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October 7, 1997

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

IB Docket No. 97-95, RM-8811;
ET Docket No. 94-124, RM-8308, RM-8784;
ET Docket No. 95-183, RM-8553.
EX PARTE PRESENTATION

Dear Mr. Caton:

Enclosed on behalf of Hughes Communications, Inc. (HCI) is an ex parte presentation that was delivered today to the Commission representatives identified therein in connection with the above-referenced proceedings. Two copies of this letter (and the HCI applications referenced therein) are included for each of the three docket proceedings referenced above.

Respectfully submitted,

John P. Janka
Arthur S. Landerholm

No. of Copies rec'd 0+5
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October 7, 1997

William F. Caton
Acting Secretary
Federal Communications Commission
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IB Docket No 97-95, RM-8811;
ET Docket No. 94-124, RM-8308, RM-8784;
ET Docket No. 95-183, RM-8553;
Hughes Communications, Inc., File No. 90-SAT-P/LA-97(A) & 119 through 127-SAT-P/LA-97;
Hughes Communications, Inc., File No. 148 through 151-SAT-P/LA-97;
Hughes Communications, Inc., File No. 157/158-SAT-P/LA-97 &159-SAT-P/LA-97(20).
EX PARTE PRESENTATION

Dear Mr. Caton:

In connection with the current satellite processing rounds, Hughes Communications, Inc. (HCI) has filed the applications referenced above for three new satellite systems that will operate in the 36.0-51.4 GHz band (the "V band"). These applications represent the focus by HCI to serve the telecommunications needs of the future in a part of the radio frequency band that has been unutilized for commercial satellite services to date.

In its pleadings in the docket proceedings referenced above, HCI urged the Commission, in developing a band plan for the V band, to take into account the satellite system proposals that are submitted in the current V band processing round. HCI also noted that the V band presents a unique opportunity to accommodate the future spectrum needs of the next generation of Fixed Satellite Service (FSS), Broadcasting Satellite Service (BSS) and Mobile

Satellite Service (MSS) systems, and urged the Commission to provide more than 2 GHz of bandwidth for satellite systems in these bands. The three applications submitted by HCI represent ways in which all of these important services can be provided at V band. Moreover, these HCI systems, which use a total of 4.1 GHz of V band spectrum in each direction (uplink and downlink), demonstrate why the amount of bandwidth that the Commission has proposed to make available for satellite services is inadequate. The Commission's current proposal simply will not support the provision of all of the satellite services proposed by HCI and others at a level that would allow the development of economically viable businesses in the future.

The HCI V band systems represent a gigantic leap forward in technology, as they offer capacity on the order of ten times that of current satellite systems, in order to meet the growing demand for digital capacity in the areas of low cost multi-media distribution, interactive mobile services, and high-data-rate trunking. While each of these three systems uses many of the same technological advances that will open the V band to commercial satellite use, the systems are complementary and each serves a decidedly different segment of the broad information and communications markets. These three systems are:

SpaceCast: An international multimedia satellite system;
StarLynx: A global mobile satellite system; and
Expressway: A global telecommunications fixed satellite system;

As each of these three systems proposes to use frequency bands that are the subject of the proceedings referenced above, HCI is submitting into the record of the docket proceedings referenced above a copy of each of these applications, as well as the following brief description of these systems and their spectrum requirements.

SPACECAST

SpaceCast is a geostationary orbit (GSO) satellite system offering innovative and affordable video and multimedia broadcast, and point-to-multipoint, services in the United States and internationally. Specifically, SpaceCast meets the growing need to offer bandwidth-intensive video and multimedia applications to businesses and homes that can be tailored to the specific needs of the end users. SpaceCast is intended to provide primarily one-way, receive-only service.

The SpaceCast system will be comprised of six satellites at four orbital positions that are interlinked by optical (laser) intersatellite links and that provide communications at both V band and Ku band. V band communications will utilize the 47.2 to 50.2 GHz (Earth-to-space) and 39.5 to 42.5 GHz (space-to-Earth) bands. The Ku band service links will utilize 500 MHz of uplink and downlink spectrum, with the precise bands depending on spectrum availability at each SpaceCast orbital position. Through spot beam technology and dual polarization, each satellite will maximize use of this spectrum by reusing it up to forty times at V band and up to eight times at Ku band.

SpaceCast serves the growing number of businesses and institutions who require the capability to distribute video and multimedia content to a diverse clientele. These businesses range from the emerging digital-age broadcasters to today's more established video content distributors. SpaceCast will offer these entities service at a wide range of transmission rates, from multiplexed 384 Kbps (used for compressed video) to 155 Mbps (for high speed, high capacity applications, such as high-resolution video cache services), and a wide variety of data rates in between. Each satellite in the system will provide the capacity equivalent of up to 166,000 channels of 384 Kbps compressed video (approximately 60 Gbps per satellite); the total global capacity of the SpaceCast system is nearly one million video channels.

The innovative SpaceCast system design, which enables the use of small beam sizes and very small receive antennas, allows a content distributor to uplink from a small, 2.5 meter antenna at any location, even the most remote, and to downlink to a variable sized coverage area that best suits its needs, whether to an individual city, a larger geographic area, the entire contiguous U.S., or beyond. This variable coverage area capability allows a broadcaster to tailor the reach of its signal to the nature of its content and its intended audience. The small uplink dish will make satellite broadcasting less expensive and more accessible, thereby allowing many new broadcasters, small and large alike, to utilize satellite technology for video and multimedia content distribution. The ability to use a range of small receive-only antennas, from 45 cm (18 inches) to 1 meter (39 inches), ensures that SpaceCast user equipment will be both affordable and easily installable in a wide range of locations.

STARLYNX

StarLynx is global system consisting of both GSO and medium Earth orbit (MEO) spacecraft that will offer a unique mix of wideband mobile and portable satellite communications services in a manner never before proposed. Specifically, StarLynx offers two-way, broadband service to small user terminals for use in conjunction with personal computers and other portable electronic devices, as well as to mobile terminals mounted on vehicles.

The StarLynx system will be comprised of four satellites at two GSO orbital positions and twenty satellites in MEO orbit, connected by laser (optical) intersatellite links. Communications services will be provided in the V band at 37.5-38.6 GHz for space-to-Earth transmissions and in 1.1 GHz of contiguous spectrum between 45.5-46.7 GHz for Earth-to-space transmissions. Through the use of spot beam technology, dual polarization, and CDMA, the system will reuse this spectrum ten times per satellite. The hybrid GSO/NGSO nature of the system facilitates co-frequency sharing with both GSO systems and other NGSO systems.

The StarLynx system will serve the rapidly increasing number of people who require voice and high-rate, interactive data services at any time and at any location. Using either the portable or mobile devices, users will be able to stay connected to a wide variety of networks, including the Internet, wide and local area networks, remote computers, asynchronous transfer mode networks, and the public switched telephone network. Service to portable user terminals (that are stationary when they transmit and receive) will use a small, flat antenna (approximately 30 x 30 cm or 11.8 x 11.8 inches) that will support data rates up to 2 Mbps. These antennas will be integrated with electronics and will work in conjunction with notebook and desktop computers, personal digital assistants, electronic planners, and other devices that would otherwise require a wired modem connection for data and voice communications. Service to mobile user terminals (that transmit and receive while in motion) will utilize somewhat larger (approximately 60 x 60 cm or 23.6 x 23.6 inches) antennas that will support data rates up to 8 Mbps. These conformal antennas will be mounted onto vehicles, including automobiles, trucks, trains, ships, and airplanes.

In short, StarLynx, which offers mobile satellite services seamlessly integrated with fixed satellite services, is an innovative system that efficiently utilizes the available spectrum for a combination of mobile and portable uses and that greatly expands the range of satellite services to be offered at V band.

EXPRESSWAY

Expressway is a GSO fixed satellite system offering a wide range of very high data rate, symmetrical, two-way switched circuits throughout the world. Fundamentally, this system is configured to provide affordable, high-capacity service to business users at rates of T1 (1.544 Mbps) to OC-3 (155 Mbps) and beyond. The system offers connections to the terrestrial infrastructure as well as high-capacity communications capabilities at fixed locations that are isolated from present or planned terrestrial systems. The use of ultra-wide bandwidth and on-board processors (which avoid the need for dedicated channels) greatly reduces the cost of service.

Expressway will be comprised of fourteen satellites at ten orbital positions around the world, that are interlinked by optical (laser) intersatellite links, and that provide communications at both V band and Ku band. V band communications will take place in the 47.2 to 50.2 GHz (Earth-to-space) and 39.5 to 42.5 GHz (space-to-Earth) bands. The Ku band service links will utilize 500 MHz of uplink and downlink spectrum, with the precise bands depending on spectrum availability at each Expressway orbital location.

Expressway supports the burgeoning demand for wideband telecommunications by offering a full range of fixed-satellite services, individually tailored to the needs of customers. Two-way service will be provided through 2.5 meter antennas. Each of the satellites in the system will provide the capacity equivalent of 42,000 simultaneous T1 circuits; the total global capacity of the Expressway system is 588,000 T1 circuits

By providing highly reliable, quickly set-up, high capacity links and by offering affordable "first and last mile" high capacity service, Expressway provides an attractive alternative to customers who seek to avoid the installation delay and costs associated with terrestrial based systems. The Expressway system also offers users affordable, high-rate data service and the ability to obtain high capacity communications services in locations that are remote from present or planned terrestrial cable, fiber, and wireless systems. The distance insensitivity of satellite-based service will permit this broadband capability to be provided at much lower cost than currently is possible. In short, the system is a high-speed network that allows virtually universal access.

Finally, please note that the restated Expressway application supersedes in its entirety the Expressway application originally submitted on July 14, 1997. While the architecture of the Expressway system remains essentially the same, HCI has made a number of minor refinements that are reflected in this amendment. For the convenience of the reader, all changes are incorporated in this restated version.

* * *

HCI would be pleased to provide the Commission with any additional information it may require with respect to these systems in connection with the above-referenced rulemaking proceedings. Copies of this letter and the three HCI applications are simultaneously being provided to the Commission representatives identified below. Please contact one of us if you have any questions.

Respectfully submitted,

Gary M. Epstein
John P. Janka
Arthur S. Landerholm

cc:

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Kathleen Campbell
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Fred Thomas
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Steve Weingarten
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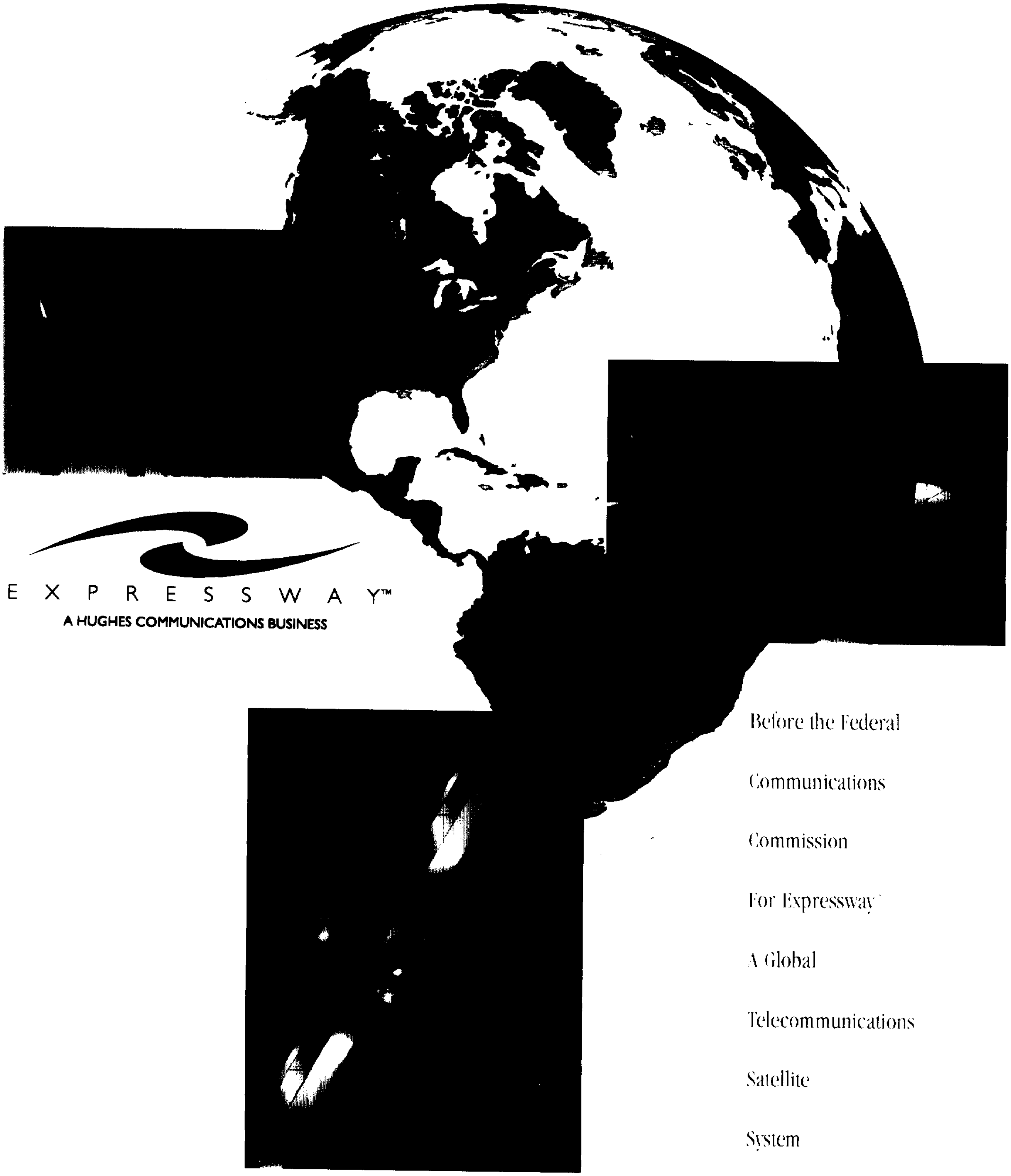
AMENDED AND RESTATED



EXPRESSWAY™

A HUGHES COMMUNICATIONS BUSINESS

Before the Federal Communications Commission For Expressway™ A Global Telecommunications Satellite System

HUGHES COMMUNICATIONS

A HUGHES ELECTRONICS COMPANY

We Make Ideas Happen®

Amended and Restated Application of

HUGHES COMMUNICATIONS, INC.

September 1997

Before the
Federal Communications Commission

for

Expressway™

A Global Telecommunications Satellite System

HUGHES
COMMUNICATIONS

Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

Amended and Restated Application of

HUGHES COMMUNICATIONS, INC.

for

Authority to Launch and Operate

EXPRESSWAY™

A Global Telecommunications Satellite System

September 1997

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President
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Table of Contents

Illustrations

Tables

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

In the Matter of the Application of	)	
HUGHES COMMUNICATIONS, INC.	)	
For Authority to Launch and Operate Expressway™, a global telecommunications satellite system	)	File No:

Pursuant to §§ 308 and 309 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308 and 309, Hughes Communications, Inc. (HCI), an indirect wholly-owned subsidiary of Hughes Electronics Corporation, hereby requests authority to launch and operate Expressway™, a geostationary orbit (GSO) global satellite system offering a wide range of very high data rate circuit switched services at V-band and Ku-band in the Fixed-Satellite Service (FSS). Expressway™ will be comprised of 14 operational satellites at ten orbital positions interlinked via optical (laser) communications to provide service worldwide.

This amended application supersedes in its entirety the Expressway™ application originally submitted on July 14, 1997. While the architecture of the Expressway™ system remains essentially the same, HCI has made a number of minor refinements that are reflected in this amendment. For the convenience of the reader, those changes are incorporated in this amended and restated version.

The Expressway™ system will contain V-band and Ku-band service links, optical intersatellite links, and telemetry, tracking, and command (TT&C) links. V-band communications will take place in the 47.2 to 50.2 GHz (Earth-to-space) and 39.5 to 42.5 GHz (space-to-Earth) bands. Ku-band communications will take place in the FSS bands: planned, extended, and/or standard bands, or a combination of these bands, depending on spectrum availability at each orbital position. Specifically, for additional coverage, HCI seeks authorization for 500 MHz of Ku-band spectrum that is currently allocated for FSS use within the 12.75-13.25 GHz and 13.75-14.5 GHz (uplink) and 10.7-12.75 GHz (downlink) bands.

HCI acknowledges that certain portions of the Ku-band are already in use at certain of the orbital positions that HCI has proposed for Expressway. HCI expressly does not seek authority to use any portion of the Ku-band at any orbital location where that portion is unavailable. The existing use of the portions of the Ku-band at different orbital locations and differences in the allocations for these bands around the world are the reasons why HCI has specified a range of Ku-band frequencies currently allocated for the FSS of which it proposes to use 500 MHz at each orbital position.

Executive Summary

EXECUTIVE SUMMARY

Hughes Communications, Inc. (HCI) hereby requests authority to launch and operate global geostationary satellite system in the Fixed-Satellite Service (FSS) bands to be known as "Expressway™".

The Expressway™ system is a state-of-the-art 14 geostationary satellite system designed to provide high capacity, wideband satellite communications on a global basis. The system will support the burgeoning demand for telecommunications by offering a full range of services, individually tailored to the needs of customers, at data rates that range from sub-T1 through T1 (1.544 Mbps) to OC-3 (155 Mbps) and higher. By utilizing processor-based satellites located at ten orbital positions around the world and interconnecting those satellites by optical (laser) links, the Expressway™ system will offer a total capacity of 588,000 T1 circuits.

Expressway™ will both complement terrestrial communications systems and offer competitive alternatives to such systems. The system offers affordable "first and last mile" connections to the terrestrial infrastructure as well as high-capacity communications capabilities for locations that are isolated from present or planned terrestrial systems. The unique Expressway™ design exploits the inherent ability of satellites to provide service that is cost-insensitive to distance. The on-board processors facilitate the provision of "bandwidth-on-demand", which avoids the need for dedicated channels and greatly reduces the cost of service.

Expressway™ will serve the needs of both metropolitan and rural users through a highly efficient hybrid use of two different frequency bands. Three GHz of uplink and downlink bandwidth in the V-band will be maximized through an extremely efficient, high power, spot beam configuration that allows the bandwidth to be reused 40 times by each satellite. The V-band capacity will be deployed primarily to serve the needs of high data rate users, and selected spot beams can be activated in-orbit to respond to market demands. In order to meet the high capacity needs of users in "thin route" areas around the world, 500 MHz of uplink and downlink bandwidth at Ku-band will be deployed through a series of larger area beams with a frequency reuse factor of ten for each satellite.

Grant of this application will serve the public interest in several important respects. Expressway™ will provide innovative services in a part of the spectrum (V-band) that has not been utilized for commercial service to date and will use the limited spectrum resource in a highly efficient manner. Expressway™ will also advance the use of Ku-band FSS spectrum through on-board processors that allow the provision of spectrum efficient "bandwidth-on-demand" services. Thus, Expressway™ will play a vital role in both providing affordable high data rate telecommunications services in the rapidly expanding international marketplace and facilitating the continued development of the National and Global Information Infrastructures.

Expressway™ will enhance existing satellite communications, promote new and innovative two-way telecommunication services, and contribute significantly to the flow of information worldwide. Grant of this application will help maintain the position of the United States as a global leader in space and communications technology and also ensure that U.S.-based satellite providers will be able to compete effectively with other global telecommunications services well into the next century.

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Introduction

1. INTRODUCTION

1.1. General Description of System Operation and Services

The Expressway™ system is comprised of geostationary orbit (GSO) satellites, an associated earth control segment, and customer equipment. The system provides high capacity, wideband data communications service on a global basis. It addresses the expanding data communication needs of customers, including domestic and multinational corporations, by providing highly reliable, quickly set-up, high capacity links. By offering affordable "first and last mile" high capacity service with attendant short and long haul connection via satellite, Expressway™ provides an attractive alternative to customers who seek to avoid installation delay and costs associated with making connections to terrestrial based systems. The Expressway™ system offers users affordable high rate data service and additional flexibility to obtain high capacity communications services in remote locations away from present or planned terrestrial cable, fiber, and wireless systems. Figure 1.1-1 illustrates the Expressway™ system worldwide coverage. Figure 1.1-2 summarizes its key features.

The system architecture is optimized to provide maximum capacity through the efficient utilization of bandwidth, power, and satellite gain-to-temperature ratio (G/T). Higher bandwidth and satellite G/T are allocated to high traffic density areas.

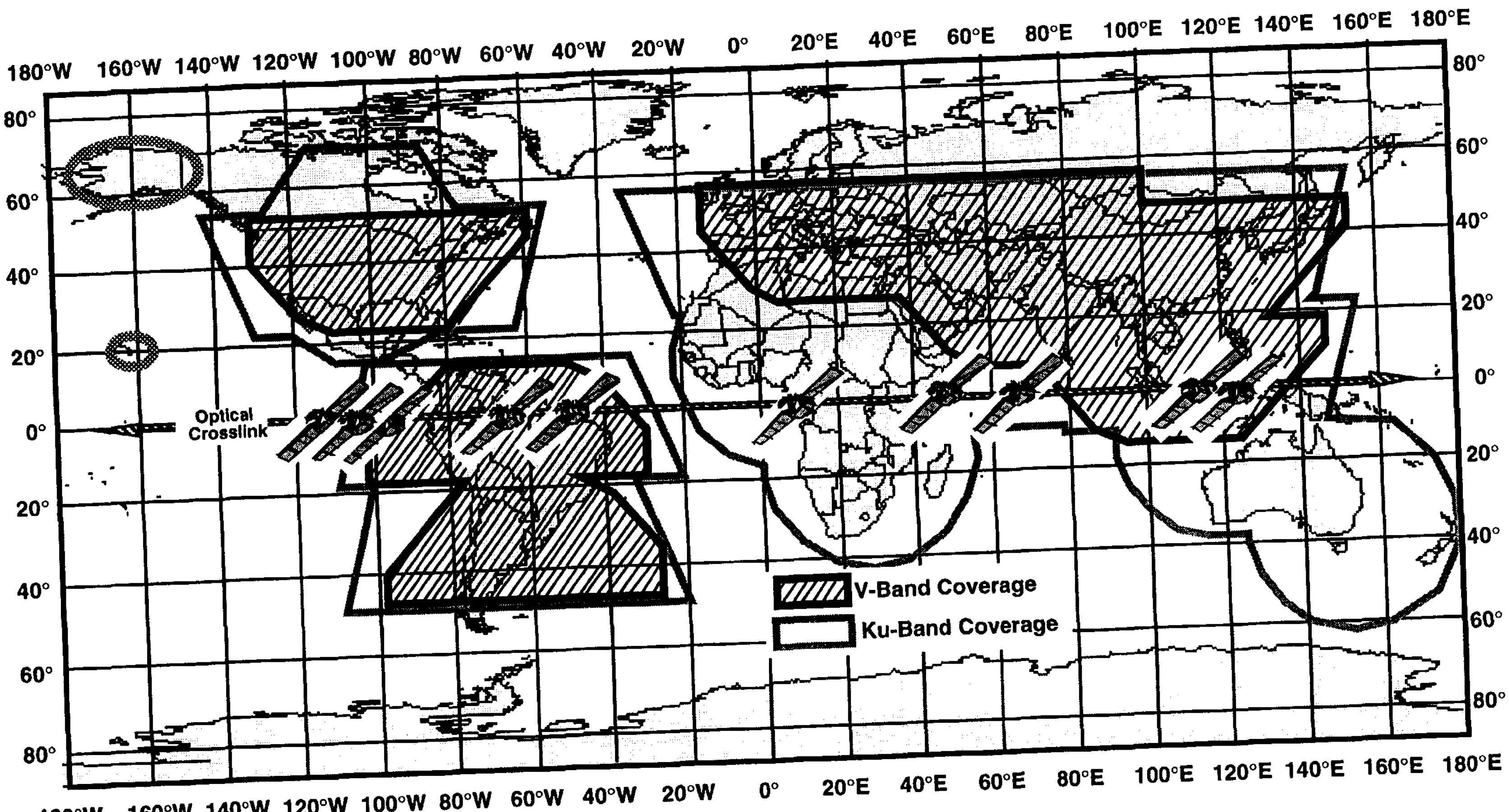

Figure 1.1-1. Expressway™ System