

C.6 Receiving System Noise Temperature

Nominal values for the SPACENET IIR receive system noise temperatures are provided below:

Narrowband (36 MHz) C-Band Transponders	550°K
Narrowband (27 MHz) Ku-Band Transponders	550°K
Wideband (54 MHz) Ku-Band Transponders	550°K

C.7 Transponder Channel Gains and Controls

The estimated transponder saturated channel gains for SPACENET IIR are provided below:

Narrowband (36 MHz) C-Band Transponders	109 dB
Narrowband (27 MHz) Ku-Band Transponders	123.5 dB
Wideband (54 MHz) Ku-Band Transponders	123.5 dB

On-orbit control of the channel gains of the above three types of transponders is achieved through the employment of ground commandable attenuators. The following defines the transponder type/bandwidth, the applicable attenuator range and the number of commandable steps/step value for each:

<u>Transponder Type/Bandwidth</u>	<u>Attenuator Range</u>	<u>No. of Steps/Value</u>
C-Band/36 MHz	12 dB	5/3 dB
Ku-Band/27 MHz	21 dB	8/3 dB
Ku-Band/54 MHz	21 dB	8/3 dB

The Ku-Band transponders will also employ limiters, switchable by ground command, to reduce the effects of uplink fade on full transponder operations. In the limiting mode, each transponder will be capable of saturation for a 15 dB range of input power levels. Each Ku-Band transponder will also employ a ground commandable linearizer in order to optimize TWTA utilization for multicarrier operations.

C.8 Receive Channel Filter Response Characteristics

SPACENET IIR's transponder receive out-of-band response is defined from the input of the receive antenna to the input of the power amplifier. The receive response of any narrowband C-Band transponder is specified to be at least 30.0 dB below the center frequency response for signals more than ± 25 MHz from center frequency and at least 35.0 dB below the center frequency response for signals more than ± 27 MHz from center frequency.

The receive response for any narrowband Ku-Band transponder is specified to be at least 30.0 dB below the center frequency response for signals more than ± 18 MHz from center frequency and at least 40.0 dB below center frequency response for signals more than ± 22 MHz from center frequency.

The receive response for any wideband Ku-Band transponder is specified to be 30.0 dB below the center frequency response for signals more than ± 38 MHz from center frequency and at least 40.0 dB below center frequency response for signals more than ± 45 MHz from center frequency.

C.9 Transmit Channel Filter Response Characteristics

The SPACENET IIR transponder transmit out-of-band response is defined from the input of the power amplifier to the output of the transmit antenna. The transmit response of any narrowband C-Band transponder is specified to be at least 8.5 dB below the frequency response for signals more than ± 25 MHz from center frequency and at least 20.0 dB below the center frequency response for signals more than ± 30 MHz from center frequency.

The transmit response for any narrowband Ku-Band transponder is specified to be at least 10.0 dB below the center frequency response for signals more than ± 17 MHz from center frequency and at least 20.0 dB below center frequency response for signals more than ± 18 MHz from center frequency.

The transmit response for any wideband Ku-Band transponder is specified to be 10.0 dB below the center frequency response for signals more than ± 34 MHz from center frequency and at least 20.0 dB below center frequency response for signals more than ± 36 MHz from center frequency.

D. Orbital Location

SPACENET IIR will replace SPACENET II, currently assigned to and operating at 69°W.L. ¹ Assignment to this location will enable continuation of service to C-Band and Ku-Band customers now using SPACENET II. However, this location will not allow the use of the satellite's capability of providing 50-state coverage, since Alaska and Hawaii are over the horizon.

E. Predicted SPACENET IIR C-Band and Ku-Band Coverage

SPACENET IIR coverage contours depicting the estimated EIRP and G/T provided from 69°W.L. are included as Figures 3 and 4 in this application. The satellite will provide simultaneous coverage of CONUS plus Puerto Rico and the Virgin Islands with all C-Band and Ku-Band transponders. This satellite is designed to provide, at a minimum, the EIRP and G/T performance depicted in Table II-19 in the general application. Functional block diagrams of the satellite communication subsystems and switching capabilities for both C and Ku-Band are provided in Section C.5 of this application.

F. Physical Characteristics of Space Station

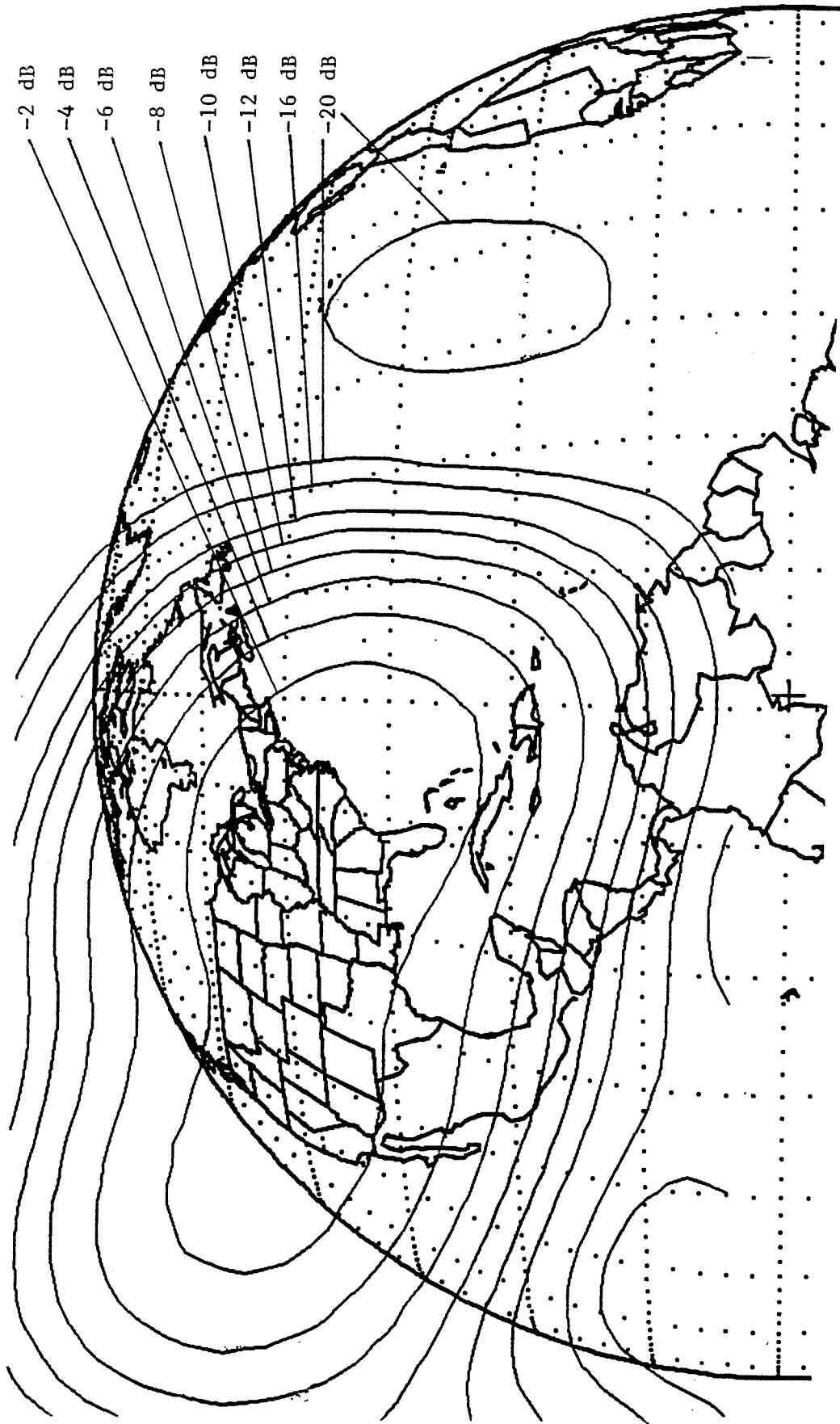
F.1 Stationkeeping Parameters

The SPACENET IIR spacecraft will be maintained within ± 0.05 degrees, in both the North-South and East-West directions, of its assigned orbital location of 69°W.L. The stationkeeping maneuvers will be performed by

¹ See, Memorandum, Opinion and Order, FCC 88-373, Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, released December 7, 1988, 3 FCC Rcd. 6972 (1988), ("1988 Orbital Assignment Plan").

Figure 3

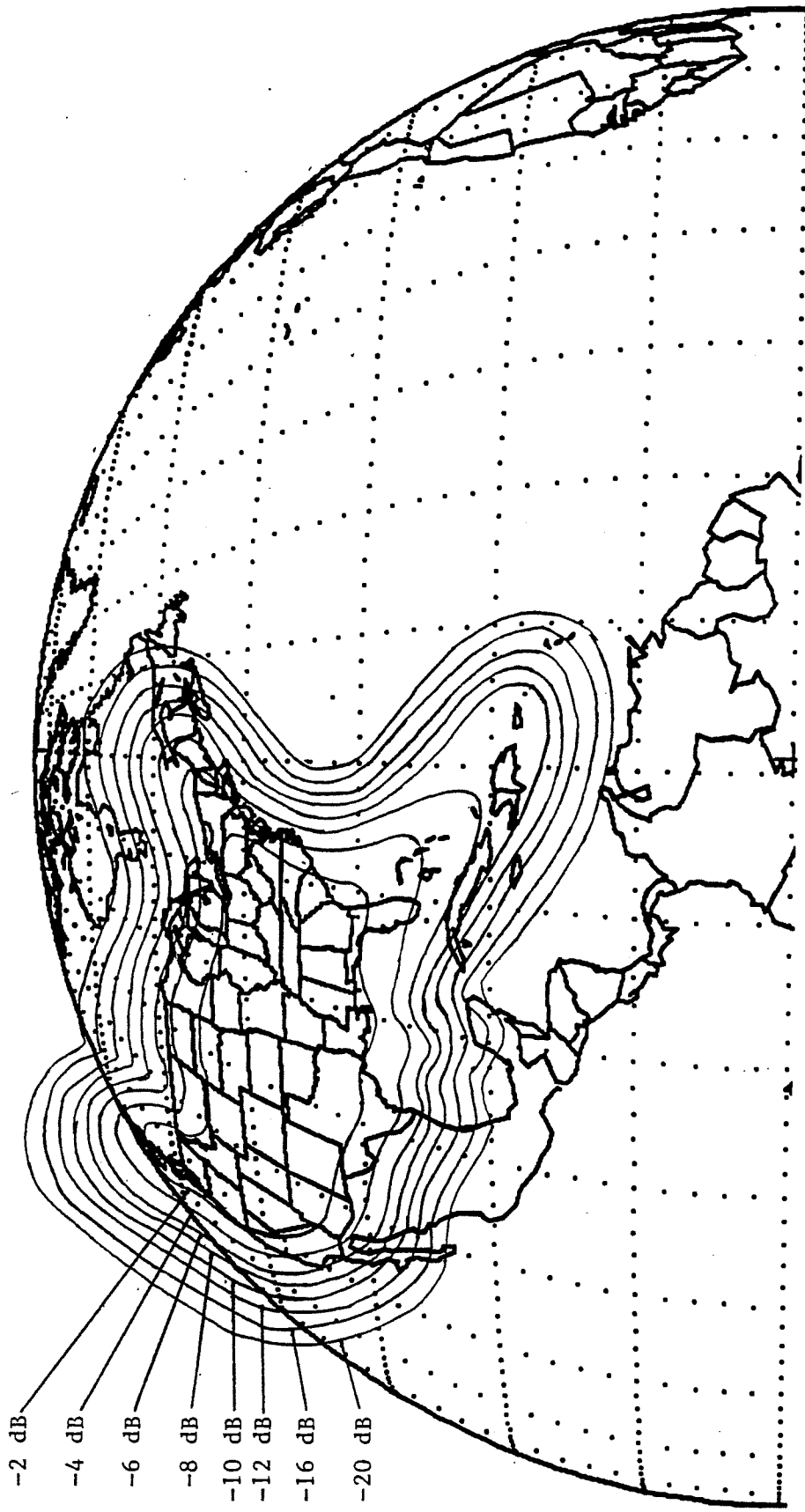
SPACENET IIR (69° WL) C-BAND COVERAGE CONTOURS



<u>Peak EIRP</u>	<u>Peak G/T</u>
38.8 dBW	2 dB/K
Minimum SFD = -91 dBW/m ²	
Tx Gain (peak) = 28.8 dB	
Rx Gain (peak) = 29.4 dB	

Figure 4

SPACENET IIR (69° WL) KU-BAND COVERAGE CONTOURS



Peak EIRP Peak G/T

47.8 dBW 6 dB/K

Minimum SFD = -97 dBW/m²

Tx Gain (peak) = 33.3 dB

Rx Gain (peak) = 33.3 dB

ground-commandable reaction control thrusters located on the North, East, and West faces of the spacecraft.

F.2 Spacecraft Antenna Pointing

The SPACENET IIR spacecraft communications antenna will be maintained within +/-0.1 degrees in both East-West (pitch) and North-South (roll) directions of its nominal boresight position during both normal spacecraft operations and stationkeeping maneuver operations.

F.3 In-Orbit Lifetime

The SPACENET IIR spacecraft will be designed for a minimum on-orbit lifetime of twelve (12) years. The spacecraft design lifetime will be ensured by a propellant supply sufficient to maintain the required stationkeeping accuracy for the specified mission life, in addition to propellant required for intermediate stage burns, transfer orbit maneuvers, and orbit injection trim.

F.4 Attitude Control Subsystem

The SPACENET IIR Attitude Control Subsystem (ACS) will provide satellite attitude control beginning with spacecraft separation from the launch vehicle and continuing through transfer to geosynchronous orbit, and will provide station acquisition and on-station attitude control. The ACS design will incorporate sun and horizon sensors, accelerometers, momentum wheels, and thrusters to perform its required functions.

F.5 Electrical Power Subsystem

The SPACENET IIR Electrical Power Subsystem (EPS) will consist of solar arrays for converting solar energy into the electrical energy required for normal operations, nickel-hydrogen batteries for supplying 100% of the required electrical energy during eclipse periods, power supply electronics for charging the batteries and limiting the maximum bus voltage, and solar array drives for rotating the solar arrays. The power output of the EPS will be

sufficient to provide the electrical power required to operate 100% of the spacecraft payload and all other subsystems for the full spacecraft design life.

G. Emission Limitations

Spurious emissions will be attenuated below the mean power output of the transponder by the following amounts.

	<u>Attenuation in any 4kHz band</u>
1) For any frequency removed from the assigned frequency by 50 to 100%	25dB
2) For any frequency removed from the assigned frequency by 100 to 250%	35dB
3) For any frequency removed from the assigned frequency by more than 250%	55 dB (C-Band) 60 dB (Ku-Band)

H. Schedule of Planned Milestone Dates

The dates which GTE Spacenet plans to follow with respect to the SPACENET IIR satellite are:

<u>Construction Commencement</u>	<u>Construction Completion</u>	<u>Expected Launch Date</u>
January 1994	January 1997	April 1997

Section 304 Waiver

As required by Section 304 of the Communications Act of 1934, as amended, GTE Spacenet waives claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction authority in accordance with this application.

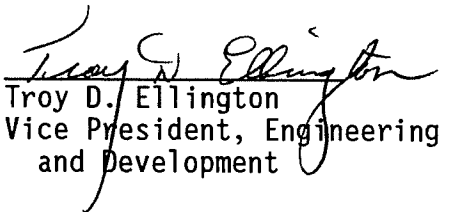
Certification

GTE Spacenet acknowledges that all of the statements in this application and in the exhibits and associated attachments are considered material representations, and that all the exhibits and attachments are a material part hereof, and are incorporated herein as if set out in full in this application.

The undersigned certifies individually and for GTE Spacenet that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

Wherefore, GTE Spacenet requests that the Commission authorize the construction of SPACENET IIR in accordance with this application.

Respectfully submitted,
GTE SPACENET CORPORATION

By: 
Troy D. Ellington
Vice President, Engineering
and Development

September 27, 1990

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

In the Matter of the Application of)
GTE SPACENET CORPORATION) File Nos.
For Authority To Construct)
A GSTAR Replacement Satellite)
in the Domestic Fixed-Satellite)
Service (GSTAR IIR))

APPLICATION

GTE Spacenet Corporation ("GTE Spacenet") pursuant to Sections 308, 309 and 319 of the Communications Act of 1934, as amended, 47 C.F.R. § 301 et. seq. hereby requests Commission authority to construct one replacement Ku-Band GSTAR IIR satellite.

A. Name/Address of Applicant

GTE Spacenet Corporation
1700 Old Meadow Road
McLean, Virginia 22102

B. Correspondence

Inquiries or correspondence regarding this application should be directed to either:

Troy D. Ellington
Vice President, Engineering
and Development
1700 Old Meadow Road
McLean, Virginia 22102
(703) 848-1400

Terri B. Natoli
Industry Relations Manager
1700 Old Meadow Road
McLean, Virginia 22102
(703) 848-1515

C. General Technical Information

C.1 Transponder Frequency and Polarization Plan

The GSTAR II Replacement will transmit (downlink) and receive (uplink) within the two 500 MHz-wide Ku-Band frequency bands defined by 11700 MHz to 12200 MHz and 14000 MHz to 14500 MHz respectively. GSTAR IIR will contain sixteen (16) narrowband (27 MHz) Ku-Band transponders and eight (8) wideband (54 MHz) transponders employing orthogonal linear polarization with full (two times) frequency re-use. Eight (8) of the narrowband and four (4) of the wideband transponders will employ vertical polarization for receive (uplink) and horizontal polarization for transmit (downlink). The remaining eight (8) narrowband and four (4) of the wideband transponders will employ horizontal polarization for receive (uplink) and vertical polarization for transmit (downlink). Each 54 MHz transponder will also be switchable by ground command to two 27 MHz transponders. The frequency plan for the GSTAR IIR Ku-Band transponders is depicted in Figure II-3 and II-4 of the general application.

C.2 TT&C Frequencies and Polarization

GSTAR IIR will receive Ku-Band uplink commands at a nominal frequency of 14001.5 MHz with horizontal polarization, the same as the current GSTAR system. The two Ku-Band telemetry downlinks will have nominal frequencies of 11702 MHz and 12198 MHz with vertical and horizontal polarizations respectively.

The uplink command will be encrypted to provide the necessary command system security.

C.3 Emission Designators

The emission types used by the transponders and the TT&C units are provided below:

Ku-Band:	36MOF4F	Single Carrier FM/TV
	24MOF4F	Dual Carrier FM/TV
	36MOG7D	Wideband Digital TDMA
	1MOOG7D	Digital SCPC (T1)

	41K6G7D	Broadcast Data
	83K2G7D	Digital Data
	25K0F3E	Analog SCPC
TT&C:	2K00G1D	Telemetry
	60K0G2D	Command

C.4 Final Amplifier Output Power

GSTAR IIR will have a Ku-Band traveling wave tube amplifier (TWTA) output power of 75 watts (regardless of whether the channel bandwidth is 27 MHz or 54 MHz) with an estimated net loss of less than 3 dB between the output of the TWTA and the antenna input.

C.5 Antenna Beam Configurations

All of the Ku-Band transponders and TT&C equipment will provide fifty (50) state coverage plus coverage of Puerto Rico and the Virgin Islands. The block diagram in Figure 1 illustrates the GSTAR IIR narrowband and wideband communications subsystem.

C.6 Receiving System Noise Temperature

Nominal values for the GSTAR IIR receive system noise temperatures are provided below:

Narrowband (27 MHz) Ku-Band Transponders	550°K
Wideband (54 MHz) Ku-Band Transponders	550°K

C.7 Transponder Channel Gains and Controls

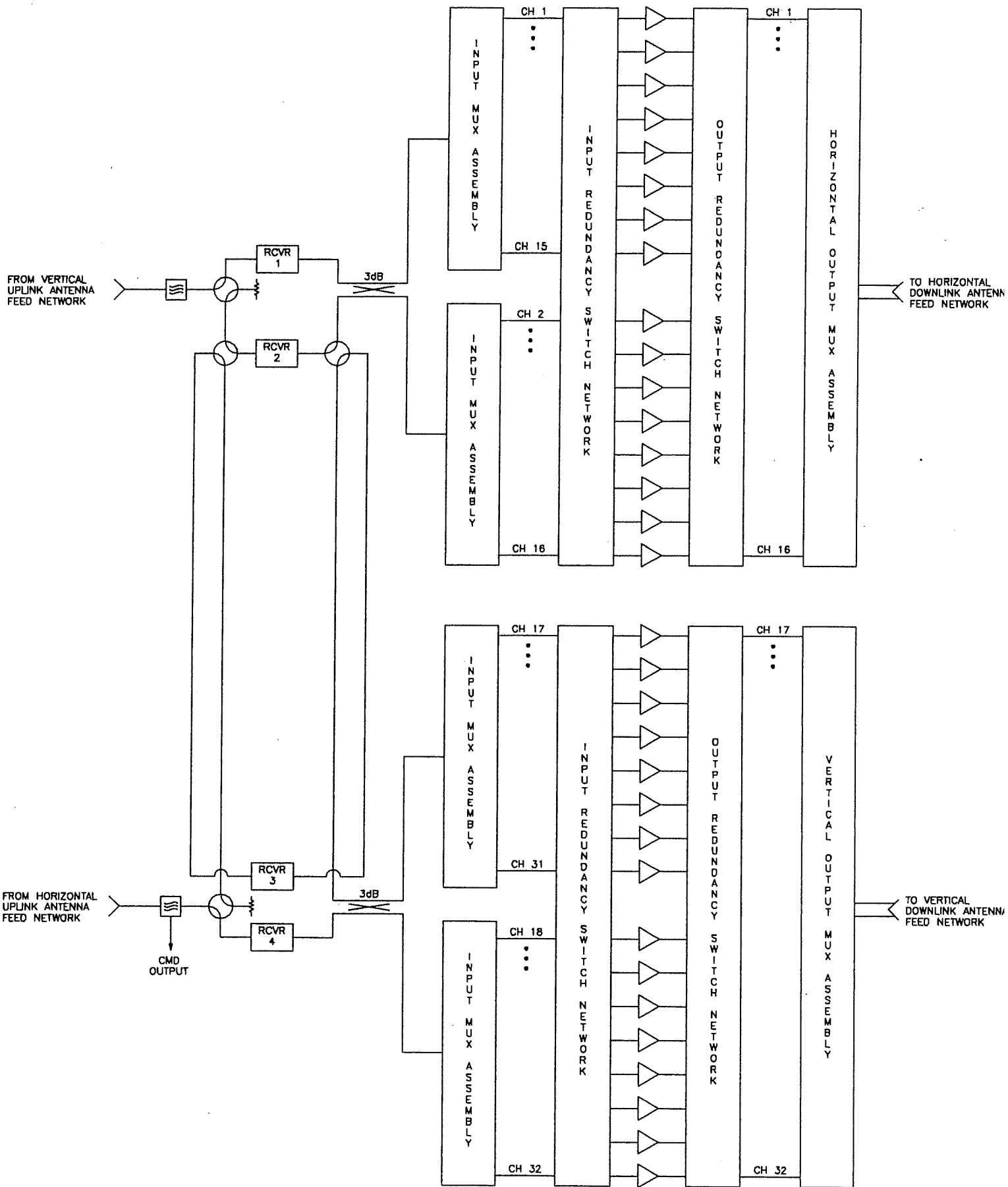
The estimated transponder saturated channel gains for GSTAR IIR are provided below:

Narrowband (27 MHz) Ku-Band Transponders	125 dB
Wideband (54 MHz) Ku-Band Transponders	125 dB

On-orbit control of the channel gains of the above two types of transponders is achieved through the employment of ground commandable attenuators. The following defines the transponder type/bandwidth, the

GSTAR Ku-Band Communications Subsystem Block Diagram

Figure 1



applicable attenuator range and the number of commandable steps/step value for both:

<u>Transponder Type/Bandwidth</u>	<u>Attenuator Range</u>	<u>No. of Steps/Value</u>
Ku-Band/27 MHz	21 dB	8/3 dB
Ku-Band/54 MHz	21 dB	8/3 dB

All transponders will also employ limiters, switchable by ground command, to reduce the effects of uplink fade on full transponder operations. In the limiting mode, each transponders will be capable of saturation for a 15 dB range of input power levels. Each Ku-Band transponder will also employ a ground commandable linearizer in order to optimize TWTA utilization for multicarrier operations.

C.8 Receive Channel Filter Response Characteristics

The GSTAR IIR transponder receive out-of-band response is defined from the input of the receive antenna to the input of the power amplifier. The receive response of any narrowband Ku-Band transponder is specified to be at least 30.0 dB below the center frequency response for signals more than ± 18 MHz from center frequency and at least 40.0 dB below the center frequency response for signals more than ± 22 MHz from center frequency.

The receive response for any wideband Ku-Band transponder is specified to be 30.0 dB below the center frequency response for signals more than ± 38 MHz from center frequency and at least 40.0 dB below center frequency response for signals more than ± 45 MHz from center frequency.

C.9 Transmit Channel Filter Response Characteristics

The GSTAR IIR transponder transmit out-of-band response is defined from the input of the power amplifier to the output of the transmit antenna. The transmit response of any narrowband Ku-Band transponder is specified to be at least 3.0 dB below the center frequency response for signals more than ± 18.5 MHz from center frequency, at least 8.5 dB below center frequency response for signals more than ± 20 MHz from center frequency, and at least 20.0 dB below center frequency response for signals more than ± 22 MHz from center frequency.

The transmit response of any wideband Ku-Band transponder is specified to be 10.0 dB below the center frequency response for signals more than ± 34 MHz from center frequency and at least 20.0 dB below center frequency response for signals more than ± 36 MHz from center frequency.

D. Orbital Location

GSTAR IIR will replace the existing GSTAR II spacecraft assigned to and operating at 105°W.L.¹ Assignment of GSTAR IIR to this location will allow continuous, uninterrupted service for Ku-Band users of GSTAR II.

E. Predicted GSTAR IIR Ku-Band Coverage

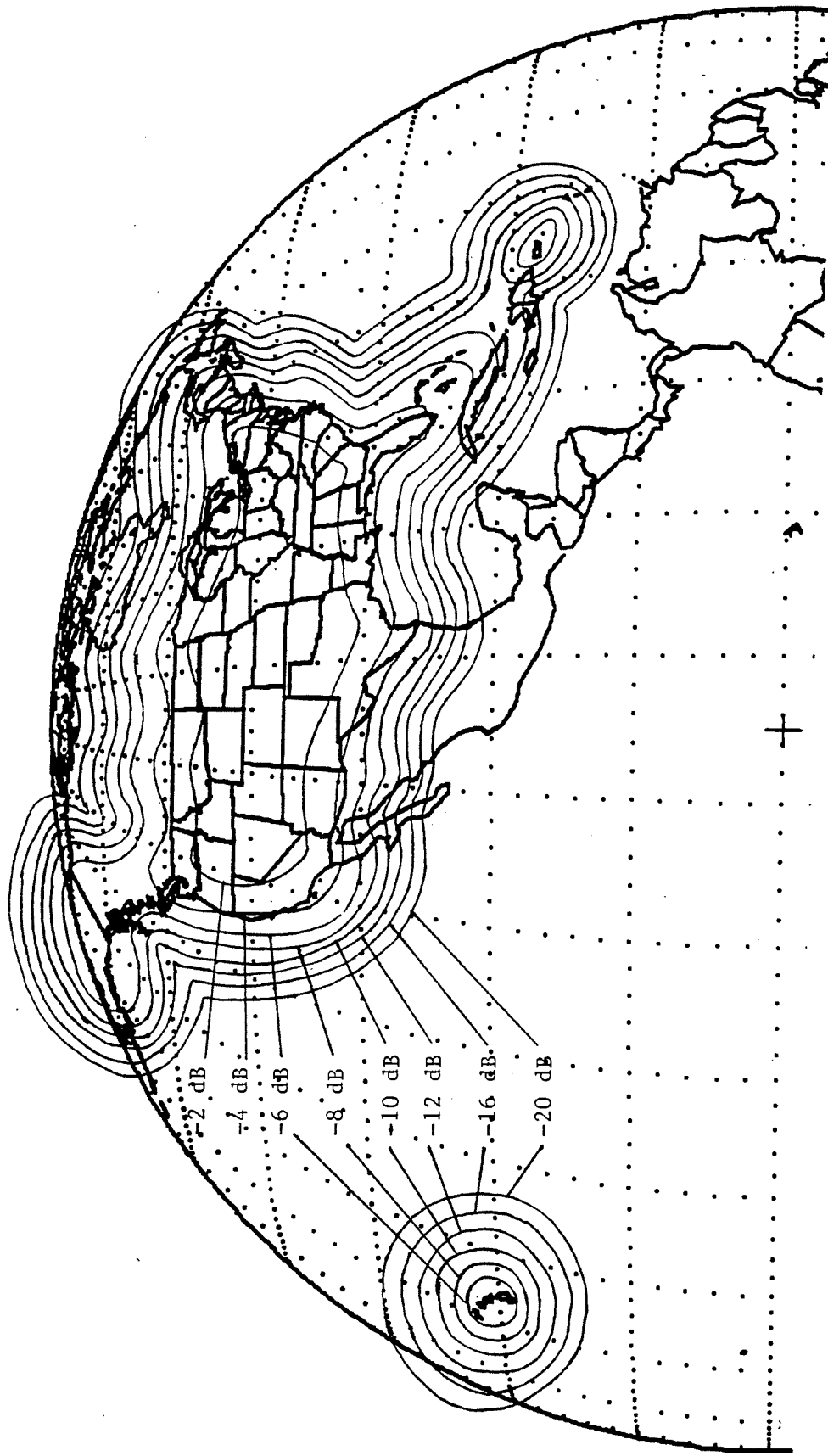
GSTAR IIR coverage contours depicting the estimated EIRP and G/T provided from 105°W.L. are included as Figure 2 in this application. All of the Ku-Band transponders will provide 50 state coverage plus Puerto Rico and the Virgin Islands. GSTAR IIR is designed to provide, at a minimum, the EIRP and G/T performance depicted in Table II-20 of the general application.

A functional block diagram of the satellite communication subsystem and switching capabilities is provided in Section C.5 of this application.

¹ See, Memorandum, Opinion and Order, FCC 88-373, Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, released December 7, 1988, 3 FCC Rcd. 6972 (1988), ("1988 Orbital Assignment Plan").

Figure 2

GSTAR IIR (105°WL) COVERAGE CONTOURS



<u>Peak EIRP</u>	<u>Peak G/T</u>
49.1 dBW	6 dB/K
Minimum SFD = -97 dBW/m ²	
Tx Gain (peak) = 33.3 dB	
Rx Gain (peak) = 33.3 dB	

F. Physical Characteristics of Space Station

F.1 Stationkeeping Parameters

The GSTAR IIR spacecraft will be maintained within +/-0.05 degrees, in both the North-South and East-West directions, of its assigned orbital location of 105°W.L. The stationkeeping maneuvers will be performed by ground-commandable reaction control thrusters located on the North, East, and West faces of the spacecraft.

F.2 Spacecraft Antenna Pointing

The GSTAR IIR spacecraft communications antenna will be maintained within +/-0.1 degrees in both East-West (pitch) and North-South (roll) directions of its nominal boresight position during both normal spacecraft operations and stationkeeping maneuver operations.

F.3 In-Orbit Lifetime

The GSTAR IIR spacecraft will be designed for a minimum on-orbit lifetime of twelve (12) years. The spacecraft design lifetime will be ensured by a propellant supply sufficient to maintain the required stationkeeping accuracy for the specified mission life, in addition to propellant required for intermediate stage burns, transfer orbit maneuvers, and orbit injection trim.

F.4 Attitude Control Subsystem

The GSTAR IIR Attitude Control Subsystem (ACS) will provide satellite attitude control beginning with spacecraft separation from the launch vehicle and continuing through transfer to geosynchronous orbit, and will provide station acquisition and on-station attitude control. The ACS design will incorporate sun and horizon sensors, accelerometers, momentum wheels, and thrusters to perform its required functions.

F.5 Electrical Power Subsystem

The GSTAR IIR Electrical Power Subsystem (EPS) will consist of solar

arrays for converting solar energy into the electrical energy required for normal operations, nickel-hydrogen batteries for supplying 100% of the required electrical energy during exlipse periods, power supply electronics for charging the batteries and limiting the maximum bus voltage, and solar array drives for rotating the solar arrays. The power output of the EPS will be sufficient to provide the electrical power required to operate 100% of the spacecraft payload and all other subsystems for the full spacecraft design life.

G. Emission Limitations

Spurious emissions will be attenuated below the mean power output of the transponder by the following amounts.

	<u>Attenuation in any 4kHz band</u>
1) For any frequency removed from the assigned frequency by 50 to 100%	25dB
2) For any frequency removed from the assigned frequency by 100 to 250%	35dB
3) For any frequency removed from the assigned frequency by more than 250%	60 dB

H. Schedule of Planned Milestone Dates

The dates which GTE Spacenet plans to follow with respect to the GSTAR IIR satellite is:

<u>Construction Commencement</u>	<u>Construction Completion</u>	<u>Expected Launch Date</u>
December 1991	October 1994	December 1994

Section 304 Waiver

As required by Section 304 of the Communications Act of 1934, as amended, GTE Spacenet waives claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction authority in accordance with this application.

Certification

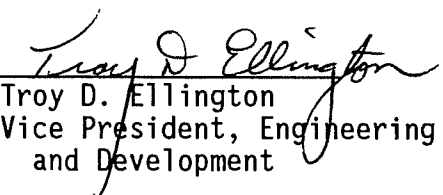
GTE Spacenet acknowledges that all of the statements in this application and in the exhibits and associated attachments are considered material representations, and that all the exhibits and attachments are a material part hereof, and are incorporated herein as if set out in full in this application.

The undersigned certifies individually and for GTE Spacenet that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

Wherefore, GTE Spacenet requests that the Commission authorize the construction of GSTAR IIR in accordance with this application.

Respectfully submitted,

GTE SPACENET CORPORATION

By: 
Troy D. Ellington
Vice President, Engineering
and Development

September 27, 1990

CERTIFICATION

GTE Spacenet acknowledges that all of the statements in these applications, associated attachments and exhibits are considered material representations, and that all the exhibits, figures and tables are a material part hereof, and are incorporated herein as it set out in full in this application.

The undersigned certifies individually and for GTE Spacenet that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

By:

Troy D. Ellington
Troy D. Ellington
Vice President, Engineering
and Development

GTE Spacenet Corporation
1700 Old Meadow Road
McLean, Virginia 22102

Dated this 27th day of September, 1990.

Barbara K. Petersen
Notary Public

My Commission Expires:

March 24, 1992

CERTIFICATION OF PERSON RESPONSIBLE
FOR PREPARING ENGINEERING INFORMATION
CONTAINED IN THIS APPLICATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application and the exhibits attached hereto; that I am familiar with Part 25 of the Commission's Rules and Appendix B to the 1983 Orbital Assignment Order; that I have either prepared or reviewed the engineering information contained in this application and the exhibits attached hereto; and that it is complete and accurate to the best of my knowledge.

By: *Sidney Skjei*
Sidney Skjei
Director, Engineering

GTE Spacenet Corporation
1700 Old Meadow Road
McLean, Virginia 22102

Dated this 27th day of September, 1990.

Barbara K. Petersen
Notary Public

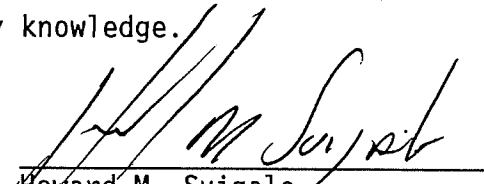
My Commission Expires:

March 24, 1992

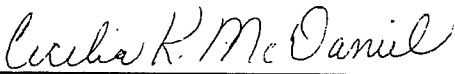
CERTIFICATION OF PERSON RESPONSIBLE
FOR PREPARING FINANCIAL INFORMATION
CONTAINED IN THIS APPLICATION

I hereby certify that I am the qualified person responsible for preparation of the financial information contained in this Application; that I am familiar with the financial requirements of Appendix B to the 1983 Orbital Processing Order; that I have either prepared or reviewed the financial information contained in this application and that it is complete and accurate to the best of my knowledge.

By:


Howard M. Svigals
Vice President of Finance
GTE Spacenet Corporation
1700 Old Meadow Road
McLean, Virginia 22102

Signed and sworn before me this 27th day of September, 1990.


Notary Public

My Commission Expires:

August 10, 1992

EXHIBIT 1

PROJECTED SATELLITE UTILIZATION
 GSTAR II

	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>
54 MHz Ku-Band						
Video	10	10	10	10	10	10
Data/Voice	6	6	6	6	6	6
Protection	0	0	0	0	0	0
Total	16	16	16	16	16	16
Capacity	16	16	16	16	16	16

PROJECTED SATELLITE UTILIZATION
SPACENET IR & IIR

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
36 MHz C-Band*															
Video	0	0	24	24	30	30	30	30	30	30	30	30	30	15	15
Data/Voice	0	0	11.12	12.48	13.88	14	14	14	14	14	14	14	14	7	7
Protection	0	0	4	4	4	4	4	4	4	4	4	4	4	2	2
Total	0	0	39.12	40.48	47.88	48	48	48	48	48	48	48	48	24	24
27 MHz Ku-Band															
Video	10.1	12.81	24.02	29.68	30	30	30	30	30	30	30	30	30	15	15
Protection	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1
Total	11.1	13.81	26.02	31.68	32	32	32	32	32	32	32	32	32	16	16
54 MHz Ku-Band															
Video	2	2	4	4	4	4	4	4	4	4	4	4	4	2	2
Data/Voice	5	5	10	10	10	10	10	10	10	10	10	10	10	5	5
Protection	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1
Total	8	8	16	16	16	16	16	16	16	16	16	16	16	8	8

* - C-Band demand assumes SPACENET's I and II will be operational through 1996.

EXHIBIT 2

Exhibit 2

Annual Expenses and Revenue Requirement (\$ Millions)

<u>Expenses</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Depreciation	0.00	0.00	0.00	0.00	24.27	31.71	38.97	46.24	46.24	46.24	46.24
Operations & Administration	0.00	0.00	0.00	0.50	1.78	2.50	3.60	3.65	4.56	6.43	6.72
Total	0.00	0.00	0.00	0.50	26.05	34.20	42.57	49.89	50.80	52.67	52.96
Revenue Requirement	0.00	0.00	0.00	6.41	54.36	62.01	145.31	159.37	170.53	170.73	170.73

Annual Expenses and Revenue Requirement (\$ Millions)

<u>Expenses</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Total</u>
Depreciation	46.24	46.24	46.24	46.24	46.24	21.97	14.53	7.27	554.88
Operations & Administration	7.06	7.44	11.71	12.29	12.91	13.54	14.21	7.46	116.35
Total	53.30	53.68	57.95	58.53	59.15	35.50	28.74	14.73	671.24
Revenue Requirement	170.73	170.73	170.73	170.73	170.73	136.63	68.42	68.42	2,066.59

Exhibit 2

Annual Investment Amounts (\$ Millions)

Investment	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Satellite Construction *	5.52	33.01	75.61	94.55	23.12	5.75	6.73	2.39	2.39	2.39	2.39
Launch Services	6.00	6.50	12.50	97.63	17.88	32.88	30.13	0.00	0.00	0.00	0.00
Launch Insurance Premium	0.00	0.00	0.00	27.68	28.19	0.00	27.48	0.00	0.00	0.00	0.00
Total Investment	11.52	39.51	88.11	219.86	69.18	38.62	64.33	2.39	2.39	2.39	2.39

Annual Investment Amounts (\$ Millions)

Investment	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Total</u>
Satellite Construction *	2.39	2.39	2.39	2.39	2.39	1.24	0.81	0.20	268.04
Launch Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	203.50
Launch Insurance Premium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.34
Total Investment	2.39	2.39	2.39	2.39	2.39	1.24	0.81	0.20	554.88

* Includes incentive payments to satellite manufacturer which are contingent upon criteria specified in the contract.

EXHIBIT 3

EXHIBIT 4

provided in Section C.5 of this application.

F. Physical Characteristics of Space Station

F.1 Stationkeeping Parameters

The SPACENET IR spacecraft will be maintained within +/-0.05 degrees, in both the North-South and East-West directions, of its assigned orbital location of 103°W.L. The stationkeeping maneuvers will be performed by ground-commandable reaction control thrusters located on the North, East, and West faces of the spacecraft.

F.2 Spacecraft Antenna Pointing

The SPACENET IR spacecraft communications antenna will be maintained within +/-0.1 degrees in both East-West (pitch) and North-South (roll) directions of its nominal boresight position during both normal spacecraft operations and stationkeeping maneuver operations.

F.3 In-Orbit Lifetime

The SPACENET IR spacecraft will be designed for a minimum on-orbit lifetime of twelve (12) years. The spacecraft design lifetime will be ensured by a propellant supply sufficient to maintain the required stationkeeping accuracy for the specified mission life, in addition to propellant required for intermediate stage burns, transfer orbit maneuvers, and orbit injection trim.

F.4 Attitude Control Subsystem

The SPACENET IR Attitude Control Subsystem (ACS) will provide satellite attitude control beginning with spacecraft separation from the launch vehicle and continuing through transfer to geosynchronous orbit, and will provide station acquisition and on-station attitude control. The ACS design will incorporate sun and horizon sensors, accelerometers, momentum wheels, and thrusters to perform its required functions.

F.5 Electrical Power Subsystem

The SPACENET IR Electrical Power Subsystem (EPS) will consist of solar arrays for converting solar energy into the electrical energy required for normal operations, nickel-hydrogen batteries for supplying 100% of the required electrical energy during eclipse periods, power supply electronics for charging the batteries and limiting the maximum bus voltage, and solar array drives for rotating the solar arrays. The power output of the EPS will be sufficient to provide the electrical power required to operate 100% of the spacecraft payload and all other subsystems for the full spacecraft design life.

G. Emission Limitations

Spurious emissions will be attenuated below the mean power output of the transponder by the following amounts.

	<u>Attenuation in any 4kHz band</u>
1) For any frequency removed from the assigned frequency by 50 to 100%	25dB
2) For any frequency removed from the assigned frequency by 100 to 250%	35dB
3) For any frequency removed from the assigned frequency by more than 250%	55 dB (C-Band) 60 dB (Ku-Band)

H. Schedule of Planned Milestone Dates

The dates which GTE Spacenet plans to follow with respect to the SPACENET IR satellite are:

<u>Construction Commencement</u>	<u>Construction Completion</u>	<u>Expected Launch Date</u>
February 1992	February 1995	May 1995

Section 304 Waiver

As required by Section 304 of the Communications Act of 1934, as amended, GTE Spacenet waives claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction authority in accordance with this application.

Certification

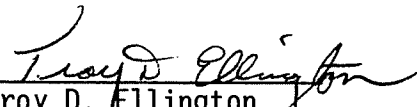
GTE Spacenet acknowledges that all of the statements in this application and in the exhibits and associated attachments are considered material representations, and that all the exhibits and attachments are a material part hereof, and are incorporated herein as if set out in full in this application.

The undersigned certifies individually and for GTE Spacenet that the statements made in this application are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

Wherefore, GTE Spacenet requests that the Commission authorize the construction of SPACENET IR in accordance with this application.

Respectfully submitted,

GTE SPACENET CORPORATION

By: 
Troy D. Ellington
Vice President, Engineering
and Development

September 27, 1990

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

In the Matter of the Application of)
GTE SPACENET CORPORATION) File Nos.
For Authority To Construct)
a SPACENET Replacement Satellite)
in the Domestic Fixed-Satellite)
Service (SPACENET IIR))

APPLICATION

GTE Spacenet Corporation ("GTE Spacenet") pursuant to Sections 308, 309 and 319 of the Communications Act of 1934, as amended, 47 C.F.R. § 301 et. seq. hereby requests Commission authority to construct one replacement hybrid C- and Ku-Band SPACENET IIR satellite.

A. Name/Address of Applicant

GTE Spacenet Corporation
1700 Old Meadow Road
McLean, Virginia 22102

B. Correspondence

Inquiries or correspondence regarding this application should be directed to either:

Troy D. Ellington
Vice President, Engineering
and Development
1700 Old Meadow Road
McLean, Virginia 22102
(703) 848-1400

Terri B. Natoli
Industry Relations Manager
1700 Old Meadow Road
McLean, Virginia 22102
(703) 848-1515

C. General Technical Information

C.1 Transponder Frequency and Polarization Plan

The proposed SPACENET II Replacement will transmit (downlink) and receive (uplink) in C-Band within the two 500 MHz-wide frequency bands defined by 3700 MHz to 4200 MHz and 5295 MHz to 6425 MHz respectively. In Ku-Band the replacement will transmit (downlink) and receive (uplink) within the two 500 MHz-wide frequency bands defined by 11700 MHz to 12200 MHz and 14000 MHz to 14500 MHz respectively. SPACENET IIR will contain twenty-four (24) narrowband (36-MHz) C-Band transponders, sixteen (16) narrowband (27 MHz) Ku-Band transponders, and eight (8) wideband (54 MHz) Ku-Band transponders employing orthogonal linear polarization with full (two times) frequency reuse in both the C-Band and the Ku-Band channels. Each 54 MHz Ku-Band transponder will also be switchable by ground command to two 27 MHz transponders. The frequency and polarization plans for SPACENET IR are provided in Figures II-1 and II-2 of the general application.

C.2 TT&C Frequencies and Polarization

The SPACENET replacement satellite will be capable of receiving uplink commands and of transmitting downlink telemetry in both C-Band and Ku-Band frequencies. The C-Band command uplink will be vertically polarized with a nominal frequency of 6423.5 MHz, the same as in the current SPACENET system. The two C-Band telemetry downlinks will have nominal frequencies of 3700.5 MHz and 4199.5 MHz with vertical and horizontal polarizations respectively, the same as in the current SPACENET system. The Ku-Band command uplink will be horizontally polarized with a nominal frequency of 14001.5 MHz, the same as in the current GSTAR system. The two Ku-Band telemetry downlinks will have nominal frequencies of 11702 MHz and 12198 MHz with vertical and horizontal polarizations respectively. The command uplinks will be encrypted to provide the necessary command system security.

C.3 Emission Designators

The emission types used by the transponders and the TT&C units are provided below:

C-Band:	36MOF4F	Single Carrier FM/TV
	36MOG7D	Wideband Digital TDMA
	1MOOG7D	Digital SCPC (T1)
	36K8F3E	Analog SCPC
Ku-Band:	36MOF4F	Single Carrier FM/TV
	24MOF4F	Dual Carrier FM/TV
	36MOG7D	Wideband Digital TDMA
	1MOOG7D	Digital SCPC (T1)
	41K6G7D	Broadcast Data
	83K2G7D	Digital Data
	25K0F3E	Analog SCPC
TT&C:	2K00G1D	Telemetry
	60K0G2D	Command

C.4 Final Amplifier Output Power

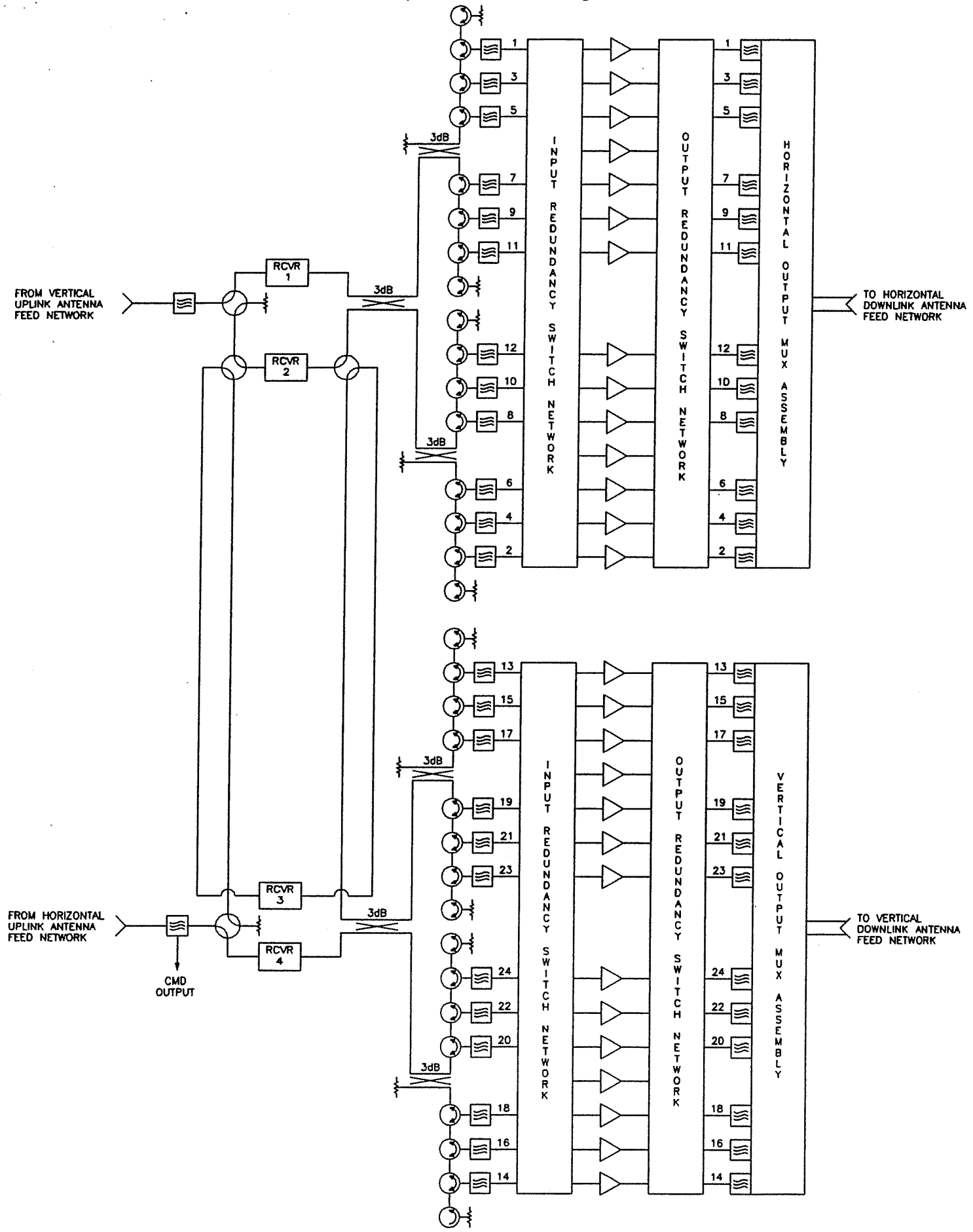
SPACENET IIR will have a C-Band high power amplifier output power of 16 watts with an estimated net loss of less than 2 dB between the output of the amplifier and the antenna input. The Ku-Band traveling wave tube amplifier (TWTA) output power is 50 watts (regardless of whether the channel bandwidth is 27 MHz or 54 MHz) with an estimated net loss of less than 2.5 dB between the output of the TWTA and the antenna input.

C.5 Antenna Beam Configurations

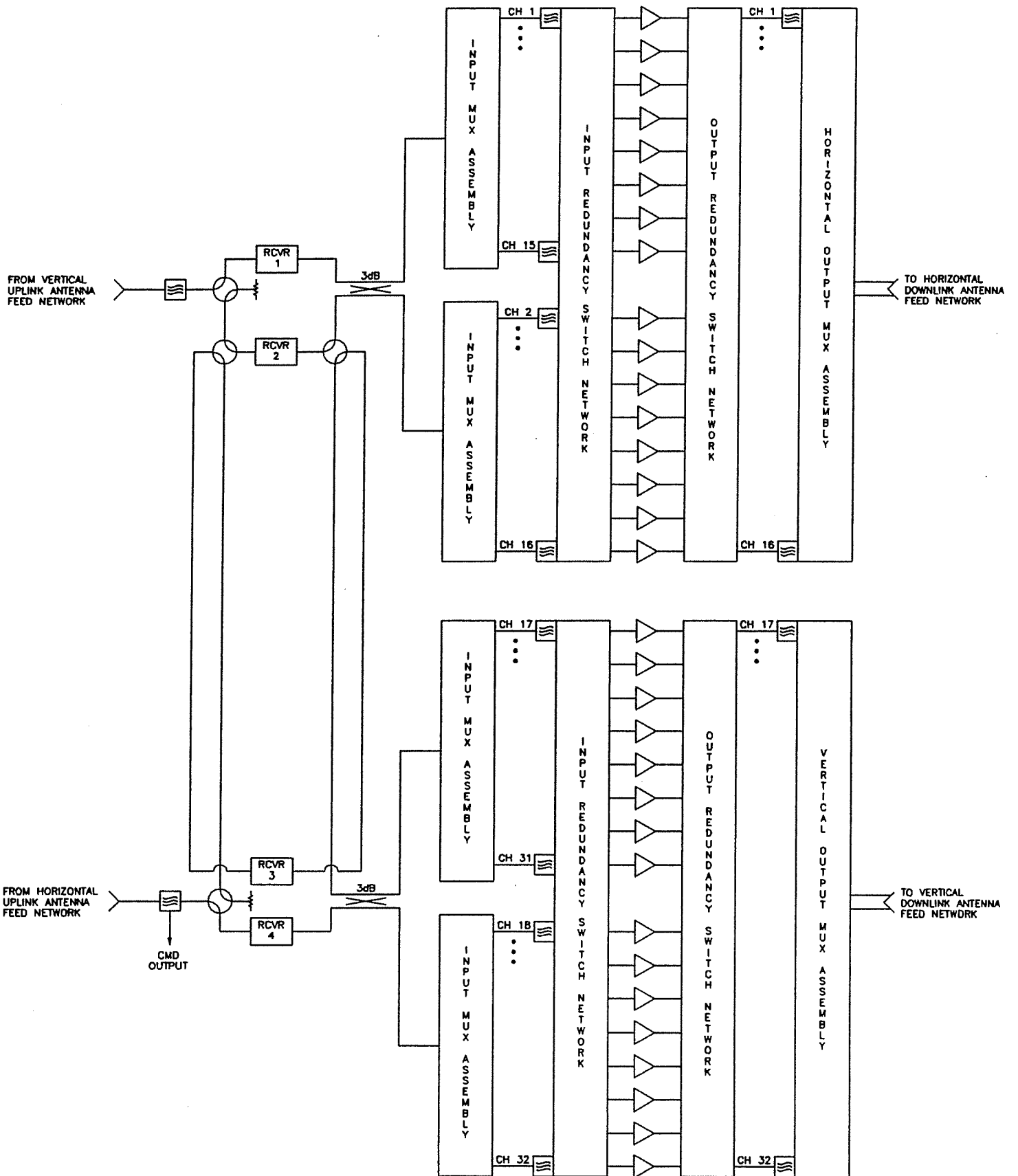
All of the narrowband C-Band and Ku-Band transponders and TT&C equipment are capable of providing fifty (50) state coverage plus coverage of Puerto Rico and the Virgin Islands. However, SPACENET IIR's assignment to 69°W.L. will preclude coverage of Alaska and Hawaii. The block diagrams in Figures 1 and 2 illustrate SPACENET IIR's C-Band and Ku-Band communications subsystems, respectively.

SPACENET C-Band Communications
 Subsystem Block Diagram

Figure 1



SPACENET Ku-Band Communications
 Subsystem Block Diagram



C.6 Receiving System Noise Temperature

Nominal values for the SPACENET IIR receive system noise temperatures are provided below:

Narrowband (36 MHz) C-Band Transponders	550°K
Narrowband (27 MHz) Ku-Band Transponders	550°K
Wideband (54 MHz) Ku-Band Transponders	550°K

C.7 Transponder Channel Gains and Controls

The estimated transponder saturated channel gains for SPACENET IIR are provided below:

Narrowband (36 MHz) C-Band Transponders	109 dB
Narrowband (27 MHz) Ku-Band Transponders	123.5 dB
Wideband (54 MHz) Ku-Band Transponders	123.5 dB

On-orbit control of the channel gains of the above three types of transponders is achieved through the employment of ground commandable attenuators. The following defines the transponder type/bandwidth, the applicable attenuator range and the number of commandable steps/step value for each:

<u>Transponder Type/Bandwidth</u>	<u>Attenuator Range</u>	<u>No. of Steps/Value</u>
C-Band/36 MHz	12 dB	5/3 dB
Ku-Band/27 MHz	21 dB	8/3 dB
Ku-Band/54 MHz	21 dB	8/3 dB

The Ku-Band transponders will also employ limiters, switchable by ground command, to reduce the effects of uplink fade on full transponder operations. In the limiting mode, each transponder will be capable of saturation for a 15 dB range of input power levels. Each Ku-Band transponder will also employ a ground commandable linearizer in order to optimize TWTA utilization for multicarrier operations.

C.8 Receive Channel Filter Response Characteristics

SPACENET IIR's transponder receive out-of-band response is defined from the input of the receive antenna to the input of the power amplifier. The receive response of any narrowband C-Band transponder is specified to be at least 30.0 dB below the center frequency response for signals more than ± 25 MHz from center frequency and at least 35.0 dB below the center frequency response for signals more than ± 27 MHz from center frequency.

The receive response for any narrowband Ku-Band transponder is specified to be at least 30.0 dB below the center frequency response for signals more than ± 18 MHz from center frequency and at least 40.0 dB below center frequency response for signals more than ± 22 MHz from center frequency.

The receive response for any wideband Ku-Band transponder is specified to be 30.0 dB below the center frequency response for signals more than ± 38 MHz from center frequency and at least 40.0 dB below center frequency response for signals more than ± 45 MHz from center frequency.

C.9 Transmit Channel Filter Response Characteristics

The SPACENET IIR transponder transmit out-of-band response is defined from the input of the power amplifier to the output of the transmit antenna. The transmit response of any narrowband C-Band transponder is specified to be at least 8.5 dB below the frequency response for signals more than ± 25 MHz from center frequency and at least 20.0 dB below the center frequency response for signals more than ± 30 MHz from center frequency.

The transmit response for any narrowband Ku-Band transponder is specified to be at least 10.0 dB below the center frequency response for signals more than ± 17 MHz from center frequency and at least 20.0 dB below center frequency response for signals more than ± 18 MHz from center frequency.

The transmit response for any wideband Ku-Band transponder is specified to be 10.0 dB below the center frequency response for signals more than ± 34 MHz from center frequency and at least 20.0 dB below center frequency response for signals more than ± 36 MHz from center frequency.

D. Orbital Location

SPACENET IIR will replace SPACENET II, currently assigned to and operating at 69°W.L.¹ Assignment to this location will enable continuation of service to C-Band and Ku-Band customers now using SPACENET II. However, this location will not allow the use of the satellite's capability of providing 50-state coverage, since Alaska and Hawaii are over the horizon.

E. Predicted SPACENET IIR C-Band and Ku-Band Coverage

SPACENET IIR coverage contours depicting the estimated EIRP and G/T provided from 69°W.L. are included as Figures 3 and 4 in this application. The satellite will provide simultaneous coverage of CONUS plus Puerto Rico and the Virgin Islands with all C-Band and Ku-Band transponders. This satellite is designed to provide, at a minimum, the EIRP and G/T performance depicted in Table II-19 in the general application. Functional block diagrams of the satellite communication subsystems and switching capabilities for both C and Ku-Band are provided in Section C.5 of this application.

F. Physical Characteristics of Space Station

F.1 Stationkeeping Parameters

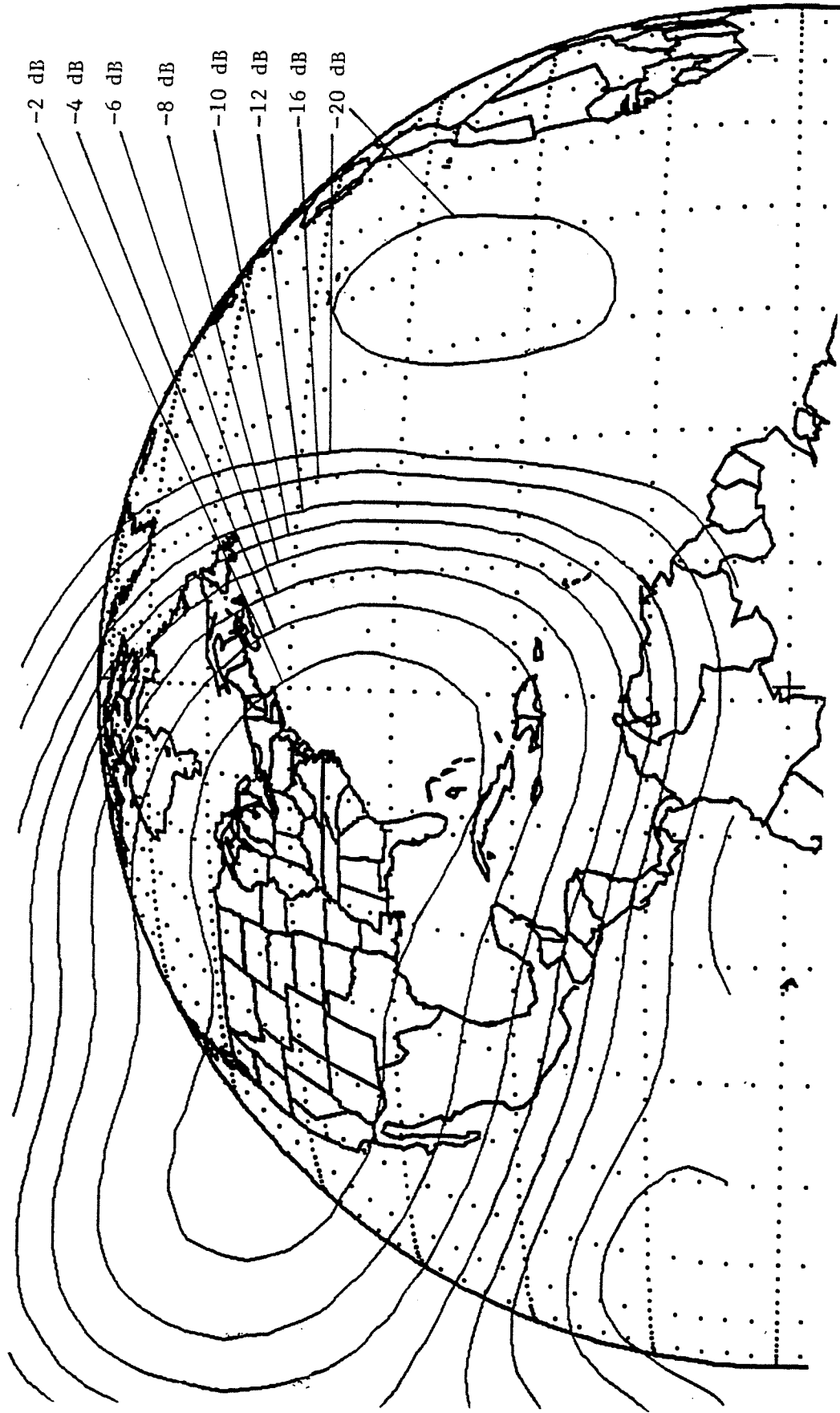
The SPACENET IIR spacecraft will be maintained within ± 0.05 degrees, in both the North-South and East-West directions, of its assigned orbital location of 69°W.L. The stationkeeping maneuvers will be performed by

¹

See, Memorandum, Opinion and Order, FCC 88-373, Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service, released December 7, 1988, 3 FCC Rcd. 6972 (1988), ("1988 Orbital Assignment Plan").

Figure 3

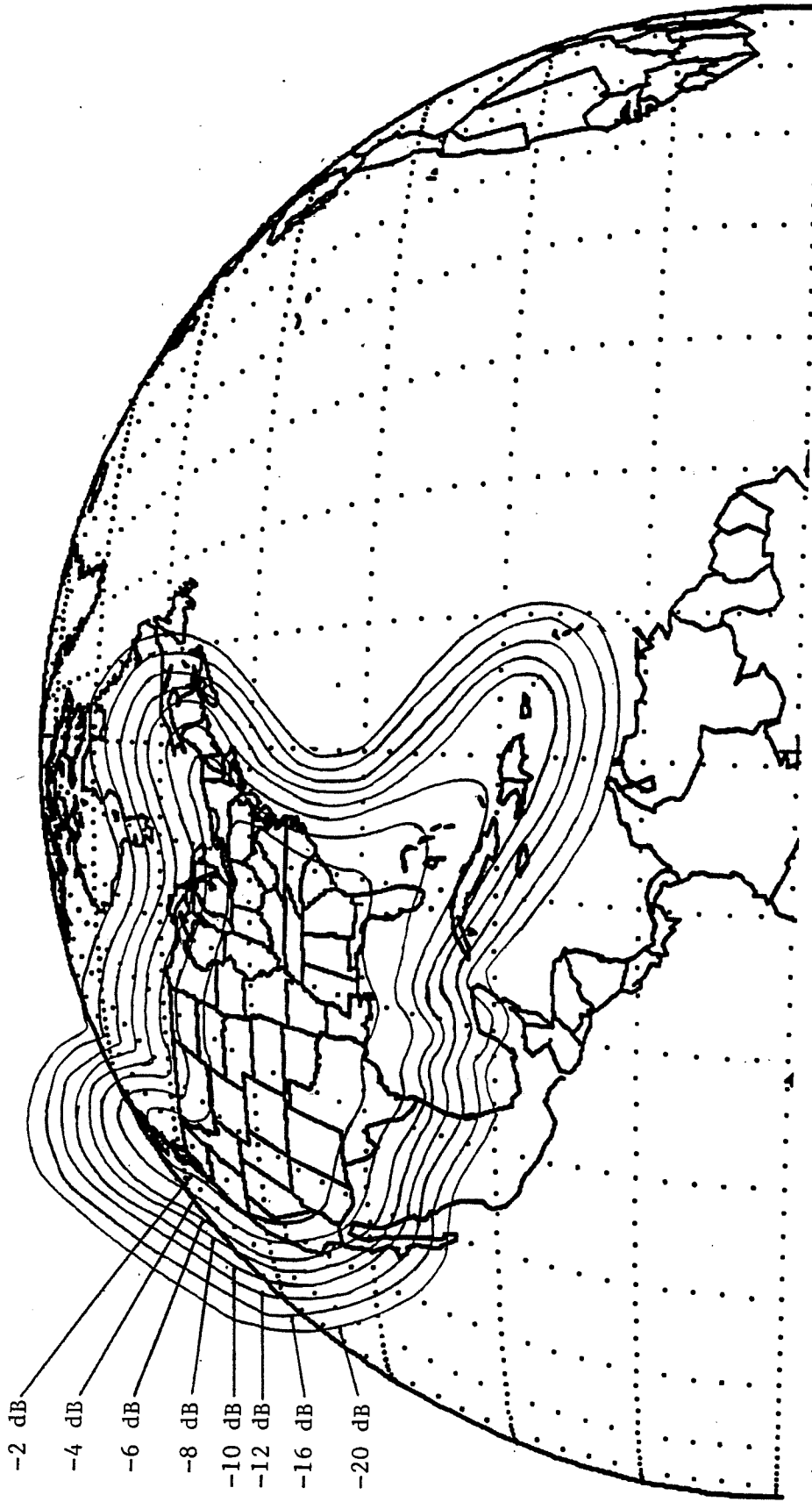
SPACENET IIR (69° WL) C-BAND COVERAGE CONTOURS



<u>Peak EIRP</u>	<u>Peak G/T</u>
38.8 dBW	2 dB/K
Minimum SFD = -91 dBW/m ²	
Tx Gain (peak) = 28.8 dB	
Rx Gain (peak) = 29.4 dB	

Figure 4

SPACENET IIR (69° WL) KU-BAND COVERAGE CONTOURS



<u>Peak EIRP</u>	<u>Peak G/T</u>
47.8 dBW	6 dB/K
Minimum SFD = -97 dBW/m ²	
Tx Gain (peak) = 33.3 dB	
Rx Gain (peak) = 33.3 dB	



1989
Annual
Report

Making Our
World Better
Tomorrow

On the Cover

Shown is equipment used in the development of semiconductor laser arrays that will be capable of launching high-speed signals into several optical fibers simultaneously. New technologies, which are being developed at GTE Laboratories, will allow network-based video services to be distributed to homes and offices through low-cost, reliable optoelectronic integrated circuits.

Highlights

Consolidated Financial Highlights			
	1989	1988	Change
	(Millions of Dollars)		
Consolidated			
Revenues and Sales	\$ 17,424	\$ 16,460	5.9%
Operating Income	3,189	3,052	4.5
Net Income	1,417	1,225	15.7
Common Shareholders' Equity	7,935	8,127	(2.4)
Return on Common Equity	17.0%	14.8%	—
Average Common Shares (in thousands)	329,649	328,589	.3
Per Common Share			
Net Income	\$ 4.16	\$ 3.58	16.2%
Dividends	2.80	2.60	7.7
Book Value	24.02	24.91	(3.6)

Contents

2	Letter to Shareholders
5	Making Our World Better Tomorrow
18	Review of Operations
25	Research and Development
26	GTE and Social Responsibility
27	GTE Policy Committee
28	Financial Review
29	Results of Operations
33	Business Group Data
35	Consolidated Financial Statements
41	Notes to Financial Statements
48	Directors and Officers
49	Corporate Information

To Our Shareholders

In 1989, GTE achieved outstanding results and record earnings while overcoming substantial business and regulatory challenges.

The year marked the end of a decade of rapid change in all of our businesses—change brought on by deregulation, increased competition and technological innovation.

We have met these challenges head-on through consolidation and reorganization of our business units, as well as by seeking and obtaining regulatory reform which will benefit both our shareholders and our customers. As a result, GTE is well positioned for strong, profitable growth in the 1990s and into the next century.

Our greatest strength continues to be our people. We could not have made such rapid progress in repositioning our business units while simultaneously achieving record earnings without the loyalty, dedication and perseverance of our employees worldwide.

However, we regard our recent accomplishments as a stepping stone—not a stopping place. We will build on our achievements in the years ahead.

To that end, we are committed to attaining three broad objectives:

- To be recognized by the media and the public as one of the world's great companies in performance and in management effectiveness;
- To be acknowledged as a world leader in all our businesses—by providing products and ser-

vices that meet customer expectations in terms of quality and cost;

- To maximize shareholders' long-term total return, as measured by share price appreciation and dividends.

In addition to these objectives, we have set an ambitious goal: To raise return on equity to 20% within the next few years.

We have made considerable progress toward achieving these objectives over the past year, and are on target with our plans.

Financial Highlights

In 1989, we also achieved record financial performance in many areas.

Net income reached a new high of \$1.4 billion, surpassing by 16% the previous record of \$1.2 billion set in 1988.

Revenues and sales increased 6% to \$17.4 billion, also a record.

Earnings per share in 1989 were \$4.16, an improvement of 16%, while return on equity increased to 17%, up from 14.8% in 1988.

The combined performance for 1988 and 1989 was truly impressive in all categories.

During the two-year period:

- Net income improved by 27%, and set records for two straight years;
- Earnings per share rose from \$3.29 to \$4.16, a gain of 26%;
- Return on equity increased from 14% in 1987 to 17% in 1989.

This sustained momentum is reflected in the substantial appreciation in the price of GTE

common stock and in dividend increases in each of the last two years—the 34th and 35th dividend increases in 36 years.

As a result, total return to shareholders reached 34% in 1988 and increased to 65% in 1989.

In both years, GTE's total return was substantially above the average for the Standard & Poor's 500 as well as the average for the regional Bell holding companies.

A contributing factor in GTE's success has been our concentrated focus on three core businesses—telecommunications, lighting and precision materials.

These are businesses we know well and manage effectively. They are also businesses with an abundance of opportunities for continuing profitable growth.

World-Class Performance

GTE has emerged as a major force in U.S. business, ranking with the leaders in size, financial strength and power.

In the most recent Forbes 500 list, GTE was 20th in net income, 32nd in revenues and sales, and 41st in total assets.

GTE has been widely recognized by industry analysts and business and financial journals for its progress in both financial performance and in re-focusing the business for long-term growth and profitability.

Key Achievements

A crucial factor in the enhanced perception of GTE is our success in structuring, positioning and



James L. Johnson, Chairman and Chief Executive Officer (left), and Charles R. Lee, President and Chief Operating Officer

shaping our businesses to capitalize on the opportunities in today's rapidly changing environment.

The sweeping consolidation and streamlining of GTE Telephone Operations continued to move forward—with all targets being met on or ahead of schedule. At the same time, the group has maintained a high level of profitability and improved the quality of its products and services.

A well-known example of GTE's reputation for innovative leadership in telecommunications is our "network-of-the-future" project in Cerritos, Calif.

The Cerritos project offers a variety of new features over a network combining copper wire, coaxial cable and fiber optics. It also represents the most extensive field trial of fiber optics in a local-exchange network. The project is part of our pioneering

effort to determine what new services are most attractive to customers as well as how they can be delivered cost-effectively.

Another highlight of 1989 was the continued dramatic growth of our mobile communications business. Our customer base grew to 263,000 by the end of the year, a 107% increase from 1988, which is significantly above the average for one of the fastest-growing businesses in the world.

By the end of the year, we were actively marketing cellular service and equipment in 208 metropolitan areas in addition to the 34 metropolitan regions and three rural areas in which we operate cellular telephone franchises.

Our other operating groups also achieved excellent results.

GTE Government Systems received additional funding of almost \$1 billion to continue its

work on the Mobile Subscriber Equipment (MSE) contract—a secure, mobile communications system for the U.S. Army. That brought to more than \$3.3 billion the amount of funds released to date. We anticipate that the total value of the MSE program for production and system support tasks could reach \$5.5 billion through the year 2000.

GTE Information Services won major contracts and continued to expand its product line through the acquisition of three new companies. In addition, GTE Directories, a unit of GTE Information Services, enhanced its already strong performance.

GTE Spacenet maintained its leadership role as an innovator in providing satellite-based communications services tailored to customer needs. Among the company's new customers in 1989 were J.C. Penney, Reuters Information Services and Cargill.

GTE Electrical Products responded to intensified competition in its markets with a "Total Quality" program that has already yielded impressive results. Two units of the Electrical Products Group—Lighting Special Products and Precision Materials—won six quality awards from major customers, including Ford, Chrysler, Raytheon and Texas Instruments.

In a further response to competitive demands, our U.S. Lighting unit is implementing a wide-ranging reorganization that entails consolidation of manufacturing, distribution and customer service operations.

All of our operations are supported by well-funded, highly focused research efforts keyed to special business needs.

For example, GTE Laboratories developed computerized network-planning and service-scheduling systems that will enable Telephone Operations to improve productivity and reduce costs substantially.

GTE Laboratories also developed a video switch-on-a-chip, which will be tested as part of the Cerritos project. The tiny device, only a quarter of an inch square, is capable of switching 64 broadcast-quality video channels to 16 individual customer lines. This will allow video signals to be transmitted economically to the home over fiber optics.

A Call for Congressional Reform

The emergence of such new technologies as digital switching and enhancements in fiber optics has greatly increased the quality, number and variety of services potentially available to telephone customers.

However, it is still not possible for us to offer advanced video-services technologies to customers in our own operating areas.

The Cable Act of 1984 restricts local telephone companies from owning cable television systems within their own operating areas, giving cable companies an unregulated monopoly in this expanding business.

GTE, the U.S. Telephone Association and other telephone companies are actively campaigning for reforms that would reduce these artificial barriers and allow local-exchange carriers to participate in this market.

Competition would serve the public interest. By using advanced technologies, telephone companies will be able to provide the public with a wider variety of more cost-efficient programming and better quality of service—enabling customers to exercise greater control over programs they receive.

Legislation now pending in Congress would either reregulate the cable industry or open the door to competition. In our view, the choice must be competition. We strongly urge our shareholders and employees to support GTE's position on this important issue.

The Power Is On

We have begun a new year—and a new decade—on a strong, positive note. In our advertising, we tell the world that: At GTE, The Power Is On.

That's not just a slogan. We're turning on that power by generating record earnings, by developing a more favorable regulatory climate and by exploring new areas for profitable growth.

The objectives that we have set are ambitious. But they are well within the reach of a company with GTE's size, resources and capabilities.

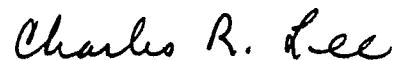
Our financial strength, enhanced by two years of excellent results, is tremendous. We have organized and focused our businesses to achieve our objectives. We have demonstrated the ability to adapt successfully to change.

Our employees throughout the world will continue to produce quality products and deliver quality services that will improve the lives of people everywhere.

All of us face the future with confidence and with a commitment to making our world better tomorrow.



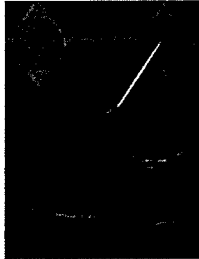
James L. Johnson
Chairman and
Chief Executive Officer



Charles R. Lee
President and
Chief Operating Officer

February 26, 1990

Making Our World Better Tomorrow



The following pages contain a portfolio of GTE products and services that are improving the way we live and work. We are proud of the quality and innovation they represent.

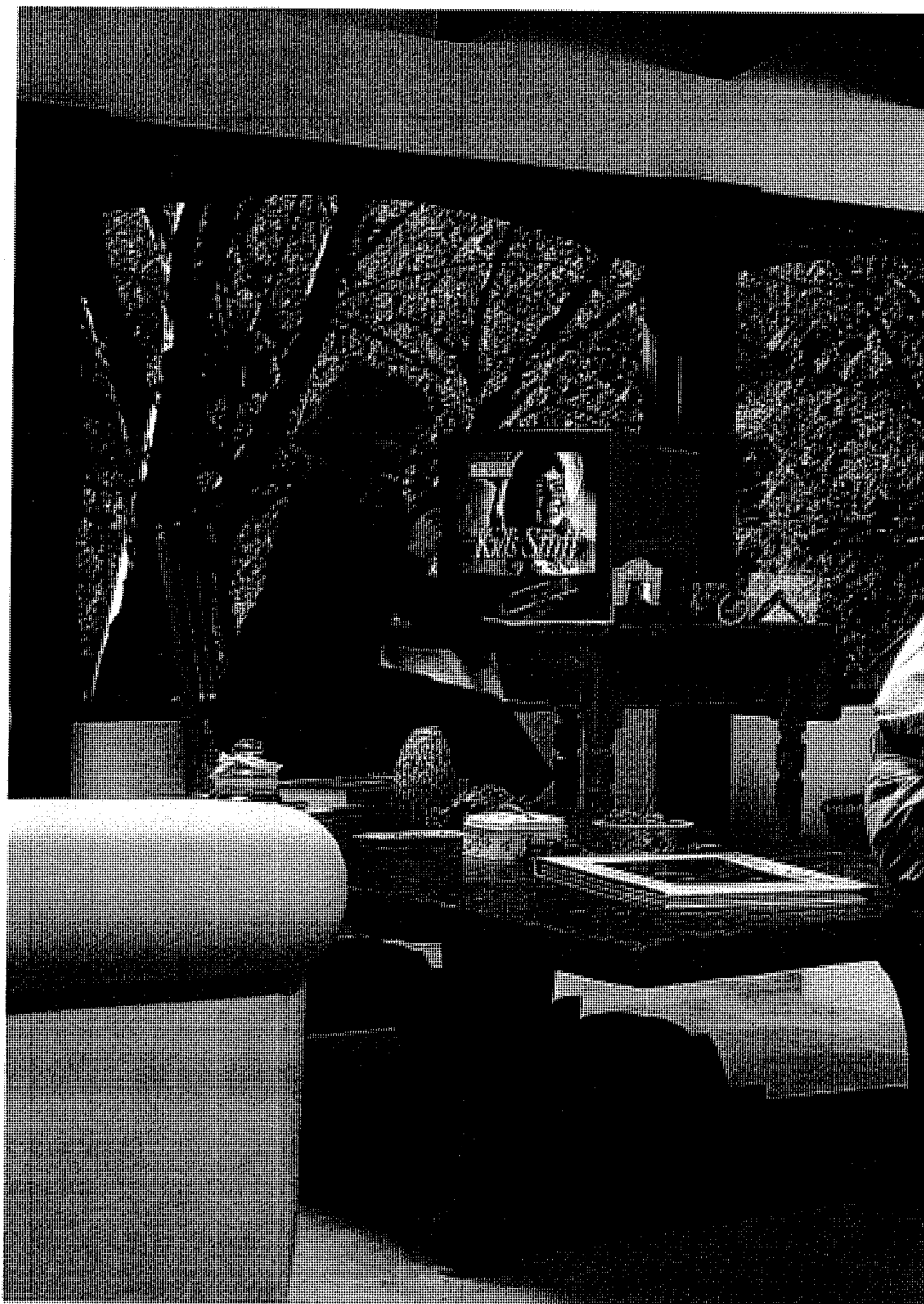
We are also proud that GTE's accomplishments are being increasingly recognized by a growing number of businesses, institutions, government agencies, consumers and the media.

In its Centennial edition of June 23, 1989, for example, *The Wall Street Journal* included GTE among a list of select companies which "will lead advances in technology, find new ways to make and market products and services, and elevate the science of management to an art."

Most of all, we are proud of our employees who—through teamwork and sensitivity to our customers' needs—are making our world better tomorrow.

**Advanced Telecommunications,
Cerritos, Calif.**

In Cerritos, Calif., GTE is beginning to test a variety of advanced services transmitted over fiber optics and coaxial cable. GTE will be testing Main StreetSM service, which offers home shopping and home banking, pay-per-view video services and other futuristic telecommunication services. Shown here, a young woman is using Main Street home shopping features while her family watches pay-per-view TV on another set.



Making Our World Better Tomorrow

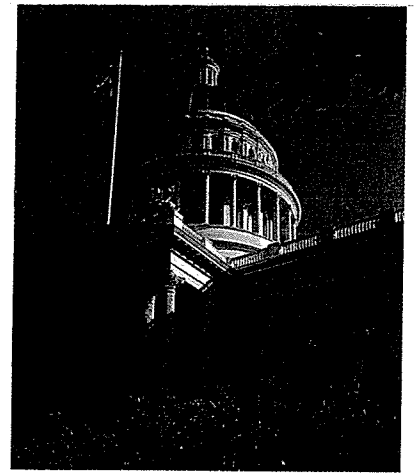


▼
**Installation of Optical Fiber
Cable, British Columbia**

The largest single project undertaken by the British Columbia Telephone Company, the burying of optical-fiber cable 500 miles across the width of the province, nears completion. It is the final link in a 4,350-mile fiber system across Canada.

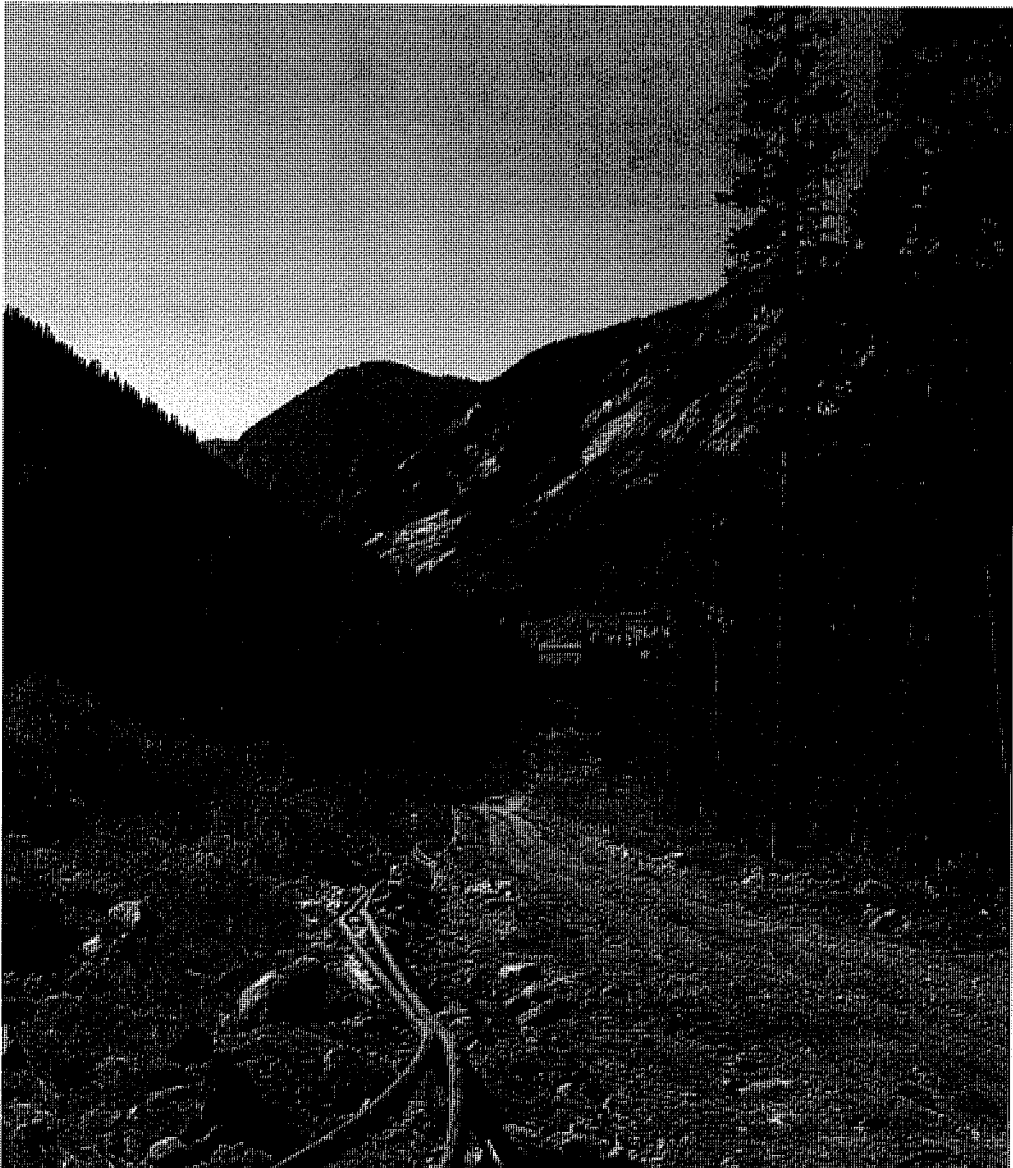
▶
**Telecommunications Network
for California**

GTE Telephone Operations received a major contract in 1989 to develop a telecommunications network for the state of California. The network will improve the overall communication among state offices.



▶
**Connectivity Evaluation Center,
Dallas, Texas**

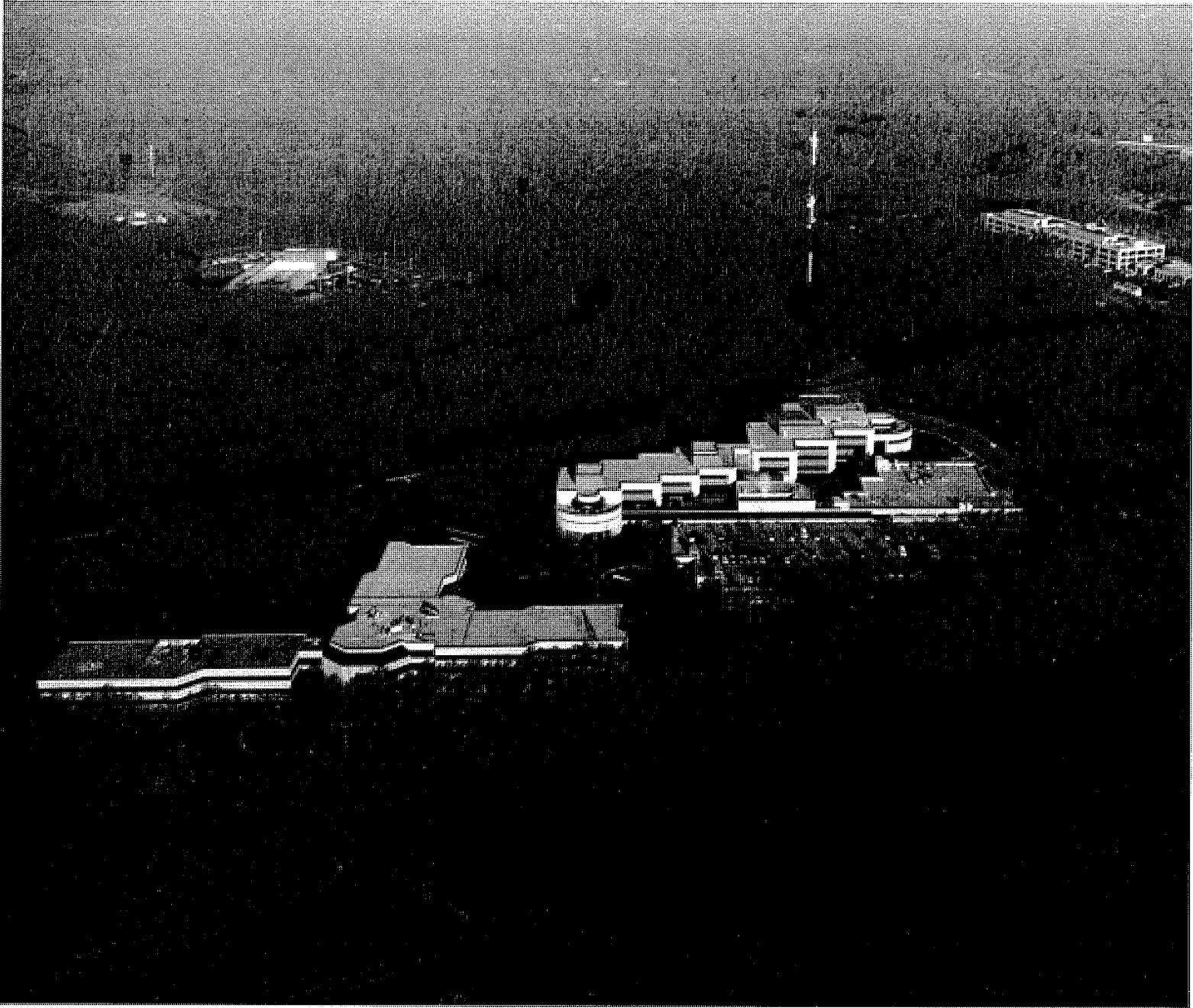
GTE Telephone Operations is a major provider of data communication and office systems products and services. GTE specializes in designing local and wide-area data networks that allow business customers to share information within their offices and around the world. In the Connectivity Evaluation Center, located near Dallas, Texas, systems engineers test a proposed communications network prior to installation at a customer's site.



Making Our World Better Tomorrow

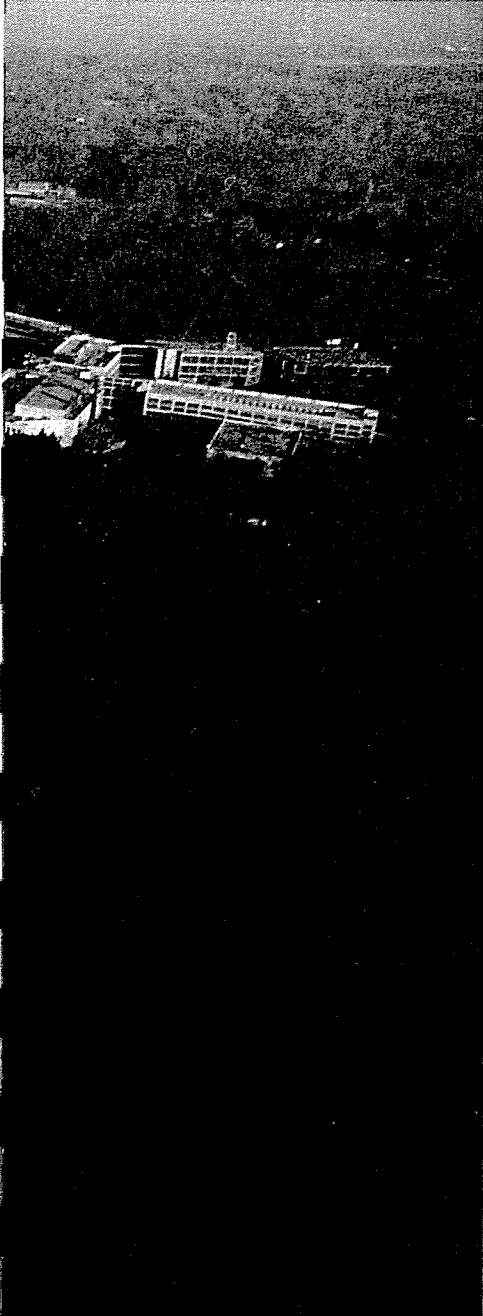


Making Our World Better Tomorrow



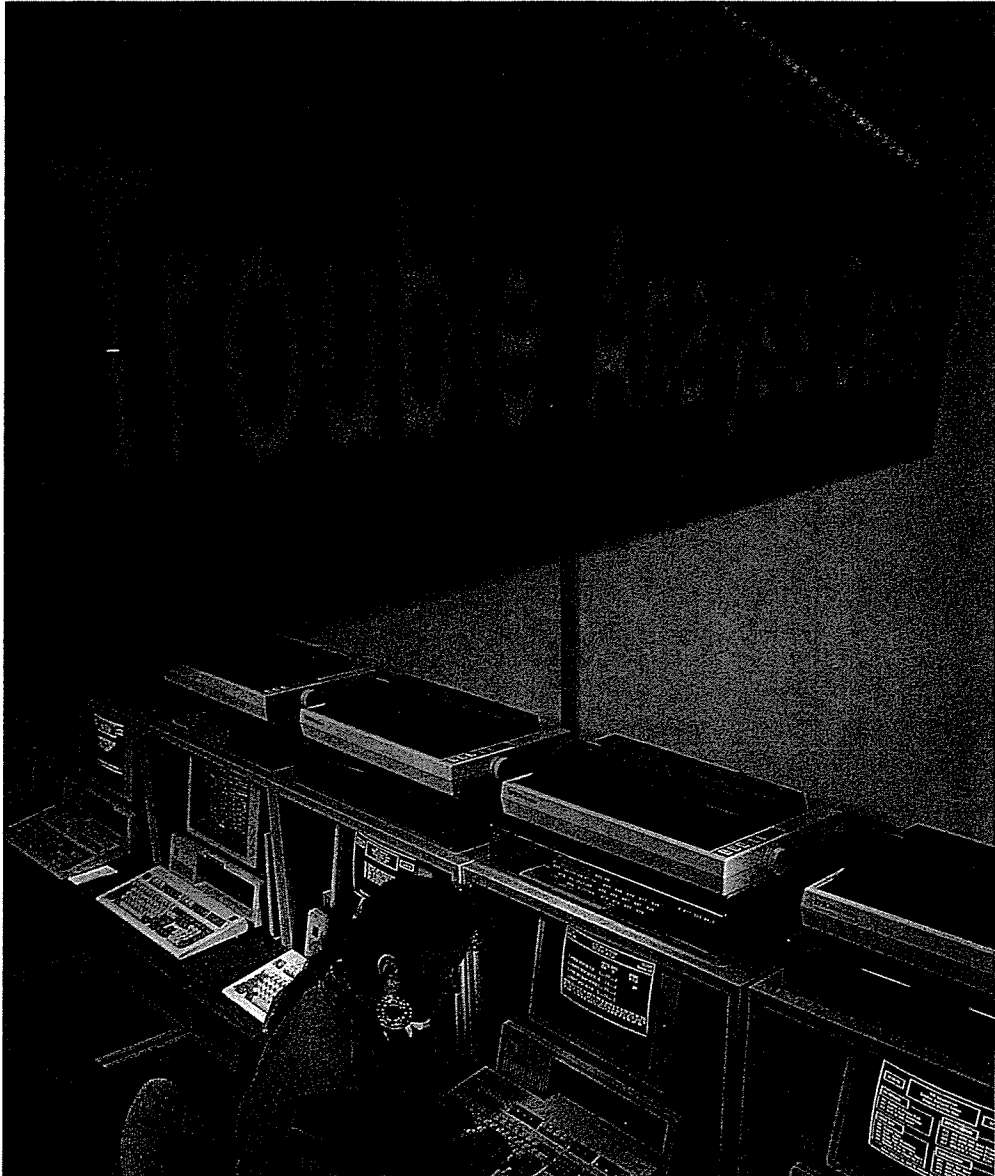
**Telecommunications Services
at Research Triangle Park, N.C.**

GTE signed Research Triangle Park as a GTE SmartPark® in 1989. A GTE SmartPark can accommodate the latest in telecommunications technology for a tenant, providing the capacity to handle all voice, data and video communications requirements. Research Triangle Park is one of 27 GTE SmartPark complexes in the United States.



▼
**Trouble Analysis Center,
Los Angeles, Calif.**

GTE Telephone Operations maintains Trouble Analysis Centers throughout its operating areas to scan and identify network problems before they are reported by customers. Focused on quality, GTE is solving problems before they become customer problems.

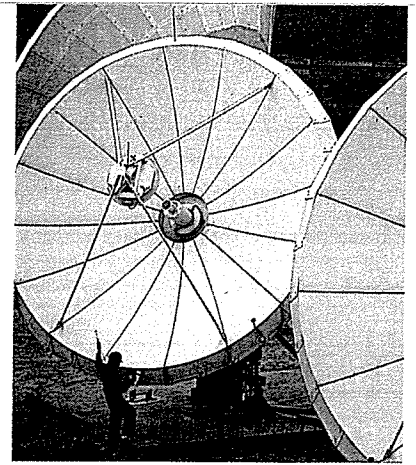


▼
**Communication Processing
System for NORAD**

Software and systems engineers for GTE Government Systems are upgrading a communications processing system for the U.S. Air Force North American Aerospace Defense Command (NORAD) based at Cheyenne Mountain, Colo. The system is a critical national defense communications program providing reliable handling of data for integrated attack warning and attack assessment.

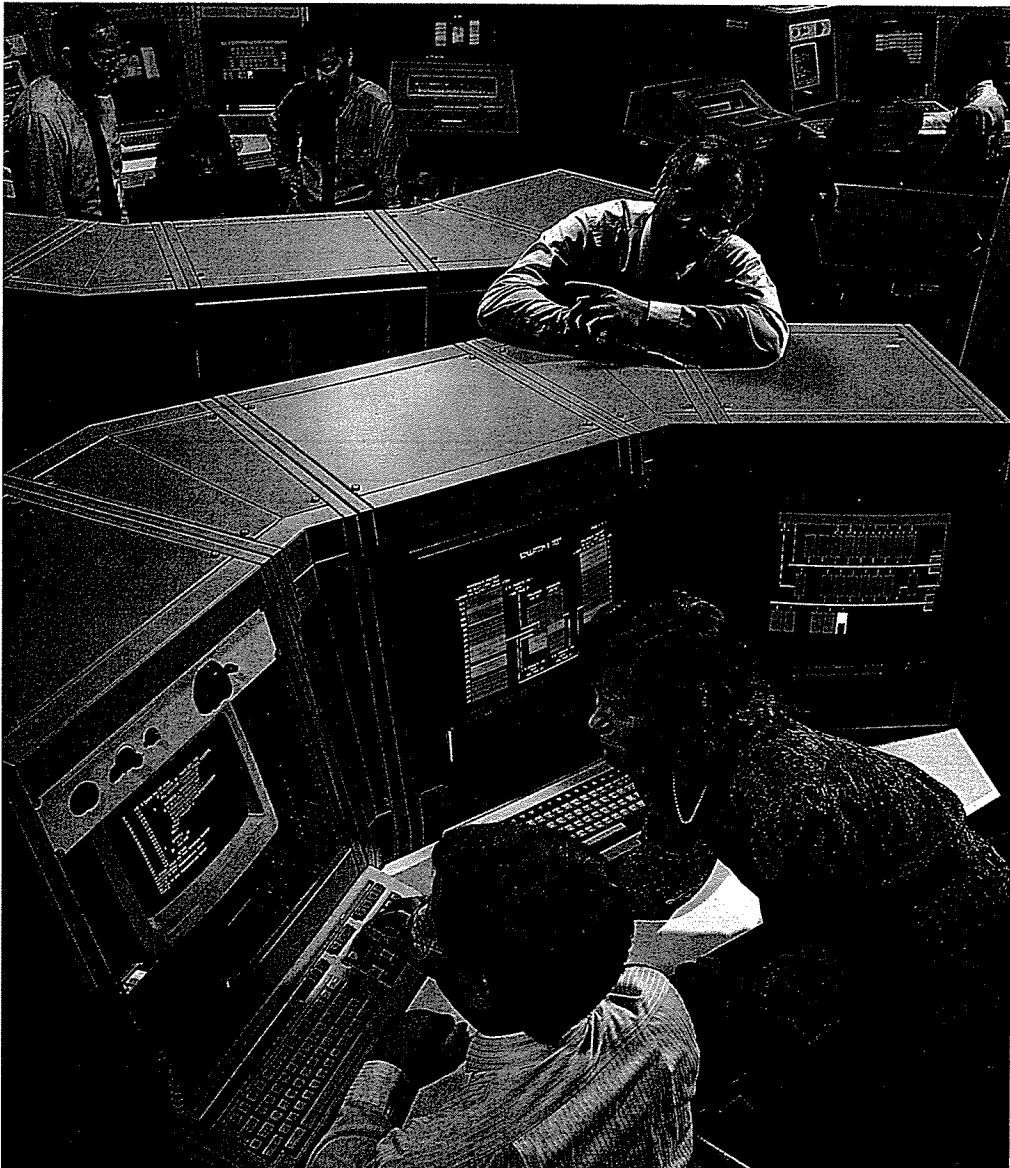
▶
**Satellite-based Information
Network for Reuters**

GTE Spacenet announced a major contract in 1989 with Reuters Information Services to implement the U.S. phase of Reuters' new global, satellite-based, information delivery network.



▶
**Tactical Communications System
for the United States Army**

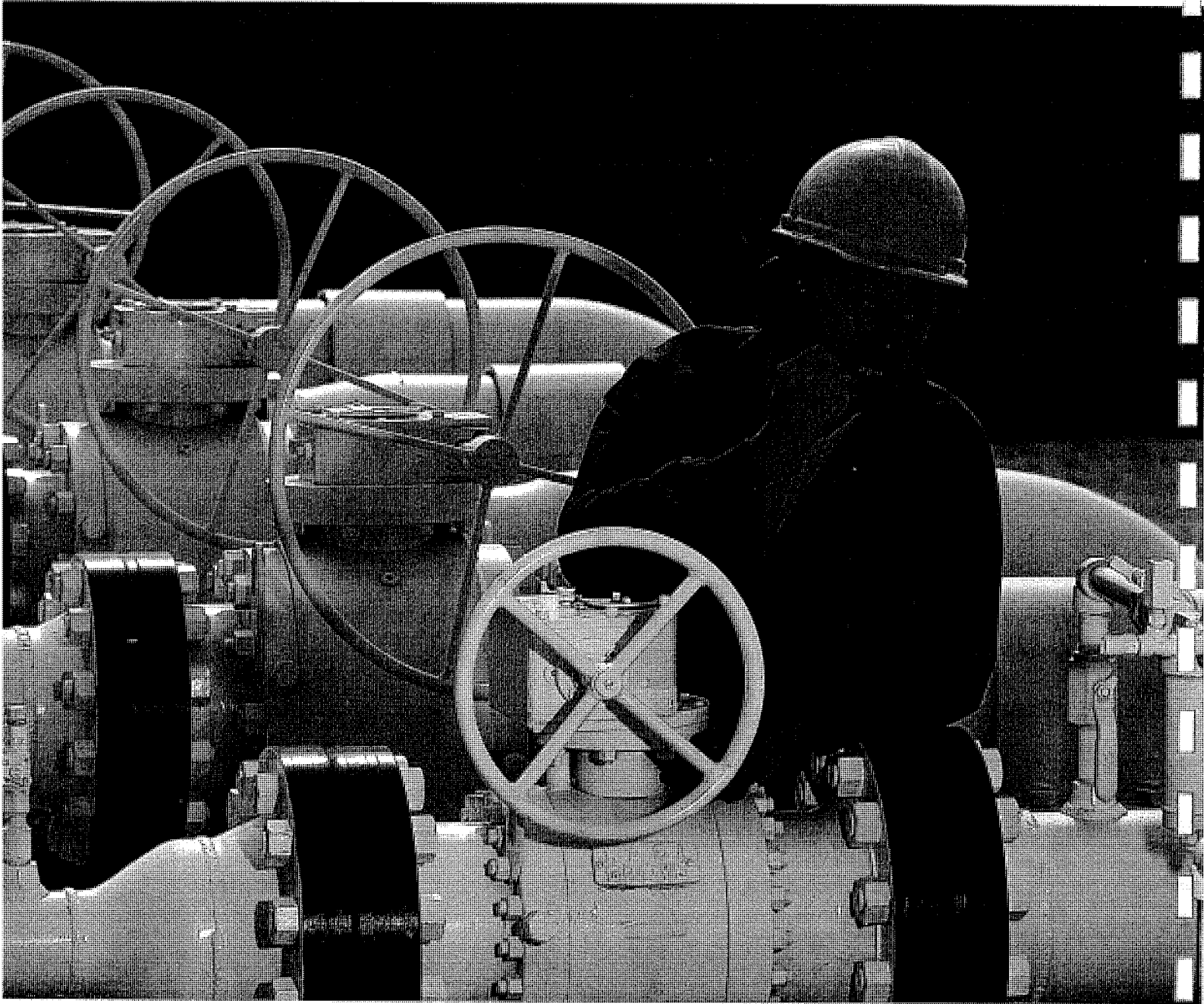
GTE Government Systems is producing a Mobile Subscriber Equipment system that replaces conventional battlefield systems with a modern, highly transportable cellular communications network. Communications include vehicle-mounted mobile radio telephones and data and facsimile terminals.



Making Our World Better Tomorrow



Making Our World Better Tomorrow



◀

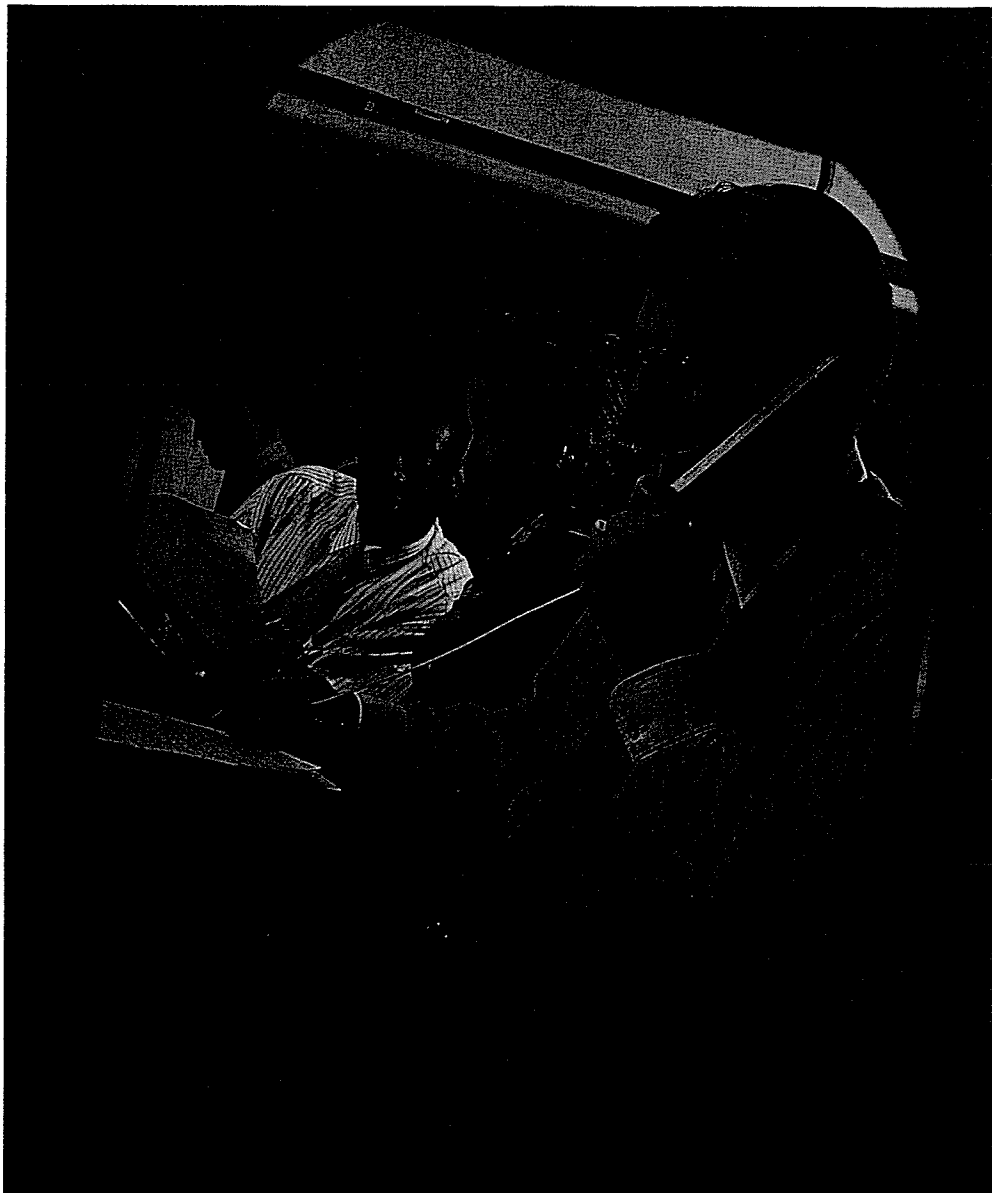
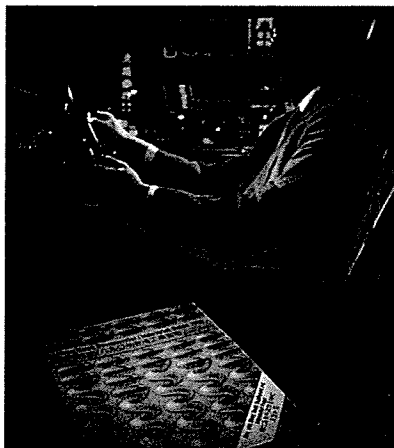
**Cellular Data Transmission
and Portable Phones**

GTE Mobile Communications' cellular customers found new ways to improve their business productivity with innovative applications of cellular services. One company installed solar-powered cellular phones along its 1,800-mile natural gas transmission pipeline. The phones transmit gas flow measurement data to central computers, providing information for natural gas billing statements.

**GTE-Produced Telephone
Directories, Hong Kong**

GTE Directories produces telephone directories for GTE and independent telephone companies throughout the world. Its international operations circle the globe, offering a multitude of residential and commercial directories and directory services.

◀



▲

**GTE Seatfone™ System
on Pan Am Shuttle**

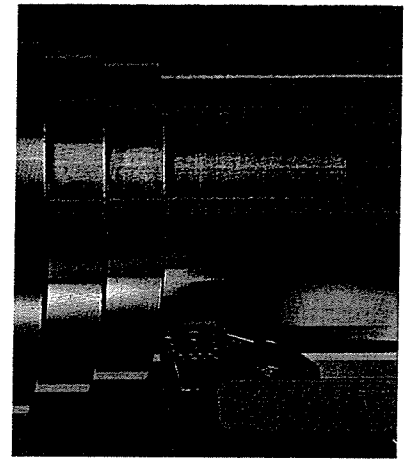
GTE Airfone, a part of GTE Mobile Communications, offers the innovative Seatfone™ service on a number of commercial airlines, including the Pan Am Shuttle. The Seatfones are installed in the back of each first-class seat and in the center seat-back of each row of coach seats, providing calling convenience for passengers.

▼
**Lighting Fiesta Mart Garden
in Houston, Texas**

Special Sylvania® lighting is being used for hydroponic gardening at the Fiesta Mart in Houston. This grocery store is pioneering the growing of high-quality vegetables and herbs in an in-store hydroponic garden only a few feet from retail produce counters.

▶
**World Leader in Cutting Tools
and Technologies**

A Valenite triple-coated carbide insert, shown here, turns alloy steel. GTE Valenite, a part of GTE Precision Materials, is a world leader in the development of cutting tools and technologies for use in industrial metal-removal operations.



▶
**Lighting Opera de la Bastille
in Paris**

Utilized in both interior and exterior locations, GTE lighting dramatizes art objects and historical artifacts as well as building architecture throughout the world. The new Opera de la Bastille in Paris is a striking example of effective use of GTE lighting.



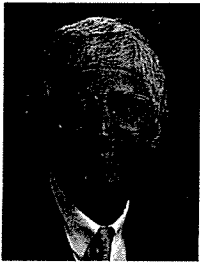
Making Our World Better Tomorrow



Review of Operations

GTE's progress in 1989 reflects the combined strength of its operating groups. The year was highlighted by entry into promising new markets and expansion in growing international fields.

The groups introduced an array of competitively priced new products and services, streamlined their operations to reduce costs and redoubled their efforts to achieve even higher quality throughout their operations.



*Kent B. Foster
President,
GTE Telephone Operations*

GTE Telephone Operations

In 1989, the Telephone Operations Group continued to restructure its business to achieve competitive cost targets and increase profitability. At the same time, the group made major advances in improving the quality of its products and services, while expanding its network services and product line to increase overall revenues.

Quality improvements included the standardization of switching services operations centers which dramatically improved the day-to-

day operation of the network.

In addition, Trouble Analysis Centers now scan the network 24 hours a day to spot problems and ensure that the trouble is resolved—often before the customer knows there is a problem.

In 1989, Telephone Operations continued its consolidation of its seven U.S. telephone companies into a single national organization with a centralized headquarters and general office in Irving, Texas, and four regional operating areas based in Florida, Indiana, Texas and California.

This consolidation has led to an overall streamlining of the business, enabling the company to respond to the marketplace and customer demands more quickly and efficiently. In addition, the consolidation allows GTE to bring more new products and services to market on a national scale, while actually reducing operating costs. The consolidation will result over time in the elimination of an estimated 14,000 positions.

In 1989, GTE also made major inroads in its bid to enter the video-services field. In Cerritos, Calif., GTE hooked up 600 residential customers to its "network-of-the-future." Using fiber optics, the Cerritos project is a test of voice, data and video services to determine customers' needs and

desires. It is the most extensive test of its kind in the country. Included in the testing will be advanced services such as video-on-demand, pay-per-view TV, home banking and home shopping services.

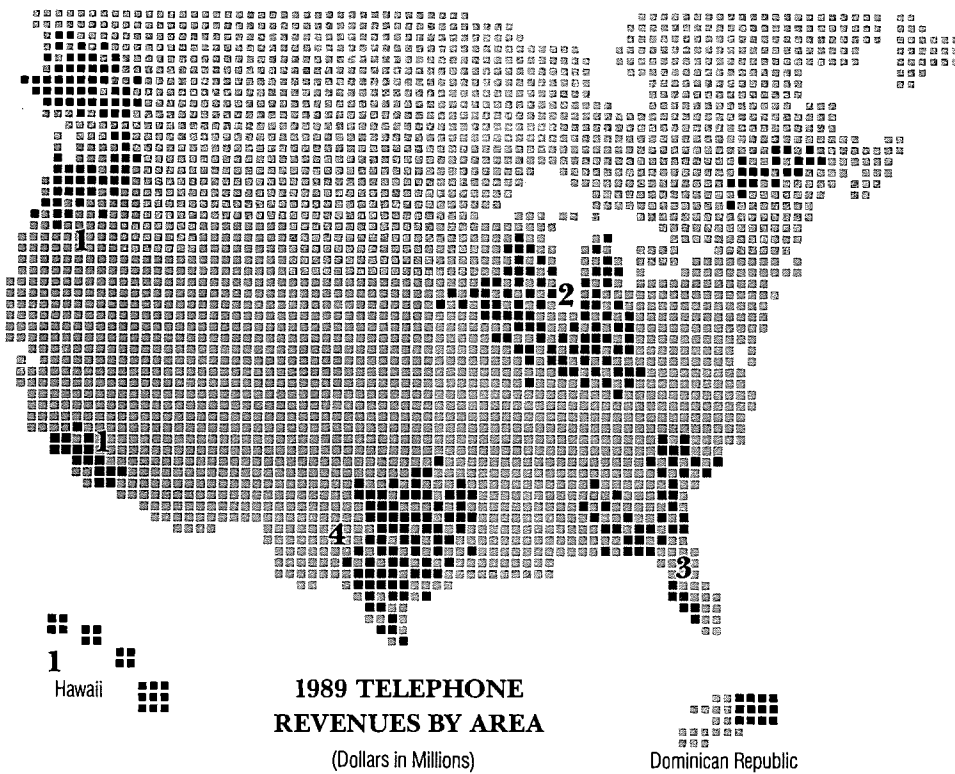
The Cerritos network will enable GTE to compare the capabilities of coaxial cable, optical fiber and standard copper telephone wire for carrying voice, data and video communications.

The attainment of GTE Telephone Operations' goals for the future is dependent on its ability to compete effectively with a variety of other companies that are entering the fast-changing telecommunications arena.

As part of its competitive strategy, GTE is introducing new services and products to satisfy business and residential customers' requirements for new communications tools and information. Here are just a few:

GTE will offer Custom Local Area Signaling Service (CLASS)—a family of advanced network services. This new service allows calling numbers to be passed between originating and terminating switching centers. The features allow customers to screen and control incoming calls over their telephones.

In the data transmission and office automation area, GTE can



1
Hawaii

1989 TELEPHONE REVENUES BY AREA

(Dollars in Millions)

1. West	\$4,114
2. North	\$2,454
3. South	\$2,151
4. Southwest	\$1,206
International and other	\$2,534

Dominican Republic

analyze, design, integrate, install and support data/office automation systems for its customers.

In 1989, GTE continued its development efforts on Integrated Services Digital Network (ISDN). With ISDN, two personal computer users can simultaneously access a document and make changes while discussing the changes by phone. Another example of ISDN application is call management, which enables the customer to match a caller's telephone number with information about the caller from a data base.

Switched 56, another network service in the final stages of development, provides high-quality, digital-data transport at speeds up

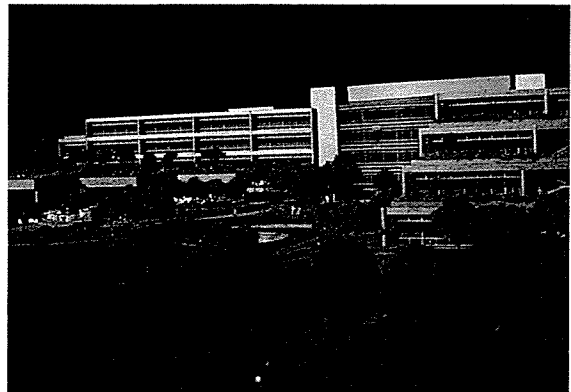
to 56 kilobits per second. With Switched 56, customers pay only for the time they use the network.

GTE's CentraNet® is a central office-based digital switching system for business customers. A new enhanced service available to CentraNet customers is Voice Messaging. The service improves communication and enhances productivity. Incoming calls are answered electronically with a voice message from the called party. Customers can respond with their own voice message that is detailed and accurate.

GTE also offers GTE SmartPark®—an innovative telecommunications service to tenants of office parks or buildings in con-

junction with business-park developers. Each is equipped with a fiber-optic infrastructure which enables GTE to provide virtually unlimited voice, data and video transmission capabilities to tenants.

In 1989, GTE also continued to press federal and state regulatory agencies for more flexibility in setting prices appropriate to the telecommunications industry's changing environment. In October, the California Public Utilities Commission approved an innovative regulatory plan, which calls for prices for basic services to be adjusted annually based on nationwide inflation rates, which are in turn adjusted by a productivity factor. In addition, the Commission set a market-based rate of return, but it ruled that earnings in excess of market rates were to be shared with customers. The



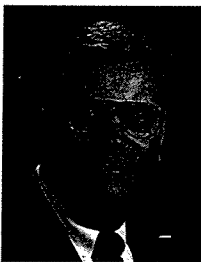
GTE Telephone Operations is constructing a new 1.1 million square-foot headquarters complex in Irving, Texas, to house more than 3,000 employees.

Review of Operations

decision of the California PUC is an encouraging endorsement of incentive regulation. The decision was effective Jan. 1, 1990.

In July, a Florida jury summarily dismissed Home Shopping Network's \$1.5 billion suit against GTE, and instead ordered HSN to pay damages to GTE for false allegations regarding the quality of service provided the television retailing firm.

The overall result for GTE was a complete vindication for the company and its employees.



*Terry S. Parker
President,
GTE Mobile Communications*

GTE Mobile Communications

For the GTE Mobile Communications Group, 1989 was a year of major progress and promise. GTE Mobile Communications, in its first full year as a major GTE operating group, began integrating the many product and service opportunities in the mobile communications segment; continued its rapid customer growth and introduced widely accepted market

Facsimile machines offered by GTE Mobile Communications now allow busy professionals to stay in constant business contact with their offices and customers while in their automobiles.



innovations.

The group's cellular businesses achieved dramatic growth in the number of customers they serve. The group also embarked on the industry's first nationwide cellular marketing strategy; began moving into the emerging international markets for mobile communications, and announced new services for customers on the move.

During 1989, GTE Mobile Communications' cellular customer base increased by 107% to 263,000. GTE Airfone expanded the number of planes equipped with its service and equipment while the total number of air-to-ground calls placed surpassed 6 million since the service was initiated in 1984.

Early in the year, the group's two cellular businesses—GTE Mobilnet and GTE Cellular Communications—implemented a new strategy for marketing the group's cellular services and products on a nationwide basis. The program established GTE as the first cellular provider to offer nationwide mobile connections with a single point of contact for customer sales, service and billing.

GTE Mobilnet provides cellular network service as a carrier in 34 metropolitan areas and in a growing number of rural service areas. It also provides cellular service

through reseller agreements across the United States. Based on the populations within the areas it serves, GTE Mobilnet is the fifth largest cellular carrier in the United States.

GTE Cellular Communications operates retail sales and service centers in GTE Mobilnet operating markets and provides similar services as GTE Mobile Communications in national market areas. The group offered cellular services in 245 U.S. cellular markets in 1989.

A milestone event occurred in August when GTE Mobilnet commenced cellular service in the nation's first "rural service area," the island of Kauai in Hawaii. Rural service areas are outside the metropolitan service areas as defined by the Federal Communications Commission.

In early 1989, GTE Cellular Communications and Hertz began testing cellular credit-card telephones in 1,600 Hertz rental cars in seven major cities. By year's end, GTE and Hertz had agreed to install some 50,000 cellular credit-card phones in the Hertz nationwide rental fleet over a five-year period. Customers who rent cars

equipped with the cellular credit-card phones can make and receive calls by using a major credit card to activate the service.

GTE's Follow Me Roaming® service gained industry-wide acceptance, with 223 U.S. and Canadian cities offering the cellular industry's first automatic procedure for receiving calls when traveling outside the customer's home system. The Follow Me Roaming® service also earned a 1989 CommForum Award established by the National Communications Forum to "recognize products and service judged most beneficial to the industry."

GTE Airfone has been providing air-to-ground telephone service for passengers on commercial airlines since 1984. By the end of 1989, the company had placed its instruments on more than 1,200 airplanes operated by 17 carriers. This was an increase of some 300 planes during the year. The company's Airfone® service phones are installed at central locations on the aircraft, while its Seatfone™ systems are located at passengers' seats.

GTE Airfone also offers Railfone® service to passengers traveling on two major Amtrak railroad routes on the East and West Coasts.



*Francis A. Gicca
President,
GTE Government Systems*

GTE Government Systems

GTE Government Systems continued in 1989 to win major contracts to provide advanced-technology command, control, communications and intelligence systems to its customers. Much of the group's progress was due to a successful effort by all of its units to take greater advantage of common technological, marketing and program-management skills.

Early in the year, the U. S. Army awarded GTE a contract of almost \$1 billion to continue work on the Mobile Subscriber Equipment (MSE) project—a military mobile communications system—which will enable Army field units to communicate from virtually anywhere in the world.

The award, funding a fourth year of production, brings the total received by GTE to \$3.3 billion to date. GTE is providing more than 1,400 switching centers, 8,000 mobile radios and 25,000 telephones for the system.

GTE Government Systems also won a \$34 million contract from

the U. S. Air Force to modernize command, control and communications systems at a number of intercontinental ballistic missile launch-control centers.

The company received an important subcontract from Hughes Aircraft of Canada to provide communications capabilities for the Canadian Automated Air Traffic System, which is being upgraded. The value of the subcontract to GTE is \$27 million over seven years.

The U. S. Defense Communications Agency issued a \$16.4 million contract to GTE to develop computer software for an automated data-processing system. The equipment will be part of the current modernization program being undertaken for the Defense Department's worldwide military communications system.

The U.S. Air Force awarded GTE

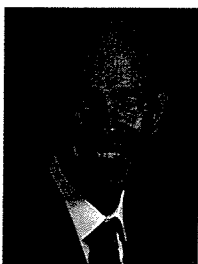


GTE is testing sophisticated equipment to modernize U. S. Air Force communication systems used at the nation's land-based ICBM launch control centers.

Review of Operations

a \$6.4 million contract as the first phase of a \$44.6 million, five-year program to provide the automated data-processing system for the Joint Space Command Intelligence Center. The sophisticated equipment will give the nation's primary space operations facility improved capabilities to analyze foreign space objects by correlating intelligence information from multiple sources.

GTE received a \$7.2 million contract as the first phase of a \$13.8 million program to improve a mobile communications intelligence system for the U.S. Army. The award calls for the company to design, develop and test prototypes of a digital voice recorder and storage system for tactical reconnaissance applications.



*William E. Starkey
President,
GTE Information Services*

GTE Information Services

GTE Information Services continued to strengthen its position in selected nationwide markets for information services in 1989.

GTE Directories, the largest of

GTE Information Services' units, is a leading publisher and distributor of Yellow Pages worldwide. During 1989, the unit brought its new On CallSM talking Yellow Pages to several areas, including Dallas/Fort Worth and Hawaii. This service enables consumers to call a free local phone number that offers recorded audio information on a wide range of subjects as well as advertising messages from companies with ads in the Yellow Pages.

The official telephone and electric company of Costa Rica, Instituto Costarricense de Electricidad, awarded GTE Directories a \$69 million contract to continue providing telephone-directory sales, publishing and printing services from 1991 to 1998. GTE has provided these services to the Costa Rican telephone company for the past 15 years.

During the year, GTE Information Services acquired three established companies that provide computer software and other systems and services to specialized sectors of the information-management market.

Systems Choice Inc., of Phoenix, Ariz., which offers software and other services to the healthcare industry, became part of the GTE Health Systems unit of Information Services.

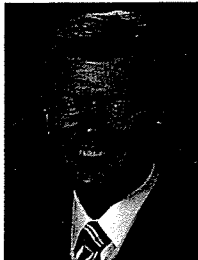
Also acquired were Locke Systems of Seattle, Wash., which markets software systems for automated management of public facilities, and Vision Technology Inc. of Reston, Va., which supplies software systems to law-enforcement and public-safety agencies. Both joined GTE Government Information Services, a GTE Information Services unit formed in 1989.

The GTE Enhanced 9-1-1 Emergency Response System was improved further in 1989. The system was made available in modules that allow it to be tailored to fit the requirements of communities of all sizes and be enlarged as the population or public needs increase. A highlight of the system's features is its capability to display additional information about a location beyond the caller's phone number and



GTE Health Systems, a subsidiary of GTE Information Services, offers sophisticated software systems—which track all aspects of patient care and hospital operations.

address on the console of the operator handling a community's 9-1-1 calls.

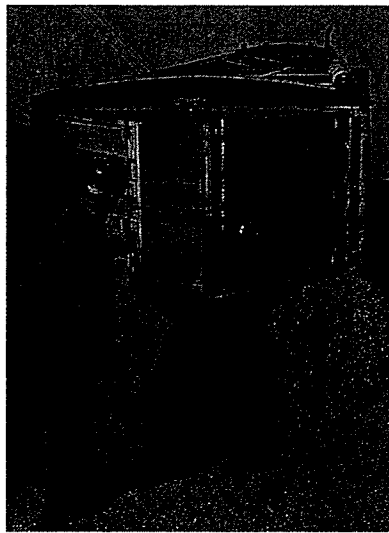


*C. J. Waylan
President,
GTE Spacenet*

GTE Spacenet

In 1989, GTE Spacenet further solidified its position as a leading provider of satellite-based services and private communications networks for a broad base of domestic and international customers that include government agencies, major retail chains, financial services, news and business organizations.

GTE Spacenet announced several multimillion-dollar contracts during the year to provide satellite services and implement private networks. These include a contract to design, install and manage a major, dedicated, point-to-multi-point communications network for the U.S. military. Cable News Network, a major television broadcasting organization, awarded GTE Spacenet a multi-year contract valued at more than \$20 million for the use of three transponders



on the GSTAR II satellite to support its expanded news programming. Reuters Information Services, a worldwide news and information company, signed a \$10 million contract for Spacenet to implement the United States portion of a new Reuters global network.

Cargill, Inc., a leading processor and transporter of agricultural and other commodities, contracted with GTE for a network linking some 250 of its locations across the United States.

International activity was also significant as GTE Spacenet International received a \$10.3 million contract in 1989 to install a satellite earth station in Taiwan. Additionally, Spacenet International has been awarded a major contract by Chevron to supply a modern INTELSAT Business Service satellite communication system in Zaire.

A key industry-leading product development achievement culminated in the introduction of a "compact private hub" earth station which can serve as a cost-effective control center for smaller

Cargill is a world leader in the commodity marketing, transportation and processing industries. GTE Spacenet is implementing a 250-site telecommunications network linking Cargill's facilities.

private data-communications networks linking from 25 to 300 locations. Spacenet's new smaller hub, costing about 75% less than a large dedicated one, makes completely private networks affordable to smaller users.

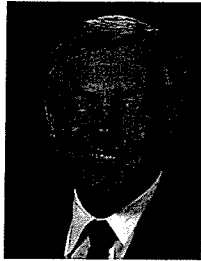
AG Communication Systems

AG Communication Systems, which began operations in January 1989 as a joint venture of GTE and AT&T, is developing advanced capabilities for GTE's GTD-5[®] EAX (Electronic Automatic Exchange) family of digital switching systems. The company's goal is to provide a smooth evolution to the next generation of switching technology for telephone companies currently using the GTD-5 systems.

Technologies being developed by AT&T for its 5ESS[®] switching system are being integrated with AG Communication Systems' technologies to bring the advanced capabilities of the Integrated Services Digital Network of the future to GTD-5 customers.

Sales of the GTD-5 continued at a strong pace in 1989, exceeding one million lines. At year's end, more than 11.5 million lines had been shipped to customers and more than 10.1 million installed at 1,896 sites in North America.

Review of Operations



*Dean T. Langford
President,
GTE Electrical Products*

GTE Electrical Products

The GTE Electrical Products Group, which manufactures and markets lighting products and precision materials worldwide, pressed forward with its aggressive "Total Quality" strategy throughout 1989. This philosophy of continuous quality improvements in all aspects of the group's operations is essential to achieving market leadership in an era of increasing competition around the globe.

Lighting

GTE's Lighting units received several awards in 1989 for high-quality products and services. For example:

- Florida Power and Light awarded GTE's U. S. Lighting plant at Manchester, N.H., its "Quality Vendor" designation for continuing to improve its Sylvania® products;
- The Ford Motor Company accorded "full service supplier" status to GTE's automotive light-

GTE produces Sylvania® halogen headlamps which are utilized extensively by automotive manufacturers throughout the world for cars marketed in North America.

ing unit at Hillsboro, N. H., for superior quality, strong technical capability and commercial excellence;

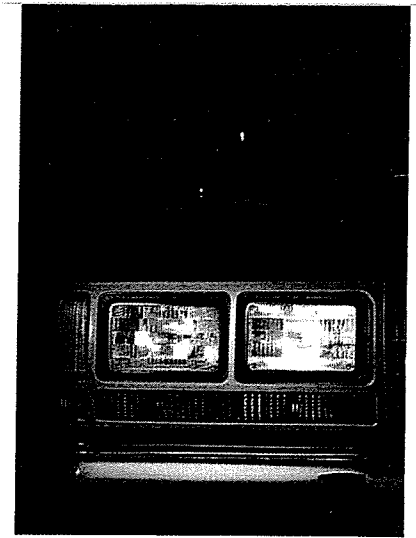
- Chrysler Corporation presented its Pentastar award to both the Hillsboro, N.H., and Seymour, Ind., facilities for consistently meeting the automaker's highest standard for excellence. It also honored GTE with its "Quality of Excellence" award for the Sylvania® halogen headlamps supplied for Chrysler's minivans.

Among the new lighting products introduced in 1989 was a line of long-life, heavy-duty halogen headlamps for trucks. GTE pioneered in developing halogen headlamps for the automotive industry.

Another new product is a family of low-wattage, metal-halide lamps that expand the design options for commercial and industrial lighting installations.

The Sylvania Tru-Aim Plus™ lamp, a small energy-saving lamp for commercial interiors, was introduced to the U.S. market in 1989.

As part of an ongoing reassessment of its business, the company's U. S. Lighting Division announced in 1989 a restructuring of its network of product-distribution centers. The new network of nine strategically located centers will make possible the closing of 17



warehouses around the country over the next 18 months. In addition, a new national customer-support center will be established to coordinate customer service and product delivery.

Plans were also announced to phase out two plants, consolidating their functions with other operations in the United States and Canada. Earlier in the year, a plant was closed and its manufacturing activities were successfully transferred to other GTE plants.

Precision Materials

GTE Precision Materials is a world leader in making high-quality, low-cost components and precision-engineered materials for GTE Lighting and for industries such as metal cutting, automotive and computer interconnect systems, information displays and semiconductor manufacturing. In 1989, GTE Precision Materials recorded significantly improved growth in its markets abroad. It also received major customer awards for high quality performance in products and processes during the year, including:

- GTE Interconnect Products received Ford's "Q1" Preferred Vendor award for electronic connectors, and
- GTE Emissive Products was named "supplier of the year" for the second year in a row by Texas Instruments for GTE—provided quartz crucibles.

Among various new products introduced by Precision Materials in 1989 was the first solid-state protective device approved by Underwriters Laboratories for installation on telephone lines at residential and commercial locations. In the past, such protectors were available only for use in telephone switching centers.

Advanced electroluminescent phosphors developed by the GTE Chemical and Metallurgical Division and introduced in 1989 are improving the sharpness and clarity of the characters displayed on the screens of small lap-top computers and other portable units.

Molybdenum wire plated with gold, also from the GTE Chemical and Metallurgical Division, is being used as the reflective surface for antennas on communications satellites.

GTE Valenite introduced the VALID™ microprocessor-based tool identification system to the industrial cutting-tool market in 1989. Serving two purposes, the

electronic device verifies the correct location of a cutting tool on a lathe, and it eliminates the need for manual programming of the machine by automatically transferring data from the cutting tool to the lathe's controls.

Research and Development

Technology has been a powerful force behind GTE's vigorous growth in its new and established lines of business.

GTE's central research organization, GTE Laboratories, continued during the year to carry out a broad spectrum of research, development and engineering programs supporting the corporation's core businesses. Complementing the GTE Labs programs are the technical activities conducted by some three dozen smaller laboratories at various GTE business units in the United States and abroad.

Researchers at GTE Laboratories are working at the cutting edge of numerous technologies. They include fiber optics, computer software and systems, communications networks, advanced switching systems, optoelectronic devices, new light sources and the science of materials.

GTE Labs' more noteworthy achievements in 1989 were:

- A video switching system on an

integrated circuit chip only one-quarter of an inch square that can send as many as 64 broadcast-quality video channels to homes and offices;

- A GTE Labs-developed software program that greatly reduces the amount of time required to plan new telecommunications networks. Transferred to GTE Telephone Operations in 1989, the Network Computer-Aided Planning program is expected to increase productivity among network planners by as much as 500%. Also, by making possible more accurate forecasting of network needs, it could save up to \$46 million in capital expenditures over the first 10 years of its use;
- A device that can boost the light signals in an optical-fiber communications system by as much as 10,000 times. A possible replacement for the larger electronic amplifiers now used, the new amplifier may reduce dramatically the cost of offering communications services over optical fibers.

GTE conducted significant research in many additional areas.

For example, by integrating computer-aided tomography (CAT) with supercomputers, researchers at GTE Labs created an innovative way to accelerate

Review of Operations

the development of new lighting systems for the future.

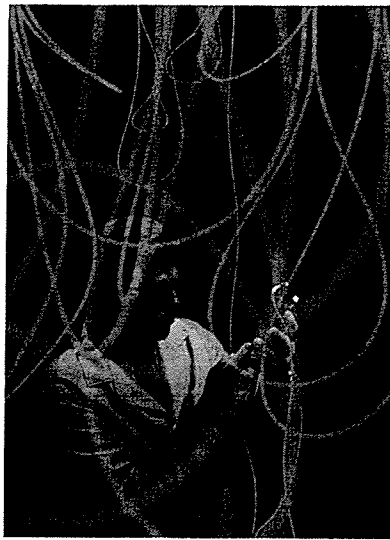
A leading R&D center for advanced ceramics, GTE Labs continued in 1989 to pioneer new processes and materials that produce tougher, more reliable products. Labs developments support the continuing improvement of such GTE products as brazing alloys, cutting tools and semiconductor processing equipment.

GTE and Social Responsibility

GTE's wide-ranging contributions program was broadened in 1989. During the year, the GTE Foundation, the company's philanthropic arm, made grants totaling \$20.3 million to educational and other human-services organizations throughout the United States.

The GTE educational programs seek to stimulate and improve students' knowledge of mathematics and science, thereby helping insure an adequate flow of teachers in these areas while training future scientists and engineers, and increasing the number of minority students in these disciplines.

A \$240,000 grant, approved in 1989, will sponsor a joint program to identify minority college undergraduates wishing to pursue teaching careers in mathematics and



science. The United Negro College Fund/GTE Summer Science Program will be conducted at GTE Laboratories.

The company established the GTE Family Literacy Program and provided \$130,000 to fund it in 1990 and 1991. The program is designed to teach parents and caregivers deficient in literacy skills to read to their children and to take reading courses provided by the Literacy Volunteers of America.

GTE expanded its Growth Initiatives for Teachers program from eight states and the District of Columbia to 11 additional states for the 1990-1991 school year. The GIFT program seeks to encourage professional excellence among teachers of mathematics and science in grades seven through 12.

During 1989, GTE and the National PTA developed comprehensive plans for their joint program, announced in 1988, to conduct an educational program to fight drug and alcohol abuse by school-age children. The materials, designed for parents of youngsters in grades three through six, will be

Scientists at GTE Laboratories are conducting advanced research in signal amplification for fiber-optics technology.

tested in the spring of 1990 and implemented by local PTA units nationwide in November.

Acknowledging the key role parents can play in helping their children abstain from drugs and alcohol, the educational materials will guide parents on how to form local support groups and work with other parents, school administrators, community officials and volunteer organizations. GTE has earmarked more than \$1 million to launch the program.

GTE continues to provide opportunities for women and members of minority groups to advance in their careers. In 1989, women made up 43% of the company's total population and minority-group members accounted for 18%.

The company expanded its programs to recruit outstanding minority-group college students for management positions in GTE units in the United States. For example, GTE's Summer Intern Program, which hires college students for professional positions each summer, has significant minority representation. More than half the minority interns are offered permanent positions with GTE after graduation.

GTE Policy Committee



Left to right: Dean L. Langford, President, GTE Electrical Products; Bruce Cariswell, Senior Vice President, Human Resources and Administration; Edward C.

Schultz, Senior Vice President, External Affairs and General Counsel; James L. Johnson, Chairman and Chief Executive Officer; Charles R. Lee, President and

Chief Operating Officer; Nicholas L. Trivisonno, Senior Vice President, Finance; Kent R. Foster, President, GTE Telephone Operations

Financial Review

Return to Shareholders

Maximizing long-term total return to its shareholders is GTE's primary financial objective. This objective is achieved by adhering to a policy of investing only in those businesses which will earn a rate of return in excess of their cost of capital over their lifetime.

GTE's annualized total return, as measured by share price appreciation and dividends, including reinvestment, for the five-year period ending 1989 was 28.7%, substantially more than the 20.3% return earned by the S&P 500 for the same period. In fact, for eight of the nine five-year periods ending 1981 to 1989, GTE's shareholders have enjoyed average annual returns in excess of those earned by the S&P 500.

In both 1989 and 1988, GTE's total return was more than double the return earned by the S&P 500 and significantly higher than the average of the regional Bell holding companies. These excellent returns were the result of substantial share price appreciation of 57% and 26% achieved in the respective two years. The above-average appreciation in share price increased total shareholder value by more than \$8 billion in 1989, after a \$3 billion increase in 1988. The increase in shareholder value reflects investors' awareness of the long-term benefits of the company's restructuring activities and other strategic actions designed to improve competitiveness and profitability, as well as positive trends in the fundamentals of GTE's core businesses.

Return on Equity

GTE's return on average common equity continued to improve in 1989, reaching 17.0%. This significant increase over 1988's level of 14.8% reflects earnings growth and the impact of GTE's share repurchase program.

The improvement in GTE's consolidated return on common equity was achieved despite continuing regulatory pressures to reduce rates of return in Telephone Operations. Continued fundamental growth at above-industry levels halted the downward trend in Telephone Operations' return on common equity.

Capitalization

GTE is committed to safeguarding the interests of its debtholders while, at the same time, using reasonable leverage to maximize shareholders' long-term total returns.

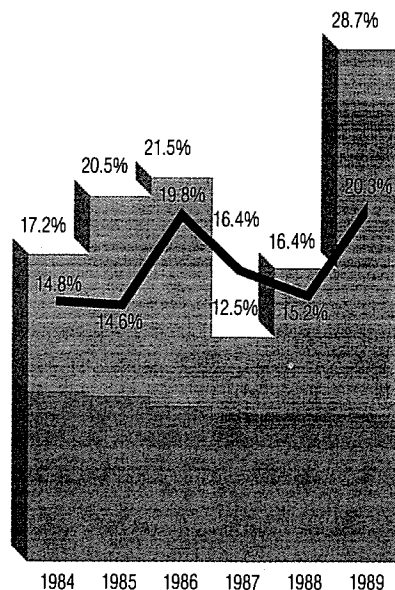
Business risk reductions resulting from repositioning actions have made it possible to increase GTE's use of financial leverage modestly over the last several years and still preserve an "A" rating. The company is committed to maintaining an "A" rating to ensure access to long-term capital at reasonable cost during all phases of the interest rate cycle.

GTE's excellent cash flow has allowed the company to utilize share repurchase programs to maintain an appropriate capital structure. A program initiated in 1988 authorized the repurchase of 25 million common shares. This was expanded in 1989 to 37.3 million shares to offset the issuance of additional shares used to fund a Consolidated Employee Stock Ownership Plan. Of the current program, 24.5 million shares were repurchased in 1988 and 1989. Since GTE's first share-repurchase program was introduced in 1986, it has repurchased 39.5 million shares at an average cost of \$47.56 per share.

In anticipation of receiving the proceeds from the sale of a 30.1% interest in US Sprint and the formation of AG Communication Systems—the joint venture with AT&T—the company had allowed its short-term debt level to increase temporarily to 8.3% at the end of 1988. Proceeds of \$697 million were received in January 1989,

FIVE YEAR RETURN TO SHAREHOLDERS*

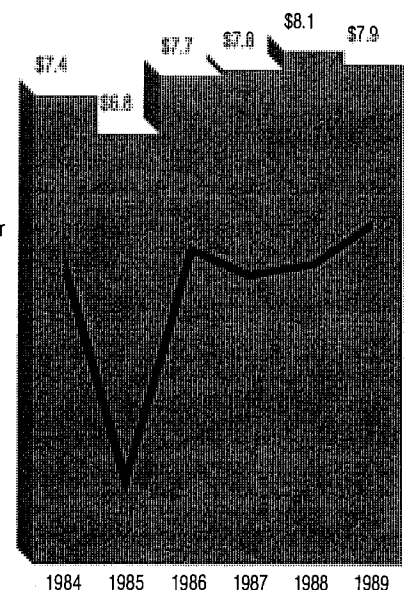
- GTE Price Appreciation
- GTE Dividend Return
- S&P 500



*Represents average annual return to shareholders over a five-year period, including price appreciation and assuming dividends were reinvested.

COMMON SHAREHOLDERS' EQUITY AND CONSOLIDATED RETURN ON EQUITY*

- Common Equity at End of Year (In Billions of Dollars)
- Percent Return



*Based on continuing operations.

**Includes the effect of a \$1.3 billion business repositioning charge. Excluding this charge, return on equity would have been 14.2%.

and the company subsequently reduced its short-term debt level to 4.8% by the end of 1989.

The two-for-one stock split announced in January 1990 will result in a share price that is more attractive to many of the company's investors. GTE's Board of Directors approved the split of GTE's common stock subject to shareholder approval of an increase in the corporation's authorized common shares.

Capital Resources and Liquidity

GTE's continued strong cash flow from operations of \$3.8 billion in 1989, combined with the proceeds from the US Sprint transaction and the joint venture with AT&T, more than provided for almost \$1 billion in dividends to shareholders and for capital expenditures of \$3.2 billion.

The capital program for 1990 is expected to be substantially unchanged from 1989. In 1989, as in prior years, the major portion of the capital program was for investment by Telephone Operations, primarily for growth and modernization of facilities. Although still significant, the portion of Telephone Operations' capital program dedicated to modernization has been declining. This decline will continue in 1990 as the program for converting the telephone network from analog to digital technology moves toward completion. Decreases in 1990 capital spending in Telephone Operations will be partially offset by other investments in new and growing enterprises within GTE's core businesses, modernization of facilities and improvements in quality.

In 1989, GTE received almost \$700 million from the sale of 12.3 million shares of common stock to the Consolidated Employee Stock Ownership Plan. Additional external funding requirements to refinance maturing issues of long-term debt, refund high-cost debt, reduce short-term debt and provide funds for share repurchases were met mainly through the issuance of long-term debt in both U.S. and non-U.S. capital markets. The

company will continue to maximize opportunities in the worldwide financial markets during 1990 to meet its requirements for external funds at the lowest possible cost.

Dividends

As part of its objective of maximizing shareholders' long-term total return, GTE is continuing its policy of a dividend-payout ratio in the upper end of the range for companies in similar businesses. As a result, GTE increased the quarterly common stock dividend by 9% in August 1989, to an annual rate of \$2.92 per share. The company's strong earnings and cash flow support the significant dividend increase—the 35th increase in 36 years.

Results of Operations

Consolidated

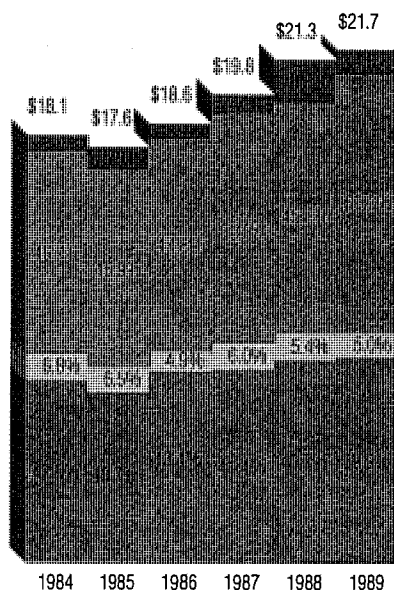
GTE achieved record high revenues, net income and earnings per share in 1989. Consolidated net income rose to \$1.4 billion, while earnings per share reached \$4.16. This represented an increase of 16% over the \$1.2 billion, or \$3.58 per share, reported in 1988. Consolidated revenues and sales increased to \$17.4 billion, 6% higher than the \$16.5 billion reported in 1988.

These record results reflect continued strong fundamental growth in GTE's operations at the same time that GTE has been taking strategic actions to revitalize its operations to meet the challenges of the 1990s. These actions include the continued reorganization and streamlining of GTE's Telephone Operations that began in 1988; a restructuring of U.S. Lighting's operations; additional investments in emerging high-growth businesses such as mobile communications; the initiation of the joint venture with AT&T in network switching

CONSOLIDATED CAPITALIZATION

(In Billions of Dollars)

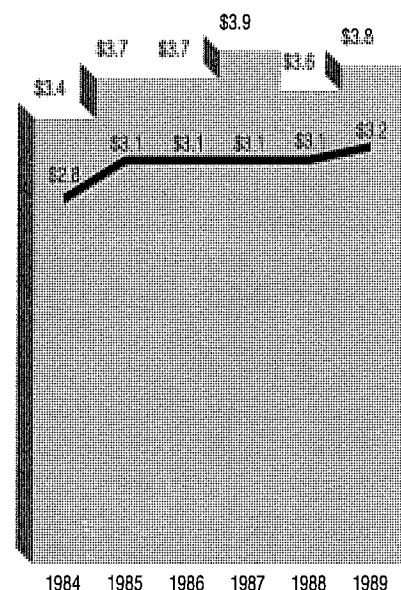
- Short-Term Debt
- Long-Term Debt
- Preferred Stock
- Common Stock



GTE CONSOLIDATED CASH FLOWS

(In Billions of Dollars)

- Net Cash from Operations
- Capital Expenditures



equipment, and the consummation of the sale of a 30.1% interest in US Sprint.

The following sections discuss business group operations in more detail.

Telephone Operations

GTE Telephone Operations provides many types of communications services. These range from local telephone service for the home or office to highly complex voice and data services for industry and national defense. The U.S. telephone operations serve 12.8 million access lines in 31 states. GTE also owns or has voting control of two telephone companies in Canada and one in the Dominican Republic, which together serve an additional 2.3 million access lines. Total access lines in service at year-end 1989 were 15.1 million, a 5% increase over 1988.

In 1989, revenues from Telephone Operations increased 7% to \$12.5 billion, while operating income increased 4% to \$2.8 billion. These results reflect higher revenues and income in GTE's U.S. and non-U.S. telephone operations, which experienced increased usage of their networks for local and long-distance calling. Substantial rate reductions in Texas and California, however, caused operating income to grow at a lower rate than revenues.

The consolidation and reorganization of Telephone Operations continue on schedule. This reorganization will not only result in additional improvements in customer service but in substantial cost savings which, in turn, will increase competitiveness. In recognition of these efforts, GTE voluntarily implemented a reduction of \$101 million annually in rates charged to interexchange carriers effective January 1, 1990. This followed a similar reduction last April which reduced interexchange carrier rates by approximately 10%. These rate

decreases could ultimately result in lower long-distance rates for consumers.

The 7% overall growth in 1989 telephone revenues is consistent with the annual growth experienced over the last five years. Combined revenues from network access and long distance services amounted to \$6.3 billion. This was 8% higher than in 1988 despite the previously discussed 10% reduction in charges to interexchange carriers in April 1989. This improvement reflects an increase in excess of 11% in the usage of GTE's U.S. local-exchange network for long-distance calling and higher revenues from non-U.S. operations.

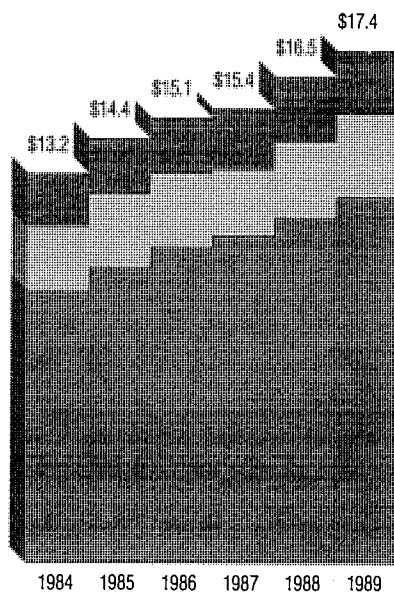
Local network revenues of \$3.6 billion were only 2% higher than 1988, although access lines in service increased 5% during the year. This was due to the impact of the substantial rate reductions ordered by the California and Texas public utility commissions in 1988 and 1989. These rate actions reduced 1989 local revenues, compared with 1988, by approximately \$200 million. The modest increase in local revenues also reflects the pattern in recent years due to the deregulation of many previously regulated telephone services. In addition, there has been less need for rate increases—inflation has been relatively stable—and GTE has continued to aggressively introduce methods to increase productivity and control costs in all of its operations.

Other telephone revenues relate primarily to non-regulated services. In 1989, these revenues totaled \$2.6 billion, 9% higher than 1988. This improvement reflects increased demand for telephone equipment, cable and supplies as well as revenues from certain previously regulated telephone services.

Improved productivity continues to be an important objective for Telephone Operations. Although access lines increased by approximately 5% in 1989, these lines were serviced by fewer employees. This is attributable in large measure to a variety of technological advances. At year-end 1989, approximately 70% of the

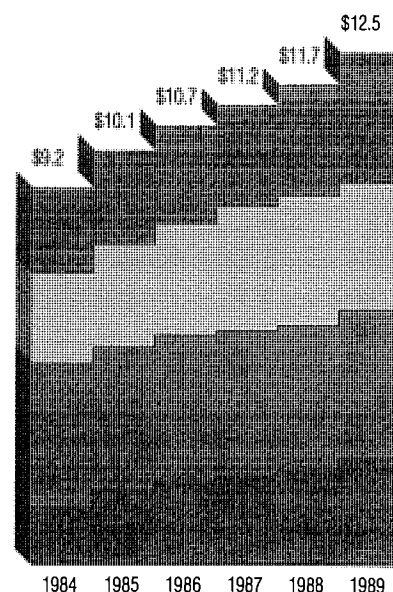
CONSOLIDATED REVENUES AND SALES BY BUSINESS GROUP
(In Billions of Dollars)

- Electrical Products
- Telecommunications Products and Services
- Telephone Operations



TELEPHONE OPERATIONS REVENUES
(In Billions of Dollars)

- Long Distance
- Network Access
- Local Network
- Other



access lines served by the GTE Telephone Operations were connected to digital switches, compared with 64% in 1988 and only 18% in 1984.

GTE Telephone Operations also continues to improve the rate of recovery of its investment in telephone plant. While gross investment in plant increased at a 6% annual rate during the 1984-1989 period, more than one-third of GTE's total investment in telephone plant was recovered through depreciation by the end of 1989, compared with only 28% in 1984.

In 1988, revenues from Telephone Operations increased 5% over 1987 to \$11.7 billion while operating income declined 6% to \$2.7 billion. The decrease in operating income reflected the net effect of positive growth in access lines, network usage and productivity gains which were offset by increased expenses associated with an accounting change mandated by the Federal Communications Commission (FCC) beginning in 1988. This change required the expensing of certain costs that were capitalized under prior accounting. The decrease also reflects the impact of rate reductions, particularly in California, as well as a provision for the reorganization and streamlining of GTE's Telephone Operations. Although operating income was lower, Telephone Operations' 1988 net income was 2% higher than 1987, primarily due to the benefit of a lower federal income tax rate.

Regulatory Trends

In the recent past, there has been increased activity directed toward changing the traditional rate of return regulatory process for interstate and intrastate telephone services. Various forms of alternative regulations have been proposed, and some adopted, which will provide economic incentives to telephone service providers to improve cost controls, efficiency and productivity.

The FCC has indicated that it expects to implement a fundamental revision in its method of regulating interstate services of local exchange carriers effective January 1, 1991. The FCC is considering replacing its current rate of return regulation for most local exchange carriers with a "price cap" mechanism which would control prices for interstate services while at the same time encouraging innovation and productivity. Under the price cap mechanism, the price caps would be increased or decreased each year if a price index, serving as an indicator of inflation, exceeded or was less than a predetermined productivity target established for the local exchange carriers.

Beginning in 1990, GTE California, the largest of our telephone operating units, serving 23% of our access lines, became subject to a new incentive regulation plan for intrastate services. The plan promotes efficiency by allowing both shareholders and customers to share in the benefits of productivity improvements. The California Public Utility Commission order, which was strongly endorsed by GTE, authorizes an overall rate of return of 11.5%. It also requires earnings between a benchmark rate of return of 13% and 16.5% to be shared equally between ratepayers and shareholders. Earnings above 16.5% would be returned to ratepayers.

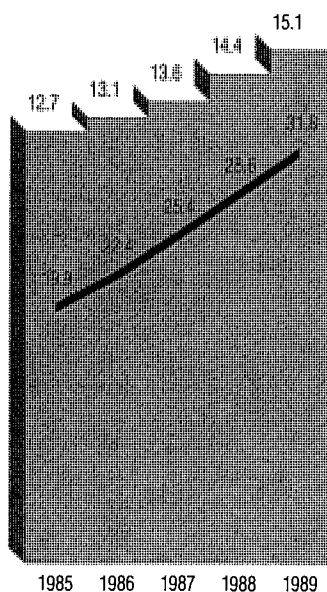
GTE supports incentive regulation and is hopeful that similar plans will be more widely adopted by regulators. We are encouraged by the fact that the combination of those states which have already adopted some form of incentive regulation, and those that have incentive regulation filings under consideration or planned, affects more than one-half of our access lines.

Telecommunications Products and Services

GTE Telecommunications Products and Services develops and markets a wide range of telecommunications systems and services through its information services, mobile communications, satellite and government

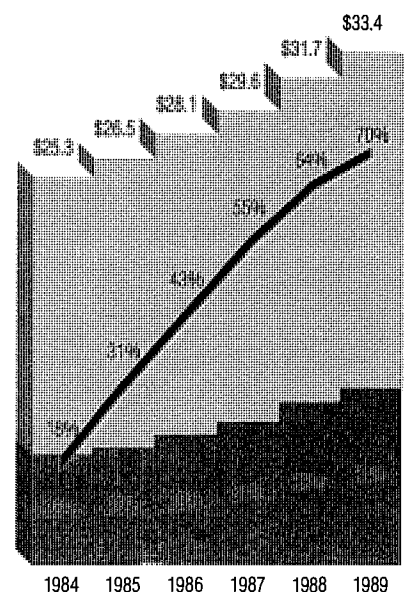
TELEPHONE OPERATIONS ACCESS LINES AND MINUTES OF USE

■ Access Lines (In Millions)
■ Minutes of Use (In Billions)



TELEPHONE OPERATIONS CAPITAL INVESTMENT AND RECOVERY
(In Billions of Dollars)

■ Gross Investment in Plant
■ Depreciation Reserve
■ Access Lines - Percent Digital



systems operations as well as its communication systems joint venture with AT&T.

Revenues and sales of Telecommunications Products and Services increased 9% in 1989 to \$2.8 billion. This compares with \$2.6 billion in 1988, which included an accounting change for directory advertising revenues. Excluding this change, 1989 revenues increased 16%, reflecting higher sales of government communication systems, cellular-mobile telephone services, satellite services and directory advertising.

Operating income increased 21% to \$128 million. This improvement reflects the higher sales as well as improved margins, particularly in cellular-mobile telephone services, satellite services and directory advertising. These gains were partially offset by start-up expenses associated with investments in new business opportunities—principally at GTE Information Services.

The sales improvement at GTE Government Systems reflects the benefit of the Mobile Subscriber Equipment communications system contract with the U.S. Army. Order backlog continued at near-record levels, reflecting the earlier major production awards of \$3.3 billion for this program.

Another unit, GTE Mobilnet, is the fifth largest provider of cellular-mobile telephone services in the United States in terms of population served. GTE Mobilnet currently operates cellular networks in 34 major metropolitan areas and three rural service areas. It serves a population of 23 million, more than half of which is in the top 30 U.S. markets. In 1989, GTE Mobilnet became the first cellular communications company to offer nationwide mobile connections with a single point of contact for customer sales and service. This unit continues to expand at an accelerated rate. During 1989, its customer base grew to 263,000 from 127,000, an increase of 107%, well above the industry average.

Outside the U.S., GTE also operates cellular mobile networks through international subsidiaries. Its largest

market is in Canada where it serves an adjusted population of 1.8 million.

GTE Directories, the largest unit in GTE Information Services, is one of the largest publishers and distributors of Yellow Pages advertising worldwide. This unit continued its excellent performance in 1989 with new advertising contracts running 10% ahead of 1988.

In 1988, revenues and sales of Telecommunications Products and Services of \$2.6 billion were 18% higher than 1987 reflecting higher sales at all units within the group, particularly directory services, cellular-mobile telephone services and government communications systems. The increase included a one-time favorable impact of a change in accounting to record directory advertising revenue upon publication rather than over the life of the directory. Excluding this accounting change, 1988 revenues for the group were 10% higher than 1987. Operating income in 1988 more than doubled, increasing to \$106 million from the \$52 million earned in 1987, reflecting the higher sales as well as improved margins.

Electrical Products

GTE Electrical Products is a leading worldwide manufacturer of lighting products for residential, commercial and industrial use. The group also manufactures and markets precision materials and custom engineered parts, components and materials for a broad range of industries.

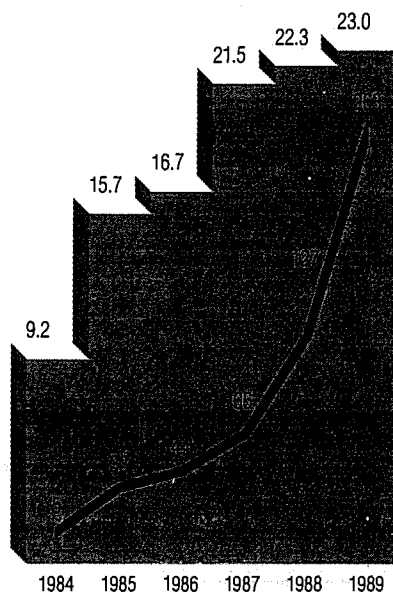
Sales in 1989 of \$2.2 billion were 2% lower than 1988, as higher worldwide lighting volume was more than offset by the impact of weaker currencies in Europe and South America, lower pricing in the U.S. and the divestiture of some marginal businesses in 1988. Operating income totaled \$222 million, compared with \$228 million in 1988. The lower operating income was primarily due to a charge in the fourth quarter of 1989 to restructure U.S. Lighting's distribution and manufacturing operations as well as to lower pricing on certain lighting products. These reductions were partially offset by the favorable effect of a change earlier in 1989 in the method of valuing certain inventories.

The restructuring action taken in the fourth quarter of 1989 will result in the closing of two lighting plants and the creation of a nationwide network of strategically located, service-oriented, product-distribution centers as well as a state-of-the-art customer-support center for a complete customer-service and product-delivery network. This streamlining of operations, together with the closing of a manufacturing facility in Montoursville, Pa., completed earlier in 1989, will reduce future operating costs as well as increase the effectiveness of service and delivery to our customers.

In 1988, Electrical Products' sales increased 5% to \$2.2 billion, while operating income increased 2% to \$228 million. The income increase reflected improved results from shipments of precision materials and international lighting products, which were partially offset by lower margins on certain U.S. lighting products.

U.S. CELLULAR—MOBILE OPERATIONS

■ Adjusted Population*
(In Millions)
■ Subscribers
(In Thousands)



*Total population served times GTE's percentage interest in the market.

Business Group Data

GTE Corporation and Subsidiaries

							Annual Growth Rate +
Consolidated Operations	1989	1988	1987	1986	1985	1984	(1984-1989)
	(Millions of Dollars)						
Results of Operations							
Revenues and sales ^(a)	\$17,424	\$16,460	\$15,421	\$15,112	\$14,372	\$13,248	5.6%
Operating income	3,189	3,052	3,153	3,238	3,201	2,835	2.4
Net income applicable to common stock	1,370	1,177	1,082	1,153	(198)	1,092 ^(b)	4.6
Per share	4.16	3.58	3.29	3.53	(.63)	3.70 ^(b)	2.4
Dividends declared per common share	2.80	2.60	2.48	2.20	2.08	2.03	6.6
Depreciation	2,621	2,559	2,474	2,305	2,016	1,847	7.3
Research and development	281	297	251	291	296	254	2.0
Assets and Capital							
Plant additions	3,449	3,288	3,349	3,419	3,354	3,076	2.3
Average investment	21,216	20,291	19,083	18,194	18,291	17,792	3.6
Long-term debt and redeemable preferred stock	11,185	10,007	9,901	9,239	8,862	9,082	4.3
Identifiable assets	31,986	31,104	28,745	27,402	25,965	25,741	4.4
Shareholders' equity	8,403	8,631	8,303	7,885	7,056	7,619	2.0
Ratios and Other Information							
Return on common equity	17.0%	14.8%	14.0%	15.9%	(2.6)%	15.8%	—
Return on investment	10.6%	9.9%	9.4%	9.8%	2.4%	9.9%	—
Employees (in thousands)	158	159	161	161	175	178	(2.3)
Foreign Operations (included above)							
Revenues and sales	\$ 2,763	\$ 2,414	\$ 2,052	\$ 2,135	\$ 2,043	\$ 1,937	7.4%
Net income	246	125	98	101	101	51	37.0
Identifiable assets	4,559	4,067	3,522	3,214	3,346	3,318	6.6
Corporate and Other							
Plant additions	\$ 95	\$ 63	\$ 47	\$ 48	\$ 61	\$ 99	(.7)%
Identifiable assets	1,063	1,549	960	1,027	790	1,606	(7.9)

+ Compound annual rate method.

^(a) Revenues and sales reflect eliminations of intergroup sales, except for sales of construction and maintenance equipment and supplies by affiliated companies to regulated telephone subsidiaries.

^(b) Includes cumulative effect of change in accounting for investment tax credits for non-telephone operations which increased 1984 net income by \$45 million or \$.15 per share.

^(c) Services provided to AT&T constituted approximately 16%, 19% and 21% of telephone revenues in 1989-1987, respectively.

^(d) Amounts shown for periods prior to 1988 include operations transferred to joint ventures and no longer consolidated.

^(e) Represents growth for 1985-1989 period; 1984 data not available.

Business Group Data

GTE Corporation and Subsidiaries

							Annual Growth Rate +
Business Group Operations	1989	1988	1987	1986	1985	1984	(1984-1989)
(Millions of Dollars)							
Telephone Operations							
Operating revenues ^(c) —							
Local network services	\$ 3,602	\$ 3,521	\$ 3,526	\$ 3,615	\$ 3,493	\$ 3,454	.8%
Network access services	3,240	3,170	2,998	2,667	2,518	2,232	7.7
Long distance services	3,062	2,661	2,505	2,450	2,238	2,109	7.7
Other	2,555	2,334	2,129	2,018	1,808	1,437	12.2
Total revenues	12,459	11,686	11,158	10,750	10,057	9,232	6.2
Operations and maintenance	7,241	6,621	5,998	5,690	5,325	4,938	8.0
Depreciation	2,379	2,347	2,281	2,128	1,857	1,724	6.6
Operating income	2,839	2,718	2,879	2,932	2,875	2,570	2.0
Plant additions	2,906	2,827	3,003	2,960	2,838	2,490	3.1
Identifiable assets	25,346	24,252	22,946	21,958	20,914	20,002	4.8
Average investment	18,360	17,598	16,946	16,299	15,713	15,198	3.9
Return on common equity	15.3%	15.1%	16.2%	17.0%	16.9%	16.3%	—
Gross toll messages (in millions)	3,836	3,430	3,092	2,837	2,650	2,418	9.7
Access minutes of use (in millions)	31,773	28,565	25,362	22,376	19,875	(e)	12.4 ^(e)
Access lines (in thousands)	15,141	14,373	13,635	13,087	12,681	12,304	4.2
Operating company employees (in thousands)	98.5	98.6	101.3	102.5	103.0	105.7	(1.4)
Access lines per employee	153.8	145.8	134.6	127.6	123.2	116.4	5.7
Telecommunications Products and Services^(d)							
Revenues and sales	\$ 2,838	\$ 2,597	\$ 2,210	\$ 2,537	\$ 2,522	\$ 2,264	4.6%
Operating income	128	106	52	126	131	53	18.8
Depreciation	163	132	119	114	103	74	17.2
Plant additions	339	297	194	267	349	337	.1
Identifiable assets	3,368	3,228	2,749	2,783	2,885	2,911	3.0
Average investment	1,223	1,123	861	849	1,081	1,267	(.7)
Electrical Products							
Sales	\$ 2,184	\$ 2,237	\$ 2,129	\$ 1,922	\$ 1,899	\$ 1,853	3.3%
Operating income	222	228	222	180	195	212	1.0
Depreciation	79	80	74	63	56	49	10.0
Plant additions	109	101	105	144	106	150	(6.3)
Identifiable assets	2,209	2,075	2,090	1,634	1,376	1,222	12.6
Average investment	1,255	1,214	1,123	933	927	861	7.8

See Notes to Business Group Data on page 33.

Consolidated Statements of Income

GTE Corporation and Subsidiaries

Years Ended December 31

	1989	1988	1987
	(Thousands of Dollars)		
<i>Revenues and Sales:</i>			
Telephone operations	\$12,459,314	\$11,685,979	\$11,158,257
Other operations	4,965,046	4,773,873	4,262,773
Total revenues and sales	17,424,360	16,459,852	15,421,030
<i>Costs and Expenses:</i>			
Telephone operations	9,620,303	8,967,887	8,279,370
Other operations*	4,614,827	4,440,412	3,988,995
Total costs and expenses	14,235,130	13,408,299	12,268,365
Operating income	3,189,230	3,051,553	3,152,665
<i>Other Deductions:</i>			
Interest expense—net	898,864	913,558	838,133
Equity in pre-tax loss of US Sprint	—	125,131	577,451
Other—net	226,304	171,902	(14,869)
Total other deductions	1,125,168	1,210,591	1,400,715
Income before income taxes	2,064,062	1,840,962	1,751,950
Income tax provision	646,792	616,281	633,133
Net income	1,417,270	1,224,681	1,118,817
Preferred stock dividends of parent	47,462	47,762	37,245
Net income applicable to common stock	\$ 1,369,808	\$ 1,176,919	\$ 1,081,572
Earnings per common share	\$ 4.16	\$ 3.58	\$ 3.29
Average common shares (in thousands)	329,649	328,589	329,171

*Includes cost of sales of \$3,772,369, \$3,685,124 and \$3,198,522 for the years 1989–1987, respectively.
See Notes to Financial Statements.

Consolidated Balance Sheets

GTE Corporation and Subsidiaries

December 31

	1989	1988
	(Thousands of Dollars)	
Assets		
<i>Current Assets:</i>		
Cash and temporary cash investments	\$ 395,802	\$ 306,979
Receivables, less allowances of \$99,496 and \$98,297	3,191,091	2,893,661
Inventories	1,416,118	1,263,934
Deferred income tax benefits	307,884	266,232
Other	286,402	881,101
Total current assets	5,597,297	5,611,907
<i>Property, Plant and Equipment, at cost:</i>		
Telephone subsidiaries	33,381,095	31,739,842
Accumulated depreciation	(11,504,742)	(10,400,217)
	21,876,353	21,339,625
<i>Other subsidiaries</i>	3,280,560	2,941,798
Accumulated depreciation	(1,456,694)	(1,294,537)
	1,823,866	1,647,261
Total property, plant and equipment, net	23,700,219	22,986,886
<i>Investments and Other Assets:</i>		
Investments in unconsolidated companies	858,344	811,613
Deferred charges	831,231	774,462
Bonds, at amortized cost	369,690	388,094
Noncurrent receivables	280,334	245,069
Intangibles and other	349,381	285,895
Total investments and other assets	2,688,980	2,505,133
Total assets	\$31,986,496	\$31,103,926

See Notes to Financial Statements.

December 31

	1989	1988
	(Thousands of Dollars)	
Liabilities and Shareholders' Equity		
<i>Current Liabilities:</i>		
Short-term obligations, including current maturities	\$ 1,049,857	\$ 1,757,738
Accounts and payrolls payable	1,918,604	1,514,144
Accrued taxes	708,325	622,751
Dividends payable	271,787	244,084
Advance billings	239,531	227,546
Accrued interest	233,397	237,373
Other	1,281,675	1,266,439
Total current liabilities	5,703,176	5,870,075
<i>Long-Term Debt</i>	10,909,397	9,704,710
<i>Reserves and Deferred Credits:</i>		
Deferred income taxes	3,742,593	3,668,964
Deferred investment tax credits	585,500	735,058
Other	1,296,883	1,329,993
Total reserves and deferred credits	5,624,976	5,734,015
<i>Minority interests in equity of subsidiaries</i>	1,070,302	861,821
<i>Preferred Stock, subject to mandatory redemption</i>	275,958	301,958
<i>Shareholders' Equity:</i>		
Preferred stock	468,043	504,833
Common stock—shares issued 351,971,990 and 349,289,499	35,197	34,929
Amounts paid in, in excess of par value	5,348,840	5,067,310
Reinvested earnings	4,428,072	3,978,219
Foreign currency translation adjustment	(11,036)	(16,665)
Guaranteed ESOP obligation	(700,000)	—
Common stock held in treasury—21,670,255 and 23,000,000, at cost	(1,166,429)	(937,279)
Total shareholders' equity	8,402,687	8,631,347
Total liabilities and shareholders' equity	\$31,986,496	\$31,103,926

See accompanying summary on page 40 for details of preferred stock and long-term debt.
See Notes to Financial Statements.

Consolidated Statements of Cash Flows

GTE Corporation and Subsidiaries

Years Ended December 31

	1989	1988	1987
	(Thousands of Dollars)		
<i>Cash Flows from Operations:</i>			
Net income	\$1,417,270	\$1,224,681	\$1,118,817
Adjustments to reconcile net income to net cash from operations:			
Depreciation	2,621,334	2,559,090	2,473,652
Deferred taxes and investment tax credits	(135,280)	107,627	285,925
Equity in pre-tax loss of US Sprint	—	125,131	577,451
Change in current assets and current liabilities, excluding the effects of acquisitions and dispositions	(120,036)	(368,531)	(443,012)
Other—net	18,691	(90,388)	(122,846)
Net cash from operations	3,801,979	3,557,610	3,889,987
<i>Cash Flows from Investing:</i>			
Capital expenditures	(3,224,844)	(3,087,010)	(3,133,896)
Investment in US Sprint	519,728	(235,000)	(699,427)
Proceeds from sales of businesses	252,638	53,297	13,900
Other—net	(44,670)	(32,526)	33,001
Net cash used in investing	(2,497,148)	(3,301,239)	(3,786,422)
<i>Cash Flows from Financing:</i>			
GTE common stock issued	991,004	291,383	316,041
Stock of subsidiaries issued	30,011	9,919	17,771
Long-term debt and preferred stock issued	729,729	664,313	1,898,804
Long-term debt and preferred stock retirements	(622,416)	(490,556)	(1,104,679)
Dividends to shareholders of parent	(973,535)	(903,250)	(853,629)
Preferred dividends of subsidiaries	(33,232)	(33,759)	(36,260)
Purchase of treasury shares	(940,531)	(338,851)	(539,092)
Increase (decrease) in short-term obligations, excluding current maturities	(413,532)	681,254	162,007
Net cash used in financing	(1,232,502)	(119,547)	(139,037)
Effect of exchange rate changes on cash and temporary cash investments	16,494	(686)	(19,775)
Increase (decrease) in cash and temporary cash investments	88,823	136,138	(55,247)
Cash and temporary cash investments:			
Beginning of year	306,979	170,841	226,088
End of year	\$ 395,802	\$ 306,979	\$ 170,841

See Note 12 for supplemental cash flow disclosures.

See Notes to Financial Statements.

**Consolidated Statements of Amounts Paid In, in Excess of Par Value,
Reinvested Earnings and Foreign Currency Translation Adjustment**

GTE Corporation and Subsidiaries

Years Ended December 31

	1989	1988	1987
	(Thousands of Dollars)		
Amounts Paid In, in Excess of Par Value:			
Balance beginning of year	\$5,067,310	\$4,769,391	\$4,457,642
Issuance of common stock	258,807	290,536	309,735
Conversion of preferred stock	22,723	7,383	2,014
Balance end of year	\$5,348,840	\$5,067,310	\$4,769,391
Reinvested Earnings:			
Balance beginning of year	\$3,978,219	\$3,637,926	\$3,372,738
Net income applicable to common stock	1,369,808	1,176,919	1,081,572
Cash dividends declared on common stock	(926,073)	(855,488)	(816,384)
Other	6,118	18,862	—
Balance end of year	\$4,428,072	\$3,978,219	\$3,637,926
Foreign Currency Translation Adjustment:			
Balance beginning of year	\$ (16,665)	\$ (83,685)	\$ (141,069)
Current period adjustment	5,629	67,020	57,384
Balance end of year	\$ (11,036)	\$ (16,665)	\$ (83,685)

See Notes to Financial Statements.

1. Summary of Accounting Policies

Principles of Consolidation

The consolidated financial statements include the accounts of all majority-owned subsidiaries. Investments in 20% to 50%-owned companies are accounted for on the equity basis. In July 1988, GTE agreed to sell a portion of its 50% interest in US Sprint and reduce its ownership to less than 20% and, accordingly, changed from the equity to the cost basis of accounting for its investment. In the fourth quarter of 1988, due to improved local conditions, the company commenced consolidation of a foreign subsidiary, previously accounted for on the cost basis. Prior earnings of the subsidiary in excess of previously recorded dividends were credited to reinvested earnings.

All significant intercompany items have been eliminated, except for sales of construction and maintenance equipment and supplies by affiliated companies to regulated telephone subsidiaries. These sales amounted to \$882 million, \$828 million and \$741 million in the years 1989-1987, respectively, and were made at prices which compare favorably with those at which comparable equipment and supplies could be obtained elsewhere.

Depreciation

The telephone subsidiaries provide for depreciation generally using the straight-line method. Depreciation provisions in 1989-1987 for the telephone subsidiaries were equivalent to a composite average percentage of 7.6%, 8.0% and 8.5%, respectively. Other subsidiaries record depreciation using straight-line and accelerated methods.

Inventories

Inventories are stated at the lower of cost or market value. Cost of inventories is determined principally by the average or first-in, first-out method of inventory valuation. Inventories at December 31 were as follows (in thousands of dollars):

	1989	1988
Finished goods	\$ 532,835	\$ 483,586
Work in process	373,283	297,423
Raw materials	197,531	221,128
Materials and supplies of telephone subsidiaries	312,469	261,797
Total	\$1,416,118	\$1,263,934

Foreign Currency Translation

Assets and liabilities of subsidiaries operating in foreign countries are translated into U.S. dollars using the exchange rates in effect at the balance sheet date. Results of operations are translated using the average exchange rates prevailing throughout the period. The effects of exchange rate fluctuations on translating foreign currency assets and liabilities into U.S. dollars are included as part of the Foreign Currency Transla-

tion Adjustment component of shareholders' equity, while gains and losses resulting from foreign currency transactions are generally included in income.

Regulatory Accounting

GTE's telephone companies follow the accounting for regulated enterprises prescribed by Statement of Financial Accounting Standards No. 71, "Accounting for the Effects of Certain Types of Regulation." This accounting recognizes the economic effects of rate regulation by recording costs and a return on investment when such amounts are recovered through rates authorized by regulatory authorities.

Effective January 1, 1988, GTE's U.S. telephone companies adopted a new Uniform System of Accounts as required by the Federal Communications Commission. The new system requires, among other things, that indirect construction costs and software costs which were capitalizable under the former system be expensed. The change did not have a material effect on net income.

Income Taxes

GTE generally provides for deferred income taxes resulting from differences in the timing of amounts reported for financial accounting and income tax purposes, the most significant of which relates to depreciation expense.

Included in telephone plant are allowances for funds used during construction and certain pension costs, sales and use taxes and payroll taxes applicable to plant construction, including certain costs which were deducted for tax purposes prior to the implementation of the Tax Reform Act of 1986. In certain regulatory jurisdictions the income tax effects of such timing differences were not deferred in accordance with ratemaking practices. These timing differences amounted to \$826 million at December 31, 1989.

Non-U.S. subsidiaries compute income taxes at rates in effect in the various countries. Earnings of these subsidiaries may also be subject to additional income and withholding taxes when they are distributed as dividends. These additional taxes, net of applicable tax credits, are accrued currently, except with respect to earnings which are not expected to be remitted because they will be permanently reinvested locally by the subsidiaries. Undistributed earnings of non-U.S. subsidiaries deemed to be permanently reinvested were approximately \$297 million at December 31, 1989.

The Financial Accounting Standards Board issued Statement No. 96 entitled "Accounting for Income Taxes," which is required to be implemented no later than the first quarter of 1992. This statement significantly changes the method by which companies will account for income taxes. Among other things, the statement will require establishment of deferred tax accounts for all temporary differences between the book and tax bases of assets and liabilities, including

those which have not been previously recognized in accordance with ratemaking practices. In addition, deferred tax accounts must be adjusted whenever new tax rates are enacted into law. Implementation of this standard is subject to approval by various regulatory commissions. When adopted, GTE does not expect that the new accounting will materially affect its results of operations.

2. Joint Ventures

In January 1989, GTE sold at book value a 30.1% interest in US Sprint, a joint venture formed in 1986 with United Telecommunications, Inc. (United) to market long-distance telephone and data-transmission services. GTE now retains a 19.9% interest in the venture which is subject to call by United before the end of 1995. GTE also has an option to sell its remaining interest to United between December 31, 1991, and December 31, 1995.

Also in January 1989, GTE formed a joint venture with American Telephone and Telegraph Company (AT&T) involving GTE's domestic network switching business known as AG Communication Systems. AT&T paid GTE approximate book value for its 49% interest in the new venture, with GTE retaining a 51% interest. The agreement provides that AT&T will assume 80% ownership in 1993 and 100% in 2003 through the purchases of GTE's interest at approximate book value at the dates of purchase.

3. Shareholders' Equity

Common Stock

The authorized common stock of GTE at December 31, 1989, consisted of 750 million shares with a par value of \$.10 per share. During the years 1989-1987, GTE repurchased 16.5 million, 8 million and 13.5 million common shares, respectively. These actions were taken as part of GTE's programs to repurchase shares of its common stock to satisfy various share requirements of its employee benefit and shareholder stock purchase plans, including, as discussed below, 12.3 million shares in 1989 for its Consolidated Employee Stock Ownership Plan. Shares of common stock issued in the last three years were as follows (in thousands):

	1989	1988	1987
Employee Stock Purchase Plan	3,955	4,090	4,034
Shareholder Systematic Investment Plan	1,787	2,175	2,193
Employee savings plans	1,548	2,139	2,316
Conversions of preferred stock	830	268	54
Consolidated Employee Stock Ownership Plan	12,324	—	—
Other	28	68	489
Total	20,472	8,740	9,086

As of December 31, 1989, 25 million shares were reserved for issuance under the various plans indicated above.

In July 1989, GTE established a Consolidated Employee Stock Ownership Plan (ESOP). The ESOP borrowed \$700 million to acquire at market value 12.3 million shares of GTE common stock which will be used to meet GTE's contributions to certain employee savings plans over the next 15 years. GTE will also make annual cash contributions to the ESOP which, when combined with dividends on the Company's common stock held by the ESOP, will be sufficient to repay the loan plus interest over the 15-year period. The unpaid balance of the loan, which has been guaranteed by GTE, is included in GTE's balance sheet as long-term debt with a corresponding reduction in shareholders' equity, which will be adjusted downward as the ESOP repays the debt.

On January 18, 1990, the Board of Directors approved a two-for-one split of GTE's common stock. The stock split is subject to approval by the shareholders of an increase in the authorized common shares from 750 million to 2 billion and a reduction in the par value from \$.10 to \$.05 per share. These actions will be voted on at the annual shareholders' meeting scheduled for April 18, 1990. If approved, one new share of GTE common stock, par value \$.05 per share, will be distributed for each existing share of common stock held of record on May 23, 1990.

Preferred Stock

All preferred stock, except the \$2.475 and the auction rate series, have voting rights generally on an equal basis with common stock. The shares of \$2.475 Series are entitled to half of a vote for each share. The auction rate preferred stock does not have voting rights, except under certain circumstances. Dividends are cumulative on all preferred stocks.

As of December 31, 1989, each share of \$50 convertible preferred stock is convertible into 1.32 common shares, except for the 5.00%, 4.00%, 4.36% and 5.28% series which are convertible into 1.34, 1.80, 3.47 and 4.53 common shares, respectively. In addition, at December 31, 1989, each share of \$2.00 convertible preferred stock is convertible into .78 common shares. During the years 1989-1987 preferred shares totaling 1,043,814, 331,747 and 43,824 were converted into 830,148, 267,628 and 54,073 common shares, respectively.

All series of the auction rate preferred stock are redeemable at the option of GTE in units of 1,000 shares at \$100,000 per unit plus accrued dividends. The dividend rate for each series of auction preferred stock is set pursuant to an auction procedure conducted prior to the commencement of the dividend period,

generally 49 days. The maximum dividend rates may range from 110% to 150% of the 60-day "AA" composite commercial paper rate.

Shareholder Rights Plan

On December 7, 1989, the Board of Directors adopted a Shareholder Rights Plan to protect shareholders against unsolicited attempts to acquire control of GTE that do not offer what GTE believes to be an adequate price to all shareholders. Under the plan each outstanding share of GTE Common Stock has associated with it a Right to purchase, upon the occurrence of certain events, one one-thousandth of a share of Series A Participating No Par Preferred Stock ("the Preferred Stock") at \$200. The Rights will become exercisable only if a person or group, without GTE's consent, commences a tender or exchange offer for, or acquires 20% or more of the voting power of GTE, or acquires 10% or more of the voting power of GTE and executes an agreement with GTE to effect a merger or other business combination.

In the event that a person or group acquires 20% or more of GTE's voting power without GTE's consent (the "Acquiring Person"), each holder of a Right, other than the Acquiring Person will be entitled to acquire that number of one one-thousandth of a share of Preferred Stock equal to the number of shares of GTE's Common Stock having a market value of twice the exercise price of the Rights. Similarly, if without GTE's consent, GTE is acquired in a merger or other business combination transaction, each holder of a Right will be entitled to acquire voting shares of the acquiring company at twice the value of the exercise price. The Rights may be redeemed by GTE at any time prior to any person or group acquiring 10% or more of GTE's voting power and will expire on December 7, 1999.

Reinvested Earnings

Reinvested earnings at December 31, 1989, included \$3.5 billion of undistributed earnings of subsidiaries. Although these earnings were substantially unrestricted for payment of cash dividends, a significant portion has been permanently reinvested and is not currently remittable.

4. Preferred Stock, Subject to Mandatory Redemption

Certain outstanding preferred stocks of GTE and its subsidiaries are redeemable at any time, in whole or in part, upon notice at a premium and certain issues may be redeemed without premiums through annual sinking funds.

GTE redeemed 111,000 shares of its preferred stock in each of the years 1989-1987. GTE's telephone subsidiaries redeemed 338,038, 253,871 and 639,296 shares of preferred stock in the years 1989-1987, respectively.

The aggregate redemption requirements of preferred stock subject to mandatory redemption for GTE and subsidiaries during the next five years are as follows (in thousands of dollars):

Year	Amount
1990	\$15,419
1991	15,951
1992	12,010
1993	12,012
1994	12,012

The aggregate voluntary redemption prices at December 31, 1989, amounted to \$120 million for GTE and \$166 million for its telephone subsidiaries.

5. Long-Term Debt

Long-term debt as of December 31, 1989, includes \$700 million of debt of the Consolidated Employee Stock Ownership Plan, guaranteed by GTE. It also includes \$130 million of debt due within one year which will be refinanced by the use of existing revolving credit or other financing arrangements that will extend their maturities beyond one year.

Estimated payments of long-term debt during the next five years are as follows (in thousands of dollars):

Year	Amount
1990	\$ 163,321
1991	474,212
1992	557,060
1993	504,711
1994	1,004,483

6. Short-Term Obligations

Telephone companies finance part of their construction programs through the use of interim short-term loans, including commercial paper, which are generally refinanced at later dates by issues of long-term debt or equity. Other short-term obligations are required to meet working capital requirements. Total short-term obligations, including loans for construction expected to be refinanced of \$596 million and \$395 million at December 31, 1989, and 1988, respectively, were as follows (in thousands of dollars):

	1989	1988
Commercial paper-average rates 9.1% and 9.4%	\$ 646,604	\$ 850,306
Notes payable to banks-average rates 11.6% and 9.1%	239,932	447,970
Current maturities of long-term debt	163,321	459,462
Total	\$1,049,857	\$1,757,738

GTE and its subsidiaries had unused lines of credit aggregating \$1.7 billion at December 31, 1989, which were available to support outstanding commercial paper and other short-term financing needs.

7. Retirement Plans

Most subsidiaries have trustee, noncontributory, defined benefit pension plans covering substantially all employees. The benefits to be paid under these plans are generally based on years of credited service and average final earnings. The company's funding policy, subject to the minimum funding requirements of employee benefit and tax laws, is to contribute such amounts as are determined on an actuarial basis to provide the plans with assets sufficient to meet the benefit obligations of the plans. The assets of the plans consist primarily of corporate equities, government securities and fixed income investments.

Net pension credits for 1989-1987 included the following components (in thousands of dollars):

	1989	1988	1987
	(U.S. and Non-U.S. Plans)	(U.S. Plans)	
Service cost-benefits earned during the period	\$ 279,008	\$ 255,903	\$ 259,810
Interest cost on projected benefit obligations	466,553	403,071	376,326
Actual return on plan assets	(1,924,948)	(1,300,967)	(729,444)
Other, net	1,165,568	615,797	77,086
Net pension credit	\$ (13,819)	\$ (26,196)	\$ (16,222)

Effective January 1, 1989, the Company adopted Statement of Financial Accounting Standards No. 87, "Employers' Accounting for Pensions" for its non-U.S. pension plans. Pension expense for these plans in 1988 and 1987 not included above amounted to approximately \$26 million and \$20 million, respectively.

The funded status of the plans at December 31, 1989 and 1988 (restated to include the non-U.S. plans) was as follows (in thousands of dollars):

	1989	1988
Plan assets at fair value	\$11,386,000	\$ 9,651,000
Projected benefit obligation	7,043,000	6,454,000
Excess of assets over projected obligation	4,343,000	3,197,000
Unrecognized net transition asset	(1,954,000)	(2,136,000)
Unrecognized net gain	(2,153,000)	(855,000)
Prepaid pension cost	\$ 236,000	\$ 206,000

The projected benefit obligations at December 31, 1989 and 1988 were generally determined using a projected increase in compensation levels of 6% and an assumed discount rate of 7.5%. The assumed long-term rate of return on plan assets was 7.5% for 1989 and 1988. The projected benefit obligations include accumulated benefit obligations of \$4.9 billion and \$4.3

billion and vested benefit obligations of \$4.3 billion and \$3.9 billion as of December 31, 1989 and 1988, respectively.

GTE and its subsidiaries generally provide health care and life insurance benefits to retirees. Benefits for eligible retirees are expensed as incurred and amounted to \$68 million and \$57 million for 1989 and 1988, respectively. The Financial Accounting Standards Board is considering whether current accounting standards should be changed to require the accrual of the estimated costs of these benefits over the service life of employees expected to receive them. If this change were required, the expense which would be recognized for these benefits would increase significantly in future periods. However, a substantial portion of the increase would be related to GTE's regulated telephone operations, which are subject to rate regulation. Accordingly, GTE expects that the additional expense would be largely offset in the ratemaking process.

8. Lease Commitments

The company and its subsidiaries have non-cancelable lease contracts covering certain buildings, office space, satellite transponders and equipment. Rental expense was \$513 million, \$470 million, and \$476 million for 1989-1987, respectively. Minimum rental commitments under non-cancelable leases through 1994 do not exceed \$300 million annually and aggregate \$337 million thereafter.

9. Interest Expense—Net

The components of interest expense-net are as follows (in thousands of dollars):

	1989	1988	1987
Interest expense	\$1,073,191	\$1,025,931	\$953,492
Allowance for funds used and interest capitalized during construction	(57,303)	(55,546)	(68,657)
Interest income	(117,024)	(56,827)	(46,702)
Total	\$ 898,864	\$ 913,558	\$838,133

10. Other—Net

The components of other-net are as follows (in thousands of dollars):

	1989	1988	1987
General corporate expenses	\$179,317	\$146,148	\$135,773
Preferred dividends of subsidiaries	33,232	33,759	36,260
Minority interests	95,567	69,014	56,622
Pension settlement gains from business repositioning	—	—	(130,669)
Sales of real estate and other	(81,812)	(77,019)	(112,855)
Total	\$226,304	\$171,902	\$ (14,869)

11. Income Taxes

Income before income taxes is as follows (in thousands of dollars):

	1989	1988	1987
Domestic	\$1,662,742	\$1,521,343	\$1,483,881
Foreign	401,320	319,619	268,069
Total	\$2,064,062	\$1,840,962	\$1,751,950

The provision for income taxes is as follows (in thousands of dollars):

	1989	1988	1987
Current			
Federal	\$569,737	\$237,019	\$140,255
Foreign	151,943	191,661	163,022
State and local	60,392	79,974	43,931
	782,072	508,654	347,208
Deferred			
Federal	(8,510)	252,583	385,682
Foreign	3,362	3,051	6,762
State and local	18,858	7,768	14,512
	13,710	263,402	406,956
Deferred investment tax credits—net	(148,990)	(155,775)	(121,031)
Total	\$646,792	\$616,281	\$633,133

Deferred investment tax credits-net includes amortization of investment tax credits previously deferred by GTE's regulated telephone operations.

Investment tax credits were eliminated by the Tax Reform Act of 1986, except for certain limited credits under transition provisions of the Act. Amortization of previously deferred credits amounted to \$137 million in 1989, and \$155 million in each of the years 1988 and 1987. Deferred investment tax credits subject to future amortization amounted to approximately \$586 million at December 31, 1989.

The provisions for deferred income taxes relate primarily to accelerated depreciation and business repositioning expenses. In the years 1989-1987 these provisions amounted to \$63 million, \$122 million and \$133 million, respectively, for depreciation and \$12 million, \$46 million and \$81 million, respectively, for business repositioning. The deferred income tax provision in 1989 also includes the reversal of previously deferred taxes applicable to investments in joint ventures sold during the year.

A reconciliation between taxes computed by applying the statutory federal income tax rates to pre-tax income and income taxes provided in the consolidated statements of income is as follows (in thousands of dollars):

	1989	1988	1987
Computed amounts at statutory rates	\$701,781	\$625,927	\$699,904
State and local income taxes, net of federal tax benefits	52,305	57,910	35,095
Minority interests and preferred stock dividends of subsidiaries	43,792	34,943	37,106
Investment tax credits	(142,225)	(164,304)	(181,097)
Depreciation of telephone plant construction costs previously deducted for tax purposes—net	48,761	58,237	48,464
Rate differentials on turnaround of deferred tax balances	(64,094)	(66,780)	(32,806)
Other differences—net	6,472	70,348	26,467
Total provision	\$646,792	\$616,281	\$633,133

12. Supplemental Cash Flow Disclosures

Set forth below as supplemental information to the Consolidated Statements of Cash Flows are changes in the components of working capital and cash paid for interest and income taxes (in thousands of dollars):

	1989	1988	1987
(Increase) decrease in assets:			
Receivables—net	\$ (476,881)	\$(625,140)	\$(443,253)
Inventories	(152,184)	19,867	(58,277)
Other current assets	(31,953)	(101,664)	182,804
Increase (decrease) in liabilities:			
Accounts and payrolls payable	404,460	83,586	248,791
Accrued taxes	85,574	139,654	(168,982)
Other current liabilities	50,948	115,166	(204,095)
Net change	\$ (120,036)	\$(368,531)	\$(443,012)
Cash paid during the year for:			
Interest	\$1,052,033	\$ 982,173	\$ 908,671
Income taxes	680,209	352,624	516,202

13. Business Group Data

Industry segment data is shown on pages 33 and 34 of this Annual Report.

Independent Public Accountants' and Management Reports

Report of Independent Public Accountants

To the Board of Directors
and Shareholders of GTE Corporation:

We have audited the accompanying consolidated balance sheets and summary of preferred stock and long-term debt of GTE Corporation (a New York corporation) and subsidiaries as of December 31, 1989 and 1988, and the related consolidated statements of income, amounts paid in, in excess of par value, reinvested earnings, foreign currency translation adjustment and cash flows for each of the three years in the period ended December 31, 1989. These financial statements are the responsibility of the company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of GTE Corporation and subsidiaries as of December 31, 1989 and 1988, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 1989, in conformity with generally accepted accounting principles.



New York, New York,
February 6, 1990

Management Report

To Our Shareholders:

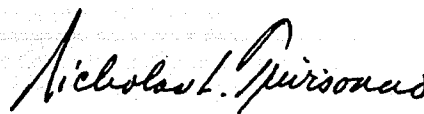
The management of GTE is responsible for the integrity and objectivity of the financial and operating information contained in this Annual Report, including the consolidated financial statements covered by the Report of Independent Public Accountants. These statements were prepared in conformity with generally accepted accounting principles and include amounts that are based on the best estimates and judgments of management.

The company has a system of internal accounting controls which provides management with reasonable assurance that transactions are recorded and executed in accordance with its authorizations, that assets are properly safeguarded and accounted for, and that financial records are maintained so as to permit preparation of financial statements in accordance with generally accepted accounting principles. This system includes written policies and procedures, an organizational structure that segregates duties, and a comprehensive program of periodic audits by the internal auditors. The company also has instituted policies and guidelines which require employees to maintain the highest level of ethical standards.

In addition, the Audit Committee of the Board of Directors, consisting solely of outside directors, meets periodically with management, the internal auditors and the independent public accountants to review internal accounting controls, audit results and accounting principles and practices, and annually recommends to the Board of Directors the selection of independent public accountants.



James L. Johnson
Chairman and Chief
Executive Officer



Nicholas L. Trivisonno
Senior Vice President-Finance
and Chief Financial Officer

Quarterly Financial Data (Millions of Dollars)
(unaudited)

GTE Corporation and Subsidiaries

	1st QTR		2nd QTR		3rd QTR		4th QTR	
	1989	1988	1989	1988	1989	1988	1989	1988
Revenues and sales	\$4,123	\$3,943	\$4,323	\$4,207	\$4,354	\$4,001	\$4,624	\$4,309
Operating income	772	768	774	803	795	740	848	741
Net income applicable to common stock	317	274	316	288	356	301	381	314
Earnings per common share	\$.97	\$.84	\$.98	\$.87	\$ 1.06	\$.91	\$ 1.15	\$.96
Common dividends declared	\$.67	\$.63	\$.67	\$.63	\$.73	\$.67	\$.73	\$.67
Common stock market price								
High	\$47.50	\$39.50	\$56.25	\$39.38	\$61.88	\$43.75	\$71.13	\$45.88
Low	42.88	34.00	44.88	33.75	52.75	37.88	60.50	42.13
Close	45.75	35.63	52.88	39.13	61.50	43.63	70.00	44.50

Corporate Information

Principal Financial Contact

For further information about GTE Corporation and its subsidiaries, please contact:

Timothy P. Murphy
Vice President
Investor Relations and
Financial Administration
GTE Corporation
One Stamford Forum
Stamford, CT 06904
(203) 965-2789
Int'l Telex: 4750071
Facsimile: (203) 965-2520

Shareholder Systematic Investment Plan

The Shareholder Systematic Investment Plan provides holders of the Corporation's common stock with a convenient way to purchase additional shares. Shareholders wishing information regarding the plan may write to: GTE Shareholder Services Incorporated, P.O. Box 158, North Quincy, MA 02171, or call toll-free (800) 225-5160. For overnight delivery services, use the following address: 1776 Heritage Drive, North Quincy, MA 02171

10-K Report

A copy of our annual report on Form 10-K filed with the Securities and Exchange Commission may be obtained by writing to the Corporate Secretary's Office, GTE Corporation, One Stamford Forum, Stamford, CT 06904

Stock Ownership Questions

Please address questions concerning ownership of common, preferred or no par preferred stock to: GTE Shareholder Services Incorporated, P.O. Box 37, North Quincy, MA 02171, or call (800) 225-5160.

Stock Exchange Listings

The common stock of GTE Corporation (symbol: GTE) is listed on the New York Stock Exchange, Inc., the Midwest Stock Exchange, Incorporated, and the Pacific Stock Exchange Incorporated and is traded on other exchanges in the United States. It is also listed in Europe on the Stock Exchange, London; the Amsterdam Stock Exchange; the Basel Stock Exchange; the Geneva Stock Exchange; the Lausanne Stock Exchange; the Paris Stock Exchange and the Zurich Stock Exchange. Additionally, it is listed on the Tokyo Stock Exchange.

The Corporation's 5.00% convertible preferred stock, \$2.00 convertible no par preferred stock and \$2.475 no par preferred stock are listed on the New York Stock Exchange, Inc.

The information in this report is not given in connection with any sales or offer to buy any securities.

Transfer Agents(T/A) and Registrars(R)

Common Stock, Preferred Stock and No Par Preferred Stock

GTE Shareholder Services Incorporated(T/A)
P.O. Box 37
North Quincy, MA 02171 or
c/o State Street Bank and
Trust Company, 61 Broad-
way, New York, NY 10004.
For overnight delivery ser-
vices, use the following
address: 1776 Heritage
Drive, North Quincy, MA
02171.

State Street Bank and Trust
Company(R) P.O. Box 5003,
Boston, MA 02107

Annual Meeting

The 1990 annual meeting of shareholders will be held on April 18, 1990, at the Italian Center, Stamford, Connecticut. Formal notice of the meeting, proxy statement and proxy card will be mailed on or about March 1.

Auditors

Arthur Andersen & Co.
1345 Avenue of the Americas
New York, NY 10105

Audio Annual Report

An audio cassette version of the 1989 Annual Report is available to visually impaired shareholders by contacting the manager—editorial and financial communication services, 10th floor, GTE Corporation, One Stamford Forum, Stamford, CT 06904.

EXHIBIT 5

Exhibit 5

GTE CORPORATION AND SUBSIDIARIES
CONDENSED SUMMARY OF CONSOLIDATED RESULTS

	<u>Second Quarter</u>		<u>Six Months Ended</u>	
	<u>1990</u>	<u>1989</u>	<u>June 30</u>	
			<u>1990</u>	<u>1989</u>
	(In Thousands)			
REVENUES AND SALES				
Telephone Operations	\$3,167,060	\$3,071,686	\$6,318,842	\$6,076,928
Telecommunications Products and Services	878,965	716,175	1,676,474	1,296,305
Electrical Products	548,200	550,547	1,115,024	1,098,369
Eliminations	<u>(15,698)</u>	<u>(14,935)</u>	<u>(30,117)</u>	<u>(25,508)</u>
Consolidated	<u>\$4,578,527</u>	<u>\$4,323,473</u>	<u>\$9,080,223</u>	<u>\$8,446,094</u>
OPERATING INCOME				
Telephone Operations	\$ 728,941	\$ 681,513	\$1,449,047	\$1,370,630
Telecommunications Products and Services	59,151	31,192	96,378	41,335
Electrical Products	<u>41,622</u>	<u>61,080</u>	<u>108,276</u>	<u>134,020</u>
Operating Income	<u>829,714</u>	<u>773,785</u>	<u>1,653,701</u>	<u>1,545,985</u>
OTHER DEDUCTIONS				
Interest expense - net	232,299	235,334	470,932	462,616
Other - net	<u>48,155</u>	<u>54,595</u>	<u>95,377</u>	<u>96,864</u>
Income before income taxes	549,260	483,856	1,087,392	986,505
Income tax provision	<u>185,552</u>	<u>155,092</u>	<u>368,517</u>	<u>328,506</u>
Consolidated net income	363,708	328,764	718,875	657,999
Preferred stock dividends of parent	<u>10,965</u>	<u>12,374</u>	<u>21,775</u>	<u>24,602</u>
Consolidated net income applicable to common stock	<u>\$ 352,743</u>	<u>\$ 316,390</u>	<u>\$ 697,100</u>	<u>\$ 633,397</u>
EARNINGS PER COMMON SHARE (a)	<u>\$.54</u>	<u>\$.49</u>	<u>\$1.06</u>	<u>\$.97</u>
AVERAGE COMMON SHARES (a)	<u>660,233</u>	<u>649,896</u>	<u>659,905</u>	<u>651,026</u>

(a) Restated for the 2-for-1 stock split that became effective on May 23, 1990.

EXHIBIT 6

FCC
430

FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Approved by ()
3060-0105
Expires 3/31/

**COMMON CARRIER AND SATELLITE RADIO LICENSEE
QUALIFICATION REPORT**

See reverse side for information
regarding public burden state

INSTRUCTIONS

- A. The "Filer" of this report is defined to include: (1) An applicant, where this report is submitted in connection with applications for cc carrier and satellite radio authority as required for such applications; or (2) A licensee or permittee, where this report is required by Commission's Rules to be submitted on an annual basis.
- B. Submit an original and one copy (sign original only) to the Federal Communications Commission, Washington, DC 20554. If more than one service is listed in Item 6, submit an additional copy for each such additional service. If this report is being submitted in connection with application for radio authority, attach it to that application.
- C. Do not submit a fee with this report.

1. Business Name and Address (Number, Street, State and ZIP Code) of Filer's Principal Office: GTE Spacenet Corporation 1700 Old Meadow Road McLean, Virginia 22102	2. (Area Code) Telephone Number: (703) 848-1000 3. If this report supercedes a previous filed report, specify its date: March 3, 1989
4. Filer is (check one): <input type="checkbox"/> Individual <input type="checkbox"/> Partnership <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Other (Specify):	5. Under the laws of what State (or jurisdiction) is the Filer organized? Delaware

6. List the common carrier and satellite radio services in which Filer has applied or is a current licensee or permittee:

Domestic Fixed Satellite Service
Point to Point Microwave

7(a) Has the Filer or any party to this application had any FCC station license or permit revoked or had any application for permit, license or renewal denied by this Commission? If "YES", attach as Exhibit I a statement giving call sign and file number of license or permit revoked and relating circumstances. Yes No

(b) Has any court finally adjudged the Filer, or any person directly or indirectly controlling the Filer, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement, or other means of unfair methods of competition? If "YES", attach as Exhibit II a statement relating the facts. Yes No

(c) Has the Filer, or any party to this application, or any person directly or indirectly controlling the Filer ever been convicted of a felony by any state or Federal Court? If "YES", attach as Exhibit III a statement relating the facts. Yes No

(d) Is the Filer, or any person directly or indirectly controlling the Filer, presently a party in any matter referred to Items 7(b) and 7(c)? If "YES", attach as Exhibit IV a statement relating the facts. Yes No

8. Is the Filer, directly or indirectly, through stock ownership, contract or otherwise, currently interested in the ownership or control of any other radio stations licensed by this Commission? If "YES", submit as Exhibit V the name of each such licensee and the licensee's relation to the Filer. Yes No

If Filer is an individual (sole proprietorship) or partnership, answer the following and Item 11:

9(a) Full Legal Name and Residential Address (Number, Street, State and ZIP Code) of Individual or Partners: Not Applicable	(b) Is individual or each member of a partnership a citizen of the United States? <input type="checkbox"/> Yes <input type="checkbox"/> No
	(c) Is individual or any member of a partnership a representative of an alien or of a foreign government? <input type="checkbox"/> Yes <input type="checkbox"/> No

If Filer is a corporation, answer the following and Item 11:

10(a) Attach as Exhibit VI the names, addresses, and citizenship of those stockholders owning of record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries.

SEE EXHIBIT VI

(b) List below, or attach as Exhibit VII the names and addresses of the officers and directors of the Filer.

SEE EXHIBIT VII

(c) Is the Filer directly or indirectly controlled by any other corporation?

If "YES", attach as Exhibit VIII a statement (including organizational diagrams where appropriate) which fully and completely identifies the nature and extent of control. Include the following: (1) the address and primary business of the controlling corporation and any intermediate subsidiaries; (2) the names, addresses, and citizenship of those stockholders holding 10 percent or more of the controlling corporation's voting stock; (3) the approximate percentage of total voting stock held by each such stockholder; and (4) the names and addresses of the president and directors of the controlling corporation.

Yes No

SEE EXHIBIT VIII

(d) Is any officer or director of the Filer an alien?

Yes No

(e) Is more than one-fifth of the capital stock of the Filer owned of record or voted by aliens or their representatives, or by a foreign government or representative(s) thereof, or by a corporation organized under the laws of a foreign country?

Yes No

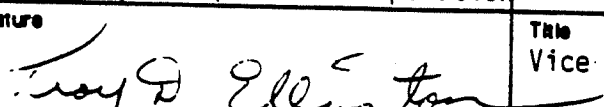
(f) Is the Filer directly or indirectly controlled: (1) by any other corporation of which any officer or more than one-fourth of the directors are aliens, or (2) by any foreign corporation or corporation of which more than one-fourth of the capital stock is owned or voted by aliens or their representatives, or by a foreign government or representative(s) thereof.

Yes No

(g) If any answer to questions (d), (e) or (f) is "YES", attach as Exhibit IX a statement identifying the aliens or foreign entities, their nationality, their relationship to the Filer, and the percentage of stock they own or vote.

11. CERTIFICATION

This report constitutes a material part of any application which cross-references it, and all statements made in the attached exhibits are a material part thereof. The ownership information contained in this report does not constitute an application for, or Commission approval of, any transfer of control or assignment of radio facilities. The undersigned, individually and for the Filer, hereby certifies that the statements made herein are true, complete and correct to the best of Filer's knowledge and belief, and are made in good faith.

WILLFUL FALSE STATEMENTS MADE ON THIS APPLICATION ARE PUNISHABLE BY FINE AND IMPRISONMENT (U.S. Code, Title 18, Section 1001) and/or REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. Code, Title 47, Section 312(a)(1)).	Date	Filer (Must correspond with that shown in Item 1)	Typed or Printed Name
	3/5/90	GTE Spacenet Corporation	Troy D. Ellington
	Signature		Title
			Vice President, Engineering and Development

NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT OF 1974 AND THE PAPERWORK REDUCTION ACT OF 1980

The solicitation of personal information requested in this form is to determine if you are qualified to become or remain a licensee in a common carrier or satellite radio service pursuant to the Communications Act of 1934, as amended. No authorization can be granted unless all information requested is provided. Your response is required to obtain the requested authorization or retain an authorization.

Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Federal Communications Commission, Office of Managing Director, Washington, DC 20554, and to Office of Management and Budget, Paperwork Reduction Project (3060-0105), Washington, DC 20503.

GTE Spacenet Corporation
Exhibit VI
Item 10 (a)
March 5, 1990

EXHIBIT VI

One hundred percent (100%) of the issued and outstanding shares of common stock of GTE Spacenet Corporation are owned by GTE Communications Services Incorporated.

One hundred percent (100%) of the issued and outstanding shares of common stock of GTE Communications Services Incorporated are owned by GTE Corporation.

GTE Spacenet Corporation
Exhibit VIII
Item 10 (c)
March 5, 1990

EXHIBIT VIII

See GTE Florida, Inc's Annual FCC Form 430, Exhibit VIII for the information regarding GTE Corporation.