

allocation problems, this study has determined total available capacity for only two geographic areas: the Atlantic Ocean Region (**AOR**) and Pacific Ocean Region (**POR**).

It is also difficult to assess how much of a satellite's total (ocean region) capacity is actually available for service to and from the U.S. This will depend on a satellite's transponder configuration as well as how the satellite is used to provide service between regions that do not involve the U.S.⁸⁸ The *maximum* attainable separate satellite system capacity that can be made available for service to and from the U.S. is estimated to be 50 percent of total separate satellite capacities. Similarly, COMSAT's *maximum* available capacity for services from and to the U.S. is assumed to be 50 percent of total **Intelsat AOR** and **POR** capacity (or 25 percent of all **Intelsat AOR** and **POR** half circuits).⁸⁹

CONCLUSIONS

Figure 3 (on page 44) shows total utilized trans-oceanic capacity in 64 kbps-equivalent circuits for switched voice, private line, and video and audio services.⁹⁰ The figure shows that total utilized capacity grew from less than 50,000 64 kbps-equivalent circuits in 1988 to more than 95,000 64 kbps-equivalent circuits in 1993. Utilized capacity for video and audio services grew

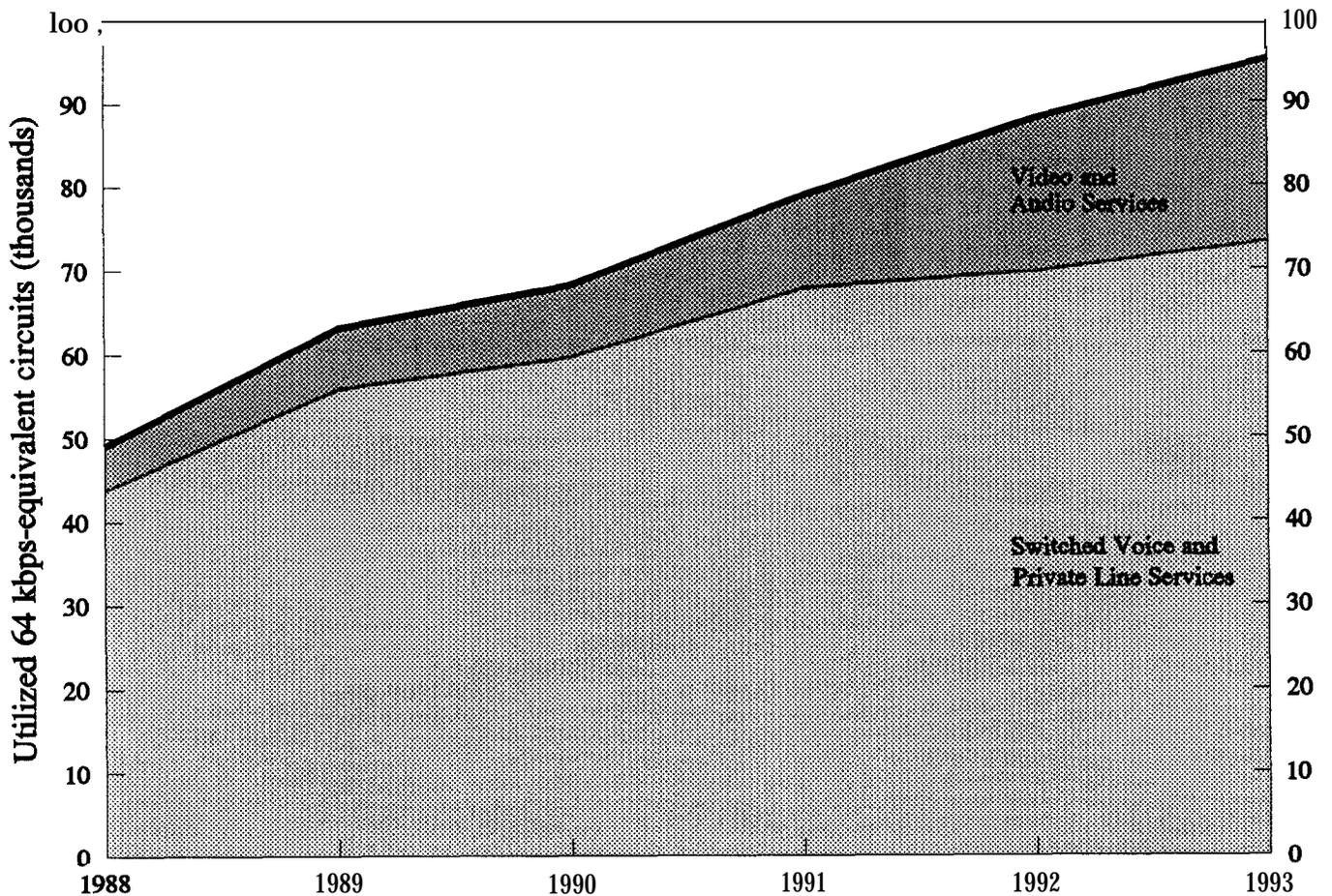
⁸⁸ The total capacity of a satellite will not be available for service to and from the U.S. because: (1) actual transponder configurations may preclude some satellite capacity from serving the U.S.; and (2) capacity used or assigned to regions other than the U.S. will not be available for service to and from the U.S.

⁸⁹ In 1992, the assumption results in capacity available to COMSAT of approximately 75,000 circuits for the **AOR** and approximately 27,000 circuits in the **POR**. This obviously overestimates by a wide margin the capacity that COMSAT would be able to actually use on the **Intelsat** system.

The assumption that COMSAT's maximum available capacity for services to and from the U.S. is 50 percent of total **Intelsat AOR** and **POR** capacity is equivalent to the assumption that COMSAT could be allocated 25 percent of all **Intelsat AOR** and **POR** half circuits. This is because each *full* circuit on a satellite is composed of the two *half circuits* on the sending and receiving end. In a market segment with no cable or separate satellite service, COMSAT would supply *all* half circuits on the U.S. side of the facility. In such a hypothetical situation, COMSAT would be able to control 100 percent of the available capacity although it would only control 50 percent of all half circuits.

⁹⁰ To allow for comparison of video and audio service with switched voice and private line services, the total size of utilized trans-oceanic telecommunications facilities can be determined by converting video and audio transponder leases to 64 kbps-equivalent circuits. One transponder lease is assumed to be equivalent to 275 64 kbps (duplex) circuits.

Figure 3
Utilized Capacity for Trans-Oceanic Service
 (Utilized 64 kbps-equivalent circuits to and from the U.S.)



NOTES:

One 36/27 Mhz-equivalent transponder lease is equal to 275 64 kbps-equivalent duplex circuits.
 Does not include utilized capacity for switched voice and private line services on separate satellite systems.
 See Chapter V for a further discussion of data sources and assumptions.
 Source: Exhibits HSH-5.1 and HSH-6.1

at a faster rate than switched voice and private line services. While video and audio services represented about 10 percent of the total market in 1988, they accounted for approximately 20 percent of the total market in 1993.

SECTION C: ANALYSIS

VI. COMPETITION TO COMSAT IN SWITCHED VOICE AND PRIVATE LINE SERVICES

As demonstrated below, COMSAT faces substantial effective competition in the provision of trans-oceanic facilities-based telecommunications services for switched voice and private line services. The evidence shows that:

- COMSAT's market shares for service in the largest geographic segments are well below 50 percent;
- Geographic segments with higher market shares account for only 6 percent of total switched voice and private line services and less than 20 percent of COMSAT's utilized capacity;
- Higher market shares in these low-traffic market segments are mitigated by competition from separate satellite systems and expanding regional cable networks.

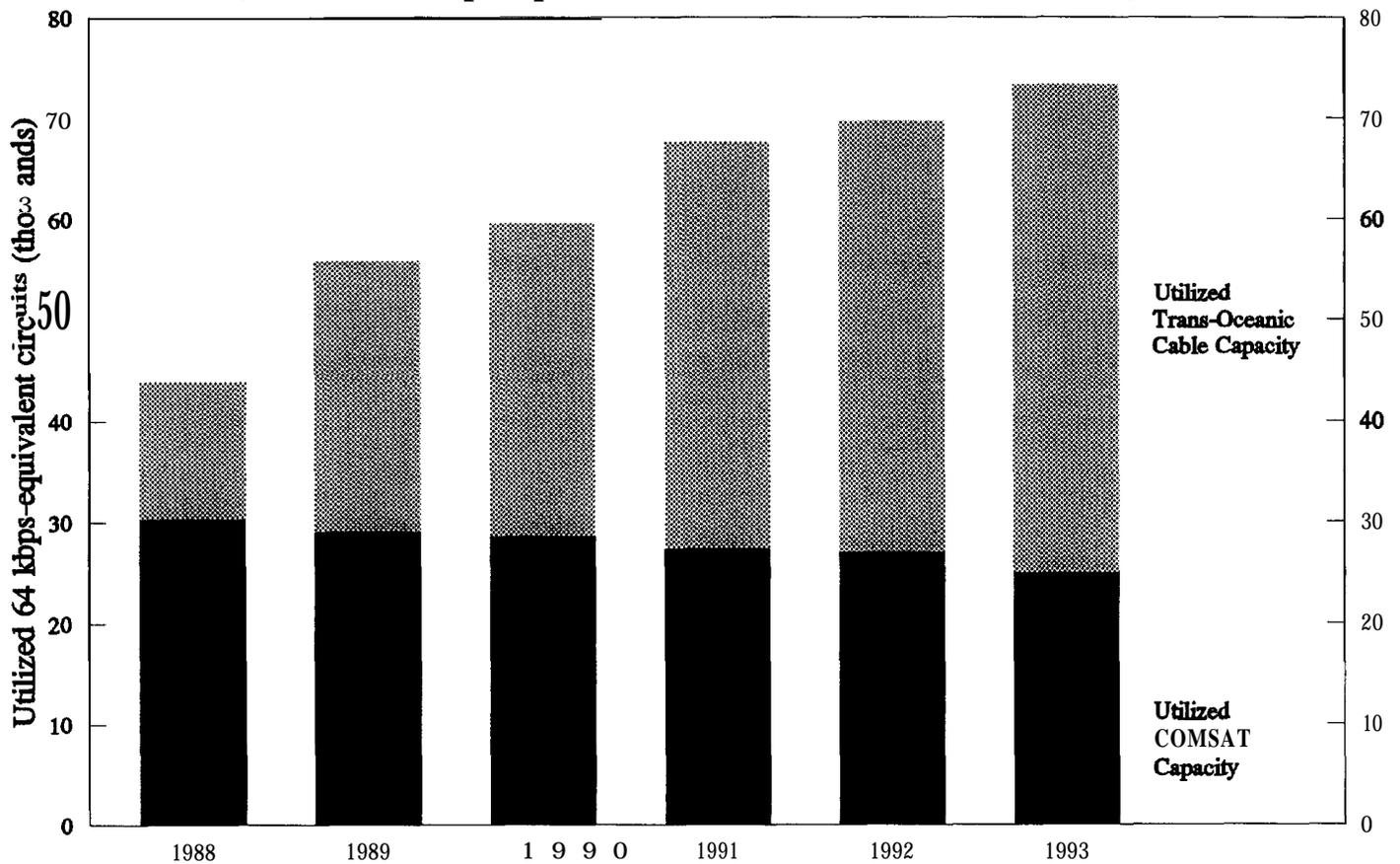
COMSAT'S MARKET SHARE IN SWITCHED VOICE AND PRIVATE LINE SERVICES

Figure 4 (on page 48) shows that COMSAT has not benefitted significantly from the overall growth in the market for capacity utilized for switched voice and private line services, nor has it been able to hold on to historical levels of utilized capacity. Total COMSAT capacity utilized for switched voice and private line services declined while the market as a whole grew. As a result, COMSAT's average market share decreased from more than two-thirds in 1988 to approximately one-third in 1993.⁹¹

Furthermore, **Figure 5** (on page 49) shows that COMSAT's market share in trans-oceanic switched voice and private line services is declining in all geographic market segments that are easily accessible by cable. To Europe/Mediterranean/Middle East, COMSAT's market share dropped from slightly more than 60 percent in 1988 to less than 25 percent in 1993. To the countries that are part of East Asia/Oceania, this drop was even more dramatic, with a decrease

⁹¹ Note that between 1988 to 1993, AT&T's average digital compression rate on COMSAT's circuits increased from 1.1 to 2.6 derived circuits per bearer circuit. (*See* Exhibit HSH-3.) This increase in compression has correspondingly decreased carriers' demand for trans-oceanic satellite capacity.

Figure 4
Utilized Capacity for Switched Voice and Private Line Services:
COMSAT vs. Trans-Oceanic Cable Systems
 (Utilized 64 kbps-equivalent circuits to and from the U.S.)

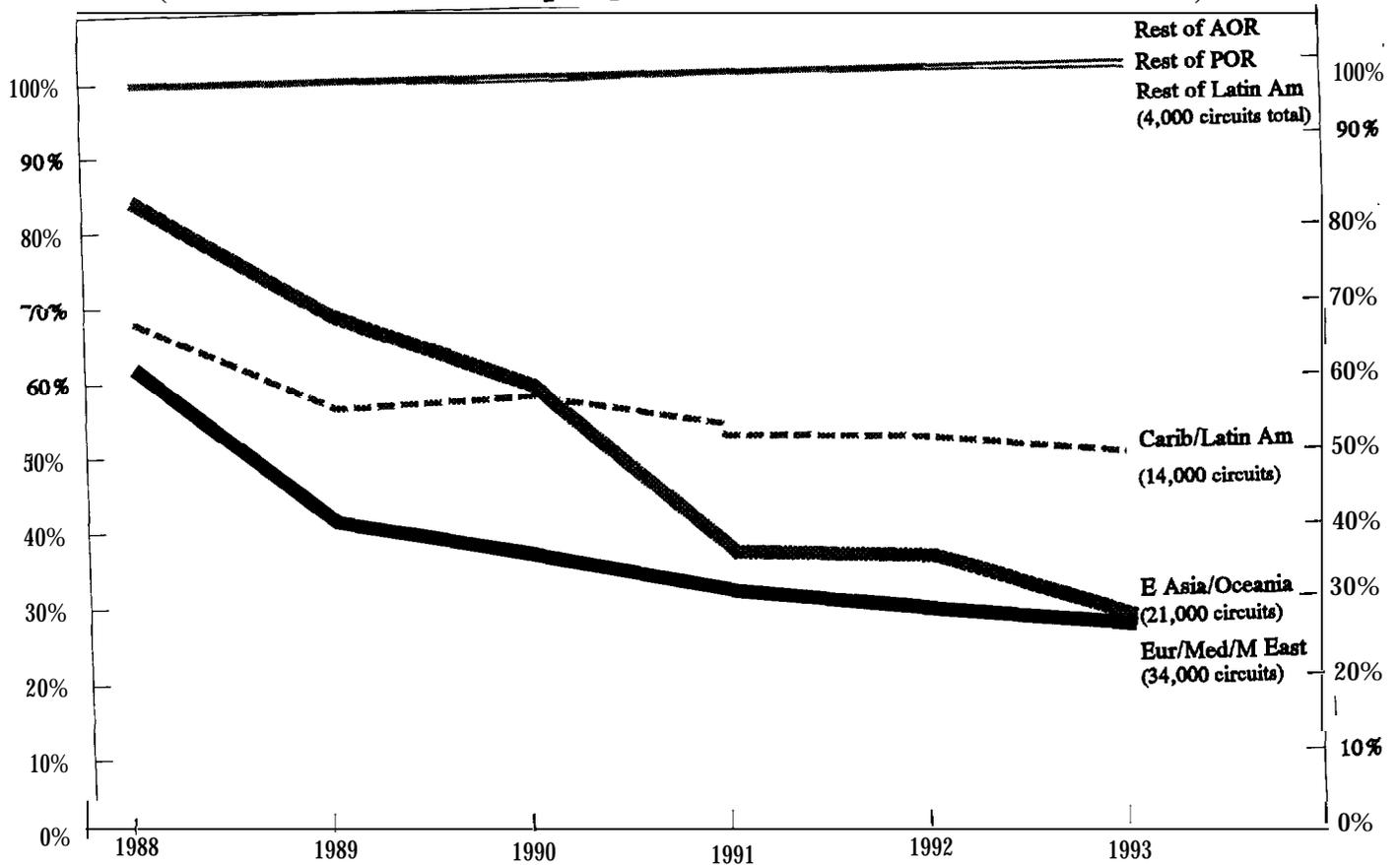


NOTES:

Does not include utilized capacity for switched voice and private line services on separate satellite systems. See Chapter V for a further discussion of data sources and assumptions.

Source: Exhibit HSH-5.1

Figure 5
COMSAT Market Shares in Utilized Capacity for
Trans-Oceanic Switched Voice and Private Line Services
(Based on utilized 64 kbps-equivalent circuits to and from the U.S.)



NOTES :

Does not take into consideration **utilized** capacity for switched voice and private line **services** on separate satellite systems.

See Chapter V for a further discussion of data source and assumptions.

Source: Exhibit HSH-5.1

from more than 80 percent in 1988 to 26 percent in 1993. Utilized capacity to the countries in Caribbean/Latin America dropped from more than two thirds in 1988 to less than 50 percent in 1993. The market share to Caribbean/Latin America is likely to drop even further once the pre-subscribed Columbus-2, Trans-Gulf, and Americas-1 cable systems come on line in 1994. These facilities will add capacity that exceeds the total currently established switched voice and private line circuits by more than a factor of three.

The exceptions to the declines in market shares shown in Figure 5 (on page 49) are the three regions where COMSAT does not presently face competition from existing planned cable systems. **Figure 6** (on page 51) shows, however, that these geographic market segments not easily accessible by cable account only for a small percentage of total facility use for switched voice and private line services. The three regions easily accessible by competing trans-oceanic cable systems account for approximately 94 percent of total utilized capacity for switched voice and private line services to and from the U.S.

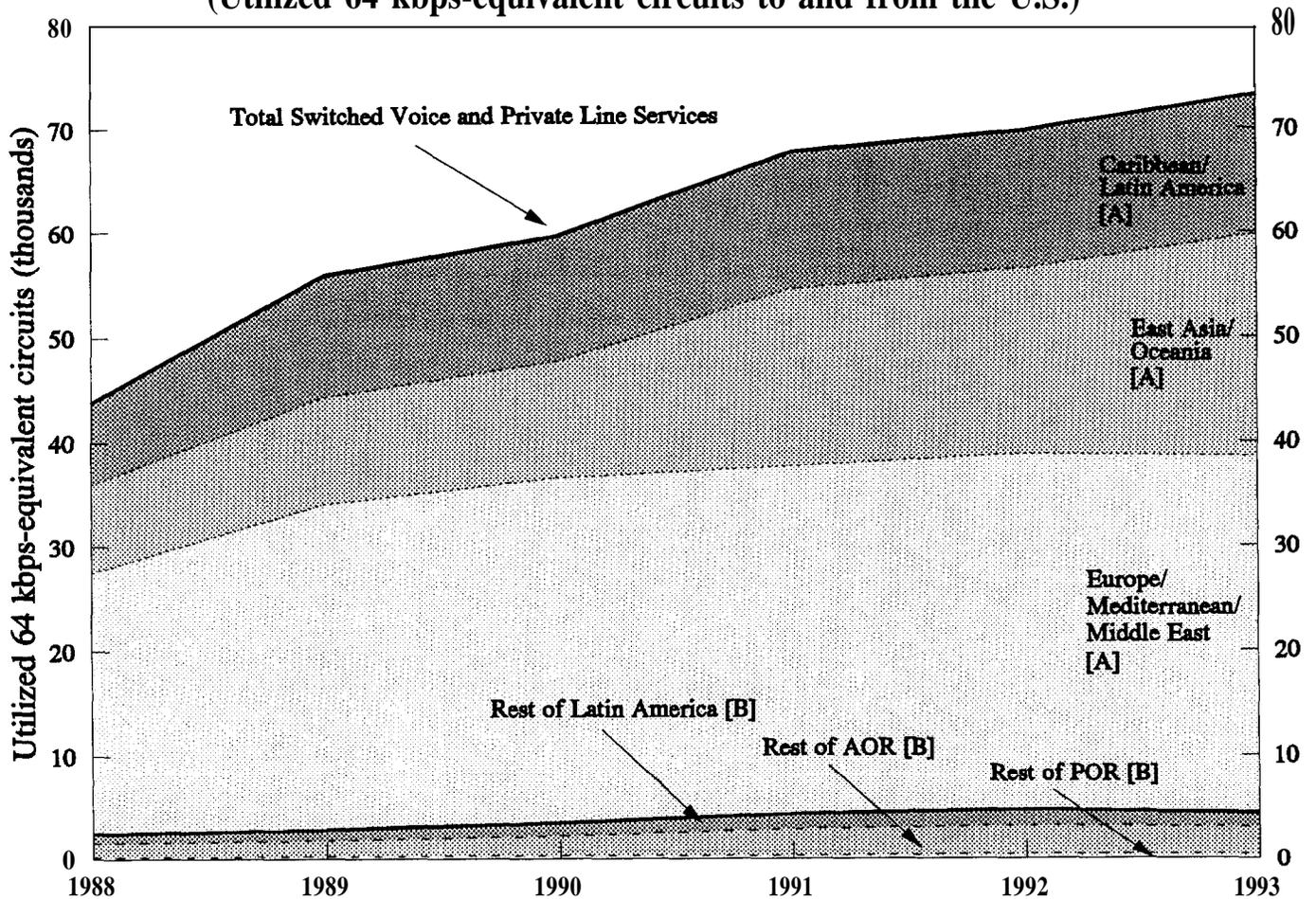
Figure 7 (on page 52) shows that COMSAT has higher shares only in the geographic segments which represent a small part of the world totals. The size of the various pies in this figure (and similar figures that follow) reflects the relative size of the service segments. In 1993, utilized capacity to these market segments accounted for only about 6 percent of total utilized capacity to and from the U.S.

COMPETITION TO COMSAT FROM PLANNED FACILITIES AND THE THREAT OF ENTRY

Competition from planned facilities and competition from the threat of entry make higher market shares in the low-traffic regions misleading indicators of the presence of effective competition for switched voice and private line services.

Every geographic market segment faces competition from planned fiber optic cables, planned separate satellite systems, and from existing satellite systems entering new market segments. COMSAT also faces world-wide competition from the threat of additional entry of both trans-oceanic cable and satellite facilities.

Figure 6
Utilized Capacity for Trans-Oceanic
Switched Voice and Private Line Services
 (Utilized 64 kbps-equivalent circuits to and from the U.S.)



NOTES:

[A] Competition from cables and separate satellite systems.

[B] competition from separate satellite systems.

Does not include utilized capacity for switched voice and private line services on separate satellite systems.

See Chapter V for a further discussion of data sources and assumptions.

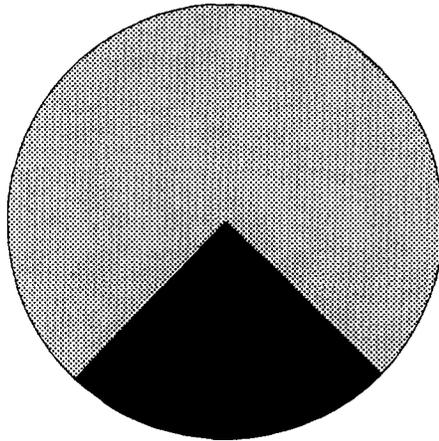
Source: Exhibit HSH-5.1

Figure 7

Market Size and COMSAT Market Shares of Trans-Oceanic Switched Voice and Private Line Services (1993)

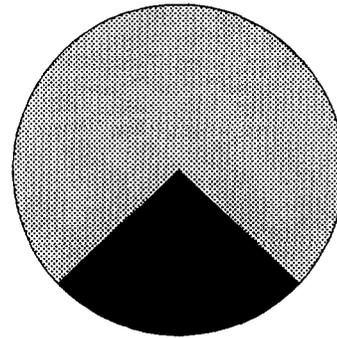
(Based on utilized 64 kbps-equivalent circuits to and from the U.S.)

Europe/Mediterranean/Middle East*
34,000 Circuits Total



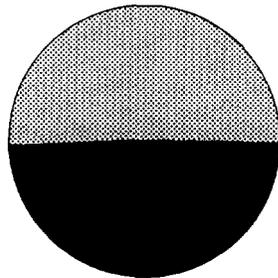
24.8%

East Asia/Oceania*
21,000 Circuits Total



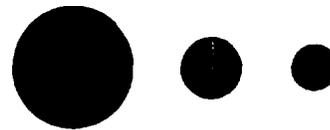
26.0%

Caribbean/Latin America*
14,000 Circuits Total



48.9%

Rest of AOR
Rest of Latin America
Rest of POR
4,000 Circuits Total



100.0%

99.1%

100.0%

■ COMSAT

▨ Other Facilities

NOTES:

* Geographic market segments with competition from existing and planned cables and satellites.

The relative size of the pies reflects the size of the market segment.

Does not include utilized capacity for switched voice and private line services on separate satellite systems.

See Chapter V for a further discussion of data sources and assumptions.

Source: Exhibit HSH-5.1

Competition to COMSAT from Planned Trans-Oceanic Cable Systems

Trans-oceanic cable capacity to and from the U.S. will *more than triple* by 1996 from 1993 levels. Global capacity additions include three new links to the Caribbean and South America, three new trans-Atlantic cable systems, one new trans-Pacific cable loop, connections between Europe and Southeast Asia, and for the first time, a direct fiber optic cable link all the way around the globe.⁹²

Sixty-six countries worldwide are accessible to the U.S. through fiber optic cables as of 1993.⁹³ In 1994, the planned Columbus-2 and Americas-1 fiber optic cable will start to provide service to an additional 18 countries. Not only will this reduce further COMSAT's market share in the Caribbean/Latin America region, but it also will provide a considerable threat of entry to the close-by countries in the Rest of Latin America geographic market segment. By the end of 1996, 97 countries will be served through trans-oceanic fiber-optic cable systems to and from the U.S.

As the regional cable networks in various parts of the world grow, more and more countries will become accessible by cable through links to the existing regional networks that are already easily accessible through fiber optic cables.⁹⁴ The desire for routing diversity with an increasing number of cable paths to high-volume markets such as Europe and East Asia integrates thin markets "along the way" into the network by using these markets as transition points. Examples are the numerous islands in the Atlantic and Pacific that have been integrated in trans-oceanic cable links.

With expanding networks of fiber optic cables, the distance from existing and planned fiber optic cables to regions not served by existing and planned cables will continue to decrease. Fast

⁹² See NTIA, *1990 World's Submarine Telephone Cable Systems*, "List of Proposed Submarine Telephone Cable Projects," at 55-56 (Exhibit HSH-11); and *Fiber Optic News*, October 25, 1993, at 8.

⁹³ See Exhibit HSH-2.

⁹⁴ In addition to trans-oceanic cables, Exhibit HSH-11 also lists intra-regional submarine cable systems.

market growth and decreasing distances between new regions and existing fiber optic systems will make fiber optic links to many low-traffic markets economical.

Competition to COMSAT from Planned Trans-Oceanic Satellite Systems

Competition from existing, planned, and potential new separate satellite systems mitigates COMSAT's higher current market share for any country that remains not easily accessible through cable systems. Between now and 1996, separate satellite systems will launch **six**⁹⁵ new telecommunications satellites for service to and from the U.S. in the AOR and POR. By the end of 1995, PanAmSat alone will be able to provide service to 98 percent of the world's population.⁹⁶

The regulatory limitation of separate satellite systems in providing switched voice services has now been effectively removed by the new U.S. policy of allowing up to 1250 64 kbps-equivalent circuits per separate system satellite to be connected to the public switched **network**.⁹⁷ Even this restriction is set to be removed by 1997⁹⁸ and is expected to be relaxed further before then.

Perhaps even more importantly, operators of separate satellite systems are already **pre**-subscribing their planned capacity. To capture some of the market growth or renew current long-term contracts when they expire, COMSAT must now offer rates that can compete with pre-subscription rates of separate satellite systems. If COMSAT tried to raise prices to regions currently not easily accessible by cable, separate satellite systems would be free to target competitive service offerings to those markets.

⁹⁵ Two PanAmSat satellites, one Orion, TRW (Pacificom-1), Globostar and **Rimsat** satellite.

⁹⁶ PAS SEC Form S-1 at 3 and 45.

⁹⁷ See *1250 Decision*.

⁹⁸ *Permissible Services of U.S. licensed International Communications Satellite Systems separate from the International Telecommunications Satellite Organization (INTELSAT)*, 7 FCC Rcd 23 13 (1992) at 23 14.

PanAmSat has publicly stated that it intends to compete primarily in those markets that are not easily accessible through cable systems. PanAmSat has stressed that Africa — accounting for much of the Rest of AOR — is one of the ‘hot’ areas for satellite communications.⁹⁹ PanAmSat’s PAS-1 can provide services to 70 countries in the Atlantic Ocean Region.¹⁰⁰ The FCC has *already* authorized PAS-1 to provide video, audio, and private line services to 50 countries in Eastern and Western Europe as well as the Caribbean and Latin America and switched voice services to 13 countries.¹⁰¹ In its May 1993 filing with the FCC, PanAmSat noted that it has started to provide switched voice services to and from the U.S.

Additionally, Columbia Communications Corporation leases C-band capacity on NASA tracking and data relay satellites (TDRSS) in the AOR and POR. It has acquired ‘landing rights’ to operate in 25 countries, including countries in Eastern Europe, and has begun establishing earth stations. In addition to occasional-use video services, Columbia has started to provide private line services in the Pacific Rim and switched voice services to eastern Europe.¹⁰² Similarly, the Russian Intersputnik satellite system with its Gorizont satellites started to provide switched voice services to the U.S. for AT&T¹⁰³ in 1992. Given the ability to now offer 1,250 public-switched circuits per satellite, Intersputnik and PanAmSat are likely to expand their level of switched voice service. As a result of separate satellites systems and their recent entry into the switched voice market, COMSAT faces considerable competition even on routes not easily accessible by cable.

⁹⁹ See Interview with Fred Landman, President of PanAmSat, in ‘PanAmSat Inks Nearly \$1 Billion in Transponder Lease Contracts’, *Satellite News*, December 6, 1993 (via *NewsNet*).

¹⁰⁰ See PAS SEC Form S-1 at 45.

¹⁰¹ *FCC Public Notice*, Report No. IS-0040, rel. November 15, 1993, Attachment 3.

¹⁰² See *Telecommunications Reports International*, July 23, 1993, at 4-5.

¹⁰³ See, e.g., AT&T’s Circuit Reports filed with the FCC, Jan. 18, 1993, and Oct. 19, 1993.

Competition to COMSAT from the Threat of Entry

Beyond competition from planned facilities, COMSAT faces competition from the threat of entry of new facilities. The fact that competing trans-oceanic telecommunication facilities have been coming on line at a very rapid pace illustrates that entry is relatively easy. Today, total trans-oceanic capacity requirements are many times the typical capacity of a single satellite. In fact, trans-oceanic facilities-based telecommunications markets grow sufficiently to justify the addition of one or two satellites and cables annually per ocean region.¹⁰⁴ Eighteen trans-oceanic fiber-optic cables and 30 trans-oceanic satellites for service to and from the U.S. will have come on line between 1988 and 1996.¹⁰⁵

With respect to intermodal competition, COMSAT continues to face the threat that new trans-oceanic and inter-regional cables systems will be built to serve countries that are not accessible through existing and planned cable systems. For example, most recently AT&T proposed to build a fiber optic cable system that would encircle Africa by the end of 1997. The cable loop would interconnect with existing and planned trans-Atlantic cables and provide service to 37 African countries or territories.¹⁰⁶ The threat of new cable systems will be particularly effective for countries that are in close proximity to areas already served by existing and planned cable systems. In these cases, short inter-regional cables to countries served by existing and planned trans-oceanic cable systems will be sufficient to provide cable service from the U.S. to these countries.

With respect to intramodal competition, several additional trans-oceanic facilities are also in their first planning stages. Most recently, Celestar Inc., a new, privately-held company, applied to

¹⁰⁴ For example, from 1988 through 1996 eighteen new satellites will have been added in the **AOR** and nine in the **POR**. During the same period, at least ten satellites (all Intelsat) will be retired or removed from the **AOR** and **POR**. (See Exhibit HSH-10).

¹⁰⁵ See Exhibit HSH-10.

¹⁰⁶ *New York Times*, April 26, 1994 at D3.

the FCC for authorization to construct three new separate system **satellites**.¹⁰⁷ Two satellites are planned to be launched in 1997 and 1998 to provide trans-Pacific switched voice, private line, and video and audio services with approximately 13,200 64 kbps-equivalent circuits to and from the U.S. Celestar stressed in its FCC application that a large portion of its service will involve the U.S. Also, **Rimsat** has been granted licenses for two satellite positions over the Indian and Pacific Oceans. The company's satellites will be able to reach from the western U.S. to Europe and **Africa**.¹⁰⁸ Similarly, Orion has stated plans to launch two additional Atlantic and Pacific Ocean satellites in 1997 and 1998¹⁰⁹ and TRW has announced that it will add its Pacificom-2 satellite as soon as needed.¹¹⁰

Other examples of competition from the threat of entry are the recent proposals to build global satellite communications systems, Teledesic Corporation proposed to build a \$9 billion satellite system with 840 small low-orbit satellites.¹¹¹ The system would offer a broad array of **fixed-satellite** voice, data and video services at prices similar to conventional wired services to and from virtually any spot on the planet.

Finally, COMSAT faces the threat that domestic satellite systems will enter or expand trans-oceanic switched voice and private line services to Central America, the Caribbean and the northern part of South America. In a recent report, the FCC indicated that it has authorized

¹⁰⁷ See *Application for Conditional Authorization to Construct an **International** Satellite System Consisting of Three In-Orbit Satellites*, FCC Public Notice, Feb. 2, 1994, Application CSS-94-011 ("**Celestar** Application").

¹⁰⁸ See "Satellite Diary", *Satellite Week*, March 14, 1994.

¹⁰⁹ See "W. Neil Bauer: President and Chief Executive Officer, Orion Network Systems Inc.", *Space News*, March 14-20.

¹¹⁰ Application of TRW Inc. for Authority to Construct, Launch, and Operate Pacificom-1, FCC File No. CSS-91-012, filed September 10, 1991, at 6.

¹¹¹ For the most recent articles, see "**McCaw** and Gates Seek to Form Global Communications System," *The Wall Street Journal*, March 21, 1994, at A-3; and "A Satellite System is Planned to Link Most of the Globe," *The New York Times*, March 21, 1994, at 1. See also Application of Teledesic Corporation for Authority to Construct, Launch and Operate a Low Earth Orbit Satellite System in the Domestic and International Fixed Satellite Service, filed with the FCC on March 22, 1994, ("**Teledesic** Application").

U.S. domestic satellites to provide trans-oceanic telecommunication services to 18 countries in Central America, the Caribbean and the northern part of Latin America.¹¹²

Summary

Competition from planned and potential new separate satellite systems in markets that remain not easily accessible through cable systems is significant. These markets are growing rapidly and have reached sizes that make them very attractive to providers of satellite-based trans-oceanic telecommunication services.

Given the number and capacity of planned facilities coming on line before the end of 1996, I expect COMSAT's market share to decline further over the next few years. If the competition from planned facilities and the threat of entry of new facilities is taken into consideration, there is substantial competition providing switched voice and private line services in all geographic market segments.

Table 4 summarizes the extent of competition for switched voice and private line services from existing and planned facilities as well as the threat of entry of new facilities by geographic market segment.

¹¹² *FCC Public Notice*, Report No. IS-0040, rel. November 15, 1993, at 3 and Attachments 1 and 2.

TABLE 4
EFFECTIVE COMPETITION IN SWITCHED VOICE AND PRIVATE LINE SERVICES

GEOGRAPHIC SEGMENT: U.S. TO	MODE OF COMPETITION	CURRENT COMPETITION FROM		
		EXISTING FACILITIES	PLANNED FACILITIES	THREAT OF ENTRY
Europe / Mediterranean / Middle East	Inter-modal	TAT-S, PTAT-I, TAT-P, TAT-IO, TAT-II, others	CANUS-1/CANTAT-3, Columbus-2, TAT-1203	trans-oceanic cables
	Intra-modal	PAS-1, TDRSS-East, Gorizont-20, Gorizont-26	PAM, Orion-1, Globostar-1	Celestar, Orion, Teledesic, others
East Asia/Oceania	Inter-modal	HAW-4/TPC-3, NPC, TPC-4, HAW-5/PacRim-East, others	TPC-5	trans-oceanic cables
	Intra-modal	TDRSS-West, Gorizont-17, Gorizont-24	PAS-I, Rimsat, Pacificom-1	Celestar, Orion, TRW, Teledesic, others
Caribbean/Latin America	Inter-modal	PTAT-1/CARAC, TCS-1, others	Columbus-2, Americas-1, Tram-Gulf	trans-oceanic cables
	Intra-modal	PAS-1, TDRSS-East, Domsats*	PAS-3, Globostar-1, Domsats	Celestar, Orion, Domsats, Teledesic, others
Rest of Latin America	Inter-modal	--	--	inter-regional cables
	Intra-modal	PAS-1	PAS-3, Globostar-1	Celestar, Orion, Rimsat, Domsats, Teledesic, others
Rest of Atlantic Ocean Region	Inter-modal	--	--	trans-oceanic and inter-regional cables
	Intra-modal	TDRSS-East, Gorizont-20, Gorizont-26	PAS-3, Globostar-1	Celestar, Orion, Teledesic, others
Rest of Pacific Ocean Region	Inter-modal	--	--	--
	Intra-modal	TDRSS-West, Gorizont-17, Gorizont-24	PAS-P, Rimsat, Pacificom-1	Celestar, Orion, TRW, Teledesic, others

*Domestic Satellite Systems

Source: Exhibit HSH-10

DISAGGREGATION OF SERVICE SEGMENTS INTO SWITCHED VOICE AND PRIVATE LINE SERVICES

It no longer is necessary to separate trans-oceanic switched voice and private line services for competitive analysis, now that the FCC has allowed separate satellite systems to enter the switched voice market segment. Most recently, the authorization to carry as many as 1,250 bearer circuits per satellite connected to the public switched network has effectively increased the supply elasticity for providing switched voice services.¹¹³ As a result, a company trying to exercise market power in switched voice service would face an immediate response from a satellite facility previously providing only private line or video and audio services.

Sufficient data on how much switched voice and private line service is carried on cable systems for all of COMSAT's customers were not available for this study. As a consequence, the developments in switched voice services and private line services have to be illustrated with the only data available, COMSAT's share of AT&T's utilized capacity for these services. The conclusions of the previous sections are not affected by considering AT&T's data on the two services separately.

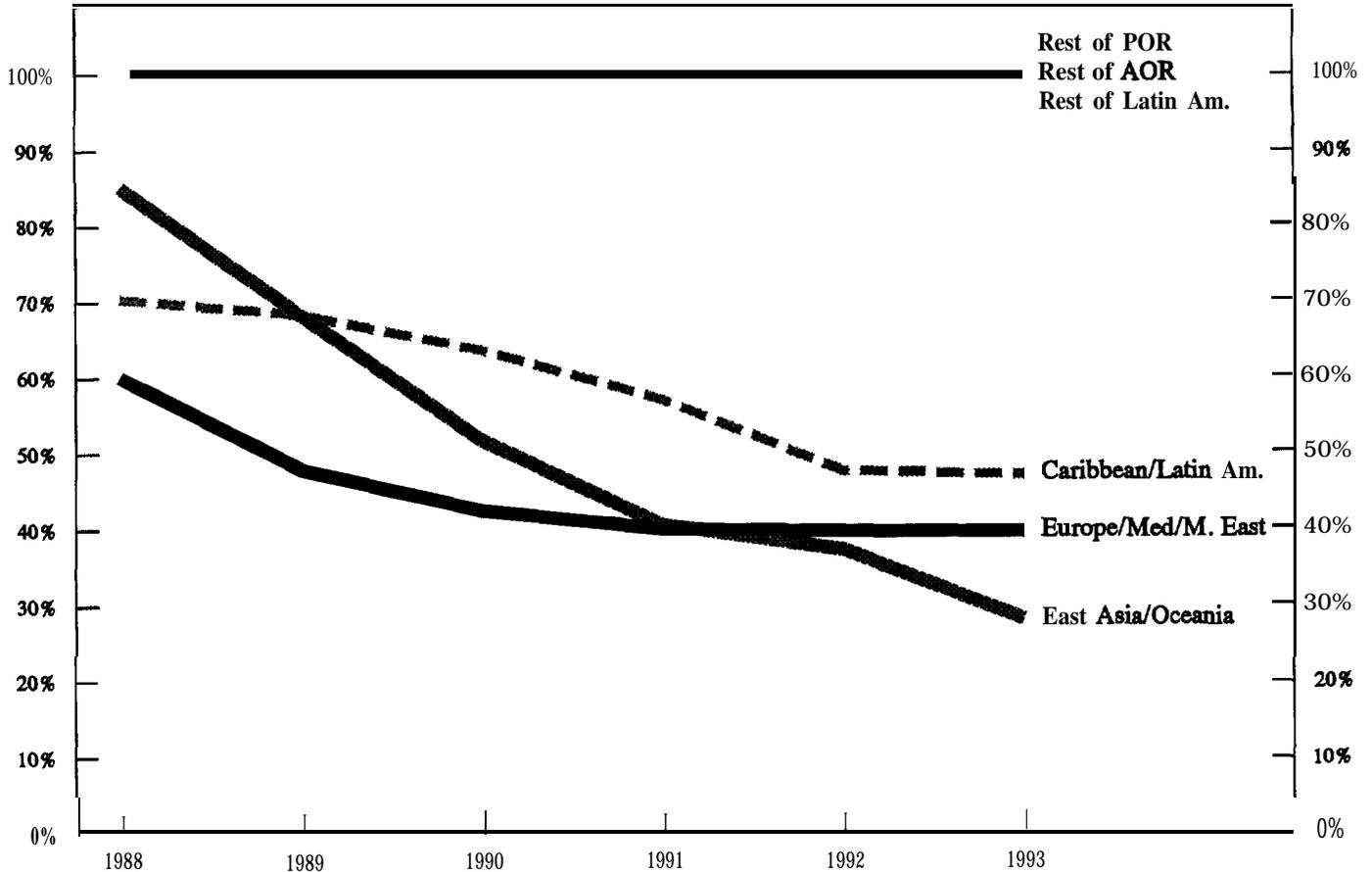
COMSAT's Share of Switched Voice Services

Figure 8 (on page 61) shows that by 1992 COMSAT's shares of AT&T's switched voice services had already dropped below 50 percent in all regions with intermodal competition from trans-oceanic cable systems. In fact, between 1988 and 1993, COMSAT's shares dropped from a range of 60 to 85 percent to between 28 and 47 percent.

The most dramatic drop occurred in the East Asia/Oceania segment where market shares decreased from 85 percent to 28 percent. In the Caribbean/Latin America segment, market shares will drop further when three new fiber optic cable systems come on line this year and carriers move satellite circuits onto these pre-subscribed facilities. These facilities will quadruple available capacity to the Caribbean/Latin America region.

¹¹³ See 1250 Decision.

Figure 8
COMSAT Shares of AT&T Switched Voice Services
 (Based on utilized 64 kbps-equivalent circuits to and from the U.S.)



NOTES:

Only AT&T traffic taken into consideration.

See Chapter V for a further discussion of data sources and assumptions.

Source: Exhibit HSH-5.2

In the regions not easily accessible by cable, COMSAT's current share of AT&T switched voice service is still close to 100 percent. However, switched voice services to these particular regions account for less than 10 percent of AT&T's total trans-oceanic switched voice circuits to and from the U.S.

COMSAT's Share of Private Line Services

Figure 9 (on page 63) paints a very similar picture for COMSAT's share of private line services. COMSAT's share of AT&T's trans-oceanic private line service in the Europe/Mediterranean/Middle East regions dropped from 18 percent in 1988 to less than 5 percent in 1993. Similarly, COMSAT's shares for the East Asia/Oceania area decreased from more than 70 percent to 32 percent over the same five-year period. COMSAT's share of AT&T's total private line circuits to this region has dropped dramatically even though the number of COMSAT's private line circuits has increased.¹¹⁴

The exception is COMSAT's share of AT&T's private line service to the Caribbean/Latin America region, which increased from approximately 40 percent to almost 70 percent in 1993. AT&T's reliance on COMSAT capacity during this period is understandable considering the fast recent economic development in the area and the fact that the new high-capacity fiber optic systems will become available only later this year.¹¹⁵ Once they are available, COMSAT is certain to lose traffic and market share to these facilities. COMSAT's shares of AT&T private line circuits to areas not easily accessible by cable are still high.¹¹⁶

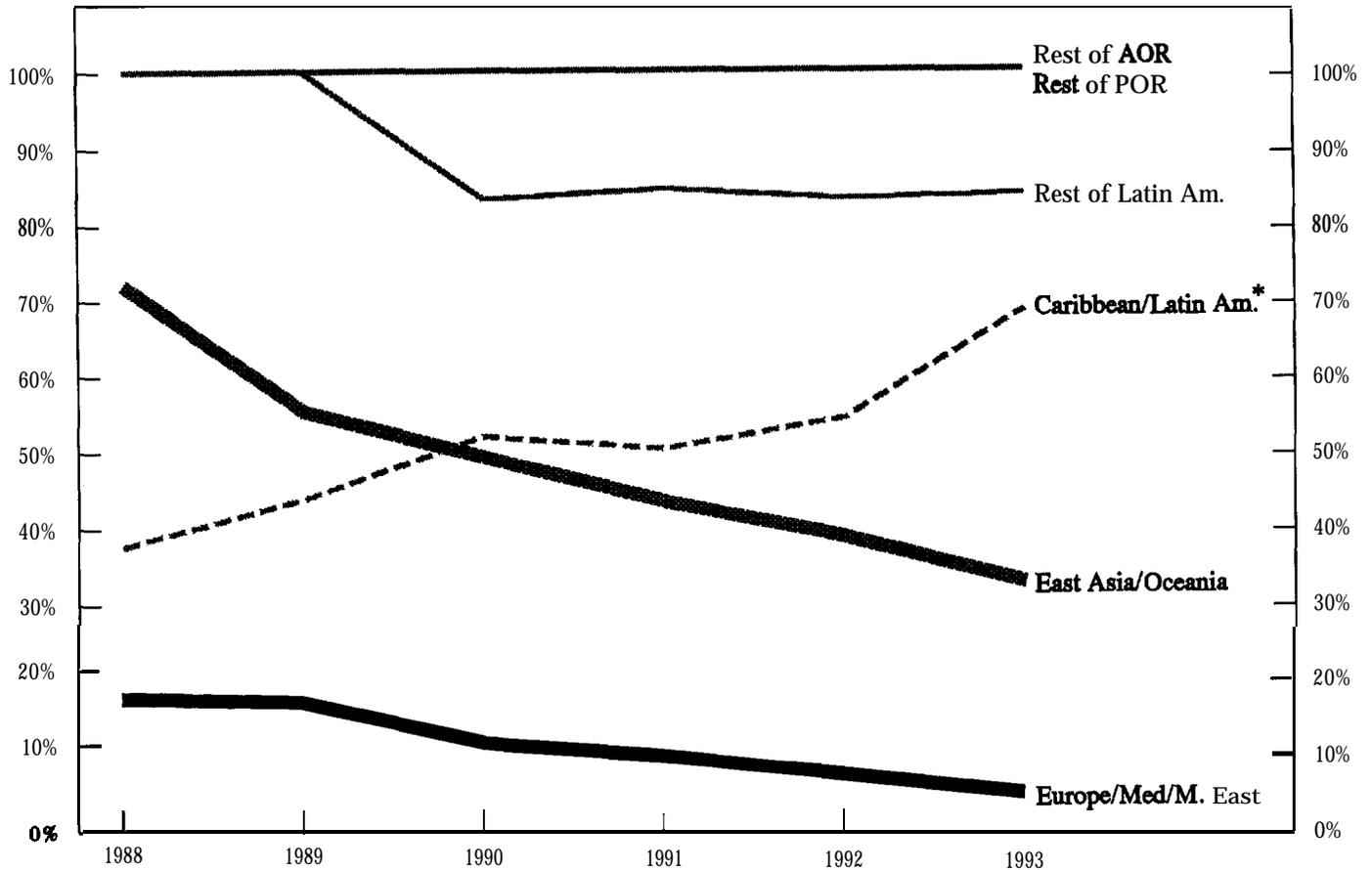
Figure 10 (on page 64) compares COMSAT's shares and total sizes of AT&T trans-oceanic switched voice and private line services in the various geographic regions for 1993. AT&T's utilized capacity for switched voice services accounts for almost three times the capacity utilized

¹¹⁴ See Exhibit HSH-5. 3.

¹¹⁵ Note that AT&T's facility use for private line service may not be representative for the market as a whole because AT&T's share of the total private line market is likely to be small (particularly compared to AT&T's share in the switched voice market).

¹¹⁶ Recall, however, that this study omits switched voice and private line services on separate satellite systems.

Figure 9
COMSAT Shares of AT&T Private Line Services
 (Based on utilized 64 kbps-equivalent **circuits** to and from the U.S.)



NOTES:

* Once the AMERICAS-1, COLUMBUS-2, and Tram-Gulf cables start service this year, the loss of market share experienced in other regions can be expected to occur here as well.

Only AT&T traffic taken into consideration.

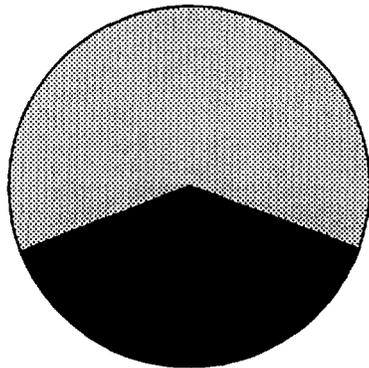
See Chapter V for a further discussion of data sources and assumptions.

Source: Exhibit HSH-5.3

Figure 10
COMSAT Shares of AT&T
Switched Voice and Private Line Services (1993)
(Based on utilized 64 kbps-equivalent circuits to and from the U.S.)

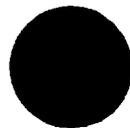
AT&T SWITCHED VOICE

Europe/Mediterranean/Middle East*
 East Asia/Oceania*
 Caribbean/Latin America*
 22,000 Circuits Total



38.5%

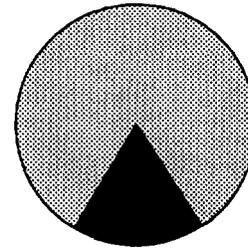
Rest of AOR
 Rest of POR
 Rest of Latin America
 2,000 Circuits Total



100.0%

AT&T PRIVATE LINE

Europe/Mediterranean/Middle East*
 East Asia/Oceania*
 Caribbean/Latin America*
 8,000 Circuits Total



17.8%

Rest of AOR
 Rest of POR
 Rest of Latin America
 100 Circuits Total



95.2%

 **COMSAT**  **Other Facilities**

NOTES:

* Geographic market segments with competition from existing and planned cables and satellites. The relative size of the pies reflects the size of the market segment. Only AT&T traffic taken into consideration. See Chapter V for a further discussion of data sources and assumptions.

Source: Exhibit HSH-5.2 and HSH-5.3

for private line services. While COMSAT still has higher shares in the regions not easily accessible by cable, its market share in regions served by existing and planned cable facilities is only about 39 percent for switched voice and 18 percent for private line services.

CONCLUSIONS

COMSAT faces effective competition from existing cable and satellite systems in providing switched voice and private line services. COMSAT's market share of utilized trans-oceanic telecommunication capacity for switched voice and private line services to geographic market segments that are easily accessible by existing and planned cable systems has been dropping from the 60 to 85 percent range in 1988 to between 25 and 50 percent in 1993. Higher current market shares to geographic market segments that are not easily accessible by cable are mitigated by planned separate satellite systems and expanding regional cable networks. These market segments account for less than 20 percent of COMSAT's utilized capacity and only 6 percent of the total market for switched voice and private line services.

VII. COMPETITION TO COMSAT IN VIDEO AND AUDIO SERVICES

COMSAT's shares of trans-oceanic video and audio services are declining rapidly. Market shares in terms of revenues in some regions are already as low as 20 percent. Average world-wide market shares will be approximately 40 percent by 1996. Indeed, the level of effective competition is actually higher than these market shares indicate:

- COMSAT's projected market shares are overstated because of limited information on loading of existing and planned separate satellite systems;
- Projected market shares do not reflect the fact that existing and planned fiber optic cables are likely to enter the trans-oceanic video and audio market; and
- COMSAT faces effective competition from the threat of entry of new trans-oceanic telecommunications facilities.

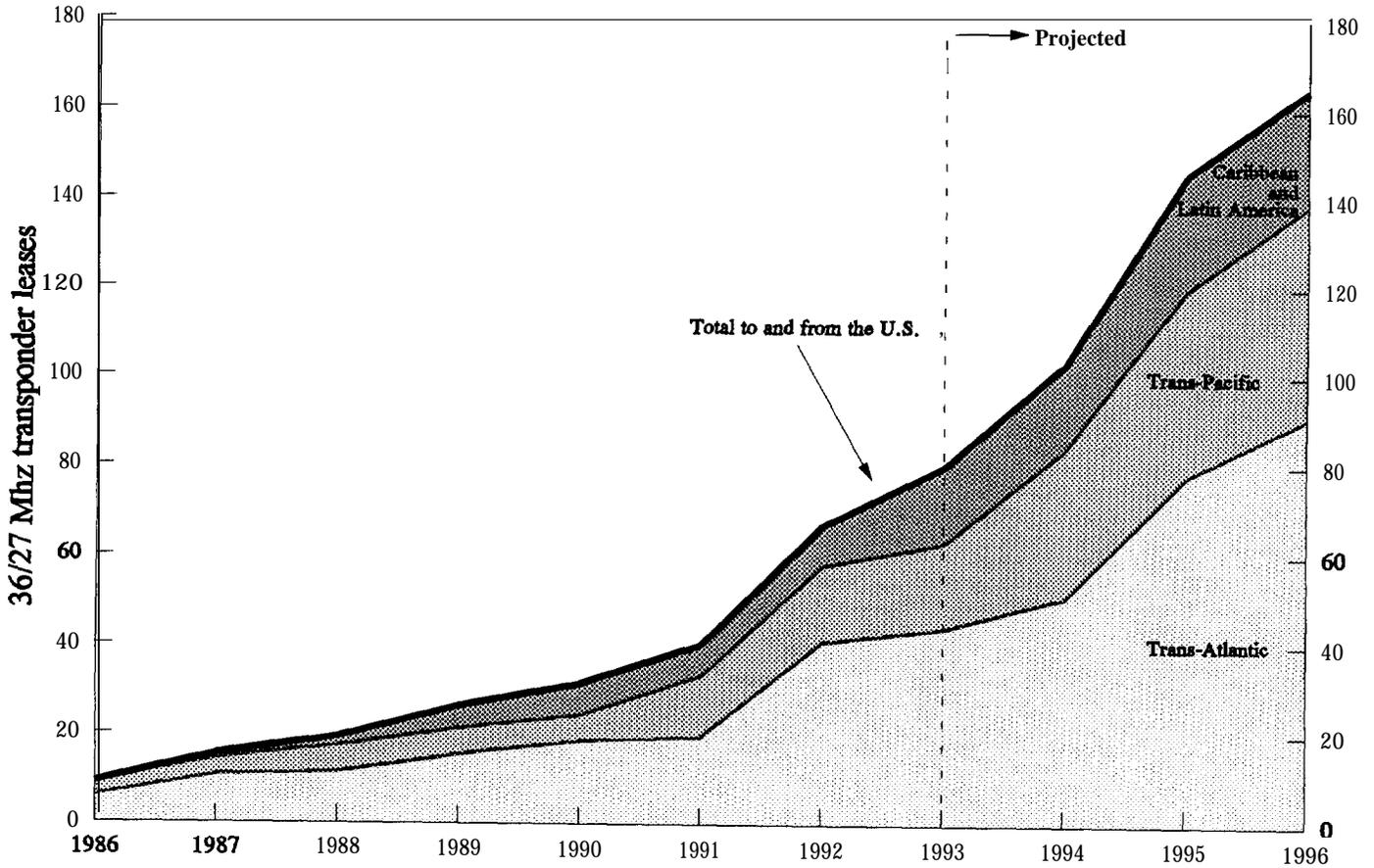
Because customers of trans-oceanic video and audio service are not fully vertically integrated, market shares for video and audio service could be estimated both in terms of utilized capacity and revenues. With the traffic and revenue forecasts provided by COMSAT and capacity utilization forecasts from other publicly available data, it was also possible to project market shares through 1996. These projections quantify to some extent the current degree of competition for the pre-subscription of planned facilities.

COMSAT'S MARKET SHARE IN UTILIZED CAPACITY FOR VIDEO AND AUDIO SERVICES

Figure 11 (on page 67) shows the rapid growth in facility use for video and audio services. By 1996, the market will have grown eighteen-fold from 1986 levels. This record of growth does not reflect the additional gain in effective utilization that customers of video and audio services will realize through the application of digital compression technologies.

COMSAT's utilized capacity for video and audio services is projected to grow as shown in **Figure 12** (on page 68). The figure also shows that competing separate satellite systems are rapidly gaining market share.

Figure 11
Utilized Capacity for Trans-Oceanic Video and Audio Services
(36/27 Mhz-equivalent transponder leases to and from the U.S.)



NOTES:

Does not include services on cables or on separate satellite systems other than PanAmSat or Orion 1.
 Also does not include capacity on U.S. domestic satellites available for service to the Caribbean and Latin America.
 See Chapter V for a further discussion of data sources and assumptions.

Source: Exhibit HSH-6.1