MSV
Mobile Satellite Ventures

January 13, 2003

Via Electronic Filing and Hand Delivery
Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Mobile Satellite Ventures Subsidiary LLC
***Ex Parte* Presentation**
IB Docket No. 01-185
File No. SAT-ASG-20010302-00017 et al.

Dear Ms. Dortch:

Mobile Satellite Ventures Subsidiary LLC ("MSV") has submitted a number of documents in the above-referenced proceedings describing the kind of ancillary terrestrial component ("ATC") that it is planning to deploy and analyzing the interference potential of the planned ATC.[1] That information has focused on a mature ATC deployment in connection with MSV's next-generation system since such a deployment presents the worst case for an interference analysis.

This letter is being filed to clarify to the extent necessary that if the Commission permits MSV to deploy ATC in connection with its licensed and currently operational satellite system (the operational parameters of which are a matter of record), the descriptions and analyses that MSV has submitted would remain valid. The system parameters for the mobile terminals and the base stations would be the same, regardless of whether they are deployed in connection with MSV's current satellite system or its next-generation system, as would the planned architecture of the ATC and manner in which it is integrated with the satellite network. The only change in

[1] *See, e.g.*, MSV *ex parte* presentation, IB Docket No. 01-185 (January 11, 2002) (general interference analysis, attached as Exhibit A); MSV *ex parte* presentation, IB Docket No. 01-185 (January 29, 2002) (further showing lack of harmful interference to AMSS receivers from ATC base stations); MSV *ex parte* presentation, IB Docket No. 01-185 (January 29, 2002) (describing impact of use of variable rate vocoders); MSV *ex parte* presentation, IB Docket No. 01-185 (May 1, 2002) (discussing MSV's extensive measurements and analysis of cross-polarization isolation); MSV *ex parte* presentation, IB Docket No. 01-185 (July 29, 2002) (discussing MSV's ability to achieve an average level of at least 10 dB of antenna discrimination); MSV *ex parte* presentation, IB Docket No. 01-185 (November 4, 2002) (interference analysis using example spot beam patterns for Inmarsat-4 submitted by Inmarsat).

deployment would be the frequency plan, which would be based on the different frequency reuse scheme of the current satellite system. This frequency plan, however, would not lead to the operation of any more mobile terminals or base stations. Similarly, the interference analyses that MSV has submitted remain valid. The only interference analysis that would change is the analysis of the potential for intra-system interference from MSV's terminals (operating on the ATC) to MSV's satellite, which would actually decrease. *See* Exhibit B.

Please direct any questions regarding this matter to the undersigned at (703) 390-2716 or Bruce D. Jacobs of Shaw Pittman LLP at (202) 663-8077.

Very truly yours,

Peter D. Karabinis, Ph.D.
Vice President and Chief Technical Officer

cc: Bryan Tramont
John Branscome
Paul Margie
Sam Feder
Barry Ohlson
Ed Thomas
Bruce Franca
Lisa Gaisford
Bob Eckert
Breck Blalock
Rick Engelman
Trey Hanbury
Paul Locke
Chris Murphy
Ron Repasi

Exhibit A

January 11, 2002

Via Electronic Filing
Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Mobile Satellite Ventures Subsidiary LLC
***Ex Parte* Presentation**
IB Docket No. 01-185

Dear Ms. Salas:

On January 10, 2002, Carson Agnew, Managing Director; Peter Karabinis, Chief Technical Officer; Lon Levin, Vice President and Regulatory Counsel; Gary Churan, Director, Mobile Terminal Engineering; Dick Evans, Senior Scientist; and Serge Nguyen, Director, Engineering; all of Mobile Satellite Ventures Subsidiary LLC ("MSV"), along with Tom Sullivan of Sullivan Telecommunications Associates, and Bruce Jacobs and David Konczal of Shaw Pittman LLP, counsel to MSV, met with Jim Ball, Paul Locke, Brian Major, Ron Repasi, Tom Tycz, and Marcus Wolf of the International Bureau. MSV presented the information contained in the attached set of presentation materials. MSV has submitted page 10 of these presentation materials under separate cover with a request for confidential treatment. This page contains information relating to the ongoing international L-band frequency coordination process which is confidential among the parties to that coordination.

Please direct any questions regarding this matter to the undersigned.

Very truly yours,

David S. Konczal

cc: Jim Ball
Paul Locke
Brian Major
Ron Repasi
Tom Tycz
Marcus Wolf

MSV's Next Generation Satellite System Coordination and Interference Considerations

Presented to the

Federal Communications Commission

January 10, 2002

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Issues to be discussed

- Potential interference to satellite uplinks (from MSV mobile terminals)
  - intra-system (from MSV MTs operating in ATC mode)
  - inter-system (from MSV MTs operating in either satellite or ATC modes)
    - adjacent channel operations
    - co-channel operations

- Potential interference to users of other systems (Inmarsat, aero telemetry) in the downlink direction (from MSV's ATC base stations)
  - densensitization/overload
  - out-of-band emissions

Key Conclusions

- ☐ Coordination of the MSS L-band will continue to be driven by satellite operations
- ☐ MSV's next generation system will improve prospects for coordination
- ☐ ATC base stations will not cause harmful interference to other systems

1. Coordination of the MSS L-band will continue to be driven by satellite operations

- **Under the most recent Operators Agreement, less than ten percent of the MSS L-band spectrum is shared co-channel**

- **Co-channel sharing between MSV's next generation satellite system and Inmarsat's satellites is likely to continue to be largely impractical -- regardless of MSV's deployment of ATC**
  - The 20 dB satellite antenna discrimination value stated by Inmarsat (for the Inmarsat 4 satellites) makes sharing unlikely
  - Co-channel sharing between satellite operations is more likely only if Inmarsat is willing to improve its antenna discrimination to about 25 dB or better

- **ATC operations will not require MSV to coordinate access to more spectrum**
  - MSV's satellite system is designed with 10 dB link margin
  - Only 0.25 dB of link margin will be expended by MSV's satellite to accommodate the effect of the ATC operations

2. MSV's next generation system will improve prospects for coordination (uplink issues)

- **Adjacent channel interference to Inmarsat satellites will be reduced by more than two orders of magnitude relative to the level produced by MSV's current satellite system**

- **Co-channel interference will be reduced by more than one order of magnitude**

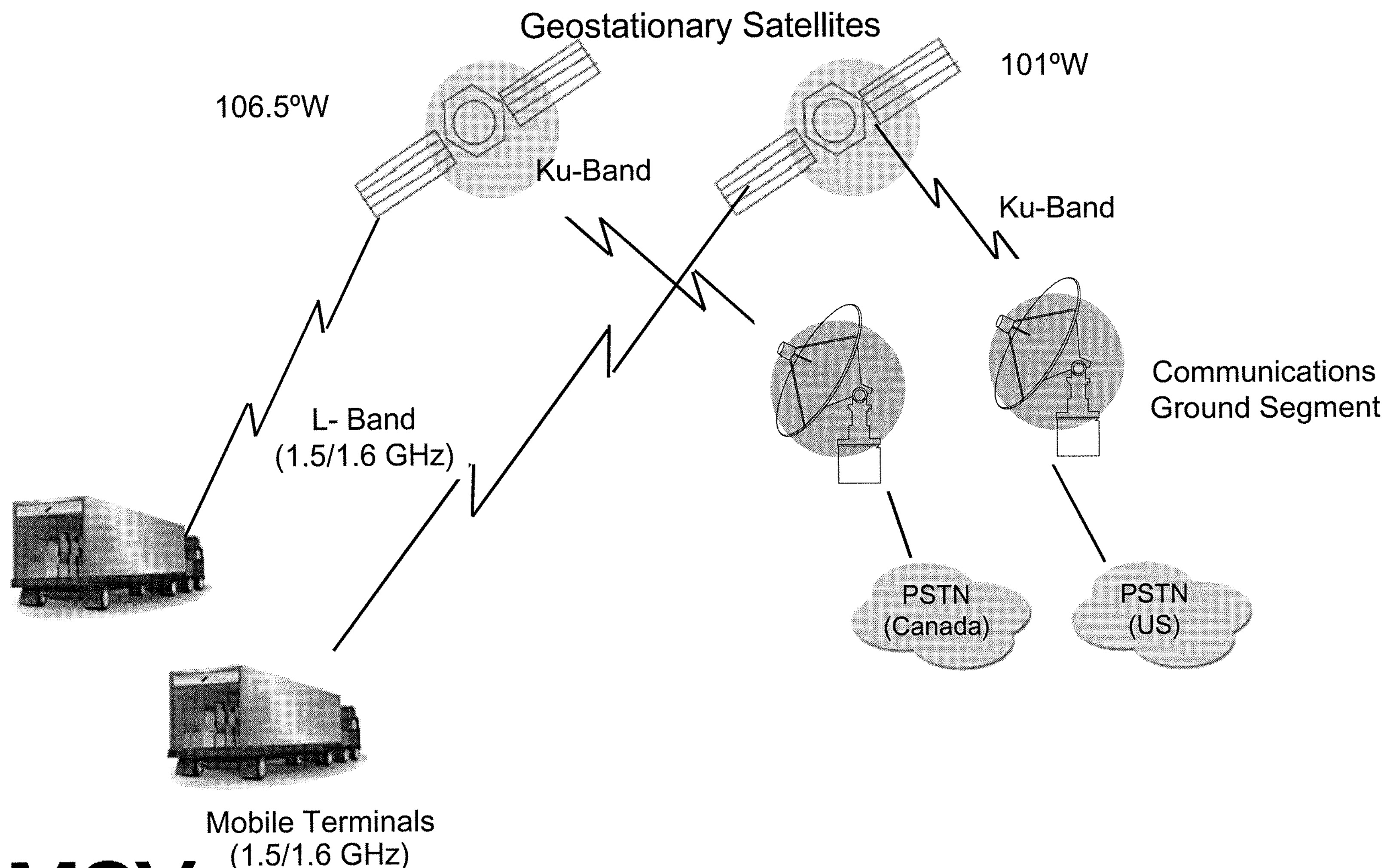
- **Fully-loaded, mature ATC operations will not impact the ability of MSV and Inmarsat systems to coordinate co-channel operations**
  - less than 1/30th of the effect of the satellite operations
  - no more than one percent contribution to $\Delta T/T$

3. ATC base stations will not cause harmful interference to other systems (downlink issues)

- **ATC base stations will not interfere with land mobile satellite terminals**
  - More than 20dB of desensitization/overload margin is provided throughout the entire service area of a base station
  - Adjacent channel interference due to out-of-band emissions is kept at less than 1% Δ T/T throughout the entire service area of a base station
- **ATC base stations will not interfere with aeronautical mobile satellite terminals**
  - Worst-case analysis assumes the aircraft is directly over an urban area covered by 1000 base stations within line of sight
  - More than 10 dB of desensitization/overload margin is provided even at the minimum allowed aircraft altitude of 304 meters
  - With respect to adjacent channel interference due to out-of-band emissions, the aggregate Δ T/T is kept below 5% at an altitude of 304 meters
- **ATC base stations can be coordinated with aeronautical telemetry**
  - The interference zone in which the allowed interference level of -181dBW/m^2/4KHz might be exceeded (assuming worst-case, line-of-sight conditions) is 0.9 km

Current System
and
Proposed (Next Generation) System

MSV's Current System Architecture



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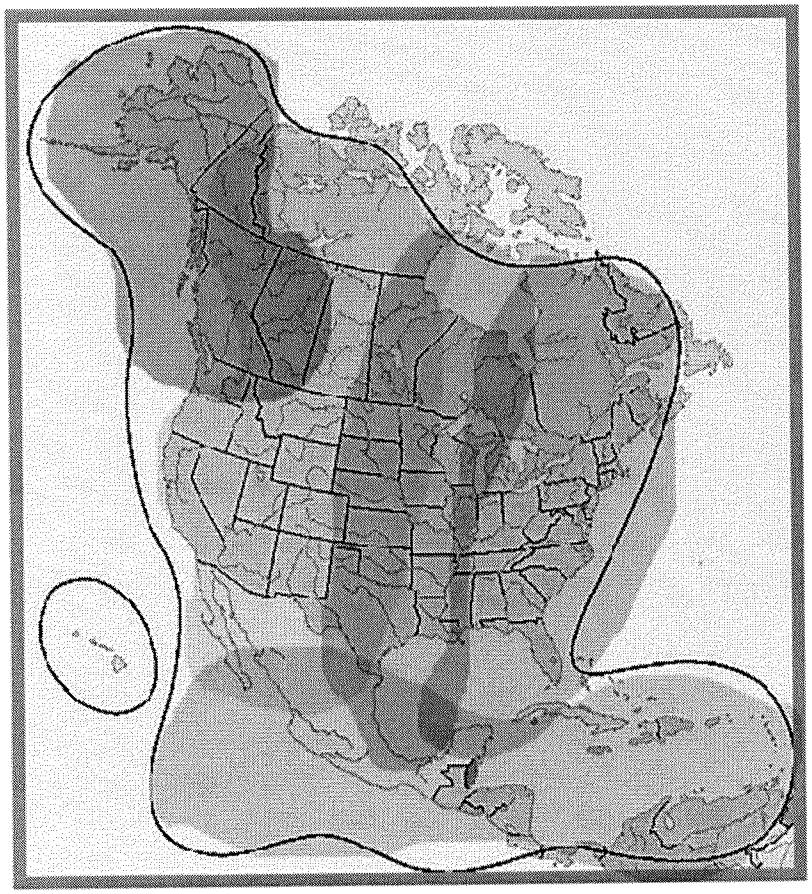
MSV's Current System Coverage



- Continental U.S.
- Canada
- Gulf of Mexico
- Caribbean
- Alaska and Hawaii
- Up to 200 miles off-shore
- Central America
- Northernmost South America

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Current Spectrum Sharing between MSV & Inmarsat

Redacted

Current MSV Customers

Public Service Customers

- American Red Cross
- USDA
- Department of Transportation
- Drug Enforcement Agency
- FAA
- FEMA
- Federal Highway Administration
- HHS
- Hawaii DOD
- NYC Fire Department
- Missouri Highway Patrol
- U.S. Fish and Wildlife

Commercial Customers

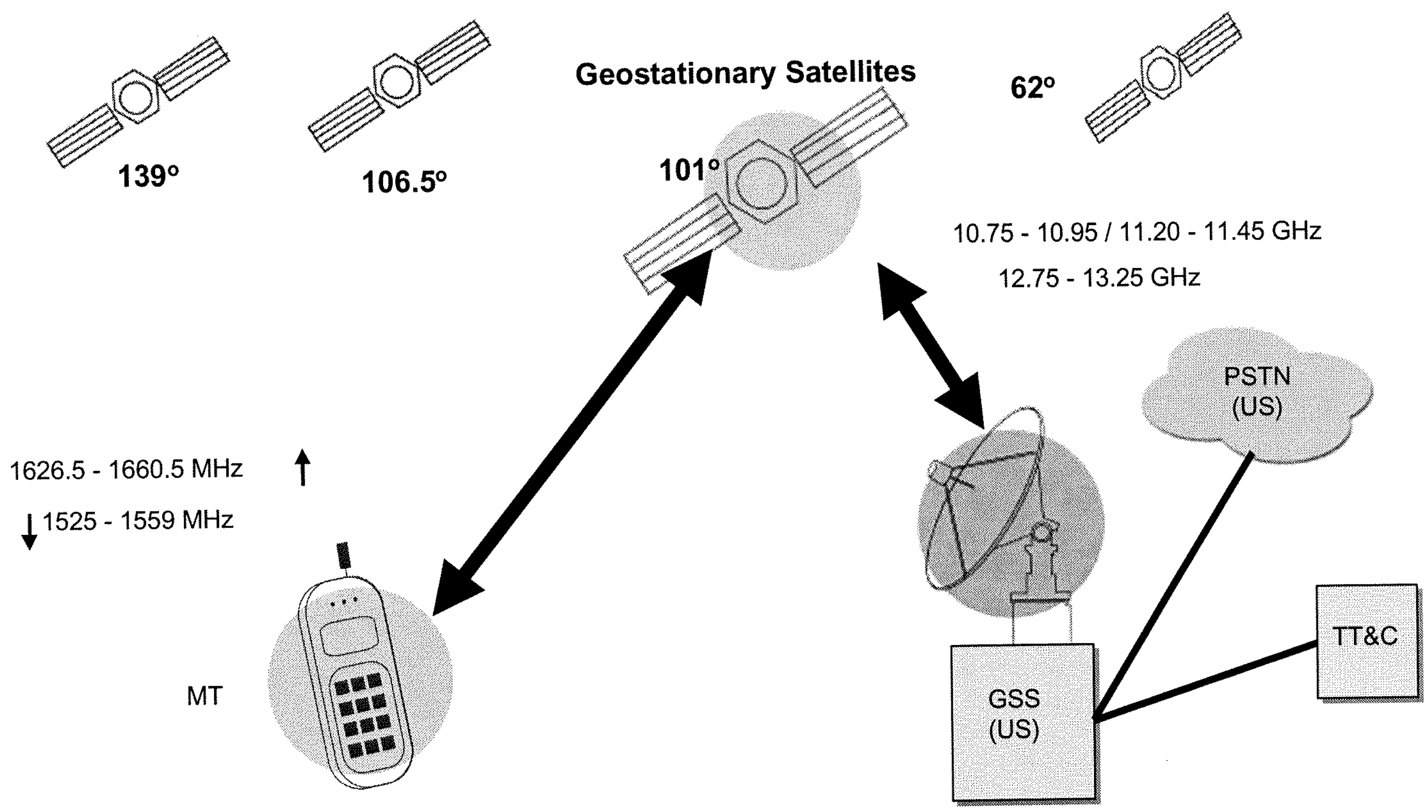
- Amoco Corp.
- AT&T Wireless
- Boeing
- CBS
- Colonial Pipeline
- El Paso Energy
- Florida Power and Light
- Northern Natural Gas
- Rio Grande Electric
- Southwest Power Pool
- Vistar
- Williams Companies

Proven Emergency Response

Jeff Corcoran, of MSV, stands with NYPD Detective Goldstein at Ground Zero.

Jeff personally delivered 50 portable MTs to the NYPD, NY/NJ Port Authority Police, NYC Fire Department and others.

MSV's Next Generation Satellite Network Elements



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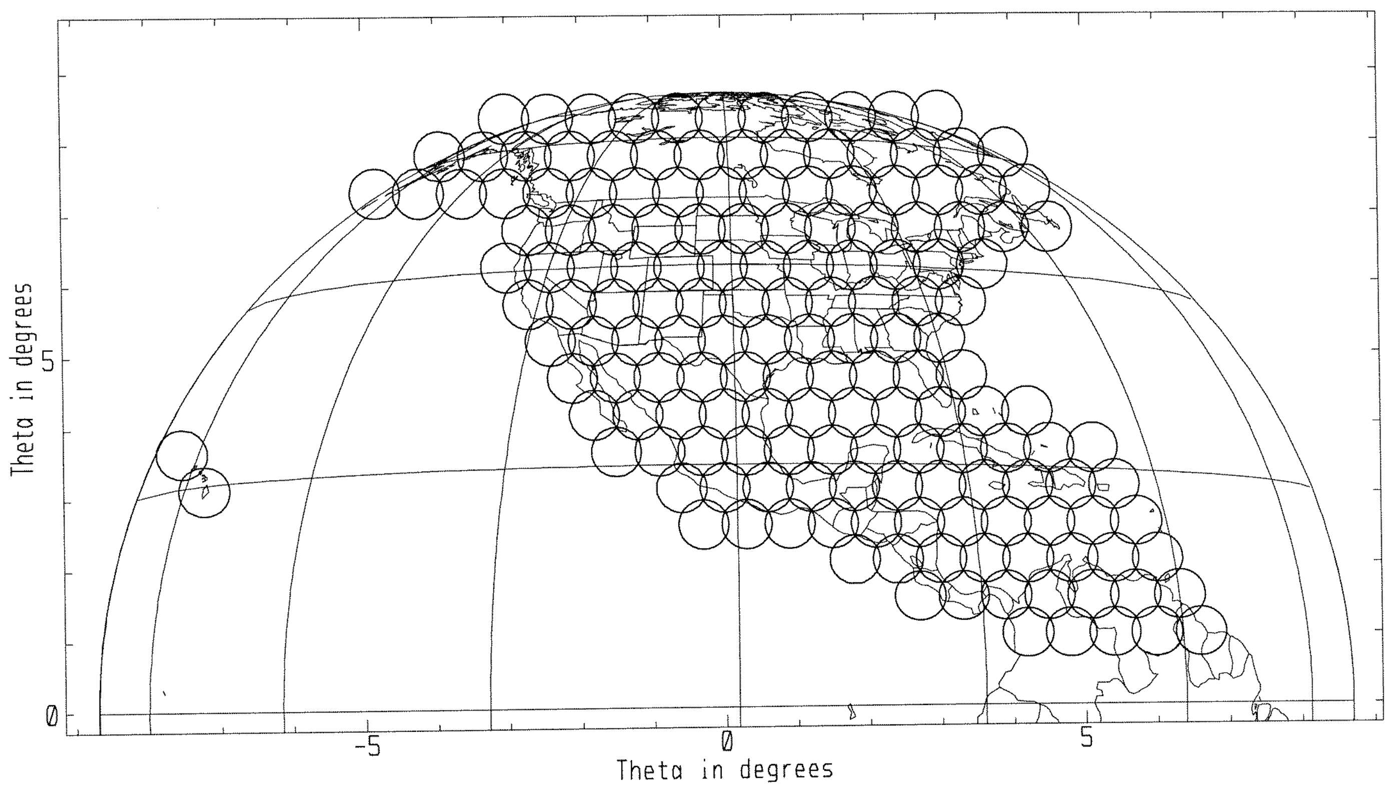
MSV's Next Generation Satellite Spot Beam Pattern

(over 200 Spot Beams)



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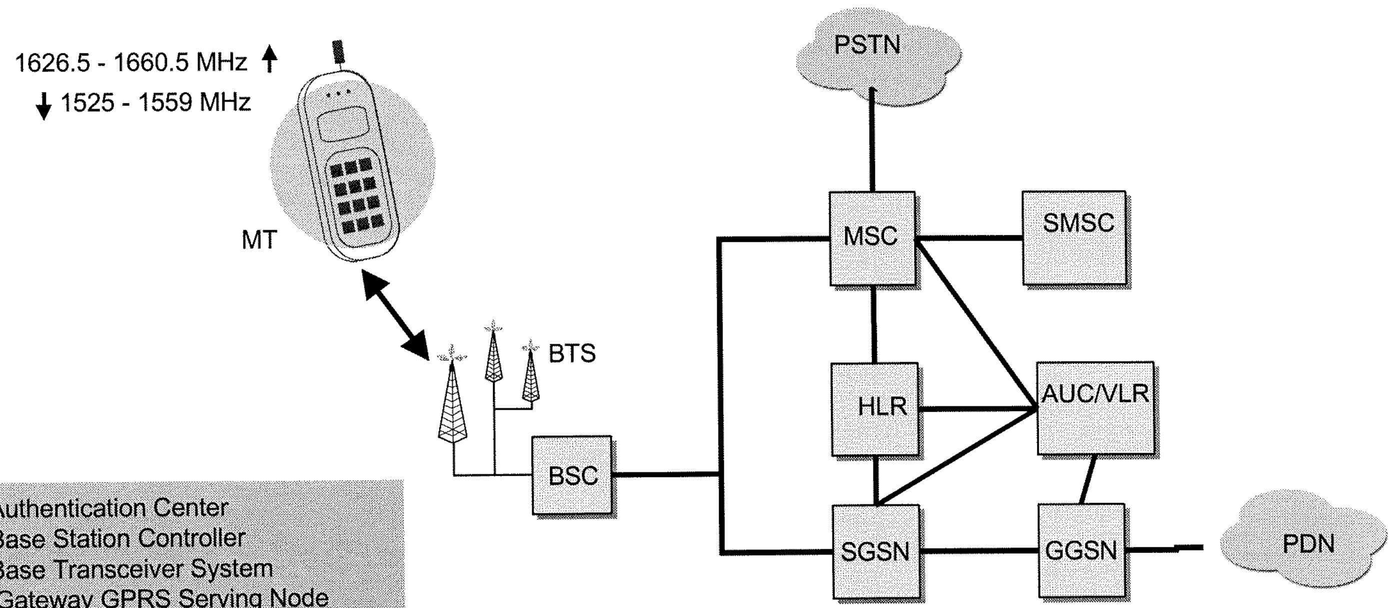
Ancillary Terrestrial Component (ATC) Elements

(Standard GSM Architecture)



AUC Authentication Center
BSC Base Station Controller
BTS Base Transceiver System
GGSN Gateway GPRS Serving Node
HLR Home Location Register
MSC Mobile Switching Center
MT Mobile terminal
PDN Packet Data Network
PSTN Public Switched Telephone Network
SGSN Serving GPRS Support Node
SMSC Short Message Service Center
VLR Visiting Location Register

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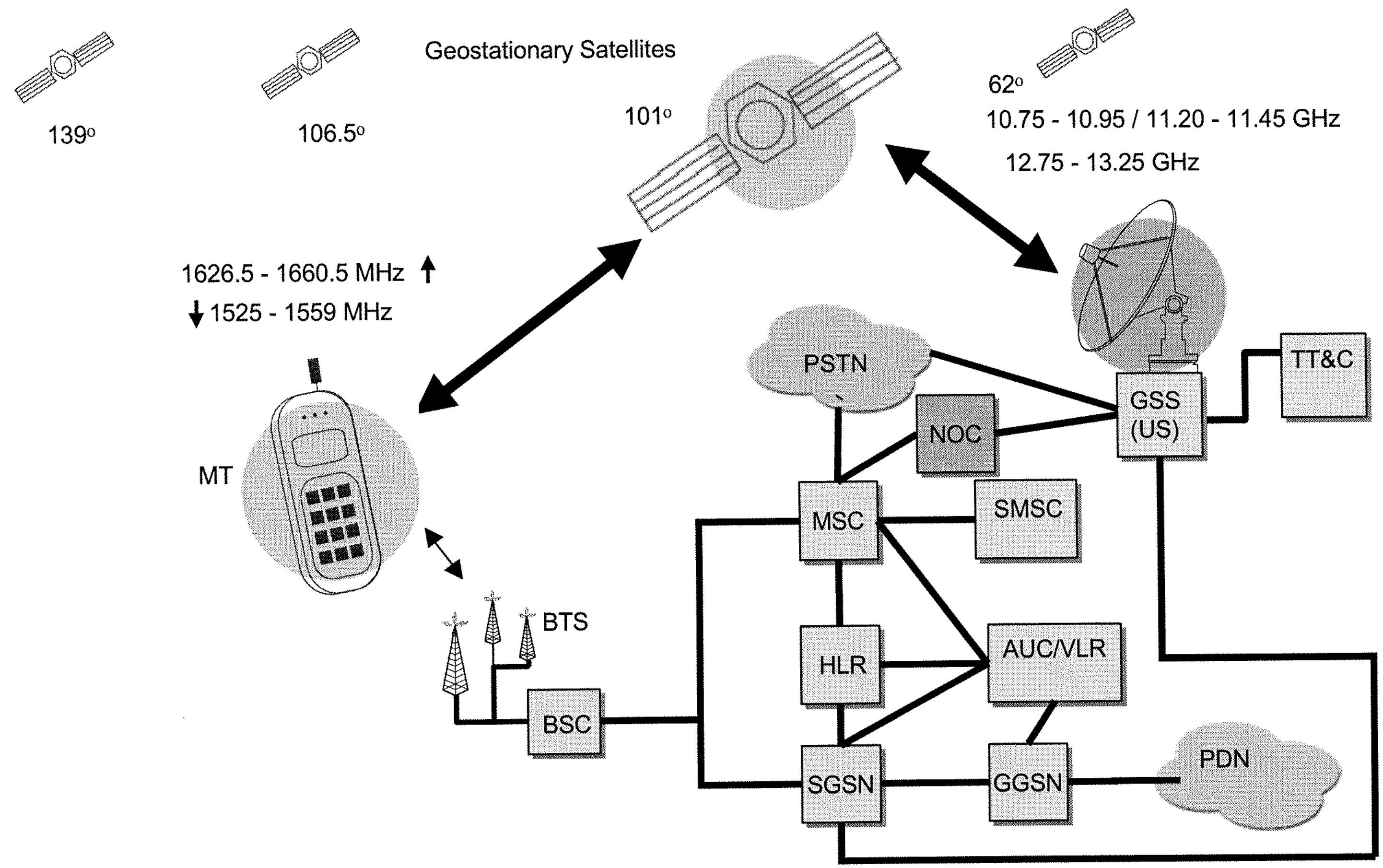
MSV's Integrated Satellite-Ancillary Network
(Standard GSM Architecture)



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Relevant MSV System Parameters

(For Current & Next Generation System)

	CURRENT GENERATION	NEXT GENERATION	
SATELLITE CHARACTERISTICS			
PARAMETER			
Satellite Longitudes	101 W and 106.5 W	101 W and 106.5W	
Satellite Transmit Band	1530 –1559 MHz	1525 –1559 MHz	
Mobile Terminal Transit Band	1631.5 – 1660.5 MHz	1626.5 – 1660.5 MHz	
Polarization	RHCP	RHCP	
Peak Antenna Gain	29 dBi	42.5 dBi	
System Temperature	600 K	450 K	
Peak G/T	3.7 dB/K	16 dB/K	
Total EIRP @ Peak Max/beam	56.6 dBW	80 dBW	
Carrier Bandwidth	6 kHz	200 kHz Satellite Transmit 50 KHz Satellite Receive	
MOBILE TERMINAL CHARACTERISTICS			
		Satellite	**Terrestial**
Access Mode	SCPC	TDMA	TDMA
Mobile Terminal Maximum EIRP	12.5 – 16.0 dBW	5 dBW	0 dBW
Polarization	RHCP	RHCP	Linear
Carrier Bandwidth-Transmit	6 KHz	50 KHz	200 KHz
Carrier Bandwidth-Receive	6 KHz	200 KHz	200 KHz
Channels per carrier (Rx/Tx)	1	32/8	8/8
BASE STATION CHARACTERISTICS			
			Terrestial
Access Mode			TDMA
BTS Maximum EIRP			19.1 dBW
Polarization			LHCP
Carrier Bandwidth-Transmit			200 kHz
Carrier Bandwidth-Receive			200 kHz
Channels per carrier			8

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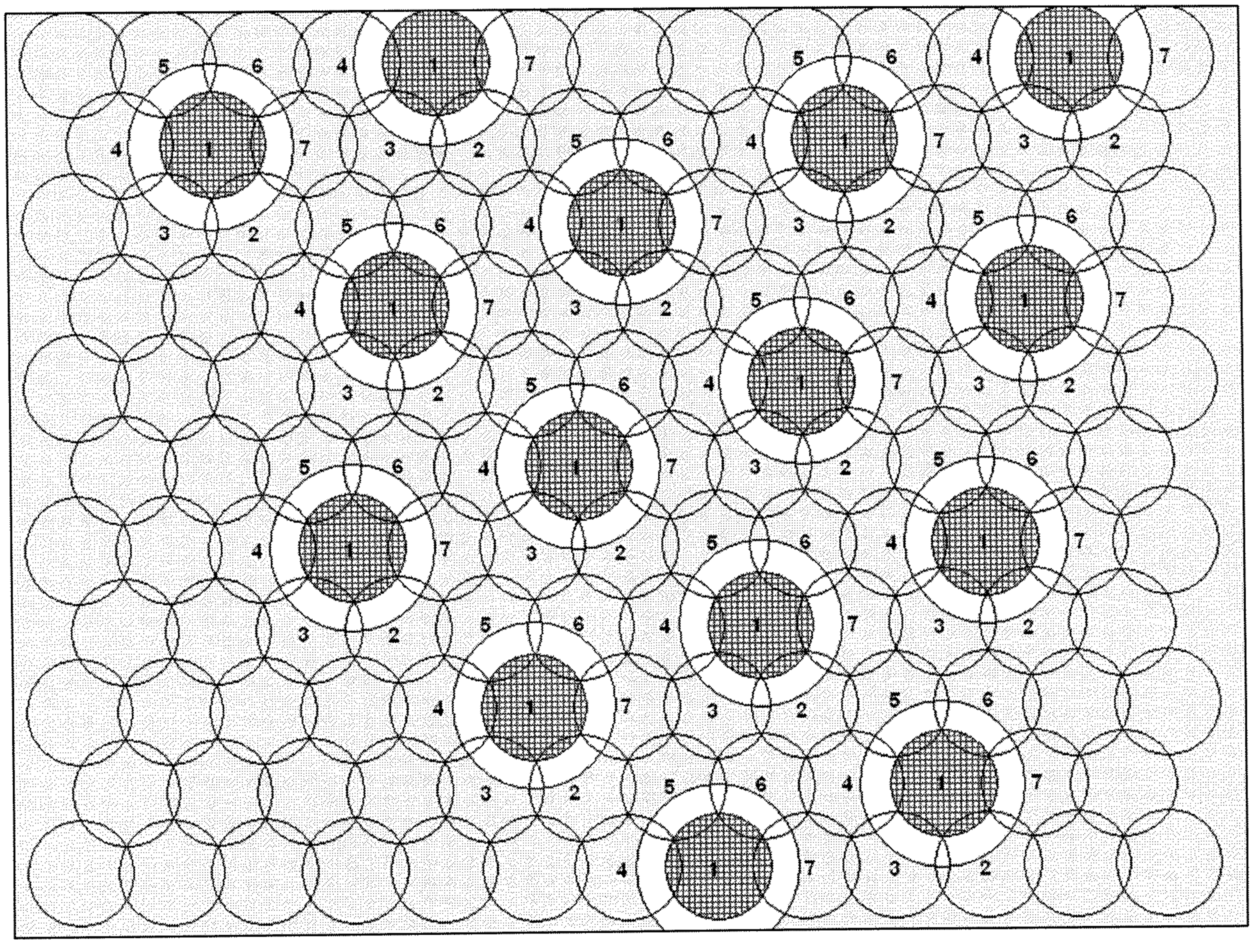
MSV's Satellite/Terrestrial Reuse Plan
(illustrative)



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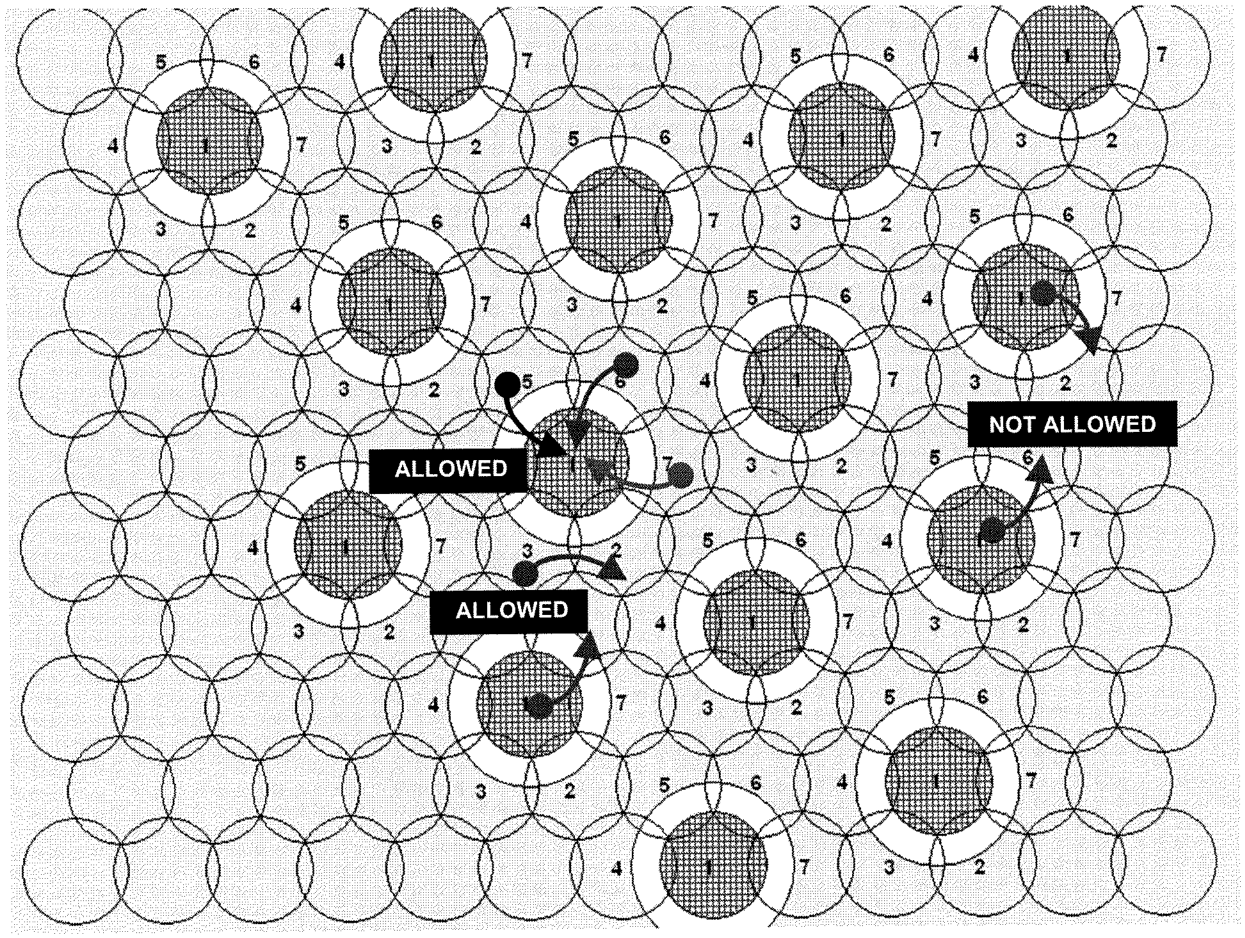
Frequency Agility
(illustrative)



Coordination and Interference Issues

Potential Intra-System Interference from MSV's Terminals to MSV's Satellite
(from ATC operations)

Parameter	Units	Values
Link Margin Degradation	dB	0.25
MSV Satellite Antenna Gain (average per beam)	dBi	41
MSV Satellite Receiver Noise Temperature	K	450
MSV Satellite Receiver Noise Spectral Density	dBW/Hz	-202.1
Maximum MSV Ancillary Terminal EIRP	dBW	0
MSV Terminal Carrier Bandwidth (ancillary mode)	kHz	200
MSV Terminal EIRP Spectral Density	dBW/Hz	-53.0
Free Space Loss	dB	188.8
Average Shielding	dB	10
MSV Satellite Receive Antenna Discrimination (Average)	dB	10
Average Power Reduction due to Closed-Loop Power Control	dB	6
Average Power Reduction due to Variable-Rate Vocoder	dB	7.4
Average Polarization Isolation (Linear to Circular)	dB	3
Voice Activity Factor	dB	1
Received Interfering Signal Spectral Density	dBW/Hz	-238.2
Max Number of Co-channel ATC Carriers per Co-channel Spot Beam Vicinity		244
Number of Users per Carrier		7
Maximum Number of ATC Users per Co-channel Spot Beam Vicinity		1,707
Number of Co-Channel Satellite Beam Vicinities over CONUS		~10
Total Number of Allowed Ancillary Co-Channel Carriers Over CONUS		2,438

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Potential Adjacent Channel Interference from MSV's Terminals to Inmarsat's North American Satellites

(from satellite and ATC operations)

Parameter	Units	Inmarsat-3			Inmarsat-4		
		Current Terminals	Next-Gen. Terminals (satellite operations)	ATC Terminals	Current Terminals	Next-Gen. Terminals (satellite operations)	ATC Terminals
Inmarsat Satellite G/T	dB/K	-1.45	-1.45	-1.45	13	13	13
Inmarsat Satellite Antenna Gain	dBi	27	27	27	41	41	41
Inmarsat Satellite Receiver Noise Temperature	K	700	700	700	650	650	650
Inmarsat Satellite Receiver Noise Spectral Density	dBW/Hz	-200.1	-200.1	-200.1	-200.5	-200.5	-200.5
Maximum MSV Terminal EIRP	dBW	16	5	0	16	5	0
MSV Terminal Max. Out-of-Band Emissions Density	dBW/Hz	-79.5	-103	-103	-79.5	-103	-103
Free Space Loss	dB	188.8	188.8	188.8	188.8	188.8	188.8
Average Shielding	dB	0	0	10	0	0	10
Average Power Reduction due to Closed-Loop Power Control	dB	0	2	6	0	2	6
Average Power Reduction due to Variable-Rate Vocoder	dB	0	0	7.4	0	0	7.4
Voice activity	dB	0	3	1	0	3	1
Average Polarization Isolation (Linear to Circular)	dB	0	0	3	0	0	3
Total Received Interfering Signal Spectral Density	dBW/Hz	-241.3	-269.8	-292.2	-227.3	-255.8	-278.2
Δ T/T Increase Per MSV carrier	%	0.0076	0.00001	0.0000001	0.2089	0.0003	0.000002
Maximum Number of MSV Carriers		1,800	1,800	90,000	1,800	1,800	90,000
Total DT/T Increase Based on Total Number of Carriers	%	3.414	0.005	0.001	3.76	0.0055	0.003

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Potential Co-Channel Interference from MSV's Terminals to Inmarsat 3 satellites

(from satellite operations only)

Parameter	Units	MSV Current Terminals	MSV Next Gen Terminals (Satellite Operations)
Inmarsat 3 Satellite G/T	dB/K	-1.45	-1.45
Inmarsat 3 Satellite Antenna Gain	dBi	27	27
Inmarsat 3 Satellite Receiver Noise Temperature	K	700	700
Inmarsat 3 Satellite Receiver Noise Spectral Density	dBW/Hz	-200.1	-200.1
Maximum MSV Satellite Terminal EIRP	dBW	16	5
MSV Terminal Carrier Bandwidth	kHz	6	50
MSV Terminal EIRP Spectral Density	dBW/Hz	-21.8	-42.0
Free Space Loss	dB	188.8	188.8
Average Shielding	dB	0	0
Inmarsat Satellite Receive Antenna Discrimination	dB	22	22
Average Power Reduction due to Closed-Loop Power Control	dB	0	2
Average Polarization Isolation (Linear to Circular)	dB	0	0
Voice Activity Factor	dB	0	3
Received Interfering Signal Spectral Density	dBW/Hz	-205.6	-230.8
Δ T/T Increase Per MSV carrier	%	28.6	0.086
System Maximum Frequency Reuse Factor		2	28
Total Δ T/T Increase at Maximum Reuse	%	57.24	2.42

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Potential Co-Channel Interference from MSV's Terminals to Inmarsat 4 Satellites
(from satellite operations only)

Parameter	Units	MSV Current Terminals			MSV Next Generation Terminals (Satellite Operations)		
Inmarsat 4 Satellite G/T	dB/K	13	13	13	13	13	13
Inmarsat 4 Satellite Antenna Gain	dBi	41	41	41	41	41	41
Inmarsat 4 Satellite Receiver Noise Temperature	K	650.0	650.0	650.0	650	650	650
Inmarsat 4 Satellite Receiver Noise Spectral Density	dBW/Hz	-200.5	-200.5	-200.5	-200.5	-200.5	-200.5
Maximum MSV Satellite Terminal EIRP	dBW	16	16	16	5	5	5
MSV Terminal Carrier Bandwidth	kHz	6	6	6	50	50	50
MSV Terminal EIRP Spectral Density	dBW/Hz	-21.8	-21.8	-21.8	-42.0	-42.0	-42.0
Free Space Loss	dB	188.8	188.8	188.8	188.8	188.8	188.8
Average Shielding	dB	0	0	0	0	0	0
Inmarsat Satellite Receive Antenna Discrimination	dB	20	25	30	20	25	30
Average Power Reduction due to Closed-Loop Power Control	dB	0	0	0	2	2	2
Average Polarization Isolation (Linear to Circular)	dB	0	0	0	0	0	0
Voice Activity Factor	dB	0	0	0	3	3	3
Received Interfering Signal Spectral Density	dBW/Hz	-189.6	-194.6	-199.6	-214.8	-219.8	-224.8
Δ T/T Increase per MSV carrier	%	1227	388	123	3.7	1.2	0.4
System Maximum Frequency Reuse Factor		2	2	2	28	28	28
Total Δ T/T Increase at Maximum Reuse	%	2454	776	245	103.6	32.7	10.4

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Potential Co-Channel Interference from MSV's Terminals to Inmarsat 3 & 4 Satellites
(from ATC operations)

Parameter	Units	Inmarsat 3 Satellite	Inmarsat 4 Satellite		
Inmarsat Satellite G/T	dB/K	-1.45	13	13	13
Inmarsat Satellite Antenna Gain	dBi	27	41	41	41
Inmarsat Satellite Receiver Noise Temperature	K	700	650.0	650.0	650.0
Inmarsat Satellite Receiver Noise Spectral Density	dBW/Hz	-200.1	-200.5	-200.5	-200.5
Maximum MSV Terminal EIRP	dBW	0.0	0.0	0.0	0.0
MSV Terminal Carrier Bandwidth	kHz	200	200	200	200
MSV Terminal EIRP Spectral Density	dBW/Hz	-53.0	-53.0	-53.0	-53.0
Free Space Loss	dB	188.8	188.8	188.8	188.8
Average Shielding	dB	10	10	10	10
Inmarsat Satellite Receive Antenna Discrimination	dB	22	20	25	30
Average Power Reduction due to Closed-Loop Power Control	dB	6	6	6	6
Average Power Reduction due to Variable-Rate Vocoder	dB	7.4	7.4	7.4	7.4
Average Polarization Isolation (Linear to Circular)	dB	3	3	3	3
Voice Activity Factor	dB	1	1	1	1
Received Interfering Signal Spectral Density	dBW/Hz	-264.2	-248.2	-253.2	-258.2
Δ T/T Increase per MSV carrier	%	0.00004	0.0017	0.0005	0.0002
Maximum CONUS-wide Frequency Reuse		2,000	2,000	2,000	2,000
Total Δ T/T Increase based on maximum reuse across CONUS	%	0.08	3.37	1.06	0.34

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Potential Out-of-Band Interference from MSV's ATC Base Stations to Inmarsat Terminals

Parameter	Units	Inmarsat Value	MSV Value
MSV Base Station Power to Antenna per 200 kHz Carrier	dBW	3.1	3.1
MSV Base Station Antenna Gain – Peak	dBi	16.0	16.0
Out-of-band Attenuation	dB	46.1	--
MSV Base Station OBE to Antenna	dBW/MHz	--	-57.9
MSV Base Station EIRP per 200 kHz Carrier (in MSV Channel)	dBW	19.1	19.1
MSV Base Station Antenna Discrimination Toward MES	dB	--	-12.5
MSV Base Station EIRP per 200 kHz Carrier (in Inmarsat Channel)	dBW	-27.0	-61.4
Distance of Inmarsat Terminal from MSV Base Station Transmitter	m	100	100
Free Space Loss (Line-of-Sight) : Walfisch-Ikegami non-line-of-sight:	dB	76.0	 95.5
Shielding	dB	0	0
Power Control Reduction	dB	6	6
Voice Activity Reduction	dB	4	4
Polarization Isolation (LHCP to RHCP)	dB	3.0	8.0
Gain of Inmarsat MES towards MSV Base Station	dBi	0.0	0.0
Sum of Attenuation Factors and MES Antenna Gain	dB	89.0	113.5
Received Interfering Signal Power in 200 kHz	dBW	-116.0	-174.9
Received Interfering Signal Power Spectral Density	dBW/Hz	-169.0	-227.9
Inmarsat MES Receiver Noise Temperature	K	150	290
Inmarsat MES Receiver Noise Spectral Density	dBW/Hz	-206.8	-204.0
Δ T/T increase per MSV 200 kHz Carrier	%	611,842.9	0.41

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- **DT/T increase per MSV carrier = 0.41% at 100m separation from base station tower.**
- **DT/T increase per MSV carrier is $\leq$ 0.8% for any separation.**

Potential Overload by MSV's ATC Base Stations of Inmarsat Terminals

Parameter	Units	Inmarsat Value	MSV Value
MSV Base Station EIRP per 200 kHz carrier	dBW	19.1	19.1
Total Bandwidth of Base Station Transmissions Per Sector	MHz	5	0.6
Max. Number of Base Station Carriers Per Sector		25	3
Distance of Inmarsat Terminal from Base Station	m	100	100
Propagation Path Loss†	dB	76	95.5
Average Power Reduction due to Closed-Loop Power Control	dB	6	6
Voice Activity Reduction	dB	4	4
Polarization Isolation	dB	3	8
Gain of Inmarsat Terminal toward Base Station	dBi	0	0
Base station antenna discrimination toward Inmarsat MT	dB	--	-12.5
Received Interfering Signal Power	dBW	-55.9	-101.9
Threshold for Overload of Inmarsat Mini-M*	dBW	-120	-75
Desensitization Margin	dB	-64.1	26.9

•26.9 dB overload margin at 100m separation from tower

† Inmarsat assumes line-of-sight propagation; MSV assumes Walfisch-Ikegami non-line-of-sight propagation as more realistic at a distance of 100 meters from the base station.
* The MSV Value is based on measurements performed by MSV and is consistent with the AIRNC specification.

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Potential Interference from MSV's ATC Base Stations to Airborne Satellite Terminals

Parameters	Units	
BTS Spurious EIRP Density/Carrier	dBW/Hz	-101.9
Carriers per Sector	--	3
Voice Activity Reduction	dB	4
Average Power Reduction due to Closed-Loop Power Control	dB	6
Polarization Discrimination	dB	8
Total Effective Spurious EIRP Density per BTS	dBW/Hz	-115.1
Calculated Receiver Spurious Power Density at Aircraft Receiver (1000 BTS)	dBW/Hz	-216.7
Aircraft Receiver Noise Temperature	dBK	25.0
Aircraft Receiver Thermal Noise Density	dBW/Hz	-203.6
Allowable Δ T/T	--	6%
Max Allowable Spurious Power Density at Aircraft Receiver	dBW/Hz	-215.8
Aggregate Receiver Δ T/T (from 1000 BTS)		4.9%
BTS EIRP per Carrier	dBW	19.1
Carriers per BTS Sector	--	3
Voice Activity Reduction	dB	4
Average Power Reduction due to Closed-Loop Power Control	dB	6
Polarization Discrimination	dB	8
BTS EIRP Total per Sector	dBW	10.9
Calculated Power at Aircraft Receiver	dBm	-60.7
Max Allowable Power at Aircraft Receiver (per ARINC specification)	dBm	-50.0
Margin to Overload Threshold	dB	10.7

- **Aggregate DT/T at 304m altitude is less than 5% from 1000 base stations**
- **Greater than 10dB margin against overload at 304m altitude from 1000 visible base stations.**

Potential Interference from ATC Base Stations to Aeronautical Telemetry Operations

Parameter	Units	
Frequency	GHz	1.525
Max Allowed Level @ <4 degrees (per Recommendation ITU-R M.1459)	dBW/m2/4 kHz	-181
Area of Isotropic Ant.	dB-m^2	-25.1
Max Allowed Level into Isotropic Antenna	dBW/4 kHz	-206.1
Ancillary Base Station Frequency	GHz	1.525
Base Station EIRP	dBW	19.1
Voice Activity Factor	dB	-4
Power Control	dB	-6
Carriers per Base Station Sector		3
Effective EIRP	dBW	13.9
Out of band Attenuation	dBc/MHz	-61
Effective Out-of-Band Emissions	dBW/4 kHz	-71.1
Base Station Filter Attenuation	dB@1525 MHz	-40
Base Station Radiated Spurious Power Density	dBW/4 kHz	-111.1
Path Loss Required to Satisfy Allowed Level	dB	95
Walfisch-Ikegami Non-Line of Sight Distance Required to Yield above Path Loss	km	0.1
Line-of-Sight Distance Required to Yield above Path Loss	km	0.9

- **Minimum separation distance of 0.9 km (0.1 km for non line-of-sight) to meet allowable ITU interference level.**
- **The distance is less than the BTS service area**

Exhibit B

Potential Intra-System Interference from MSV's Terminals to MSV's First-Generation Satellite

(from ATC operations)

Parameter	Units	Values
Link Margin Degradation	dB	0.12
MSV Satellite Antenna Gain (average per beam)	dBi	29
MSV Satellite Receiver Noise Temperature	K	600
MSV Satellite Receiver Noise Spectral Density	dBW/Hz	-200.8
Maximum MSV Ancillary Terminal EIRP	dBW	0
MSV Terminal Carrier Bandwidth (ancillary mode)	kHz	200
MSV Terminal EIRP Spectral Density	dBW/Hz	-53.0
Free Space Loss	dB	188.8
Average Shielding	dB	10
MSV Satellite Receive Antenna Discrimination (Average)	dB	10
Average Power Reduction due to Closed-Loop Power Control	dB	6
Average Power Reduction due to Variable-Rate Vocoder	dB	7.4
Average Polarization Isolation (Linear to Circular)	dB	3
Voice Activity Factor	dB	1
Received Interfering Signal Spectral Density	dBW/Hz	-250.2
Max Number of Co-channel ATC Carriers per Co-channel Spot Beam Vicinity		2,438
Number of Users per Carrier		7
Maximum Number of ATC Users per Co-channel Spot Beam Vicinity		17,066
Number of Co-Channel Satellite Beam Vicinities over CONUS		1
Total Number of Allowed Ancillary Co-Channel Carriers Over CONUS		2,438

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