

Bruce D. Jacobs, Esquire
Glenn S. Richards, Esquire
Fisher, Wayland, Cooper & Leader
1255 23rd Street, N.W.
Suite 800
Washington, D.C. 20037
(Counsel for AMSC)

Lon C. Levin
Vice President
American Mobile Satellite Corporation
1150 Connecticut Avenue, N.W.
4th Floor
Washington, D.C. 20036

Robert A. Mazer, Esquire
Albert Shuldiner, Esquire
Nixon, Hargrave, Devans & Doyle
One Thomas Circle, N.W.
Suite 800
Washington, D.C. 20005
(Counsel for Constellation)

Dr. Robert L. Riemer
Committee on Radio Frequencies
HA-562
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

Norman R. Leventhal, Esquire
Raul R. Rodriguez, Esquire
Stephen D. Baruch, Esquire
Levanthal, Senter & Lerman
2000 K. Street, N.W.
Suite 600
Washington, D.C. 20006-1809
(Counsel for TRW, Inc.)

Jill Abeshouse Stern, Esquire
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N.W.
Second Floor
Washington, D.C. 20037
(Counsel for Ellipsat)

Cheryl Lynn Schneider, Esquire
Communications Satellite Corporation
950 L'Enfant Plaza S.W.
Washington, D.C. 20024

William K. Keane, Esquire
Winston & Strawn
1400 L Street, N.W.
Washington, D.C. 20005
(Counsel for AFTRCC)

Jeffrey L. Sheldon
General Counsel
Utilities Telecommunications Council
1140 Connecticut Avenue, N.W.
Suite 1140
Washington, D.C. 20036

Arun Bhumitra
Vice President
ARJAY Telecommunications
20669 Hawthorne Blvd.
Torrance, California 90503

M. Worstell
Vice President, Contracts
Litton Aero Products
6101 Condor Drive
Moorpark, California 93021

John L. Bartlett
Wiley, Rein & Fielding
1776 K Steeet, N.W.
Washington, D.C. 20006
(Counsel for ARINC / ATA)

J. Ellis McSparran
3S Navigation
23141 Plaza Pointe Drive
Laguna Hills, California 92653

Gary M. Epstein
James F. Rogers
Kevin C. Boyle
Latham & Watkins
1001 Pennsylvania Avenue, N.W.
Suite 1300
Washington, D.C. 20004
(Counsel for Hughes Aircraft)

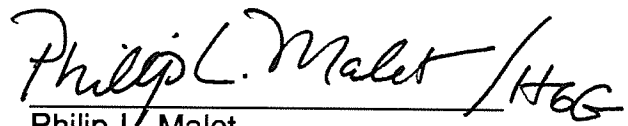
E. William Henry
Henry M. Rivera
Ginsburg, Feldman and Bress
Chartered
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036
(Counsel for RDSS, Inc.)

Bruce L. Bucklin
Acting Chief
Technical Operations Section
Drug Enforcement Administration
U.S. Department of Justice
Washington, D.C. 20537

Terri B. Natoli
Regulatory and Industry
Relations Manager
GTE Spacenet
1700 Old Meadow Road
McLean, Virginia 22102

Tedson J. Myers
Reid & Priest
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(Counsel for AfriSpace, Inc.)

Victor J. Toth, P.C.
Law Offices
2719 Soapstone Drive
Reston, Virginia 22091
(Counsel for Celsat, Inc.)


Philip L. Malet

*

BY HAND

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

In re Application of:)
)
MOTOROLA SATELLITE) File Nos.. 9-DSS-P-91 (87)
COMMUNICATIONS, INC.) CSS-91-010
)
For Authority to Construct,)
Launch and Operate a Low Earth)
Orbit Satellite System in the)
RDSS Uplink Band)
_____)

MINOR AMENDMENT

Motorola Satellite Communications, Inc. ("Motorola") hereby amends its IRIDIUM™ system¹ Application pursuant to Sections 1.65 and 25.116 of the Commission's Rules and Regulations to reflect certain design changes that it intends to make to the IRIDIUM™ system as it was described in its Application of December 1990 and its Supplement of February 1991. Subject to Commission approval, a number of important enhancements are planned to the IRIDIUM™ system design in order to improve the system's overall efficiency and quality of service. In addition, the Application is being amended to provide updated program milestones and cost information.

Planned changes to the IRIDIUM™ system design include an increase from 37 to 48 in the number of beams associated with each satellite and a reduction in the number of satellite orbital planes and space vehicles which comprise the constellation.

¹ IRIDIUM™ is a registered trade name and trade and service mark of Motorola Inc.

The number of planes is being reduced from seven to six and the number of active space vehicles is being reduced from 77 to 66.² Slight increases are being made to the angular separation between the planes in the constellation and to the orbital altitude. The TDMA format is being modified to provide longer integration times to improve communications through foliage and other blockages.

The use of a greater number of beams and the improved TDMA format will enable system capacity to be dynamically reallocated to specific geographic areas thereby improving the system's ability to respond to a higher demand for service in particular areas.

In order to incorporate these changes into the system design, the size, weight and power of each of the satellites is being changed somewhat from the earlier design.

Accordingly, Motorola amends its IRIDIUM™ system application as follows:

- (1) Each satellite will now utilize more spot beams (up to 48 beams) to form a continuous overlapping pattern on the Earth. Figure R-1 shows an integrated antenna pattern architecture for a single satellite at the equator. This figure replaces Figure V-3 in the Application. New Figures R-2 to R-5 depict representative satellite L-band antenna gain contours for beams of each ring of the updated design. These revised figures replace Figures V-4 through V-10 of the Application. On a global basis, the entire constellation's beam pattern as projected on the surface of the Earth results in approximately 2,150 active beams with a frequency reuse of about 180 times. Within the contiguous United States ("CONUS"), the system will achieve about five times frequency reuse.
- (2) The constellation of satellites which will comprise the IRIDIUM™ system is being changed to 66 operational low-Earth orbit ("LEO") satellites. Each of these satellites will now be circling the globe in six (versus seven) near-polar orbits (with an inclination angle of approximately 86 degrees) approximately 780 (versus 765) kilometers above the Earth. Due to the reduction in the number of orbital planes, each co-rotating plane will now be equally spaced approximately 31.6 degrees apart. The spacing between planes 1 and 6 will be about 22 degrees.

² In addition, the number of spare satellites that will be constructed is being reduced from 10 to 9.

- (3) In order to avoid potential interference with other systems and services presently authorized to utilize a portion of the RDSS uplink band, Motorola no longer requests authorization to use frequency spectrum between 1610 - 1616 MHz. Thus, the IRIDIUM™ system now proposes to operate subscriber links (both uplink and downlink) within the frequency range 1616 - 1626.5 MHz.
- (4) The TDMA format is being revised. Figure R-6 shows the revised frame format, which replaces Figure V-12 of the Application. Within each beam, the system maintains the FDMA concept. The uplink and downlink frequency plans for each L-band beam are now identical and are illustrated in Figure R-7, which replaces Figures V-14 and V-15 of the Application. The new satellite configuration and TDMA format permits each transmit / receive beam to be visited up to four times per frame.
- (5) A new link parameter summary and revised link budget calculations reflecting the changes in the design are tabulated in Tables R-A-1 through R-A-7. These tables replace Tables A-1 through A-7 in Appendix A of the Application.
- (6) The system architecture will change slightly. Due to greater flexibility in allocation of capacity to focused geographic areas with higher demand, the effective capacity of the system is being increased by these design changes. The peak capacity in any given beam over 10.5 MHz of L-Band frequency spectrum is being increased to 960 channels of which 780 are full duplex voice channels. The contiguous U.S. is covered by approximately 59 beams which yield a capacity of 4720 channels of which 3835 are full duplex voice channels.
- (7) The spatial diversity of the gateway links for each satellite is being increased by the addition of two steerable satellite antennas making a total of four. No increase in bandwidth is required. The satellite gateway antenna pattern remains circular but the gain will increase approximately 7 dB. However, the net EIRP has been reduced by 1.6 dB (clear) due to a reduction in the transmitter output power.
- (8) The intersatellite link antennas are being changed to a circular pattern that conforms to CCIR recommendation 465-3. This pattern, which obsoletes Figure V-17 of the Application, will reduce the power flux density that appears on the surface of the earth.
- (9) Each satellite within the constellation is now larger and more capable than the design in the Application. A new Table R-1 showing the major IRIDIUM™ satellite characteristics, as modified, is included with this Amendment. This table replaces Table V-1 of the Application. An artist's concept of the current satellite design is also included as Figure R-8 hereto which replaces Figure V-31 of the Application. The main mission antenna subsystem of each satellite will include three multi-beam

phased array antennas, each containing an array of transmit / receive modules which will form the three sides of the satellite. Tables R-2 and R-3 relate current estimates of the power and mass budgets for the satellites. These tables replace Tables V-6 and V-7 of the Application.

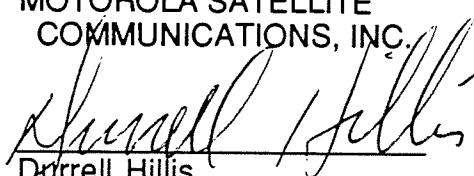
- (10) Tables R-4 and R-5 reflect revised program milestones and cost estimates based upon the redesigned system. These tables replace Tables VIII-1 to VIII-3 of the Application. Financial information from Motorola's latest Annual Report (1991) and 1992 second quarter report is also being submitted. This information supercedes excerpts from the 1989 Annual Report and 1990 third quarter report in Appendix E of the original application.
- (11) A revised Exhibit I to Appendix G of the Application is also included with this Amendment.

The design changes described in this Amendment further optimize the capabilities of the IRIDIUM™ system. In combination, they reflect Motorola's continuing efforts to maintain its leadership in the development of LEO RDSS / MSS satellite systems and to ensure that the IRIDIUM™ system remains an efficient state-of-the-art satellite system. Moreover, these changes further demonstrate the technical feasibility of the IRIDIUM™ system design and the innovative nature of Motorola's pioneering efforts in this area.

The changes reported in this Amendment do not substantially alter the IRIDIUM™ system and will not result in any increase in interference to other systems. Accordingly, this minor Amendment is not subject to the public notice requirements of Section 25.151 of the Commission's Rules.

Respectfully submitted,

MOTOROLA SATELLITE
COMMUNICATIONS, INC.



Darrell Hillis
President

Dated: 8/8/92

Its Attorneys:

Philip L. Malet
Steptoe & Johnson
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-6239

James G. Ennis
Fletcher, Heald & Hildreth
1225 Connecticut Avenue, N.W.
Suite 400
Washington, D.C. 20036
(202) 828-5782

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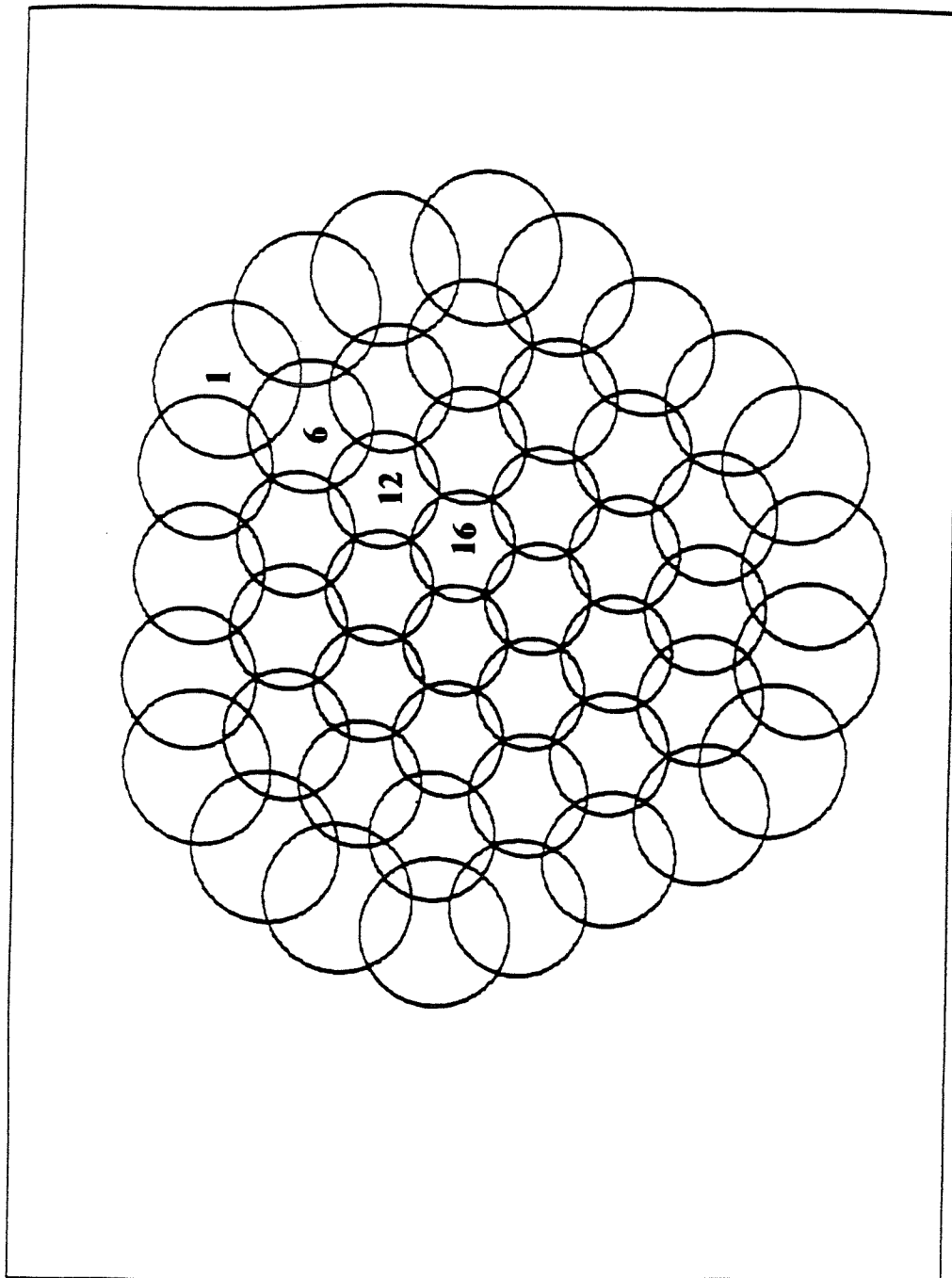


Figure R-1 48 Cell L-Band Integrated Antenna Pattern Architecture

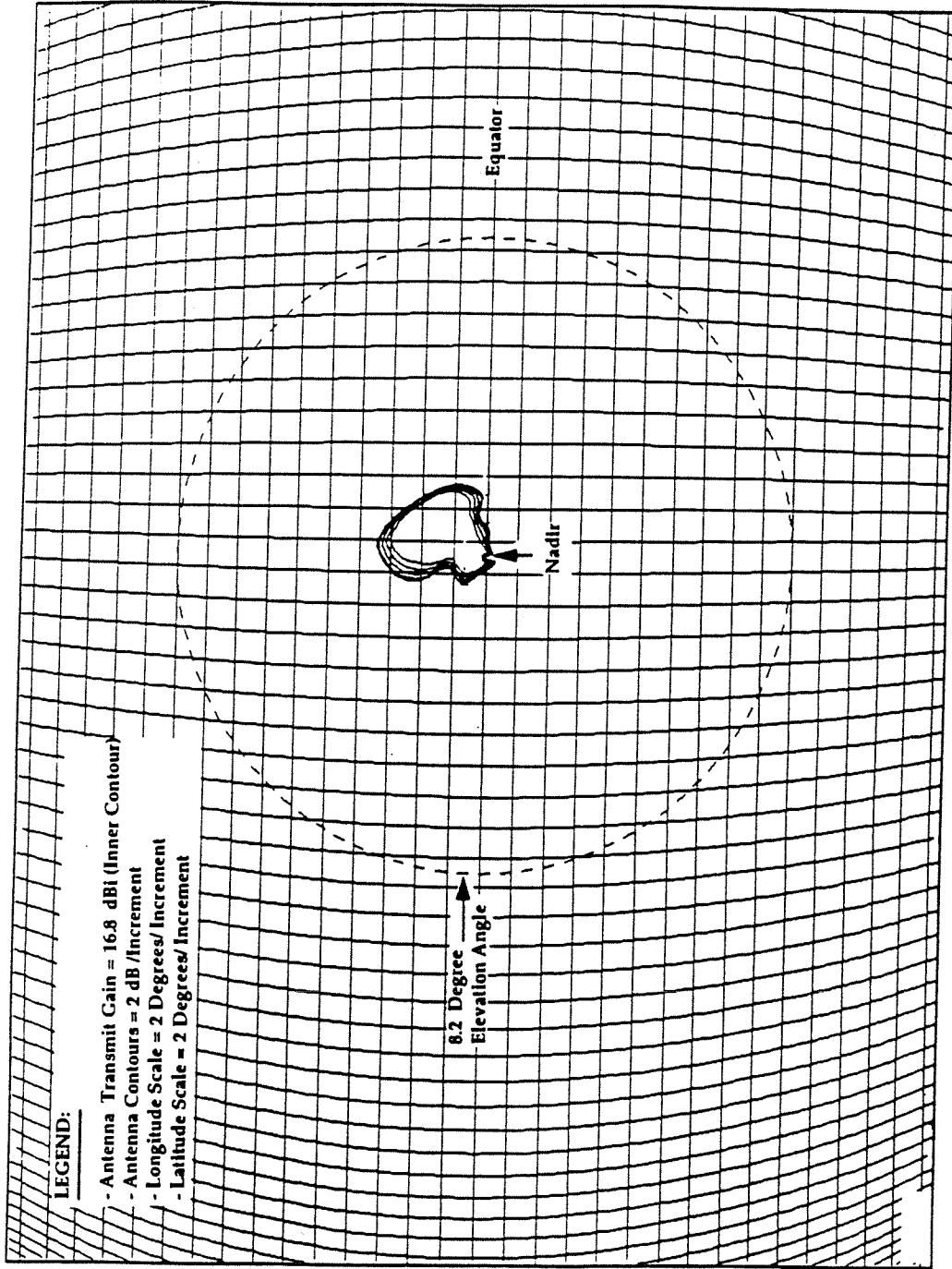


Figure R-2 Representative Pattern for Cells in Ring 1

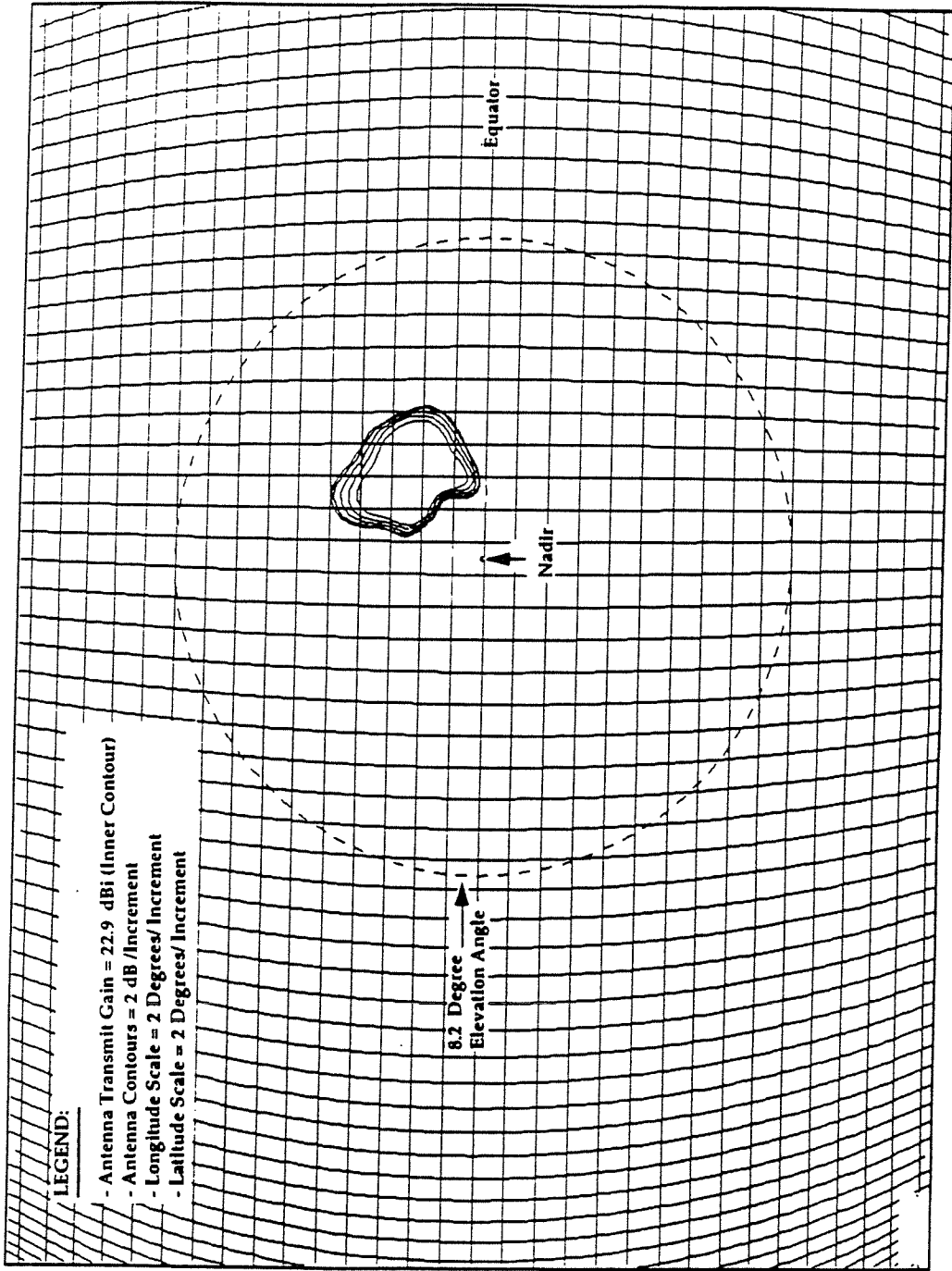


Figure R-3 Representative Pattern for Cells in Ring 2

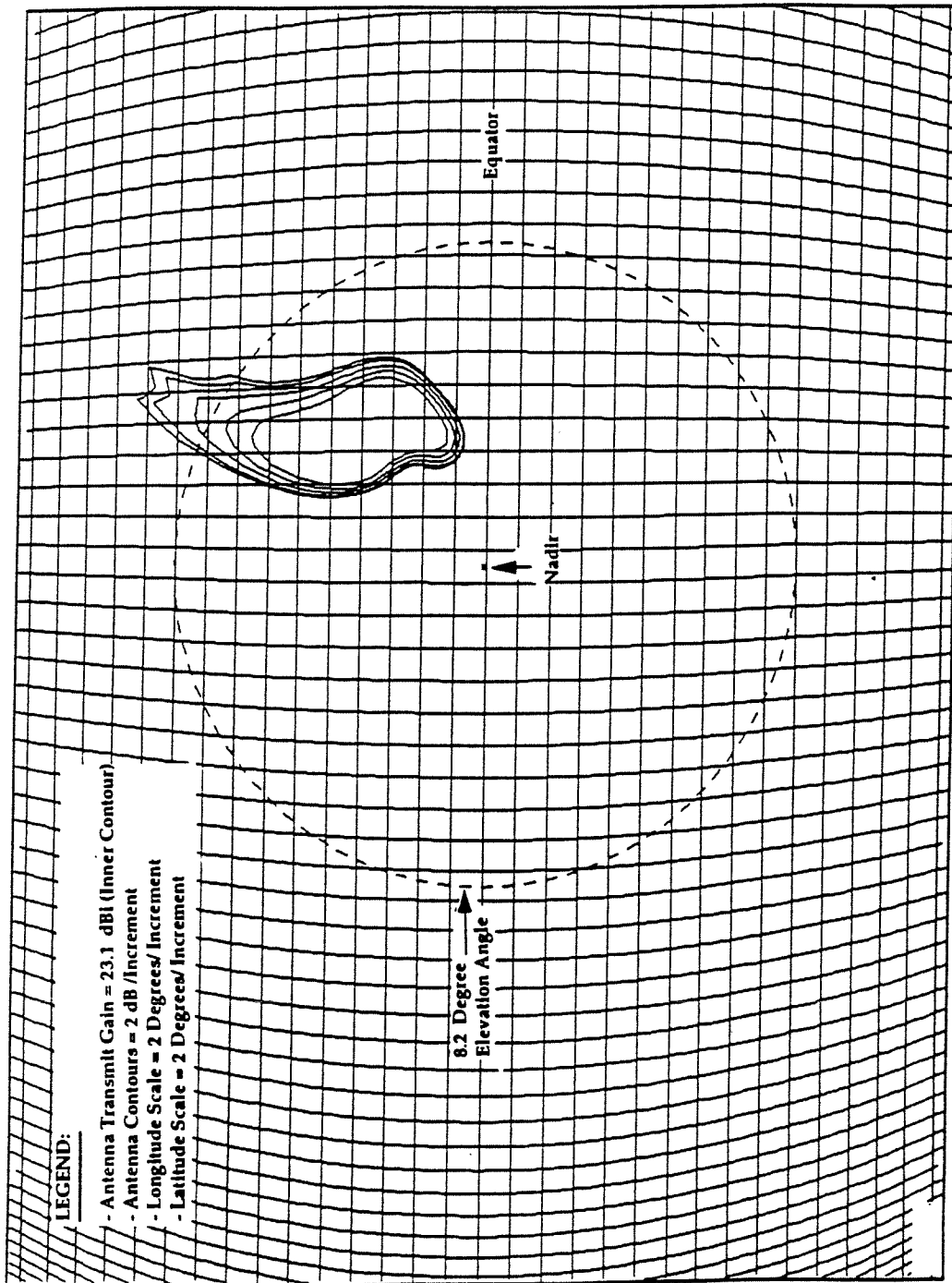


Figure R-4 Representative Pattern for Cells in Ring 3

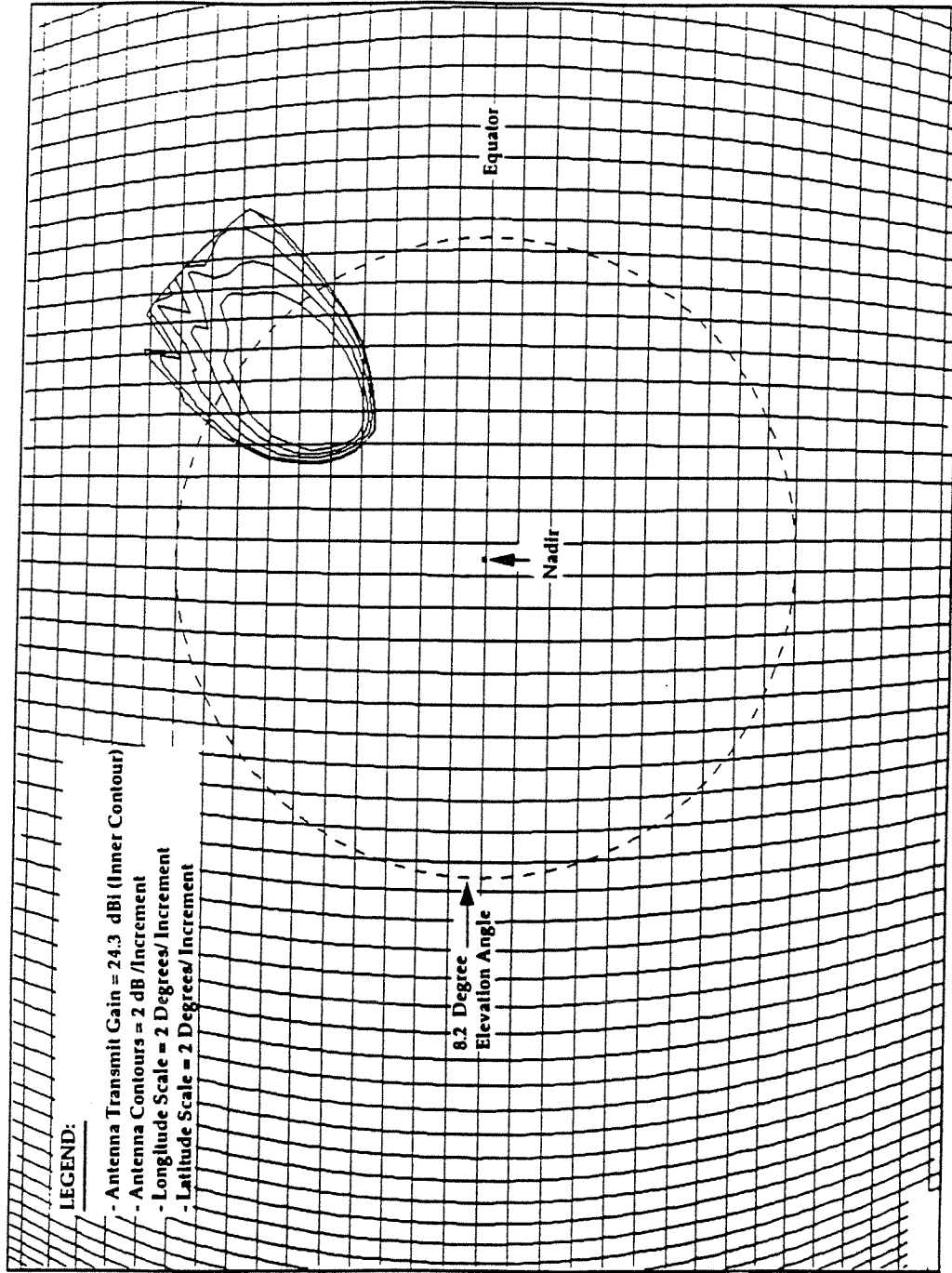
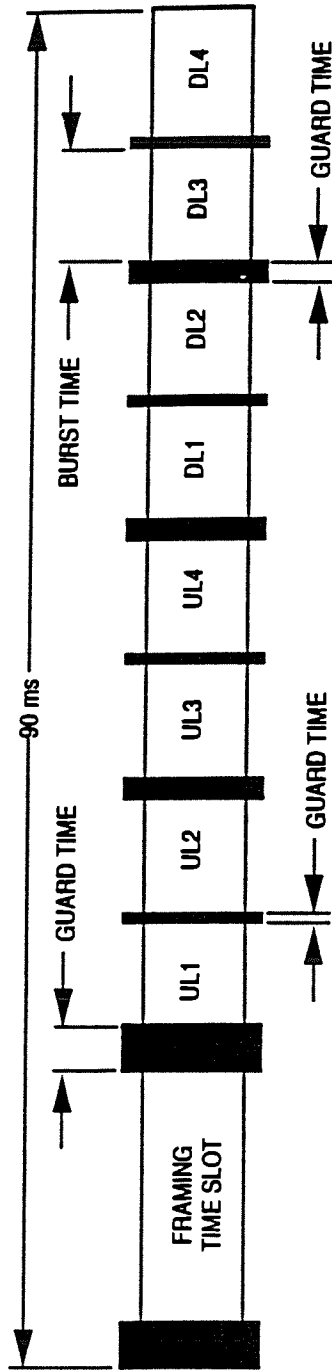
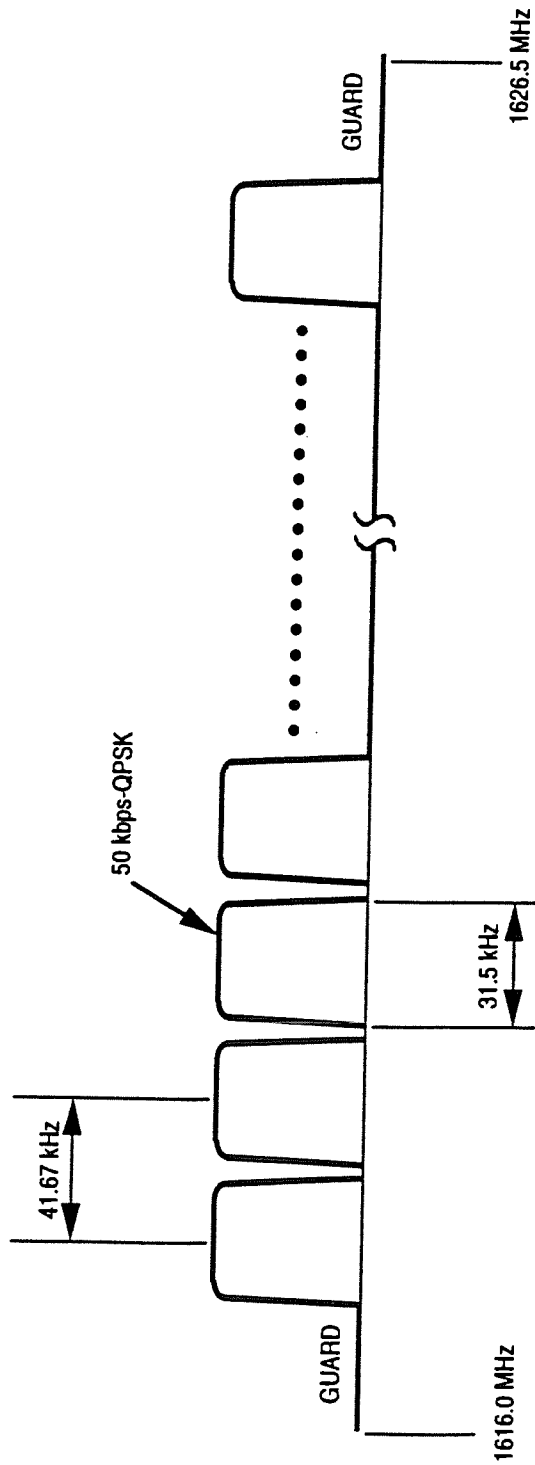


Figure R-5 Representative Pattern for Cells in Ring 4



21338-2M

Figure R-6 TDMA Frame Format



21339-1M

Figure R-7 L-band Uplink / Downlink R.F. Frequency Plan

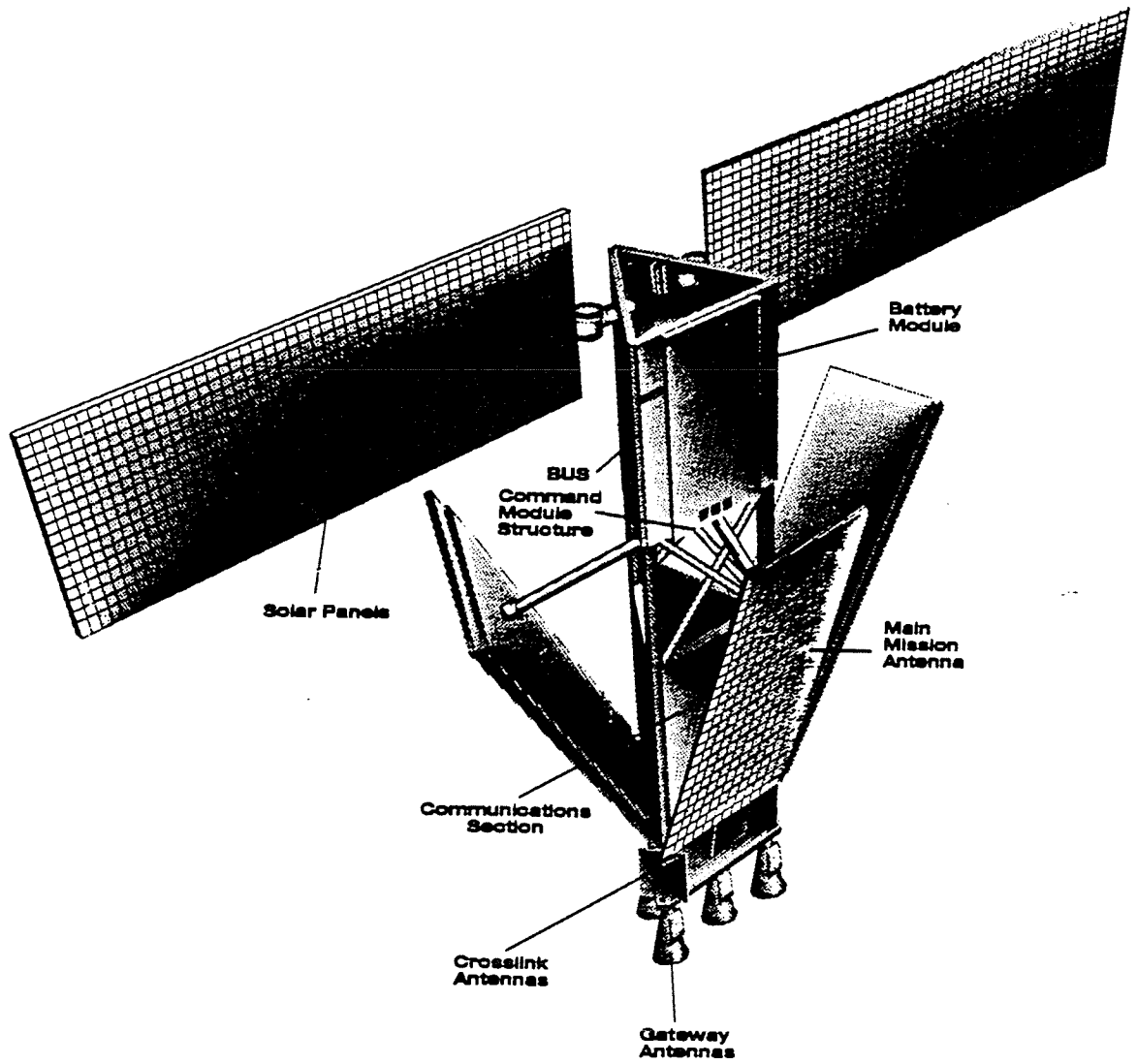


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TABLE R-A-1

LINK PARAMETER SUMMARY

	SV--USER (ISU)		SV--GW		SV-SV
	Down	Up	Down	Up	
Multiplexing	TDMA/FDMA		TDM/FDMA		TDM/FDMA
Modulation	QPSK		QPSK		QPSK
Baseband Filtering	40% Raised Cosine		Filtered		Filtered
FEC Rate	multiple rates		1/2	1/2	1/2
Coded Data Rate (Mbps)	0.05	0.05	6.25	6.25	25.00
Occupied BW per Channel (kHz)	31.50	31.50	4375.00	4375.00	17500.00
Center Frequency (GHz)	1.62125	1.62125	20.00	29.40	23.28
Total Bandwidth (MHz)	10.50	10.50	100.00	100.00	200.00
Carrier Spacing (MHz)	0.04167	0.04167	7.50	7.50	25.00

TABLE R-A-2

SV-ISU DOWNLINK, WITH SHADOWING
[Representative Cells]

	CELL 1	CELL 6	CELL 12	CELL 16
Azimuth Angle (Deg)	32.4	38.3	40.5	60.0
Ground Range (km)	2215.3	1424.9	957.3	528.8
Nadir Angle (Deg)	61.9	56.4	48.2	33.4
Elevation Angle (Deg)	8.2	20.8	33.2	51.9
Slant Range (km)	2461.7	1696.2	1278.5	960.0
Space Vehicle:				
HPA Burst Power (W)	3.5	2.2	1.3	3.0
(dBW)	5.5	3.5	1.2	4.8
Xtmr Ckt Loss (dB)	2.1	2.1	2.1	2.1
Eff. EOC Antenna Gain(dBi)	24.3	23.1	22.9	16.8
EIRP (dBW)	27.7	24.5	22.0	19.5
Propagation:				
Space Loss (dB)	164.5	161.3	158.8	156.3
Prop. Losses (dB)	15.7	15.7	15.7	15.7
Total Prop. Loss (dB)	180.2	177.0	174.5	172.0
Iridium Subscriber Unit:				
Rcvd Signal Strength (dBW)	-152.5	-152.5	-152.5	-152.5
Antenna Gain (dBi)	1.0	1.0	1.0	1.0
Signal Level (dBW)	-151.5	-151.5	-151.5	-151.5
Req Eb/(No+Io)(dB)	5.8	5.8	5.8	5.8
Eb/Io (dB)	18.0	18.0	18.0	18.0
Req. Eb/No (dB)	6.1	6.1	6.1	6.1
Ts (K)	250.0	250.0	250.0	250.0
Sig level Req(dBW)	-151.5	-151.5	-151.5	-151.5
Link Margin(dB)	0.0	0.0	0.0	0.0
G/Ts (dB/K)	-23.0	-23.0	-23.0	-23.0
SPFD at ISU (dBW/sq-m/4kHz)	-135.8	-135.8	-135.8	-135.8

TABLE R-A-3

SV-ISU UPLINK, WITH SHADOWING
[Representative Cells]

	CELL 1	CELL 6	CELL 12	CELL 16
Azimuth Angle (Deg)	32.4	38.3	40.5	60.0
Ground Range (km)	2215.3	1424.9	957.3	528.8
Nadir Angle (Deg)	61.9	56.4	48.2	33.4
Elevation Angle (Deg)	8.2	20.8	33.2	51.9
Slant Range (km)	2461.7	1696.2	1278.5	960.0
Iridium Subscriber Unit:				
HPA Burst Pwr (W)	3.7	3.6	1.9	3.7
(dBW)	5.7	5.6	2.9	5.7
Ckt Loss (dB)	0.7	0.7	0.7	0.7
Ant Gain (dBi)	1.0	1.0	1.0	1.0
EIRP (dBW)	6.0	5.9	3.2	6.0
Uplink EIRP density (dBW/4kHz)	-3.0	-3.1	-5.8	-3.0
Propagation:				
Space Loss (dB)	164.5	161.3	158.8	156.3
Prop. Losses (dB)	15.7	15.7	15.7	15.7
Total Prop. Loss (dB)	180.2	177.0	174.5	172.0
Space Vehicle:				
Rcvd Signal Strength (dBW)	-174.2	-171.1	-171.3	-166.0
Eff. EOC Antenna Gain(dBi)	23.9	22.6	22.8	16.4
Signal Level (dBW)	-150.3	-148.5	-148.5	-149.6
Req Eb/(No+Io) (dB)	5.8	5.8	5.8	5.8
Eb/Io (dB)	18.0	18.0	18.0	18.0
Req. Eb/No (dB)	6.1	6.1	6.1	6.1
Ts (K)	500.0	500.0	500.0	500.0
Sig Level Req.(dBW)	-148.5	-148.5	-148.5	-148.5
Link Margin(dB)	-1.8	0.0	0.0	-1.1
G/T (dBi/K)	-3.1	-4.4	-4.2	-10.6

TABLE R-A-4

SV-ISU DOWNLINK, NO SHADOWING
[Representative Cells]

	CELL 1	CELL 6	CELL 12	CELL 16
Azimuth Angle (Deg)	32.4	38.3	40.5	60.0
Ground Range (km)	2215.3	1424.9	957.3	528.8
Nadir Angle (Deg)	61.9	56.4	48.2	33.4
Elevation Angle (Deg)	8.2	20.8	33.2	51.9
Slant Range (km)	2461.7	1696.2	1278.5	960.0
Space Vehicle:				
HPA Burst Power (W)	0.2	0.1	0.1	0.2
(dBW)	-6.5	-8.5	-10.8	-7.2
Xtmer Ckt Loss (dB)	2.1	2.1	2.1	2.1
Eff. EOC Antenna Gain(dBi)	24.3	23.1	22.9	16.8
EIRP (dBW)	15.7	12.5	10.0	7.5
Propagation:				
Space Loss (dB)	164.5	161.3	158.8	156.3
Prop. Losses (dB)	0.7	0.7	0.7	0.7
Total Prop. Loss (dB)	165.2	162.0	159.5	157.0
Iridium Subscriber Unit:				
Rcvd Signal Strength (dBW)	-149.5	-149.5	-149.5	-149.5
Antenna Gain (dBi)	1.0	1.0	1.0	1.0
Signal Level (dBW)	-148.5	-148.5	-148.5	-148.5
Req Eb/(No+Io)(dB)	5.8	5.8	5.8	5.8
Eb/Io (dB)	18.0	18.0	18.0	18.0
Req. Eb/No (dB)	6.1	6.1	6.1	6.1
Ts (K)	250.0	250.0	250.0	250.0
Sig level Req(dBW)	-151.5	-151.5	-151.5	-151.5
Link Margin(dB)	3.0	3.0	3.0	3.0
G/Ts (dBi/K)	-23.0	-23.0	-23.0	-23.0
SPFD at ISU (dBW/sq-m/4kHz)	-132.8	-132.8	-132.8	-132.8

TABLE R-A-5

SV-ISU UPLINK, NO SHADOWING
[Representative Cells]

	CELL 1	CELL 6	CELL 12	CELL 16
Azimuth Angle (Deg)	32.4	38.3	40.5	60.0
Ground Range (km)	2215.3	1424.9	957.3	528.8
Nadir Angle (Deg)	61.9	56.4	48.2	33.4
Elevation Angle (Deg)	8.2	20.8	33.2	51.9
Slant Range (km)	2461.7	1696.2	1278.5	960.0
Iridium Subscriber Unit:				
HPA Burst Pwr (W)	0.4	0.2	0.1	0.3
(dBW)	-4.5	-6.4	-9.1	-5.2
Ckt Loss (dB)	0.7	0.7	0.7	0.7
Ant Gain (dBi)	1.0	1.0	1.0	1.0
EIRP (dBW)	-4.2	-6.1	-8.8	-4.9
Uplink EIRP density (dBW/4kHz)	-13.2	-15.1	-17.8	-13.9
Propagation:				
Space Loss (dB)	164.5	161.3	158.8	156.3
Prop. Losses (dB)	0.7	0.7	0.7	0.7
Total Prop. Loss (dB)	165.2	162.0	159.5	157.0
Space Vehicle:				
Rcvd Signal Strength (dBW)	-169.4	-168.1	-168.3	-161.9
Eff. EOC Antenna Gain(dBi)	23.9	22.6	22.8	16.4
Signal Level (dBW)	-145.5	-145.5	-145.5	-145.5
Req Eb/(No+Io) (dB)	5.8	5.8	5.8	5.8
Eb/Io (dB)	18.0	18.0	18.0	18.0
Req. Eb/No (dB)	6.1	6.1	6.1	6.1
Ts (K)	500.0	500.0	500.0	500.0
Sig Level Req.(dBW)	-148.5	-148.5	-148.5	-148.5
Link Margin (dB)	3.0	3.0	3.0	3.0
G/T (dBi/K)	-3.1	-4.4	-4.2	-10.6

Table R-A-6
SV-Gateway Links

Carrier Frequency	GHz	20.00		29.40	
		Downlink		Uplink	
Item		Rain	Clear	Rain	Clear
Range	km	2326.0	2326.0	2326.0	2326.0
Transmitter					
Power	dBW	0.0	-9.7	13.0	-11.8
Antenna Gain	dB	26.9	26.9	56.3	56.3
Circuit Loss	dB	-3.2	-3.2	-1.0	-1.0
Pointing Loss	dB	-0.5	-0.5	-0.3	-0.3
EIRP	dBWi	23.2	13.5	68.0	43.2
System					
Margin	dB	3.2	3.2	2.1	2.1
Space Loss	dB	-185.8	-185.8	-189.1	-189.1
Propagation Loss	dB	-14.2	-1.5	-30.0	-1.5
Polarization Loss	dB	-0.2	-0.2	-0.2	-0.2
Total Prop. Loss	dB	-201.5	-188.8	-220.2	-191.7
Receiver					
Rec. Sig. Strength	dBWi	-180.2	-177.2	-153.4	-149.7
Pointing Loss	dB	-0.2	-0.2	-0.8	-0.8
Antenna Gain	dB	53.2	53.2	30.1	30.1
Received Signal	dBW	-127.2	-124.2	-124.1	-120.4
Ts	K	731.4	731.4	1295.4	1295.4
Noise Density	dBW/Hz	-200.0	-200.0	-197.5	-197.5
Noise Bandwidth	dBHz	64.9	64.9	64.9	64.9
Noise	dBW	-135.1	-135.1	-132.6	-132.6
Link Eb/No	dB	7.9	10.9	8.5	12.2
Eb/lo	dB	25.0	25.0	16.0	16.0
Comp. Eb/(No + lo)	dB	7.8	10.7	7.8	10.7
Required Eb/No	dB	7.7	7.7	7.7	7.7
Excess Margin	dB	0.1	3.0	0.1	3.0
SPFD at GW	dBW/ m ² / 1MHz	-134.3	-131.3		

Table R-A-7

SV-SV Intersatellite Links					
Carrier Frequency	GHz	23.28	23.28	23.28	23.28
Item		E/W	E/W with Sun	N/S	N/S with Sun
Range	km	4400.0	4400.0	4050.0	4050.0
Transmitter					
Power	dBW	5.3	5.3	5.3	5.3
Antenna Gain	dB	36.7	36.7	36.7	36.7
Circuit Loss	dB	-1.8	-1.8	-1.8	-1.8
Pointing Loss	dB	-1.8	-1.8	-1.8	-1.8
EIRP	dBWi	38.4	38.4	38.4	38.4
System					
Margin	dB	1.8	0.0	2.6	0.0
Space Loss	dB	-192.7	-192.7	-191.9	-191.9
Polarization Loss	dB	0.0	0.0	0.0	0.0
Receiver					
Rec. Sig. Strength	dBWi	-156.1	-154.3	-156.1	-153.5
Pointing Loss	dB	-1.8	-1.8	-1.8	-1.8
Antenna Gain	dB	36.7	36.7	36.7	36.7
Received Signal	dBW	-121.2	-119.4	-121.2	-118.6
Ts	K	720.3	1188.3	720.3	1188.3
Noise Density	dBW/Hz	-200.0	-197.9	-200.0	-197.9
Noise Bandwidth	dBHz	71.0	71.0	71.0	71.0
Noise	dBW	-129.0	-126.9	-129.0	-126.9
Link Eb/No	dB	7.8	7.5	7.8	8.3
Eb/lo	dB	27.0	27.0	27.0	27.0
Comp. Eb/(No + lo)	dB	7.7	7.5	7.7	8.2
Required Eb/No	dB	7.7	7.7	7.7	7.7
Excess Margin	dB	0.0	-0.2	0.0	0.5

TABLE R-1
MAJOR IRIDIUM SATELLITE CHARACTERISTICS

Stabilization	3-Axis
Mission Life	5 Years minimum
Station Keeping	2.0 km Cross track 5.7 km In track 4.7 km Radial track
Frequency Bands	1616-1626.5 MHz 18.8-20.2 GHz 27.5-30.0 GHz 22.55-23.55 GHz
Earth Coverage	5.9 Million Square (Statute) Miles Per Satellite <i>= 15.281 x 10⁶ Km²</i>
Max. Number of L-Band Uplink Channels per Satellite	3840 <i>1 SQUARE MILE = 2.59 Km²</i>
Max. Number of L-Band Downlink Channels per Satellite	3840
Max. Number of Intersatellite Channels per Satellite	About 6,000
Max. Number of Gateway Channels per Satellite	About 3,000
Total Occupied Bandwidth	10.5 MHz @ L-band 200 MHz @ Ka-band (Intersatellite links) 100 MHz @ Ka-band (gateway uplink) 100 MHz @ Ka-band (gateway downlink)
Polarization	
L-band	Right Hand Circular
Ka-band (Gateway and TT&C links)	Right Hand Circular
Ka-band (Intersatellite links)	Vertical
Transmit EIRP	7.5 to 27.7 dBw @ L-band 13.5 to 23.2 dBw @ Ka-band (Gateway) 38.4 dBw @ Ka-band (Intersatellite)
Satellite G/T	-10.6 to -3.1 dBi/K @ L-band -1.0 dBi/K Ka-band (Gateway) 8.1 dBi/K @ Ka-band (Intersatellite)
Wet Mass with Reserve	approximately 700 kg
Orbit	Near Polar (6 planes) about 86 deg. inclination

TABLE R-2
SV POWER ALLOCATION

SECTION	ORBIT AVG. POWER CONSUMPTION (W)
Bus Section	90
MMA Section	300
Communications Section	200
	—
Space Vehicle	590

TABLE R-3
SV MASS ALLOCATION

SECTION	ALLOCATED MASS (kg)	
	DEPLOYMENT	SPARE
Bus Section (wet)	332	358
MMA Section	116	116
Communications Section	160	160
Contingency	81	81
	—	—
Space Vehicle (wet)	689	715

TABLE R-4
CONSTRUCTION AND LAUNCH MILESTONES

MILESTONE	YEAR
Satellite Construction Begins	1993
First Satellite Constructed	1995
First Satellite Launched	1996
First Satellite in Service	1996
Last Satellite Constructed	1997
Last Satellite Launched	1998
IRIDIUM Begins Operations	1998
IRIDIUM Provides Services	1998

TABLE R-5
PROJECTED SYSTEM COSTS (\$ MILLIONS)

	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>
Pre-Operating Expenses	11	36	58	60	70	44	5
1st Year Operational Expense							14
Research and Development	12	180	138	58	15	13	13
Satellite Construction		163	387	486	311	90	
Launch Services and Insurance					302	294	41
System Control Facilities (2)		3	4	37	11	37	
Interest		1	3	13	72	161	226
TOTAL COSTS	23	383	590	654	781	639	299

Notes: Depreciation (\$ Millions) is expected to be \$303 in 1996, \$835 in 1997 and \$950 in 1998

TABLE R-6
EXHIBIT I (Revised)
TECHNICAL INFORMATION

Radio Frequency and Polarization Plan

L-Band (Uplink and Downlink)

Frequency	1616-1626.5 MHz (10.5 MHz)
Polarization	Right Hand Circular
Center Frequency	1.62125 GHz
Channel Bandwidth	31.5 kHz
Channel Spacing	41.67 kHz

Gateway and TT&C (Up/Downlink)

Frequency	27.5-30.0 GHz (100 MHz)
	18.8-20.2 GHz (100 MHz)
Polarization	Right Hand Circular
Center Frequency (Uplink)	29.40 GHz
Center Frequency (Downlink)	20.00 GHz
Channel Bandwidth	4.375 MHz
Channel Spacing	7.5 MHz

Intersatellite Link

Frequency	22.55-23.55 GHz (200 MHz)
Polarization	Vertical
Center Frequency	23.28 GHz
Channel Bandwidth	17.5 MHz
Channel Spacing	25 MHz

Final Amplifier Output Power

L-Band (Cells 1-48)	0.1 to 3.5 Watts per carrier (Burst)
Ka-Band	
Gateway	0.1 to 1.0 Watts per channel
Intersatellite	3.4 Watts per carrier (Burst)

Receiving System Noise Temperature

L-Band	500 K
Ka-Band	
Gateway	1295 K
Intersatellite	720 K (1188 K with sun)

Gain of Each L-Band Channel (Not a transponder)

TABLE R-6 (Page 2 of 3)

Orbital Locations	
Altitude	780 kilometers - Nominal
Number of Planes	6 near polar Planes
Spacing of Planes	31.6 Degrees - Nominal (except planes 1 & 6 spaced 22.0 Degrees - Nominal)
Number of Satellites per Plane	11 Satellites
Spacing of Satellites In Plane	32.7 Degrees
Predicted Satellite Coverage Contours	See Figures R-2 through R-6
Functional Block Diagram of Satellite Communications System and Switching Capabilities	See Section V of the IRIDIUM system application
Physical Characteristics of Satellite	
Station Keeping	2.0 km cross-track (3 Sigma) 5.7 km in-track (3 Sigma) 4.7 km radial (3 Sigma)
Antenna Axis Attitude	See Figures R-2 through R-6
Antenna Pointing Accuracy Toward Earth	1.0 Degrees in Azimuth (3 sigma) 0.7 Degrees in Elevation (3 sigma)
Estimated Minimum Lifetime of In-Orbit Satellite	5 Years
Attitude Stabilization and Station- Keeping Systems	Roll: <0.5 Degrees (3 sigma) Pitch: <0.4 Degrees (3 sigma) Yaw: <0.75 Degrees (3 sigma)
Electrical Energy System	< 1200 watt solar array < 50 Amp-hour battery
Emission Limitations (L-Band)	
Channel Spacing	41.67 kHz
Spurious Emissions	-30 dB @ 1 x Channel Spacing from carrier -60 dB @ 2 x Channel Spacing from carrier

**FINANCIAL QUALIFICATIONS SHOWING
(UPDATED)**



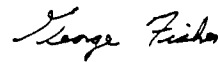
Management is responsible for the preparation, integrity and objectivity of the consolidated financial statements and other financial information presented in this report. The accompanying consolidated financial statements were prepared in accordance with generally accepted accounting principles, applying certain estimates and judgments as required.

Motorola's internal controls are designed to provide reasonable assurance as to the integrity and reliability of the financial statements and to adequately safeguard, verify and maintain accountability of assets. Such controls are based on established written policies and procedures, are implemented by trained, skilled personnel with an appropriate segregation of duties, and are monitored through a comprehensive internal audit program. These policies and procedures prescribe that the Company and all employees are to maintain the highest ethical standards and that its business practices throughout the world are to be conducted in a manner which is above reproach.

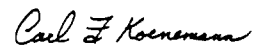
KPMG Peat Marwick, independent auditors, are retained to audit Motorola's financial statements.

Their accompanying report is based on an audit conducted in accordance with generally accepted auditing standards, which includes the consideration of the Company's internal controls to establish a basis for reliance thereon in determining the nature, timing, and extent of audit tests to be applied.

The Board of Directors exercises its responsibility for these financial statements through its Audit Committee, which consists entirely of independent non-management Board members. The Audit Committee meets periodically with the independent auditors and with the Company's internal auditors, both privately and with management present, to review accounting, auditing, internal controls and financial reporting matters.



George Fisher
Chairman of the Board
and Chief Executive Officer



Carl F. Koenemann
Executive Vice President
and Chief Financial Officer

INDEPENDENT AUDITORS' REPORT

The Board of Directors and Stockholders of Motorola, Inc.:

We have audited the accompanying consolidated balance sheets of Motorola, Inc. and consolidated subsidiaries as of December 31, 1991 and 1990, and the related statements of consolidated earnings, stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 1991. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan the audit to obtain reasonable assurance about whether the financial statements are free of material misstatements. 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 consolidated financial statements referred to above present fairly, in all material respects, the financial position of Motorola, Inc. and consolidated subsidiaries at December 31, 1991 and 1990, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 1991 in conformity with generally accepted accounting principles.



KPMG Peat Marwick
Chicago, Illinois

January 14, 1992

(In millions, except per share amounts)

Motorola, Inc. and Consolidated Subsidiaries

Years ended December 31	1991	1990	1989
<i>Net sales</i>	\$11,341	\$10,885	\$ 9,620
<i>Costs and expenses</i>			
Manufacturing and other costs of sales	7,245	6,882	5,905
Selling, general and administrative expenses	2,468	2,414	2,289
Depreciation expense	886	790	650
Interest expense, net	129	133	130
Total costs and expenses	10,728	10,219	8,974
<i>Earnings before income taxes</i>	613	666	646
<i>Income taxes provided on earnings</i>	159	167	148
<i>Net earnings</i>	\$ 454	\$ 499	\$ 498
<i>Net earnings per share</i>	\$ 3.44	\$ 3.80	\$ 3.83
Average shares outstanding	131.9	131.3	130.0

STATEMENTS OF CONSOLIDATED STOCKHOLDERS' EQUITY

(In millions, except per share amounts) Years ended December 31	Common Stock and Additional Paid-in Capital			Retained Earnings		
	1991	1990	1989	1991	1990	1989
Balances at January 1	\$1,324	\$1,269	\$1,240	\$2,933	\$2,534	\$2,135
Net earnings	-	-	-	454	499	498
Stock option plans	19	55	29	-	-	-
Dividends declared (\$.76 per share in 1991, 1990 and 1989)	-	-	-	(100)	(100)	(99)
Balances at December 31	\$1,343	\$1,324	\$1,269	\$3,287	\$2,933	\$2,534

See accompanying notes to consolidated financial statements.

(In millions, except per share amounts)

Motorola, Inc. and Consolidated Subsidiaries

December 31		1991	1990
Assets	<i>Current assets</i>		
	Cash and cash equivalents	\$ 302	\$ 265
	Short-term investments, at cost (approximating market)	231	312
	Accounts receivable, less allowance for doubtful accounts (1991, \$79; 1990, \$68)	1,953	1,857
	Inventories	1,242	1,245
	Future income tax benefits	417	419
	Other current assets	342	354
	Total current assets	4,487	4,452
	Property, plant and equipment, net	4,194	3,778
	Other assets	694	512
	Total assets	\$9,375	\$8,742
Liabilities and Stockholders' Equity	<i>Current liabilities</i>		
	Notes payable and current portion of long-term debt	\$ 852	\$ 995
	Accounts payable	897	889
	Accrued liabilities	1,314	1,164
	Total current liabilities	3,063	3,048
	Long-term debt	954	792
	Deferred income taxes	196	203
	Other liabilities	532	442
	<i>Stockholders' equity</i>		
	Common stock, \$3 par value		
	Authorized shares: 300.0, 1991 and 1990		
	Outstanding shares: 132.2, 1991; 131.7, 1990	398	395
	Preferred stock, \$100 par value issuable in series		
	Authorized shares: 0.5 (none issued)	-	-
	Additional paid-in capital	945	929
	Retained earnings	3,287	2,933
	Total stockholders' equity	4,630	4,257
	Total liabilities and stockholders' equity	\$9,375	\$8,742

See accompanying notes to consolidated financial statements.

(In millions)

Motorola, Inc. and Consolidated Subsidiaries

Years ended December 31		1991	1990	1989
Operating	Net earnings	\$ 454	\$ 499	\$ 498
	Add (deduct) non-cash items			
	Depreciation	886	790	650
	Net change in deferred income taxes	(5)	(62)	(31)
	Amortization of debt discount	27	26	-
	Change in assets and liabilities, net of effects of acquisitions and dispositions			
	Accounts receivable, net	(96)	(173)	(293)
	Inventories	3	(74)	(44)
	Other current assets	12	(65)	(72)
	Accounts payable and accrued liabilities	154	187	316
	Gain on dispositions of businesses	(22)	-	-
	Other assets	(145)	28	94
	Other liabilities	90	151	76
	Net cash provided by operations	1,358	1,307	1,194
Investing	Acquisitions and advances to affiliated companies	(52)	(117)	(53)
	Dispositions of businesses	40	2	25
	Payments for property, plant and equipment	(1,317)	(1,256)	(1,094)
	Other changes to property, plant and equipment, net	16	38	(47)
	(Increase) decrease in short-term investments	81	(110)	(57)
	Net cash used for investing activities	(1,232)	(1,443)	(1,226)
Financing	Increase (decrease) in notes payable and current portion of long-term debt	(143)	208	(251)
	Increase in long-term debt	135	7	389
	Issuance of common stock	19	55	29
	Payment of dividends to stockholders	(100)	(100)	(99)
	Net cash provided by (used for) financing activities	(89)	170	68
Increase in Cash and Cash Equivalents		\$ 37	\$ 34	\$ 36

See accompanying notes to consolidated financial statements.

1 Summary of Significant Accounting Policies

Consolidation: The consolidated financial statements include the accounts of the Company and all majority-owned subsidiaries. All significant intercompany accounts and transactions are eliminated in consolidation.

Cash Equivalents: The Company considers all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents.

Inventories: Inventories are valued at the lower of average cost (which approximates computation on a first-in, first-out basis) or market (i.e., net realizable value or replacement cost), less progress payments on long-term contracts.

Property, Plant and Equipment: Property, plant and equipment is stated at cost less accumulated depreciation. Depreciation is recorded principally using the declining-balance method, based on the estimated useful lives of the assets (buildings and building equipment, 5-50 years; machinery and equipment, 2-12 years).

Foreign Currency Translation: The Company uses the U.S. dollar as the functional currency for financial reporting. Gains and losses from translation to U.S. dollars are included in net earnings. The Company enters into foreign exchange contracts to hedge its investments in foreign subsidiaries. Gains and losses on these hedges are also included in net earnings.

The Company periodically enters into foreign exchange contracts to hedge identifiable transactions. Gains and losses from these contracts are classified in net earnings in the same category as the underlying transaction.

Reclassifications: Certain amounts in the 1990 and 1989 financial statements and related footnotes have been reclassified to conform to the 1991 presentation. These reclassifications are not significant.

2 Income Taxes

The Company provides for income taxes based on earnings reported for financial statement purposes. Income tax expense differs from income taxes currently payable because of timing differences in the recognition of certain income and expense items for tax and financial statement purposes.

Components of earnings before income taxes

	1991	1990	1989
United States	\$166	\$381	\$342
Other nations	447	285	304
Total	\$613	\$666	\$646

Components of income taxes provided on earnings

	1991	1990	1989
Current			
United States	\$ 54	\$147	\$117
Other nations	104	51	29
State income taxes (U.S.)	6	31	33
	164	229	179
Deferred	(5)	(62)	(31)
Income taxes	\$159	\$167	\$148

Income tax payments were \$150 million in 1991, \$236 million in 1990 and \$159 million in 1989.

Income taxes are not provided on cumulative undistributed earnings of certain non-U.S. subsidiaries amounting to \$741 million and \$739 million at December 31, 1991 and 1990, respectively. It is intended that these earnings will be permanently invested in operations outside the U.S. Should these earnings be distributed, foreign tax credits would reduce the additional U.S. income tax which would be payable.

At December 31, 1991, certain non-U.S. subsidiaries had loss carryforwards for financial reporting and income tax reporting purposes of approximately \$100 million and \$80 million, respectively, with expiration dates starting in 1992. The Company also has alternative minimum tax credit carryovers of \$25 million with no expiration date.

Differences between income tax expense computed at the U.S. federal statutory tax rate of 34% and income taxes provided on earnings

	1991	1990	1989
Income tax expense at statutory rate	\$208	\$226	\$220
Taxes on non-U.S. earnings	(24)	(37)	(49)
State income taxes	5	20	21
Foreign Sales Corporation	(22)	(23)	(12)
Tax credits	(7)	(4)	(8)
Other	(1)	(15)	(24)
Income taxes	\$159	\$167	\$148

Deferred income tax expense (benefit)

	1991	1990	1989
Depreciation	\$ (7)	\$ 6	\$ 35
Deferred taxes on non-U.S. earnings	39	21	33
Employee benefits	1	(23)	(27)
Inventory valuations	(6)	(13)	(11)
Completed contract accounting	(5)	7	(10)
Alternative minimum tax credit	(25)	-	-
Other, net	(2)	(60)	(51)
Net change in deferred taxes	\$ (5)	\$ (62)	\$ (31)

The Internal Revenue Service has examined the federal income tax returns for Motorola, Inc. through 1985 and the returns have been settled through 1983. In connection with the audits for the years 1984 and 1985, the IRS has proposed adjustments to the Company's income and tax credits for those years which would result in substantial additional tax. The Company disagrees with most of the proposed adjustments and is contesting them.

Note continued on page 28

In the opinion of the Company's management, the final disposition of these matters will not have a material adverse effect on the business or financial position of the Company.

In June 1991, the Financial Accounting Standards Board (FASB) issued an exposure draft amending Statement of

Financial Accounting Standards (SFAS) 96, "Accounting for Income Taxes." If finalized, the proposed Statement would be effective for fiscal years beginning after December 15, 1992. The Company has not yet adopted SFAS 96 and the cumulative impact of adoption is not yet determinable.

3 Debt and Credit Facilities

<i>Long-term debt</i>		
December 31	1991	1990
12% eurodollar notes due 1994	\$ 68	\$ 68
11½% eurodollar notes due 1997 (callable prior to stated maturity)	93	93
8¼% ECU notes due 1992	66	69
8% sinking fund debentures due 2007 (callable at 103.4% reducing to 100% of the principal amount)	62	62
5.75% industrial revenue bonds due 2014	20	20
Zero coupon notes due 2009	465	438
8.4% debentures due 2031 (redeemable at the holders' option in 2001)	200	0
Capitalized lease obligations	17	38
Other long-term debt	42	23
	<u>1,033</u>	<u>811</u>
Less current maturities	79	19
Long-term debt	\$ 954	\$ 792

Short-term debt

December 31	1991	1990
Commercial paper	\$ 703	\$ 733
Notes to banks	56	224
Other short-term debt	14	19
	<u>773</u>	<u>976</u>
Add current maturities	79	19
Notes payable and current portion of long-term debt	\$ 852	\$ 995

The zero coupon notes due 2009, referred to as Liquid Yield Option™ Notes (LYON™), have an aggregate face value of \$1.32 billion. The LYONs are subordinated notes, have no periodic interest payments, are convertible into 4.567 shares of Motorola common stock for each \$1,000 face value note, and were priced to yield 6% to maturity. The notes may be redeemed by the holders in specified circumstances prior to the stated maturity date.

Aggregate maturities and sinking fund requirements for long-term debt, in millions, during the next five years are as follows: 1992, \$79; 1993, \$9; 1994, \$72; 1995, \$12; 1996, \$3.

The industrial revenue bonds have an interest rate which was reset for the remaining life of the bonds on January 1, 1992, when the rate changed from 5.75% to 6.75%.

The Company has domestic and international credit facilities for short-term borrowings, generally with banks. It pays commitment fees of approximately 1/10% on its domestic credit facilities and generally no fees on its foreign credit facilities. Short-term credit facilities totaled \$1.88 billion at December 31, 1991, of which \$1.06 billion remain unused. Domestic credit facilities primarily back up the issuance of commercial paper, while foreign credit facilities generally support working capital requirements.

The Company's finance subsidiary has entered into interest rate swaps covering \$100 million of the commercial paper, fixing the interest rate for periods of 2 to 5 years.

Outstanding letters of credit aggregated approximately \$103 million at December 31, 1991.

4 Property, Plant and Equipment

December 31	1991	1990
Land	\$ 117	\$ 116
Buildings	1,993	1,771
Machinery	4,864	4,257
Equipment leased to others	415	415
	<u>7,389</u>	<u>6,559</u>
Less accumulated depreciation	3,195	2,781
Property, plant and equipment, net	\$ 4,194	\$ 3,778

5 Leases

The Company owns most of its major facilities, but does lease certain office, factory and warehouse space, land, data processing and other equipment under principally noncancellable operating leases. In addition, equipment is leased to others under noncancellable operating leases.

Rental expense, net of sublease income, was \$142 million in 1991, \$132 million in 1990 and \$125 million in 1989.

Capital lease expenditures were \$30 million in 1989.

Expenditures were not significant in 1991 and 1990.

At December 31, 1991, future minimum lease revenues under noncancellable leases and lease obligations, net of minimum sublease rentals, were as follows:

	Lease Revenues	Lease Obligations
1992	\$49	\$114
1993	28	77
1994	13	45
1995	5	29
1996	2	19
Beyond	1	64

6 Employee Benefit and Incentive Plans

Retirement Benefits: The Company and certain subsidiaries have profit sharing plans, principally contributory, in which all eligible employees participate. The Company makes contributions to profit sharing funds in the United States and other nations, which are generally based upon percentages of pretax earnings, as defined, from those operations.

Company contributions to all profit sharing plans totaled \$45 million, \$51 million and \$48 million in 1991, 1990 and 1989, respectively.

The Company's noncontributory pension plan covers most domestic employees after one year of service. The benefit formula is dependent upon employee earnings and years of service. The Company's policy is to fund the accrued pension cost or the amount allowable based on the full funding limitations of the Internal Revenue Service, if less.

The Company has a noncontributory supplemental retirement benefit plan for its elected officers. The plan contains provisions for funding the participants' expected retirement benefits when the participants meet the minimum age and years of service requirements.

Benefits under all pension plans are valued based upon the projected unit credit cost method. The assumptions used to develop the projected benefit obligations for the plans for 1991 and 1990 were as follows:

	1991	1990
Discount rate for obligations	8.5%	9%
Future compensation increase rate	5.5%	5.5%
Investment return assumption	9.25%	9.25%

Components of net U.S. pension expense for the regular pension plan

	1991	1990	1989
Service costs	\$ 69	\$ 63	\$ 57
Interest cost on projected obligation	43	34	26
Actual return on plan assets	(154)	(11)	(103)
Net amortization and deferral	89	(47)	51
Net pension expense	\$ 47	\$ 39	\$ 31

The net U.S. expense for the elected officers supplemental retirement benefit plan was \$17 million in 1991 and \$14 million in 1990 and 1989.

U.S. Funded Plans

December 31	1991		1990	
	Regular	Elected Officers	Regular	Elected Officers
Actuarial present value of:				
Vested benefit obligation	\$ (426)	\$ (31)	\$ (341)	\$ (26)
Accumulated benefit obligation	(460)	(54)	(365)	(40)
Projected benefit obligation for services rendered to date	(641)	(63)	(476)	(54)
Plan assets at fair value; primarily listed stocks, bonds and cash equivalents	761	41	575	34
Plan assets in excess of (less than) projected benefit obligation	120	(22)	99	(20)
Unrecognized net (gain) loss from past experience different from assumptions	(117)	16	(88)	11
Unrecognized prior service cost	1	30	1	32
Unrecognized net transition (asset) liability	(80)	10	(91)	11
Pension asset (liability) recognized in balance sheet	\$ (76)	\$ 34	\$ (79)	\$ 34

The Company uses a three-year market-related asset value method of amortizing actuarial gains and losses.

Net transition amounts and prior service costs are being amortized over periods ranging from 10 to 15 years.

Certain non-U.S. subsidiaries have varying types of retirement plans providing benefits for substantially all of their employees. Amounts charged to earnings for all non-U.S. plans were \$33 million in 1991, \$25 million in 1990 and \$15 million in 1989.

In addition to providing pension benefits, the Company provides certain health care benefits to its retired employees. The majority of its domestic employees may become eligible for these benefits if they reach normal retirement age while working for the Company. The cost of retiree health care benefits is recognized as expense when claims are paid and totaled \$5 million in 1991 and 1990, and \$4 million in 1989. There are no significant postretirement health care benefit plans outside of the United States.

In December 1990, the FASB issued SFAS 106, "Accounting for Postretirement Benefits Other than Pensions," which requires employers to recognize expense on the accrual basis during the periods that employees render services. The FASB has deferred the required implementation until fiscal years beginning after December 15, 1992. The Company has not yet adopted SFAS 106. The Company is presently evaluating the impact of changes it may make to the postretirement benefit plan. Based upon the existing plan, management believes the net plan obligation would range from \$190 million to \$300 million. Net periodic cost of the plan would range from \$35 million to \$50 million per year. The immediate recognition of the plan liability would eliminate the "amortization of the unrecognized transition obligation" component of the cost and thus reduce the net periodic cost of the plan by \$10 million to \$15 million. Should the Company decide to fund some or all of the transition obligation, the amount of the net periodic cost of the plan could be significantly reduced.

Management Incentive: The Company may provide up to 7% of its annual consolidated pretax earnings, as defined in the Motorola Executive Incentive Plan, for the payment of cash incentive awards to key employees. During 1991, \$16 million was provided for incentive awards, as compared to \$23 million and \$24 million in 1990 and 1989, respectively.

Stock Options: Under the Company's employee stock option plans, shares of common stock have been made available for grant to key employees. The exercise price of each option granted is 100% of market value on the date of the grant.

Shares subject to option

(In thousands of shares)	1991	1990
Options outstanding at January 1	6,495	6,502
Additional options granted	1,563	1,595
Options exercised	(476)	(1,555)
Options terminated, cancelled or expired	(87)	(47)
Options outstanding at December 31	7,495	6,495
Shares reserved for future options grants	6,802	278
Total shares reserved	14,297	6,773
Total options exercisable	5,933	4,877

Options exercised during 1991 were at per share prices ranging from \$21.00 to \$59.82. Options outstanding at December 31, 1991 were at per share prices ranging from \$22.77 to \$87.25.

7 Other Financial Data

Income statement information

	1991	1990	1989
Research and development	\$1,079	\$1,030	\$ 839
Maintenance and repairs	204	207	178
Foreign currency gains (losses)	16	(27)	(6)
Interest expense, net:			
Interest expense	176	180	168
Interest income	(43)	(40)	(35)
Amount capitalized	(4)	(7)	(3)
Interest expense, net	\$ 129	\$ 133	\$ 130

Balance sheet information

	1991	1990
Inventories:		
Finished goods	\$ 443	\$ 405
Work in process and production materials	799	840
Inventories	1,242	1,245
Accrued liabilities:		
Compensation	233	255
Taxes other than income	116	96
Income taxes payable	56	48
Contribution to employees' profit sharing funds	45	51
Dividends payable	25	25
Other	839	689
Accrued liabilities	\$1,314	\$1,164

Financial data of consolidated financial subsidiary

	1991	1990	1989
Total revenue	\$ 20	\$ 15	\$ 31
Net earnings	8	5	7
Total assets	238	120	166
Total liabilities	(203)	(84)	(134)
Stockholders' investments and advances	\$ 35	\$ 36	\$ 32

The Company's finance subsidiary purchases customer obligations under long-term contracts from the Company at net carrying value. Its insurance subsidiary insures some of the Company's property risks.

Finance subsidiary interest income of \$20 million in 1991, \$15 million in 1990 and \$31 million in 1989 is included in net sales. Interest expense of \$8 million in 1991 and 1990, and \$20 million in 1989 is included in manufacturing and other costs of sales. In addition, long-term finance receivables of \$186 million in 1991 and \$93 million in 1990 are included in other assets.

The Company's cash payments for interest expense (net of amounts capitalized) were \$122 million in 1991, \$113 million in 1990 and \$175 million in 1989.

8 Commitments and Contingencies

The Company had \$695 million of forward foreign exchange contracts outstanding as of December 31, 1991. Management believes that these forward contracts should not subject the Company to undue risk due to foreign exchange movements because gains and losses on these contracts should offset losses and gains on the assets, liabilities and transactions being hedged.

Commitments to extend or guarantee financing and recourse obligations under receivable sale arrangements aggregated \$518 million as of December 31, 1991. Commitments to extend or guarantee financing include commitments for customer financing and for the financing of non-consolidated affiliates. Customer financing commitments require the customer to meet certain conditions established in the financing arrangements. As of December 31, 1991, customers had not met the

conditions on half the commitments. Commitments represent the maximum amounts available under these arrangements and may not be completely utilized.

As of December 31, 1991, the Company had no significant concentrations of credit risk.

The Company records costs associated with any environmental matters when they become probable and reasonably estimable. The amount of such charges to earnings was \$18 million in 1991.

The company is a defendant in various suits and is subject to various claims which arise in the normal course of business. In the opinion of management, the ultimate disposition of these matters will not have a material adverse effect on the business or financial position of the Company.

9 Information by Industry Segment and Geographic Region

Industry segment information

Years ended December 31	Net Sales			Operating Profit					
	1991	1990	1989	1991		1990		1989	
Semiconductor Products	\$ 3,679	\$ 3,433	\$3,036	\$356	9.7%	\$320	9.3%	\$193	6.2%
Communications Products	3,629	3,560	3,310	191	5.3%	230	6.5%	305	9.1%
General Systems Products	2,847	2,648	1,902	330	11.6%	354	13.4%	342	17.9%
Government Electronic Products	704	766	785	63	8.9%	68	8.9%	58	7.4%
Information Systems Products	587	599	552	(13)	(2.2)%	(1)	(0.2)%	18	3.2%
Other Products	392	355	403	(41)	(10.5)%	(6)	(1.7)%	(7)	(1.7)%
Adjustments and eliminations	(497)	(476)	(368)	4	-	1	-	(4)	-
Industry segment totals	\$11,341	\$10,885	\$9,620	890	7.8%	966	8.9%	905	9.4%
General corporate expenses				(148)		(167)		(129)	
Interest expense, net				(129)		(133)		(130)	
Earnings before income taxes				\$613	5.4%	\$666	6.1%	\$646	6.7%

Years ended December 31	Assets			Fixed Asset Expenditures			Depreciation		
	1991	1990	1989	1991	1990	1989	1991	1990	1989
Semiconductor Products	\$3,196	\$2,851	\$2,590	\$ 653	\$ 548	\$ 536	\$362	\$345	\$306
Communication Products	2,728	2,616	2,348	245	234	216	169	159	124
General Systems Products	1,759	1,503	1,139	236	223	182	139	101	55
Government Electronic Products	373	381	418	26	36	36	36	35	31
Information Systems Products	373	386	403	43	47	36	37	35	36
Other Products	275	286	275	15	39	39	23	15	15
Adjustments and eliminations	(52)	(20)	(44)	-	-	-	-	-	-
Industry segment totals	8,652	8,003	7,129	1,218	1,127	1,045	766	690	567
General corporate	723	739	557	99	133	79	56	50	36
Consolidated totals	\$9,375	\$8,742	\$7,686	\$1,317	\$1,260	\$1,124	\$822	\$740	\$603

Expenditures and depreciation do not include amounts for equipment leased to others.

Geographic area information*

Years ended December 31	Net Sales			Operating Profit					
	1991	1990	1989	1991	1990		1989		
United States	\$ 8,802	\$ 8,759	\$8,123	\$452	5.1%	\$697	7.8%	\$633	7.7%
Other nations	6,340	5,896	4,910	501	7.9%	308	5.2%	313	6.4%
Adjustments and eliminations	(3,801)	(3,770)	(3,413)	(63)	-	(39)	-	(41)	-
Geographic totals	\$11,341	\$10,885	\$9,620	890	7.8%	966	8.7%	905	9.3%
General corporate expenses				(148)		(167)		(129)	
Interest expense, net				(129)		(133)		(130)	
Earnings before income taxes				\$613	5.4%	\$666	6.1%	\$646	6.7%

December 31	Assets		
	1991	1990	1989
United States	\$5,656	\$5,041	\$4,653
Other nations	3,164	3,084	2,605
Adjustments and eliminations	(168)	(122)	(129)
Geographic totals	8,652	8,003	7,129
General corporate assets	723	739	557
Consolidated totals	\$9,375	\$8,742	\$7,686

*As measured by the locale of the revenue-producing operations

The Company operates predominantly in the electronic equipment, systems, and components industry. Operations involve the design, manufacture and sale of diversified lines of products, which include, but are not limited to: two-way radios, pagers, cellular telephones and systems; semiconductors, including integrated circuits and micro-processor units; data communication and distributive data processing equipment and systems; and electronic equipment and industrial electronics products. Manufacturing and distribution operations in any one country, other than the U.S., does not account for more than 10% of consolidated net sales or total assets.

Operating profit (revenues less operating expenses) excludes general corporate expenses, net interest and income taxes. Intersegment sales, principally semiconductor components, amounted to \$510 million for 1991, \$489 million for 1990 and \$382 million for 1989. Intersegment

and intergeographic transfers are accounted for on an arm's length pricing basis and comply with domestic and foreign tax regulations.

Identifiable assets (excluding intersegment receivables) are the Company's assets that are identified with classes of similar products or operations in each geographic area. Corporate assets are primarily administrative headquarters, cash, and marketable securities.

Sales to United States Federal Government agencies aggregated \$1.03 billion for 1991, \$1.08 billion for 1990 and \$1.07 billion for 1989. In 1991, no single customer or group under common control represented 10% or more of the Company's sales.

The equity in net assets of non-U.S. subsidiaries amounted to \$2.34 billion at December 31, 1991 and \$1.84 billion at December 31, 1990.

10 Stockholder Rights Plan

Each outstanding share of the Company's common stock carries with it one preferred share purchase right. Each right becomes exercisable for one-thousandth of a share of the Company's junior participating preferred stock, series A, at an exercise price of \$150 per one-thousandth of a share (subject to adjustment) if a person or group acquires 20% or more of the Company's common stock or announces a tender or exchange offer for 30% or more of the Company's common stock. If a person or group acquires 20% or more of the Company's common stock and in certain other circumstances, each right (except, in

some instances, those held by an acquiror) becomes exercisable for an amount of the Company's common stock (or that of an acquiror) having a market value of twice the exercise price. In some cases, the Board of Directors may exchange one exercisable right for one share (subject to adjustment) of the Company's common stock (or the equivalent) and may suspend the exercisability of the rights. The rights have no voting power, expire on November 20, 1998, and may be redeemed for \$.05 per right prior to a public announcement that 20% or more of the Company's shares have been accumulated by a person or group.

(In millions, except as noted)

Motorola, Inc. and Consolidated Subsidiaries

Years ended December 31		1991	1990	1989	1988	1987
Operating Results	Net sales	\$11,341	\$10,885	\$9,620	\$8,250	\$6,727
	Manufacturing and other costs of sales	7,245	6,882	5,905	5,040	4,071
	Selling, general and administrative expenses	2,468	2,414	2,289	1,957	1,665
	Depreciation expense	886	790	650	543	494
	Interest expense, net	129	133	130	98	79
	Total costs and expenses	10,728	10,219	8,974	7,638	6,309
	Earnings before income taxes	613	666	646	612	418
	Income taxes provided on earnings	159	167	148	167	110
	Net earnings	\$ 454	\$ 499	\$ 498	\$ 445	\$ 308
Net earnings as a percent of sales	4.0%	4.6%	5.2%	5.4%	4.6%	
Per Share Data (In dollars)	Net earnings	\$ 3.44	\$ 3.80	\$ 3.83	\$ 3.43	\$ 2.39
	Dividends declared	0.76	0.76	0.76	0.67	0.64
Balance Sheet	Total assets	\$ 9,375	\$ 8,742	\$7,686	\$6,710	\$5,517
	Working capital	1,424	1,404	1,261	758	932
	Long-term debt	954	792	755	343	344
	Total debt	1,806	1,787	1,542	1,381	917
	Total stockholders' equity	\$ 4,630	\$ 4,257	\$3,803	\$3,375	\$3,008
Other Data	Current ratio	1.46	1.46	1.48	1.29	1.52
	Return on average invested capital	7.8%	9.4%	10.3%	11.0%	8.8%
	Return on average stockholders' equity	10.2%	12.3%	13.9%	13.9%	10.7%
	Year-end employment (in thousands)	102	105	104	102	98
	Average shares outstanding	131.9	131.3	130.0	129.6	128.9

QUARTERLY AND OTHER FINANCIAL DATA

(In millions, except per share amounts; unaudited)

Quarterly	1991				1990			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Net sales	\$2,743	\$2,814	\$2,745	\$3,039	\$2,533	\$2,715	\$2,703	\$2,934
Gross profit	987	1,037	947	1,125	904	1,024	980	1,095
Net earnings	116	119	93	126	127	161	102	109
Net earnings per share	0.88	0.90	0.70	0.96	0.98	1.22	0.78	0.82
Dividends declared and paid	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Stock prices:								
High	64.81	70.31	68.88	65.06	69.88	88.13	88.13	66.50
Low	46.81	56.69	60.88	55.00	54.50	64.13	59.13	49.88

The number of holders of record of Motorola Common Stock on January 31, 1992 was 15,087.



1992

Motorola, Inc.

Second Quarter

Report

2

STATEMENTS OF CONSOLIDATED EARNINGS

(Unaudited)

Motorola, Inc. and Consolidated Subsidiaries

	Second Quarter		Six Months	
	'92	'91	'92	'91
(Dollars in millions except share figures)				
<i>Net sales</i>	\$3,141	\$2,814	\$6,196	\$5,557
Manufacturing and other costs of sales	2,009	1,789	3,956	3,521
Selling, general, and admin. expenses	651	625	1,331	1,251
Depreciation	247	203	467	394
Interest, net	38	32	74	65
Total costs and expenses	2,945	2,649	5,828	5,231
<i>Earnings before income taxes</i>	196	165	368	326
<i>Income taxes</i>	50	46	95	91
<i>Net earnings</i>	146	119	273	235
<i>Net earnings per share</i>	\$ 1.09	\$.90	\$ 2.05	\$ 1.78
Dividends per share	.19	.19	.38	.38
Return on average invested capital*	8.2%	7.9%	—	—
R&D expenditures	307	260	595	516
Weighted average shares outstanding (in millions of shares)	133.3	131.8	133.0	131.8

* Based on the performance of the four preceding quarters ending with July 4, 1992 and June 29, 1991.

The sales and earnings results reported herein include, in the opinion of management, all adjustments (consisting of reclassifications and normal recurring adjustments) necessary for a fair statement of income. The results for the quarter and half are not necessarily indicative of the results to be expected for the full year.

CONDENSED CONSOLIDATED BALANCE SHEETS

(Unaudited) Motorola, Inc. and Consolidated Subsidiaries

(In millions)	July 4, 1992	Dec. 31, 1991
<i>Assets</i>		
Cash and cash equivalents	\$ 537	\$ 302
Short-term investments, at cost (approximating market)	258	231
Accounts receivable, less allowance for doubtful accounts (1992, \$80; 1991, \$79)	1,970	1,953
Inventories	1,309	1,242
Other current assets	827	759
Total current assets	4,901	4,487
Property, plant and equipment, less accumulated depreciation (1992, \$3,549; 1991, \$3,195)	4,265	4,194
Other assets	721	694
Total assets	\$9,887	\$9,375
<i>Liabilities And Stockholders' Equity</i>		
Notes payable and current portion of		
long-term debt	\$ 659	\$ 852
Accounts payable	842	897
Accrued liabilities	1,416	1,314
Total current liabilities	2,917	3,063
Long-term debt	1,263	954
Other liabilities	801	728
Stockholders' equity	4,906	4,630
Total liabilities, stockholders' equity	\$9,887	\$9,375

Soon after the close of each fiscal quarter, Motorola submits a report on form 10-Q to the Securities and Exchange Commission containing certain additional financial information concerning its business. A copy of this report may be obtained without charge by addressing your request to the Secretary, Motorola, Inc., Corporate Offices, 1303 E. Algonquin Road, Schaumburg, Illinois 60196.

CERTIFICATION OF PERSON RESPONSIBLE
FOR PREPARING ENGINEERING INFORMATION

I hereby certify that I am the technically qualified person responsible for preparation of the attached engineering information submitted in support of Motorola Satellite Communications, Inc.'s Amendment to its Application for a low earth orbit satellite system, that I am familiar with Part 25 of the Commission's Rules and Regulations, that I have either prepared or reviewed the attached engineering information, and that it is complete and accurate to the best of my knowledge.



Title: Spectrum Utilization Manager

Motorola Satellite Communications

Date: August 10, 1992

CERTIFICATE OF SERVICE

I, Hugh Grambau, hereby certify that the foregoing Minor Amendment was served by first-class mail, postage prepaid, this ____ day of _____, 1992 on the following persons:

- * Chairman Alfred C. Sikes
Federal Communications Commission
Room 814
1919 M Street, N.W.
Washington, D.C. 20554

- * Commissioner James H. Quello
Federal Communications Commission
Room 802
1919 M. Street, N.W.
Washington, D.C. 20554

- * Commissioner Sherrie P. Marshall
Federal Communications Commission
Room 826
1919 M. Street, N.W.
Washington, D.C. 20554

- * Commissioner Andrew C. Barrertt
Federal Communications Commission
Room 844
1919 M. Street, N.W.
Washington, D.C. 10554

- * Commissioner Ervin S. Duggan
Federal Communications Commission
Room 832
1919 M. Street, N.W.
Washiington, D.C. 20554

- * Thomas P. Stanley
Chief Engineer
Federal Communications Commission
2025 M. Street, N.W.
Room 7002
Washington, D.C. 20554

- * Raymond LaForge
Federal Communications Commission
Room 7334
2025 M. Street, N.W.
Washington, D.C. 20554

* Cheryl Tritt
Chief, Common Carrier Bureau
Federal Communications Commission
Room 500
1919 M. Street, N.W.
Washington, D.C. 20554

* Wendell R. Harris
Assistant Bureau Chief
Common Carrier Bureau
Federal Communications Commission
Room 6010
2025 M. Street, N.W.
Washington, D.C. 20554

* Cecily C. Holiday
Chief, Satellite Radio Branch
Federal Communications Commission
Room 6324
2025 M. Street, N.W.
Washington, D.C. 20554

* James R. Keegan
Chief, Domestic Facilities Division
Common Carrier Bureau
Federal Communications Commission
2025 M. Street, N.W.
Room 6010
Washington, D.C. 20554

* Thomas Tycz
Deputy Chief
Domestic Facilities Division
Common Carrier Bureau
Federal Communications Commission
Room 6010
2025 M. Street, N.W.
Washington, D.C. 20554

* Fern J. Jarmulnek
Satellite Radio Branch
Federal Communications Commission
Room 6324
2025 M. Street, N.W.
Washington, D.C. 20554

* Walda W. Roseman
Director
Office of International Communications
Federal Communications Commission
Room 658
1919 M. Street N.W.
Washington, D.C. 20554

Richard D. Parlow
Associate Administrator
Office of Spectrum Management
NTIA
U.S. Department of Commerce
14th & Constitution Avenue, N.W.
Washington, D.C. 20230

Greg Daffner
Craig Moll
NTIA
U.S. Department of Commerce
14th and Constitution Avenue, N.W.
Washington, D.C. 20230

Richard Barth
Director
Office of Radio Frequency Management
National Oceanic and
Atmospheric Administration
U.S. Department of Commerce
Room 3332
Federal Office Building #4
Washington, D.C. 20233

Leslie Taylor, Esquire
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, Maryland 20817-4302
(Counsel for Norris Satellite and LQSS)

Linda K. Smith, Esquire
Robert Halperin, Esquire
Crowell & Moring
1001 Pennsylvania Avenue N.W.
Washington, D.C. 20004-2505
(Counsel for Loral Qualcomm)

Bruce D. Jacobs, Esquire
Glenn S. Richards, Esquire
Fisher, Wayland, Cooper & Leader
1255 23rd Street, N.W.
Suite 800
Washington, D.C. 20037
(Counsel for AMSC)

Lon C. Levin
Vice President
American Mobile Satellite Corporation
1150 Connecticut Avenue, N.W.
4th Floor
Washington, D.C. 20036

Robert A. Mazer, Esquire
Albert Shuldiner, Esquire
Nixon, Hargrave, Devans & Doyle
One Thomas Circle, N.W.
Suite 800
Washington, D.C. 20005
(Counsel for Constellation)

Dr. Robert L. Riemer
Committee on Radio Frequencies
HA-562
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

Norman R. Leventhal, Esquire
Raul R. Rodriguez, Esquire
Stephen D. Baruch, Esquire
Levanthal, Senter & Lerman
2000 K. Street, N.W.
Suite 600
Washington, D.C. 20006-1809
(Counsel for TRW, Inc.)

Jill Abeshouse Stern, Esquire
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N.W.
Second Floor
Washington, D.C. 20037
(Counsel for Ellipsat)

Cheryl Lynn Schneider, Esquire
Communications Satellite Corporation
950 L'Enfant Plaza S.W.
Washington, D.C. 20024

William K. Keane, Esquire
Winston & Strawn
1400 L Street, N.W.
Washington, D.C. 20005
(Counsel for AFTRCC)

Jeffrey L. Sheldon
General Counsel
Utilities Telecommunications Council
1140 Connecticut Avenue, N.W.
Suite 1140
Washington, D.C. 20036

Arun Bhumitra
Vice President
ARJAY Telecommunications
20669 Hawthorne Blvd.
Torrance, California 90503

M. Worstell
Vice President, Contracts
Litton Aero Products
6101 Condor Drive
Moorpark, California 93021

John L. Bartlett
Wiley, Rein & Fielding
1776 K Steeet, N.W.
Washington, D.C. 20006
(Counsel for ARINC / ATA)

J. Ellis McSparran
3S Navigation
23141 Plaza Pointe Drive
Laguna Hills, California 92653

Gary M. Epstein
James F. Rogers
Kevin C. Boyle
Latham & Watkins
1001 Pennsylvania Avenue, N.W.
Suite 1300
Washington, D.C. 20004
(Counsel for Hughes Aircraft)

E. William Henry
Henry M. Rivera
Ginsburg, Feldman and Bress
Chartered
1250 Connecticut Avenue, N.W.
Washington, D.C. 20036
(Counsel for RDSS, Inc.)

Bruce L. Bucklin
Acting Chief
Technical Operations Section
Drug Enforcement Administration
U.S. Department of Justice
Washington, D.C. 20537

Terri B. Natoli
Regulatory and Industry
Relations Manager
GTE Spacenet
1700 Old Meadow Road
McLean, Virginia 22102

Tedson J. Myers
Reid & Priest
701 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(Counsel for AfriSpace, Inc.)

Victor J. Toth, P.C.
Law Offices
2719 Soapstone Drive
Reston, Virginia 22091
(Counsel for Celsat, Inc.)

Philip L. Malet / HEG
Philip L. Malet

* BY HAND