American satellite operators.[25] The company expects to launch two more satellites in 1997 and 1998 and has announced plans for Orion 4, 7, 8 and 9.[26]

Columbia Communications

Columbia is marketing 12 transponders on each of three satellites in the NASA tracking and data relay satellite system (TDRSS) to provide a full range of telecommunications services between East Asia and North and Central America (TDRS-5), as well as between North and Central America and Europe and North Africa (TDRS-4 and TDRS-6).[27] While not publicly disclosing revenue data, Columbia Communications has stated that it is focusing its business on trans-Atlantic and trans-Pacific video transmission and lists CBS, Reuters, HBO and the BBC (among others) as video customers.[28]

Intersputnik

Created by the former Soviet Union to compete with Intelsat, Intersputnik today is open to all nations and financed by its member countries according to their usage shares.[29] Although somewhat smaller and less sophisticated technically than Intelsat, Intersputnik is a well-established satellite system providing a full spectrum of telecommunications services world-

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23 Orion Network Systems, Inc., SEC Form 10-K.

24 Orion Network Systems Inc., SEC Form 10-Q (for first and second quarter 1996).

25 "Orion Sharpens Focus on New Markets, Next Satellites," *Space News*, March 11, 1996

26 Orion Network Systems Inc., FCC launch applications.

27 *1996 Satellite Industry Directory*, Phillips Business Information, Potomac, MD, pp 318-22; "New Columbia TDRS Satellite Enters Service," *TELE-satellite News*, July 3, 1996.

28 Columbia Communications Corporation, Presentation, ISOG '95 Conference, Hong Kong, November 7, 1995.

29 Similar to Intelsat, Intersputnik is an international, intergovernmental organization owned by its members (mostly former Soviet-bloc countries). For a description of governance and ownership structure, see *Intersputnik User Handbook*, Moscow, 1995.

wide. Using space-segment capacity on a large number of Gorizont and Express satellites in at least 11 orbital positions operated by Russia's Ministry for Postal Services and Telecommunications, Intersputnik today serves users in 70 different countries.[30] In 1995, fourteen U.S. telecommunications providers have received blanket authority from the FCC to provide video, private line, and switched voice services to and from the U.S. on five of these Russian satellites.[31] At least seven additional Express satellites are scheduled for launch.[32] Intersputnik has registered 15 new orbital positions with the ITU of which seven are suitable for transoceanic services to and from the U.S.[33]

Regional and Domestic Systems

Several regional and domestic satellite systems also provide (or are capable of providing) transoceanic video transmission service to and from the U.S.[34] For example, Hispasat

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[30] Intersputnik also is able to utilize space segment on Russian Gals and Raduga satellites. (*Intersputnik User Handbook*, Moscow, 1995; *1996 Satellite Industry Directory*, Phillips Business Information, Potomac, MD, pp. 129-139, 242, 366-370). The *1996 Satellite Industry Directory* lists a total of 15 Gorizont, 13 Raduga, 2 Gals, and 2 Express satellites. Gorizont and Raduga satellites are sometimes referred to as Statsionar (for C-Band applications) and Loutch (for Ku-band applications).

[31] *FCC*, File No. I-T-C-92-164, July 5, 1995.

[32] *1996 Satellite Industry Directory*, Phillips Business Information, Potomac, MD, pp. 241, 366.

[33] *Intersputnik User Handbook*, Moscow, 1995.

[34] Regional/domestic satellite systems in Asia, Europe and the Middle East, and the Americas already dominate regional video markets and are expanding both capacity and coverage area at a rapid pace. Excluding satellite systems with global coverage, it is estimated that today, Asia and the Pacific are served by 40 domestic/regional satellites; almost 50 domestic/regional satellites currently provide service to the Americas and the Caribbean; and more than 40 domestic/regional satellites are in orbit above Europe and the Middle East. (Pfeifenberger and Houthakker, "Does Intelsat Face Effective Competition," presented on April 26, 1996, at Intelsat Restructure and Satellite Competition Conference, Columbia University; finalized article: July 1996). To serve the Asia-Pacific region, for example, 17 new satellites are forecast for 1996 ("Analysts Predict Temporary Satellite Surplus for Asia," *Space News*, May 29, 1995) and a total of 62 new satellites are planned for the region through the year 2000 ("Satellite Players Look Over Next Horizon," *Communications Week International*, October 23, 1995, p. 49).

Many of these regional satellite systems offer services that Intelsat would be able to provide as well. If Intelsat performed these services, the uplink of U.S. programing edited for regional markets would likely also involve Comsat. As a result, even though Comsat does not compete *directly* with regional systems that do not cover parts of the U.S., Comsat *indirectly* competes with these systems because, as Intelsat Signatory, it would provide the uplink space segment for regionalized U.S. programing to

(continued...)

transmits Spanish TV programing across the Atlantic to the U.S. (and the rest of North and South America);[35] JCSAT covers Hawaii and reports to have provided trans-Pacific video service between the U.S. and Japan;[36] French Telecom satellites cover eastern Canada and the northeastern U.S.; the Argentine and Mexican satellite systems can provide service between Latin America and large parts of the U.S.; and coverage of Canadian satellites includes most of North America. Furthermore, U.S. domestic satellites operators, including major companies such as Hughes, AT&T, and GE Americom, have now been authorized by the FCC to expand their satellite video services internationally.[37] For example, Hughes -- the world's largest private satellite system that (even before the acquisition of PanAmSat) directly owns 10 Galaxy/SBS satellites and partially owns, leases, or operates 10 others[38] -- is already aggressively expanding its video services abroad. Earlier this year, the company launched its Galaxy IIIR satellite from which it now provides direct broadcast services to all of Latin America with programing largely uplinked from the U.S.[39]

Fiber Optic Cables

Within North America, fiber optic cables already carry a significant portion of video transmission services.[40] In fact, for some U.S. broadcasting networks, such as Fox Communications, fiber has already become the medium of choice for point-to-point video transmission.[41] Fiber video service is now available also on transoceanic routes. Since the

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34 (...continued)
Intelsat satellites. If Intelsat loses in the competition for regional video markets, Comsat loses its chance to provide the uplink space segment of regional programing directly contributed from the U.S.

35 Hispasat, "Canales de TV y radio para América," May 1996.

36 JCSAT presentation, Hong Kong, ISOG 1995 (Autumn).

37 "Industry Generally Endorses FCC's Decision Eliminating Satellite Regulatory Distinctions," *Telecommunications Reports*, January 29, 1996, pp. 20-21.

38 Hughes Press Release, July 29, 1996; "What We Do: Owned and Operated Fleet," Hughes Webpage.

39 William H. Boyer, "Across the Americas, 1996 is the Year When DBS Consumers Benefit From More Choices," *Satellite Communications*, April 1996, pp. 23-26.

40 "Satellite or Fiber? The Distinctions Blur," *Satellite Communications*, June 1992, pp. 26-29.

41 "Coping with C-band Shortage," *Satellite Communications*, July 1995, pp. 26-28. For example, all of
(continued...)

1994 Study, Vyvx (a pioneer in fiber video transmission with an extensive U.S. network) has introduced occasional-use video transmission between the fiber video networks in North America (U.S. and Canada) and the U.K. through its "AtlanticVision" fiber optic service. [42] The company is planning to introduce occasional-use fiber video service from North America to Japan and continental Europe, and is also exploring full-time transoceanic fiber video service with detailed fiber-to-fiber restoration plans.[43] More recently, AT&T has started to offer international 45-Mbps private line service that provides sufficient transmission capacity to carry up to three broadcast-quality video transmissions.[44]

Given the significant excess capacity on transoceanic fiber optic systems, offering video services would seem a logical next step. Entry of fiber video is facilitated by demand for point-to-point video service. Obvious examples for point-to-point service are applications such as "backhaul" of news and sports events. International distribution of video programming is also likely to be point-to-point for its transoceanic leg because overseas programming typically involves local editing (e.g., commercials) at regional "hubs," before further distribution to cable TV networks and end users via regional satellites.[45] Global news gathering networks utilizing similar "hub and spoke" systems also may be able to utilize fiber

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41 (...continued)
NBC's editing for the 1996 Summer Olympic Games was performed in New York via fiber optic links to Atlanta ("Power Up and Let the Games Begin," *The New York Times*, July 8, 1996, p. D5.)

42 "AtlanticVision: Transatlantic Fiber Video Services," Brochure, Vyvx, Tulsa, Oklahoma, 1995.

43 Conversation with Anu Krishanswamy, Vyvx; "NAB Notebook," *Communications Daily*, April 18, 1996.

44 "Industry News," *Telecommunications Reports*, April 1, 1996, p. 50; see also "Digital Video: Live from anywhere," *Satellite Communications*, July 1996, pp. 31-33.

45 See Michael A. Einhorn, *INTELSAT: A Reform Proposal*, Economic Analysis Group Discussion Paper, Antitrust Division, U.S. Department of Justice, July 6, 1996, pp. 4-5. It is estimated that distribution of programing through regional satellites accounts for 90 percent of a major broadcaster's total spending on satellite services, leaving only 10 percent for transoceanic satellite services.

There are a number of examples of transoceanic point-to-point transmission with later distribution through regional/domestic satellites: CNN links Intelsat transoceanic transmission with Thor, Astra 1B, and Arabsat 1C for distribution in Europe and the Middle East, and PAS-2 with Superbird B, Apstar 1, and Palapa B2P for distribution in Asia; ESPN links PAS-1 transoceanic transmission with Anik and Brazilsat for distribution in Argentina and Brazil; and the Discovery Channel links PAS-1 transmissions with Morelos 2 and Solidaridad 1 for distribution in Mexico. ("World-wide Programming: U.S. Cable Networks Go Global via Satellite," *Via Satellite*, September 1995, pp. 47-52).

video services to connect hubs fed by regional satellites. With the cost of transoceanic fiber optic cable service below the costs of point-to-point satellite service,[46] and new cable systems being built despite low overall utilization, the use of fiber for transoceanic video service is likely to continue to expand.

New Satellites

As discussed in the 1994 Study, the impending entry of new facilities is a significant competitive force in the transoceanic satellite communications market. Because a sizeable portion of a satellite's capacity typically is leased even before launch, companies attempting to presubscribe capacity on their new satellites exert considerable competitive pressure years before the facilities are launched. As discussed in more detail below, current market shares fail to reflect the full degree of competition that exists in the provision of transoceanic satellite services.

Given the high rate of new launches (and the fact that telecommunications satellite technology and launch services are widely available today), effective entry barriers do not appear to exist.[47] As the large number of launches shows, individual satellite capacity has become relatively small compared to telecommunications traffic growth expectations. Operators of satellite systems have been able to find financing for their projects and, increasingly, ambitious new satellite projects are backed by large companies with substantial financial resources. More than 60 telecommunications satellites are already scheduled for launch in 1996 and 1997 world-wide.[48] Arianespace, which deployed 13 satellites in 1995 and has scheduled 17 launches for 1996, plans to order extra rockets so it can launch 65 to

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[46] 1994 Study, pp. 95-97.

[47] Although the coordination of orbital slots has become more difficult, experience to date shows that new entrants have managed to find geostationary orbits from which to provide the service they desire. New technologies (digital compression, higher-capacity satellites, increased frequency reuse), co-location of several satellites, and the reduction of the minimum spacing between orbital slots, all serve to further mitigate scarcity concerns. Industry analysts also appear to concur that the problem is not a scarcity of slots as much as outdated international coordination procedures. It has been suggested that better coordination would allow more than double the number of all transponders now in orbit. ("Satellite Panel Decries Auctions, Praises Digital, Questions ITU's Capabilities," *Communications Daily*, April 18, 1996).

[48] Launch manifests for Ariane, Atlas, Delta, Long March, and Proton.

70 satellites during 1997 and 1998.[49] As noted above, existing transoceanic competitors (such as PanAmSat, Orion, and Intersputnik) are adding a large number of new satellites over the next two to three years. Between 1996 and the year 2000 at least 155 geostationary satellites are projected to be launched world-wide.[50]

In addition, several new players in the transoceanic telecommunications market—major U.S. companies—have proposed to build and launch within the next several years new Ka-band satellite systems, most of which will provide video services with full global coverage:[51]

- AT&T has applied for authorization to launch twelve geo-stationary satellites providing services "ranging from basic telephone connectivity to advanced multimedia offerings both domestically and globally."[52]
- Lockheed Martin has applied for authorization to launch its nine-satellite Astrolink system to deliver international video, voice, and data telecommunications services.[53]
- GE applied for its global nine-satellite GE-Star system for video, high-speed data, and other broadband applications.[54]
- Hughes is already marketing its global Galaxy/Spaceway system that, with launches of an additional 20 satellites starting in 1998, will also provide a full range of world-wide switched voice, private line, and video services.[55]

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[49] "Arianespace Gears Up for Increased Launch Demand," *Telecommunications Reports*, January 8, 1996, p. 22.

[50] "The Satellite Industry Convenes," *Via Satellite*, April 1996, p. 54.

[51] "Star Wars: In New Space Race, Companies are Seeking Dollars From Heaven," *Wall Street Journal*, October 10, 1995, p. A1.

[52] *AT&T Application*, FCC, September 29, 1995.

[53] "Lockheed Martin, AT&T Plan Satellite Services," *The Washington Post*, October 5, 1995, page B13. *Astrolink Communications Satellite Application*, FCC, September 27, 1995.

[54] *Application of GE American Communications, Inc.*, FCC, September 29, 1995.

[55] *Application of Hughes Communications Galaxy, Inc.*, FCC, September 29, 1995. "Spaceway: A Revolution in Communications," Brochure. Hughes has already ordered 10 launches from Sea Launch Co., an international partnership led by Boeing and RSC-Energia of Russia (*Telecommunications Reports*, December 25, 1995, p. 42). Recall that Hughes, even before its recent decision to acquire PanAmSat, was describing itself as the world's largest private satellite company. It directly owns 10 Galaxy/SBS satellites and partially owns, leases or operates 10 others.

- And, most recently, Motorola applied for authorization to build its M-Star system, a constellation of 72 interconnected non-geostationary satellites, providing broadband fixed-satellite space segment capacity on a wholesale, non-common carrier basis.[56]

Considering the financial and technological capabilities of the parties backing these proposals, the threat of entry from these systems is very real. Several of these systems will combine transoceanic capabilities with the benefits of full regional coverage.[57] For example, Galaxy/Spaceway, Astrolink, GE*Star, VoiceSpan, and Orion, will link satellites in "regional" orbital slots over the Americas, Europe, and Asia, through transoceanic satellite-to-satellite beams.

Table 1 lists selected satellites capable of providing service to and from the U.S. that were announced since the 1994 Study. These new satellites (not anticipated in our previous Study) are grouped by orbital locations in three regions: the Atlantic Ocean Region (AOR), the Americas,[58] and the Pacific Ocean Region (POR). In addition to regional coverage in the Americas, Europe, and Africa, satellites in the AOR can generally provide trans-Atlantic service and service in and between North America and the Caribbean and Latin America. New satellites located over the Americas generally offer regional coverage and service between North America, the Caribbean, and Latin America, but cannot reach across the Atlantic or Pacific oceans. And POR satellites generally provide regional service in Asia and Oceania with coverage across the Pacific to Hawaii and western North America. Planned satellites with orbital positions that do not allow U.S. coverage, such as satellites in positions above the Indian Ocean Region (IOR), are not included in this table. Those new satellites may, however, be accessible from the U.S. through inter-satellite or cable links.

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[56] "Motorola Unit Proposes Broadband Satellite System," *Telecommunications Reports*, September 9, 1996, pp. 34-35. In contrast to Motorola's Iridium system, M-Star is targeting the fixed-satellite service market. The system is proposed to handle data rates in excess of 50 Mbps, sufficient to carry at least three digitally compressed broadcast video signals. Launches would begin approximately two years after FCC authorization.

[57] Single satellites that are capable of providing services between regions (such as between the Americas and Europe, the Middle East, and Africa) generally cannot provide full coverage of each region to which they provide service.

[58] The table does not include any planned satellites of currently existing U.S., Mexican, Argentine, and Canadian systems with regional coverage to and from the U.S.

Table 1 Selected Global/Multi-Regional Satellites with U.S. Coverage (Announced since 1994 Study)[59]	
AOR	PAS-5, PAS-6 at 43W (early 1997)[60] PAS-9, PAS-10 at 58W (1997, 1998); PAS-11 at 79W (1999) Orion F2 at 47W (1997), Orion F3 at 12W (1998) Galaxy/Spaceway (1998+) from orbital locations[61] 67W, 49W, and through inter-satellite links VoiceSpan (2000+) from orbital locations 54W, 359E, and through inter-satellite links Morning Star (1998+) from orbital location 69.5W Astrolink (2000+) from orbital location 29W and through inter-satellite links GE*Star (2000+) from orbital location 82W and through inter-satellite links Intersputnik from new orbital locations 3W, 6W, 23W, 32.5W, 83W M-Star (1999+)—Motorola's fixed-service 72-satellite LEO system
Americas	Orion F4 at 127W (1999), Orion F7 at 93W (1999), Orion F9 at 83W (2000) Galaxy/Spaceway (1998+) from orbital locations 99W, 101W VoiceSpan (2000+) from 103W, 93W, 54W and through inter-satellite links Cyberspace (2000+) 110W Astrolink (2000+) 96W GE*Star (2000+) 106W Intersputnik from new orbital location 97W M-Star (2000+)—Motorola's fixed-service 72-satellite LEO system
POR	PAS-8 at 166E (early 1998) Galaxy/Spaceway (1998+) from 125E, 149E, 164E, 173E, and through inter-satellite links VoiceSpan (2000+) and through inter-satellite links Morning Star (1998+) from orbital location 148W Astrolink (2000+) from orbital location 168E and through inter-satellite links GE*Star (2000+) through inter-satellite links Intersputnik from new orbital location 153.5E M-Star (2000+)—Motorola's fixed-service 72-satellite LEO system

Given the abundance of proposed entry in the transoceanic satellite market, the rapid increase in competition that Comsat has experienced in the last few years is certain to continue.

[59] None of the listed satellites was reflected in the 1994 Study. Note, however, that a few projects that were anticipated in the 1994 Study (such as TRW and Globostar) have not yet materialized.

[60] Again, note that PanAmSat's commercial satellite identification differs from the numbering system used in the company's FCC applications.

[61] The comment "from orbital location(s)" applies to systems that will co-locate more than one satellite per designated orbital location.

III. ANALYSIS OF COMSAT MARKET SHARES

This section details the results of the current analysis of market size and Comsat market share for total transoceanic video services (including audio service and occasional-use and short-term video service) to and from the U.S. for three geographic market segments: trans-Atlantic, to Latin America (including the Caribbean), and trans-Pacific. Appendix A provides a more detailed discussion of measurement of market size, definition of market segments, and data used in this analysis. Market conditions for occasional-use and short-term video services, in particular, are discussed in Section V of this study.

Competition in the market for transoceanic video services has experienced dramatic changes in the last few years. As a result, Comsat's shares of transoceanic video services to and from the U.S. have declined rapidly.

Market Size and Growth of Transoceanic Video Services

The 1994 Study showed that the erosion of Comsat's market shares, which started in the late 1980s, was expected to accelerate rapidly in 1994. Still, despite the overall loss in market share, we estimated that Comsat would be able to capture approximately half of the projected growth in video services to and from the U.S.[62] If borne out, this projection would have increased Comsat's revenues from full-time video transponder leases from $28.8 million in 1993, to $43.8 million in 1995 and $50.8 million in 1996. However, facts now show the 1994 projections to be too optimistic. In actuality, Comsat's revenues from full-time video services reached only $39.1 million in 1995 and are expected to be below $36 million for 1996.[63]

In contrast to Comsat's video services, overall demand for transoceanic video services to and from the U.S.—as measured in utilized transponder capacity—has grown 20 percent a year since 1993. **Figure 2** illustrates that, over the last three years, utilized capacity for video services to and from the U.S. has increased more than 50 percent on trans-Atlantic routes

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[62] 1994 Study, pp. 66-78.

[63] See Appendix, Table COM-1.

(from 53 to 80 transponders); has almost tripled to Latin America (from 19 to 50 transponders); and has expanded by 50 percent (from 22 to 33 transponders) across the Pacific. Due to digital compression, the effective capacity made available for transoceanic video service has increased even faster.

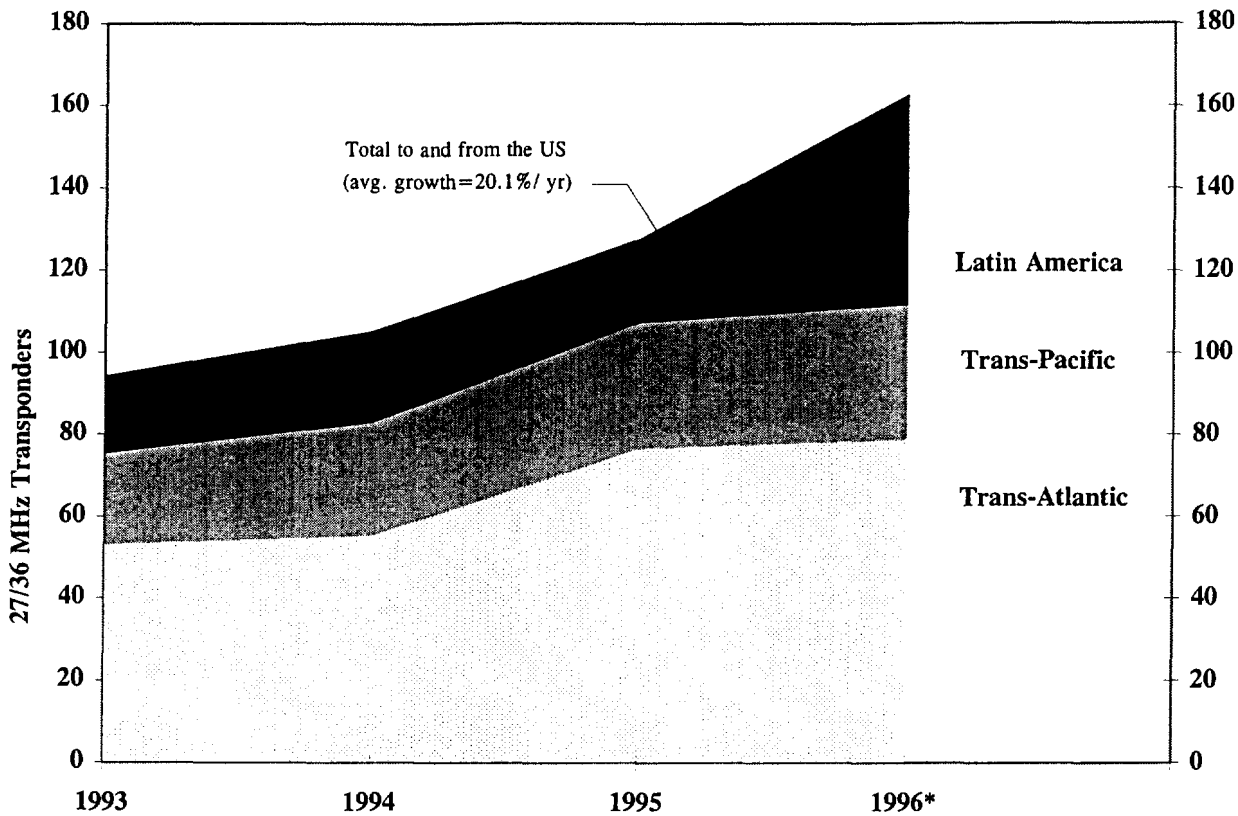
Yet, while the market for video transponder leases for service to and from the U.S. has grown substantially in recent years, Comsat has been unable to participate in the rapid growth. **Figure 3** clearly illustrates that over the last three years, competing satellite systems were able to capture all of the market growth while Comsat has been unable to retain even its 1993 volume of video transponder leases.

Comsat Shares of Transoceanic Video Services

Comsat's inability to capitalize on the growth in the video market over the last few years directly translates into lost market shares. **Figure 4** shows that Comsat's overall share of satellite transponders utilized for transoceanic video services to and from the U.S. has declined from approximately 80 percent in 1993 (the last year of actual data in the 1994 Report) to a 1996 overall level of less than 45 percent. Moreover, this market share is overstated because the underlying analysis does not quantify transoceanic video service on a number of competing facilities,[64] nor attempt to account for competition in the presubscription of satellite services.

[64] Video service to and from the U.S. was not quantified for U.S. domestic, Canadian, Argentine, and Mexican, domestic satellite systems, Japanese and French satellites with transoceanic capability, and transoceanic fiber optic cables.

Figure 2
Total Utilized Capacity for Transoceanic Video and Audio Services
(27/36 MHz-equivalent transponders to and from the U.S.)



Notes:

*1996 Estimate based on extrapolation of partial-year data.

Includes full-time equivalent transponder utilization for short-term and occasional-use video service.

Includes PanAmSat, Orion, Columbia, Intersputnik, Galaxy L.A., and Hispasat.

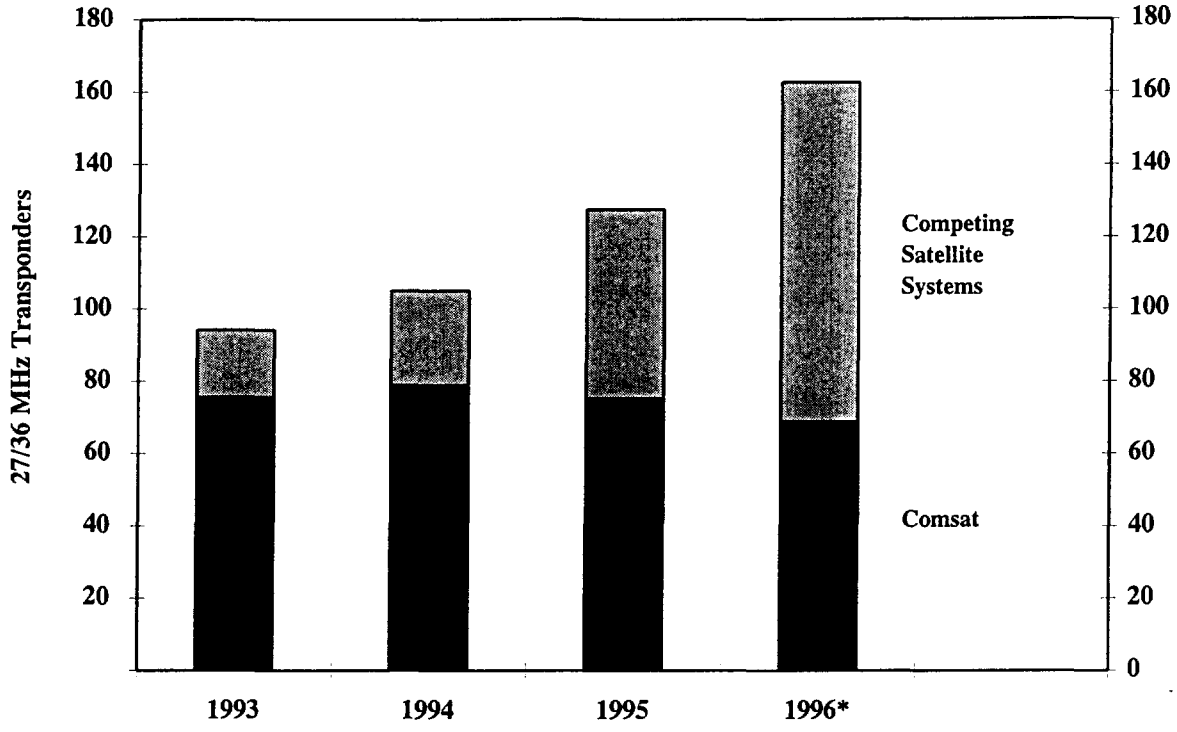
Does not include transborder service of U.S. domestic, Mexican, Argentine, and Canadian satellite systems.

Does not include other regional satellite systems with transoceanic coverage (France Telecom, JCSAT).

Does not include fiber video service to Canada and the U.K.

Source: Appendix, Table SUM-1.

Figure 3
Utilized Capacity for Transoceanic Video and Audio Services: Comsat and Competing Satellite Systems
(27/36 MHz-equivalent transponders to and from the U.S.)



Notes:

*1996 Estimate based on extrapolation of partial-year data.

Includes full-time equivalent transponder utilization for short-term and occasional-use video service.

Includes PanAmSat, Orion, Columbia, Intersputnik, Galaxy L.A., and Hispasat.

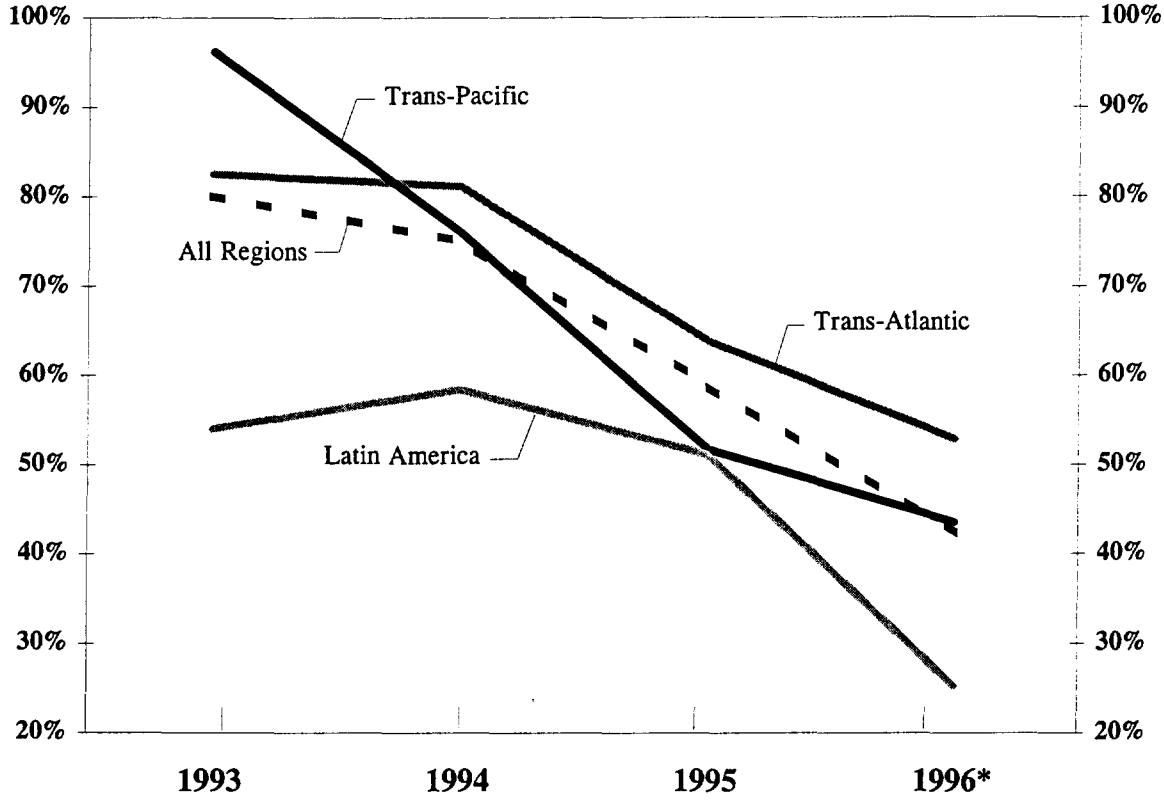
Does not include transborder service of U.S. domestic, Mexican, Argentine, and Canadian satellite systems.

Does not include other regional satellite systems with transoceanic coverage (France Telecom, JCSAT).

Does not include fiber video service to Canada and the U.K.

Source: Appendix, Table SUM-1.

Figure 4
Comsat Market Shares in Utilized Capacity for Transoceanic Video and Audio Services
(Based on 27/36 MHz-equivalent transponders to and from the U.S.)



Notes:

*1996 Estimate based on extrapolation of partial-year data.

Includes full-time equivalent transponder utilization for short-term and occasional-use video service.

Includes PanAmSat, Orion, Columbia, Intersputnik, Galaxy L.A., and Hispasat.

Does not include transborder service of U.S. domestic, Mexican, Argentine, and Canadian satellite systems.

Does not include other regional satellite systems with transoceanic coverage (France Telecom, JCSAT).

Does not include fiber video service to Canada and the U.K.

Source: Appendix, Table SUM-2.

Comsat 1996 market shares for individual geographic routes to and from the U.S. vary from a low of 25 percent to the Caribbean and Latin America, to 53 percent for trans-Atlantic video service and 44 percent on trans-Pacific routes. While the level of market shares still varies between geographic routes, the trend has been the same: *Comsat has lost significant market share in each region over the last few years.* In none of the geographic regions has Comsat been able to benefit in any meaningful way from the growth of video markets.

This inability to participate in growth and the rapid decline in market share appear to be unprecedented in the telecommunications industry. For example, the FCC recently reported that it took 12 years for AT&T's market share of interstate switched access (*i.e.*, switched voice service) to decline from somewhat more than 80 percent (in 1984) to approximately 55 percent (today).[65] Furthermore, and in stark contrast to Comsat, AT&T's market *volume* has doubled during this time period despite the decline in the company's market share.

IV. OTHER PRO-COMPETITIVE SUPPLY AND DEMAND CHARACTERISTICS

The fact that Comsat has lost significant market share in transoceanic video services indicates that substantial competition exists in this market. Separate satellite systems have expanded their coverage areas, and new competitors have appeared as a result both of regulatory reform and new entry. Given the unique supply and demand characteristics, current market shares clearly understate the extent to which competition has evolved in this market. Market characteristics include:

- Rapid entry of new facilities (see Section II) has become a significant competitive force in the market for transoceanic satellite services;
- Providers of transmission capacity compete in the presubscription market long before the actual facility goes into service and its existence can be reflected in market shares;
- Significant capacity remains unutilized on new satellites;
- Comsat has introduced new, lower-cost service options to its video customers;

[65] *Long Distance Market Shares—First Quarter 1996*, Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, July 1996, Figures 1 and 2.

- The convergence of once distinct types of services and geographic markets creates additional choices for customers;
- The absence of geographic rate differentiation (as the Commission has recognized in its Partial Relief Order) extends the price pressures from highly competitive routes to routes with lesser competition;
- Comsat is burdened with substantial competitive handicaps that originate in Intelsat's structure as an inter-governmental cooperative and the fact that Comsat's regulatory burden exceeds that of its competitors; and
- Customers typically are large, sophisticated corporations with significant financial resources and bargaining power.

Presubscription Practices

Today's market shares of utilized capacity on existing facilities are mostly yesterday's news. The fact that a sizeable amount of capacity on planned facilities usually is presubscribed will not be reflected in actual market share data until these facilities become operational. As a result, observed market shares will significantly understate the actual level of competition. Some capacity usually is presubscribed on a long-term basis years before a facility becomes available. Earlier this year, for example, PanAmSat had already negotiated $3.2 billion in future global telecommunications services.[66] In fact, given the lead times and financial commitments required for the construction of new satellite systems, proposed facilities may not be built until a portion of their planned capacity is presubscribed under long-term contracts.[67] As a result, new or existing providers of international telecommunications facilities attempting to presubscribe capacity exert considerable competitive pressure long before the facilities become operational and their existence and utilization can be reflected in market shares.

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[66] "A Widow's Pique," *The New York Times*, June 16, 1996, Section 3, p. 15. See also Donaldson, Lufkin & Jenrette Securities Corporation, "PanAmSat Corporation: Coverage Initiated with Outperform Rating," November 6, 1995; and "Star Wars: In New Space Race Companies are Seeking Dollars From Heaven," *Wall Street Journal*, October 10, 1994, p. A8.

[67] PanAmSat expects that *half* of its available future satellite capacity will be subscribed on a pre-launch basis and approximately 80 percent of its capacity sold under long-term contracts—many for the useful life of the satellites (SEC Form S-1, filed May 25, 1993, p. A-4).

Unutilized Capacity

Despite presubscription, significant satellite capacity remains unutilized on new facilities. For example, PanAmSat expects that 50 percent of each satellite's capacity is still unsubscribed when it is launched. Similarly, one year after the launch of Orion 1, full-time contracts filled only 40 percent of the satellite's capacity (and occasional-use contracts have accounted for another 10 percent). Because new satellites are launched as existing satellites become more fully subscribed, significant unutilized capacity on the new facilities remains available to compete with Comsat.[68] Moreover, even as satellites become more fully subscribed over the years, part of their capacity will continue to compete in the short-term and occasional-use market. For example, PanAmSat expects that approximately 20 percent of its satellites' capacity would compete in the short-term market at all times. Furthermore, the trend to digital compression of broadcast signals increases the effective amount of unutilized capacity of competing satellite systems.

Figure 5 shows unutilized capacity for PanAmSat, Orion, and Columbia's AOR and POR satellites relative to total capacity utilized for Comsat video services.[69] The figure shows that due to the launch of only partly presubscribed satellites, total unutilized capacity has grown considerably since 1993. Unutilized capacity available on the AOR and POR satellites of these systems could now accommodate all of Comsat's video transponder leases. Significantly, this holds true for each ocean region individually.[70] The sheer size of unutilized capacity relative to Comsat's full-time-equivalent video transponder leases illustrates the significant increase in supply elasticity since the 1994 Study and the high level of effective competition that Comsat now faces in this market segment.

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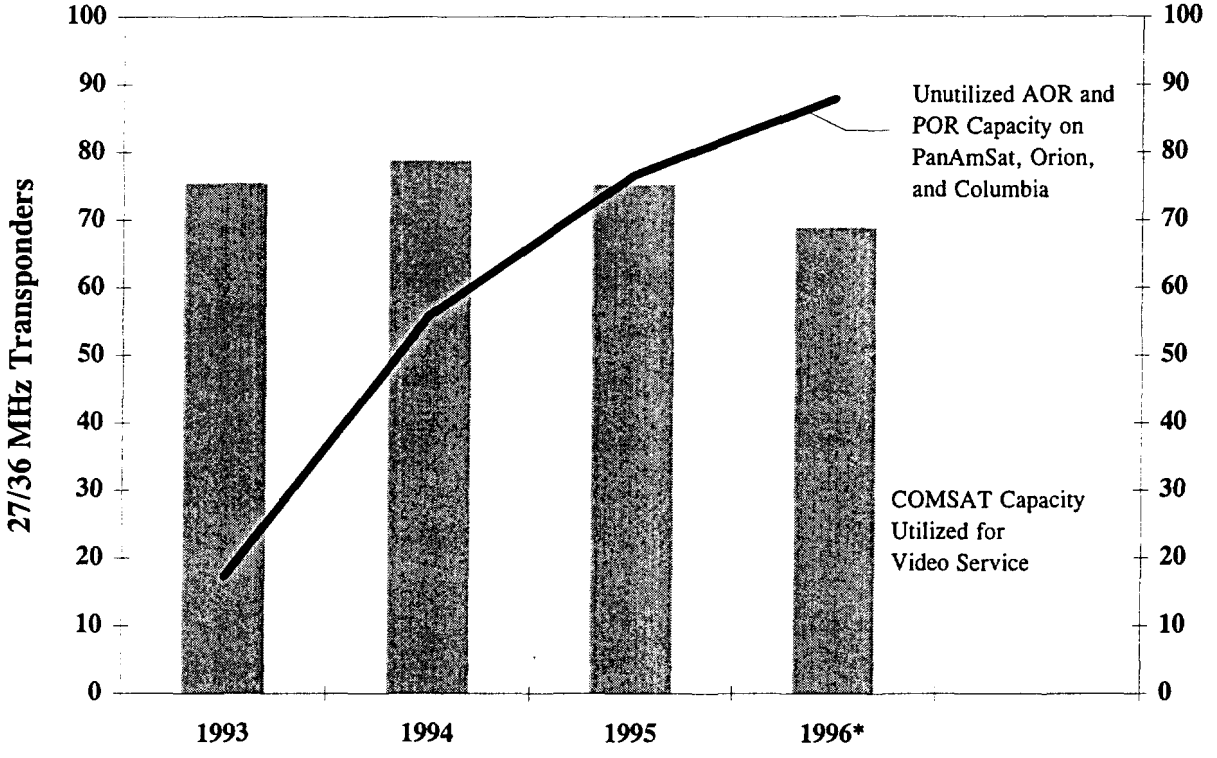
[68] Recall that, for example, PanAmSat and Orion have scheduled six new satellites to be launched through 1998.

[69] Note that the 1994 Study did not report unutilized capacity on competing satellite systems.

[70] See Appendix, Table UNUT-1.

Figure 5
Unutilized AOR and POR Capacity on Selected Satellite Systems vs. Comsat Capacity Utilized for Video Services



Notes:

*1996 Estimate based on extrapolation of partial-year data.

Utilized Comsat capacity includes full-time equivalent transponder leases for occasional-use and short-term video services.

Source: Appendix, UNUT-1.

Convergence of Market Segments

New technologies and the elimination of regulatory barriers have resulted in increasing degrees of overlap in what were once distinct markets and new service choices for customers. This phenomenon is referred to as "convergence," and it is becoming an important aspect of competition in the transoceanic telecommunications market that makes many traditional market definitions obsolete. Geographic convergence in the satellite market includes global systems offering domestic and regional services, domestic satellite services expanding regionally, and regional systems expanding coverage areas while also providing domestic services. As noted in Section II of this report, a number of regional systems can already provide trans-oceanic service. Convergence in many cases is the result of the relaxation of regulations that had created market distinctions where there were no technological constraints. For example, the FCC has authorized U.S. domestic satellite systems to offer international service and, more recently, decided to eliminate regulations that prevented U.S. separate systems from offering U.S. domestic service.[71] The flexibility of many satellites in terms of coverage area provides ample opportunity for geographic convergence to continue.[72] As regional and trans-oceanic fiber optic systems become increasingly interconnected, geographic distinctions will blur further.

Significantly, geographic distinctions blur as more customers use satellites to distribute video programing on a world-wide basis. For customers that require global distribution, video transmission from the U.S. across the Pacific becomes a substitute for trans-Atlantic transmission (and *vice versa*). For example, some Japanese broadcasters (Fuji TV, NHK) use PanAmSat to transmit their signals first to Europe and then across the Atlantic to the U.S.

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[71] "Industry Generally Endorses FCC's Decision Eliminating Satellite Regulatory Distinctions," *Telecommunications Reports*, January 29, 1996, pp. 20-21.

[72] For example, Hughes Communications applied for authorization to lease transponders on a domestic Brazilian satellite to provide U.S. domestic service. ("Citing Domsat Capacity Shortage, PanAmSat Opposes Hughes Plan," *Telecommunications Report International*, November 11, 1994; "PanAmSat, Hughes Differ on Length of Brazilsat Authority," *Telecommunications Report*, December 4, 1995.) A domestic Canadian Anik satellite recently has been transferred to an orbital position to provide service to Arab League countries in the Middle East and North Africa ("Hughes Loses ArabSat Contract to France's Aerospatiale," *Satellite Week*, April 19, 1993); and two Canadian Anik satellites have been moved to provide domestic services in Argentina (*1995 Satellite Almanac*, p. 226).

rather than directly across the Pacific.[73] Similarly, Viacom avoids trans-Atlantic transmission to Africa by using PAS-4 (IOR) to transmit its signals from Asia to Africa.[74]

Just as geographic markets are converging, so too are service markets. But again, technological progress (such as digitalization) and liberalization of regulatory constraints are eliminating critical differences. For example, television and traditional telecommunications are converging as U.S. telecom carriers and cable TV operators are investing heavily to combine voice, data and video services for end-users domestically and internationally.[75] Furthermore, the distinction between data and video transmission will continue to fade as the use of digital video technology expands. Digital video in combination with hub and spoke systems for video distribution will also reduce the advantage global satellite systems may have over the combination of fiber optic transmission (into a hub) and regional satellite transmission (to the spokes). For large users of video service with global satellite networks, such as major news gathering organizations, the ability to create a global distribution network with a combination of overlapping regional/domestic systems offers a realistic substitute for some transoceanic routes.

Clearly, the convergence of services and geographic markets creates additional choices for customers that were not available in the past.

Comsat Rate Trends and Service Options

Despite the fact that the cost of satellite capacity has been fairly stable,[76] the 1994 Study showed that in response to increasing competition, Comsat had decreased rates and introduced a number of new, lower-priced service options to its customers.[77] In the last two years, Comsat has reduced its short-term Ku-band video rates, introduced lower-priced bulk

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[73] DaiLink SatCom, Ltd., *Transponder Loading Database*, Vienna, VA, April 30, 1996; DaiLink SatCom, Ltd, *Transponder Loading Database—PanAmSat* Update, Vienna, VA, September 11, 1996.

[74] *Id.*

[75] See "U.S. Telco Grabs Lead in Global TV but Partnership Pose Question," *TV International*, March 11, pp. 10-11.

[76] 1994 Study, p. 100 and Exhibit HSH-10.1.

[77] 1994 Study, pp. 100-102 and Exhibits HSH-8, HSH-9.

contracts for occasional-use video services, and started to offer lower-cost service options for digital video transmissions.[78] Furthermore, to the extent that new satellites offer higher signal strength, customers receive more value from their video space segment leases because higher signal strength allows either for a reduction of earth station size or an increase of information throughput.

Geographic Rate Averaging

As the Commission recognized in the Partial Relief Order, the absence of geographic rate differentiation for Comsat services extends the competitive pressure in some geographic markets (e.g., from the U.S. to Latin America, Europe, and Asia) to the regions which temporarily may still have fewer competitive alternatives (e.g. Africa), "since a given [customer] will pay no more for 'thin route' service than for service in highly competitive markets."[79] In other words, because a particular rate for a particular Comsat service currently applies to all routes, the price pressure on highly competitive telecommunications routes benefits routes with lesser competition.

It needs to be pointed out, however, that even "thin" routes, such as from the U.S. to Africa, are now served by several alternative providers in addition to Comsat. Both PanAmSat and Intersputnik offer global coverage and, for example, most satellite systems with trans-Atlantic coverage also provide partial coverage of Africa (e.g., Orion, Columbia, France Telecom). PanAmSat already provides high-powered satellite coverage of all of Africa, the Indian Ocean Region and Asia through its PAS-3R, PAS-4, and PAS-2 satellites.[80]

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[78] Note, however, that restructuring of rates may have increased some rate components and new, higher-value services have been introduced. Average revenues per transponder have increased, for instance, as more customers have elected to lease transponder capacity on a non-preemptible basis (as opposed to lower priced but less protected preemptible transponders) or chose intermediate-term leases as a substitute for lower-priced long-term commitments.

[79] Partial Relief Order, ¶ 26.

[80] PanAmSat states that it is *the* leading provider of video service to Latin America, Africa, and South Asia (PanAmSat, SEC Form 10-K, 1995, p. 33). Moreover, Africa, for example, is reported to offer particularly abundant opportunities for providers of satellite services. ("Mobile and Fixed Satellite Service Operators see Opportunity in Africa," *Satellite Week*, May 16, 1994.)

Comsat's Competitive Handicaps

The rapid growth in capacity, coverage, and services offered by Comsat's competitors has made Comsat's structural and regulatory handicaps even more pronounced than at the time of the 1994 Study. Comsat's loss of market share is a direct result of its inability to respond quickly and creatively to competition.

The disparate regulatory treatment of Comsat, stemming from the early 1980s, constrains Comsat's ability to respond to competitive pressures and individual customer service needs. Regulatory relief for Comsat, therefore, would enhance competition by enabling customers to optimize their choices from alternative service providers. Comsat's competitors are not burdened with any FCC tariff filing requirements, notice periods, or other constraints on pricing flexibility, and thus are able consistently to underbid Comsat in negotiations for video service contracts. Limited tariff pricing flexibility also deprives video customers of more attractive counter-offers by Comsat. Unlike its unregulated competitors, Comsat cannot offer individually negotiated packages to satisfy individual customers' service needs or combine domestic and international transmission capabilities. Significantly, the current constraints on Comsat's pricing flexibility may frustrate price competition and may even facilitate coordinated pricing among Comsat's competitors.

Moreover, Comsat is burdened with at least three competitive handicaps that are directly related to Intelsat's structure. First, Intelsat's multilateral governing structure makes it very difficult to reach decisions efficiently. With Signatories' often conflicting interests (in part because of ownership interests in competing cable and satellite facilities),[81] Intelsat's decision making process (*e.g.*, making investment decisions, developing new services, targeting particular market segments) is increasingly stymied by conflicts of interest and is too cumbersome for today's fast-moving marketplace. Second—as PanAmSat often points out to investors[82]—Intelsat's general purpose satellites, which originally were designed for carrier-to-carrier switched voice service, are not well-suited to serve today's faster-growing

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[81] See pp. 2-3 in Pfeifenberger and Houthakker, "Competition to International Satellite Communications Services," attached to Written Testimony of Johannes P. Pfeifenberger, Before the U.S. House of Representatives, Committee on Commerce, Subcommittee on Telecommunications and Finance, September 25, 1996.

[82] PanAmSat, SEC Form S-1, filed May 25, 1993, p. 42.

global video services market. Finally—as both PanAmSat and Orion frequently emphasize[83]—Comsat's marketing flexibility is limited because its customers have to arrange with separate entities for the U.S. ground segment as well as the ground and space segment on each foreign end of the transmission.[84] PanAmSat stresses that this marketing structure has greatly increased the administrative procedure and costs involved in obtaining satellite services from Intelsat and Comsat.[85]

Customer Characteristics

Characteristics of Comsat's video customers result in significant demand elasticity and, thus, increase the level of effective competition. The customers in the world-wide market for transoceanic video services are easily identified and targeted by competing service providers.[86] Furthermore, these customers for the most part are sophisticated corporations with substantial leverage in negotiating price reductions and desired service features. A striking example of the high level of demand elasticity is Comsat's recent loss of a five-year, $100 million Latin America video contract with News Corp.[87]

Comsat's video customers are major TV networks and broadcasters (such as ABC, CBS, CNN, NBC) with substantial experience in the international satellite video market. For example, by October 1994, Turner Broadcasting (CNN, TNT, Cartoon Network) already utilized 17 satellites to distribute its programming world-wide (of which only two were Intelsat's).[88] Some video customers (such as Hughes and GE Americom) even own and operate competing regional satellite systems. Other customers of full-time video services

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[83] PanAmSat, SEC Form S-1, filed May 25, 1993, p. 42; PanAmSat, SEC Form 10-K, 1995, p. 17; Orion Network System Inc., Prospectus, June 27, 1995.

[84] Only within the European Union are video customers able to arrange video downlinks to multiple countries through a single European Intelsat Signatory.

[85] PanAmSat, SEC Form 10-K, 1995, p. 17.

[86] Thus, making it conducive for competitors to enter the market. (See *In the Matter of Motion of AT&T Corp. to be Declared Non-Dominant for International Service*, FCC 96-209, Order, released May 14, 1996, ¶ 43).

[87] "Comsat Loses $100 Million Satellite Deal," *The Washington Post*, March 5, 1996.

[88] "Worldwide Programming: U.S. Cable Networks Go Global Via Satellite," *Via Satellite*, September 1995, p. 46.

(such as IDB and Keystone) compete as resellers of Comsat capacity in short-term and occasional-use video markets. As **Table 2** shows, many of these customers dwarf Comsat in size and financial resources.

Table 2
1995 Revenues of Comsat and Selected Video Customers[89]

Company	Revenues (millions)
Comsat	852
International Communications	292
Video & Audio	45
Turner	3,437
Entertainment (TBS, TNT, Cartoon Network)	1,376
News (Headline News, CNN, CNN Int'l, CNNfn)	765
VIACOM	11,689
Networks and Broadcasting (MTV, VH1, Showtime, Nickelodeon, The Movie Channel)	2,140
Westinghouse	6,296
Communications & information systems (incl. CBS)	378
GE	43,013
Broadcasting (incl. NBC, GE-Americom)	3,441
Capital Cities/ABC (acquired by Disney in Feb. 1996) owns ABC, ESPN, ESPN II	6,900

The competitive pressure that Comsat faces in the sophistication and visibility of its video customers is also evident by the fact that customers switch among alternative providers of video services in order to obtain price reductions or more desirable service features. The annual turnover of video leases amounts to a significant portion of Comsat's video service. In the four years 1993 through 1996, a total of 38 full-time video transponder leases were terminated or expired and were not renewed; 22 leases expired and were renewed; and 36 new 27/36 MHz-equivalent transponder leases have been added.[90] This amounts to a total of 96 changes in 27/36 MHz-equivalent video transponder leases or an average of 24 changes per year. Compared to approximately 60 full-time video transponder leases, Comsat's annual turnover amounts to more than a third of its annual video business. This high "churn rate"[91]

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[89] Source: Value Line (1995) and 1995 Annual Reports and SEC Forms 10-K.

[90] See Appendix, Table COM-1.

[91] The term "churn rate" is used by the FCC to describe the turnover in customers due to switching between (continued...)

demonstrates that Comsat and its competitors are close substitutes and provides clear further evidence that significant competitive pressures have emerged in the transoceanic video market to and from the U.S. There should be little doubt that Comsat's video customers are highly sophisticated, are aware of their competitive options, and have significant negotiating leverage.

V. COMPETITION IN OCCASIONAL-USE AND SHORT-TERM VIDEO

The FCC and some video customers have raised concerns over potential Comsat market power in occasional-use (including short-term) video services. This market power concern appears to have been a major factor in the Commission's decision to deny regulatory relief for Comsat's video services in its Partial Relief Order.

Comsat's 1995 revenues from occasional-use (and short-term) video services amounted only to $5.5 million world-wide. Competing satellite systems do not publish data on their occasional-use video revenues, but the market has evolved significantly since the 1994 Study and there is considerable new evidence that the occasional-use video market is characterized by substantial and effective competition.

PanAmSat, Orion, Columbia, Intersputnik, and various regional satellite systems provide and actively promote occasional-use and short-term video services in direct competition with Comsat and Intelsat.[92] Today, PanAmSat provides service to 110 countries and stresses its full global coverage for occasional-use video services.[93] The company notes that it provides more than 10,000 hours of service for occasional-use and part-time applications on PAS-1, that it reserves satellite capacity for occasional-use service, and that it expects to continue

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[91] (...continued)
alternative suppliers. (See *In the Matter of Motion of AT&T Corp. to be Declared Non-Dominant for International Service*, FCC 96-209, Order, released May 14, 1996, ¶ 45).

[92] PanAmSat, SEC Form S-1, filed May 25, 1993; *PanAmSat Global Satellite System*, Brochure; Orion Network Systems Inc., SEC Form 10-K, 1995, p. 15; Intersputnik Users Handbook, Moscow, 1995, p. 61-62; Columbia Communications Corporation, Presentation, ISOG '95 Conference, Hong Kong, November 7, 1995.

[93] *PanAmSat Global Satellite System*, Brochure, p. 8.

to provide occasional-use service of at least 6 hours per satellite per day.[94] In 1996, PanAmSat's short-term and occasional-use service during the three summer months alone exceeded 10,000 hours.[95] At PanAmSat's published rates for occasional-use and short-term 27 MHz analog video transponders (ranging from monthly rates of $230,400[96] to hourly rates between $900 and $1,920[97]), a volume of 10,000 hours translates into a revenue range of $3.1 million to $19.2 million. Thus, PanAmSat's occasional-use and short-term video revenues most likely exceed Comsat's by a significant margin. In addition, some of PanAmSat's full-time customers resell their leased capacity on an occasional-use basis. For example, Global Access—a provider of world-wide satellite and fiber transmission services for the broadcast industry—recently announced a large-volume commitment for space segment on all four PanAmSat satellites to provide a wide variety of occasional-use broadcast services on a global basis.[98]

Orion also stresses that it provides satellite video services on an "on-demand" (i.e., occasional-use and short-term) basis in the form of transmission capacity for special events and remote news feeds.[99] In early 1996, more than 10 percent of Orion's total satellite capacity was utilized by occasional-use customers.[100] At average revenues per video transponder of approximately $1.3 million per year and 62 (27/36 MHz-equivalent) transponders on its first satellite,[101] Orion's occasional-use and short-term service may

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94 *PanAmSat Global Satellite System*, Brochure, p. 8.; PanAmSat, SEC Form S-1, filed May 25, 1993, p. A4.

95 "PanAmSat to Broadcast More Than 10,000 Hours of Sporting Events Coverage During Three-Month Period," PanAmSat Press Release, July 1, 1996.

96 *PanAmSat Global Special Event Rate Card*, November 1, 1994.

97 *PanAmSat Global Video Service Rate Card*, June 1, 1994. Hourly rates are (1) for more than 1980 and (2) for less than 90 hours per year. The minimum commitment period is 10 minutes at a rate of 1/6 the hourly tariff.

98 "Global Access Expands International Transponder Capacity," PanAmSat Press Release, December 11, 1995.

99 Orion Network Systems, SEC Form 10-K, 1995.

100 "Orion Sharpens Focus on New Markets, Next Satellites," *Space News*, March 11, 1996.

101 See Appendix, Tables ORI-1 and ORI-3.