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DELIVERY BY HAND

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December 19, 1996

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

RECEIVED
DEC 19 1996
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Re: Notice of ex parte presentation in RM-881
ET Docket No. 95-183, RM-8553, PP Docket No.
93-253, ET Docket No. 94-124, RM-8308

Dear Mr. Caton:

Motorola Satellite Systems, Inc. ("Motorola"), through its attorneys, and pursuant to Section 1.1206 of the Commission's rules, hereby reports that an oral ex parte presentation was made on December 17th by representatives of Motorola to the International Bureau. In attendance at this meeting were Donald Gips, John Sloan, Virginia Marshall, and Steve Sharkey. During this presentation the attached documents were distributed and discussed along with the positions of Motorola as set forth in its comments in the above-referenced proceedings. In addition, Motorola distributed copies of the attached charts which set forth Motorola's understanding of the number and location of licensed fixed stations in the 38.6-40.0 GHz band as reflected in the Commission's records as of November 1996, as well as a compressed grouping of the licensed stations if the Commission were to reassign these channels.

An original and six copies of this letter are being submitted for inclusion in the above-referenced dockets. Copies of this notice are also being sent to those Commission personnel in attendance at the presentation.

Respectfully submitted,



Philip L. Malet

Counsel for Motorola Satellite
Systems, Inc.

cc: Mr. ~~Philip Malet~~
Mr. Steve Sharkey
Mr. John Sloan
Ms. Virginia Marshall



MOTOROLA

Satellite Communications Group

**M-Star Presentation
to FCC**

December 17, 1996

The M-Star System

**A Global Network of Non-Geostationary Communications
Satellites Providing Broadband Services
in the 40/50 GHz Bands**

**Filed 4 September 1996 by:
Motorola Satellite Systems, Inc.**



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**M-Star Presentation
to FCC**

December 17, 1996

M-Star Presentation Outline

- **Introduction**
- **Business Plan**
- **System Architecture**
- **Spectrum Plan**
- **Sharing Considerations**
- **Sharing Rules**
- **Summary**



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**M-Star Presentation
to FCC**

December 17, 1996

Business Application

- **The M-Star System Provides a Global Communications Network**
 - **That offers:**
 - » **Real time, wideband information transfer of digital video, data, voice, and Audio**
 - **Using Multiple Protocols:**
 - » **ISDN, X.25, FDDI, OC-1, Plus Others**
 - **At Data Rates From:**
 - » **2.048 Mbps to 51.84 Mbps**



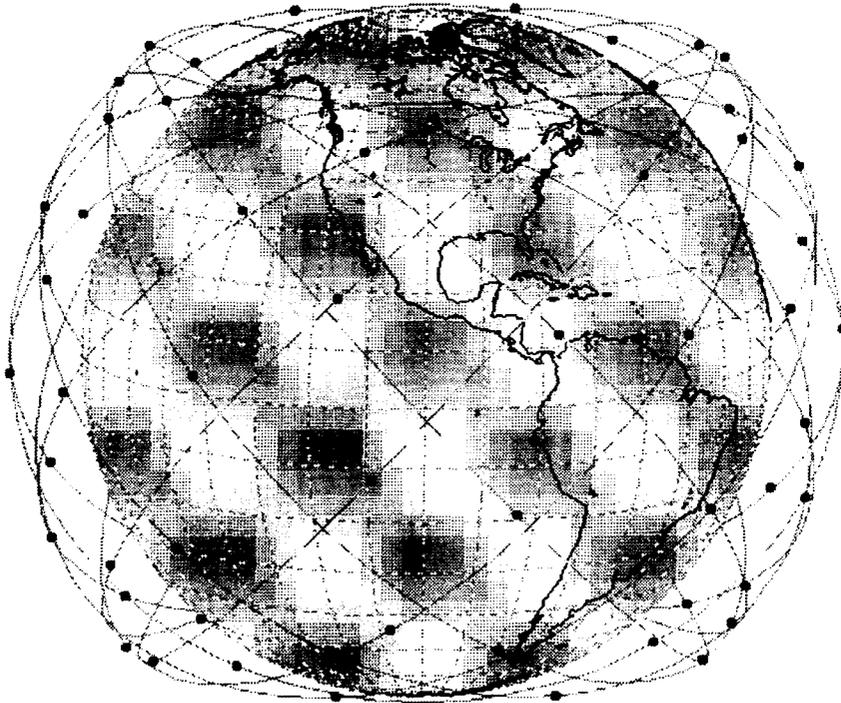
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**M-Star Presentation
to FCC**

December 17, 1996

M-Star Constellation



Number of Planes:	12
Satellites per Plane:	6
Inclination:	47°
Altitude:	1350 km
Minimum Elevation Angle:	22°



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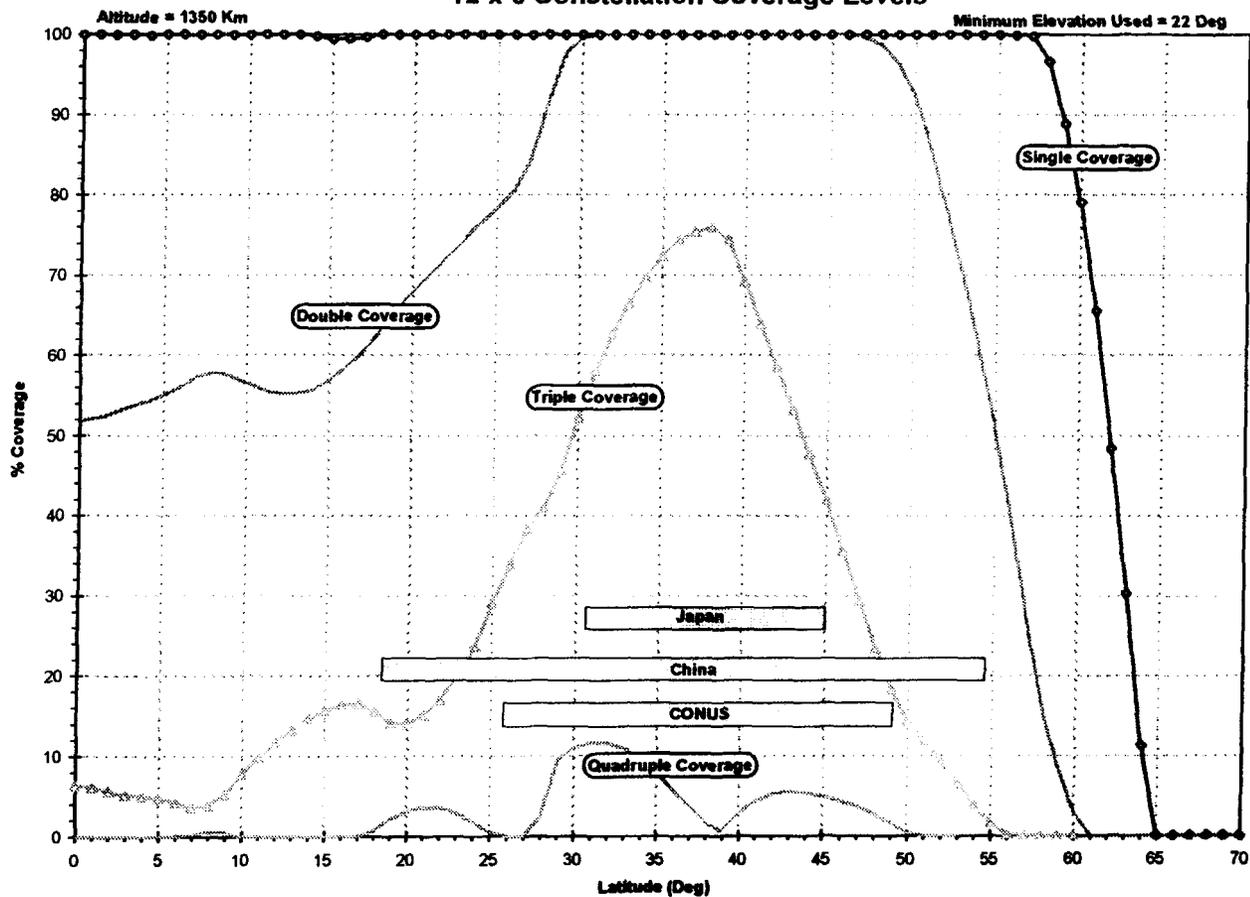
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**M-Star Presentation
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December 17, 1996

M-Star Multiple Coverage

12 x 6 Constellation Coverage Levels





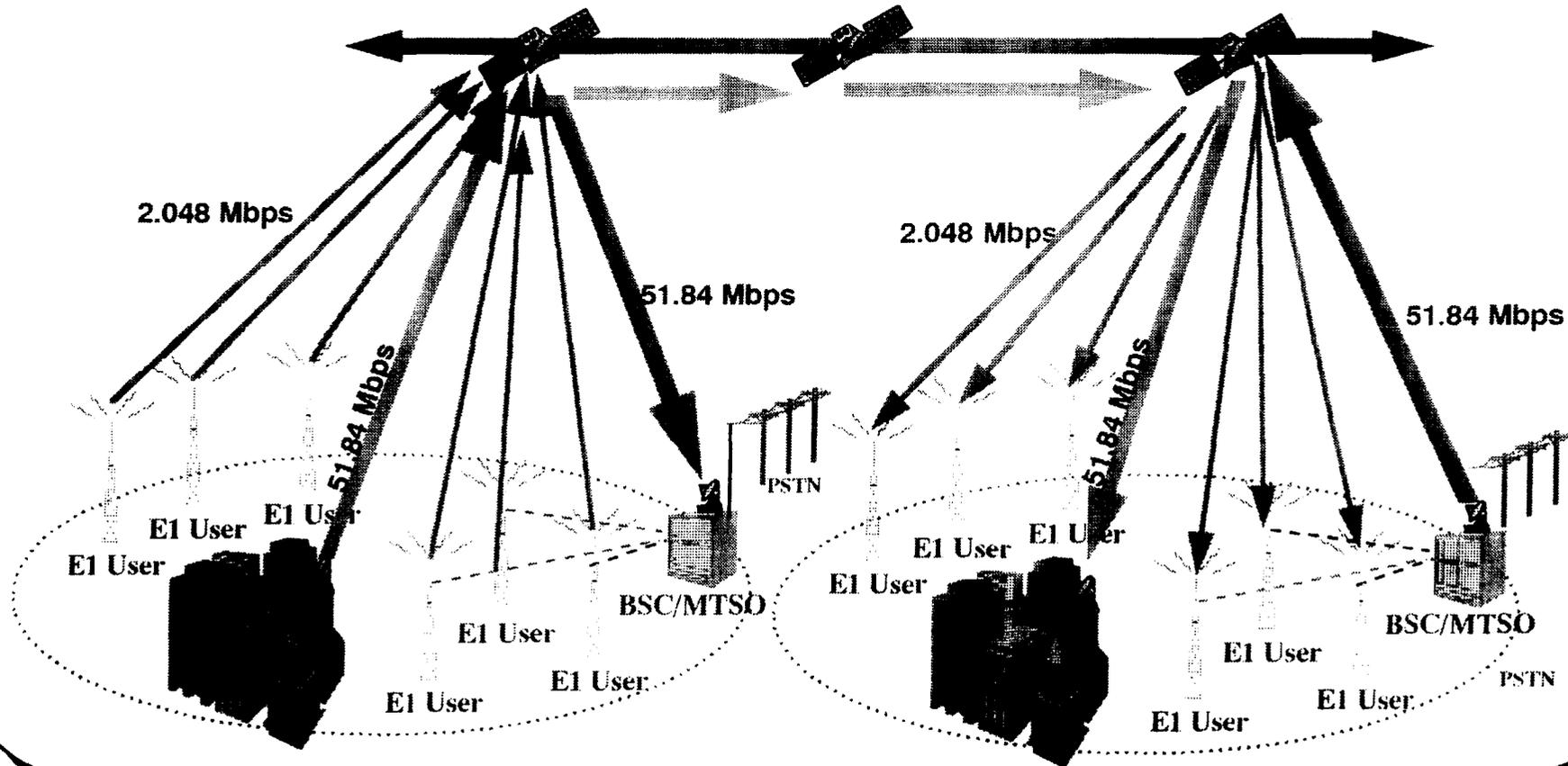
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December 17, 1996

Global Satellite Network





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December 17, 1996

M-Star Services

- **Interconnection Between Wireless Backhaul**
- **Large Private Data Networks**
 - **Large business terminals**
 - **Enterprise networks**
- **LAN-to-LAN Direct Connections**
- **Small Services Connectivity or Aggregate Of Service Providers (E-1)**



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M-Star Spectrum Requirements

- **Service Links:**
 - space-to-Earth: 37.5 - 40.5 GHz
 - Earth-to-space: 47.2 - 50.2 GHz
- **Inter-Satellite Links:**
 - 59.0 - 64.0 GHz or 65 - 71 GHz
- **TT&C Links (normal):**
 - Operates in service link bands
- **TT&C Links (launch and emergency):**
 - Earth-to-space: 1750 - 1850 MHz and 2025 - 2110 MHz
 - space-to-Earth: 2200 - 2290 MHz



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Spectrum Selection Criteria

- **Sufficient Bandwidth to Provide High Data Rate Services**
- **Last Usable Satellite Spectrum**
- **Global Availability**



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M-Star System Designed to Share Spectrum

- **With Other Fixed Satellite Service Systems Using Space Diversity Techniques**
 - GSO's
 - NGSO's
- **With Point-to-Point Fixed Systems**
 - Subject to Reasonable Sharing Rules
- **Sharing Not Feasible**
 - Mobile Service
 - Point-to-Multi-point
 - SkyStation



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Fixed Satellite Service/Fixed Service Sharing Scenario

- **37.5-40.5 GHz**
 - **Spectrum Sharing Is Achievable When Following Sharing Constraints Are Met.**
 - » **M-Star Interference Into Fixed Service:**
 - Can share without coordination
 - » **Fixed Service Into M-Star Earth Stations:**
 - M-Star will accept interference without coordination
 - If: Fixed Service transmitters are limited to an EIRP of less than -22 dBW/MHz
 - And: Adaptive Power Control is applied for fading conditions
- **47.2-50.2 GHz**
 - **Spectrum Sharing Is Achievable by Coordination or Band Segmentation.**



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ADAPTIVE POWER CONTROL

- **Technical Approach**
 - **Design Considerations**
 - » **EIRP Density Limit (-22 dBW/MHz) => Have approximately 10 dB of margin to meet BER rate of 10^{-6} in unfaded conditions for a 2.3 km link.**
 - » **Dynamic Range => Need approximately 50 dB for full fading conditions due to precipitation. Fading rates are expected to be less than 1 dB/s.**
 - » **Detection Criteria => Use error rate detector to set link power.**
- **Minimal Increased Capital Cost**
 - **Typically less than \$300 per site**
 - **Multiple hardware design approaches are available, all are with today's technology.**



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ADAPTIVE POWER CONTROL (Cont.)

- **Benefits**

- **Minimizes Intra-System Interference**
 - » **Allows for Fixed Service links to be closer together**
- **Enhances Sharing with Fixed Satellite Service Terminals**
- **Increase Reliability resulting in lower operational and maintenance cost**
- **Allows unrestricted deployment of Fixed Service links**



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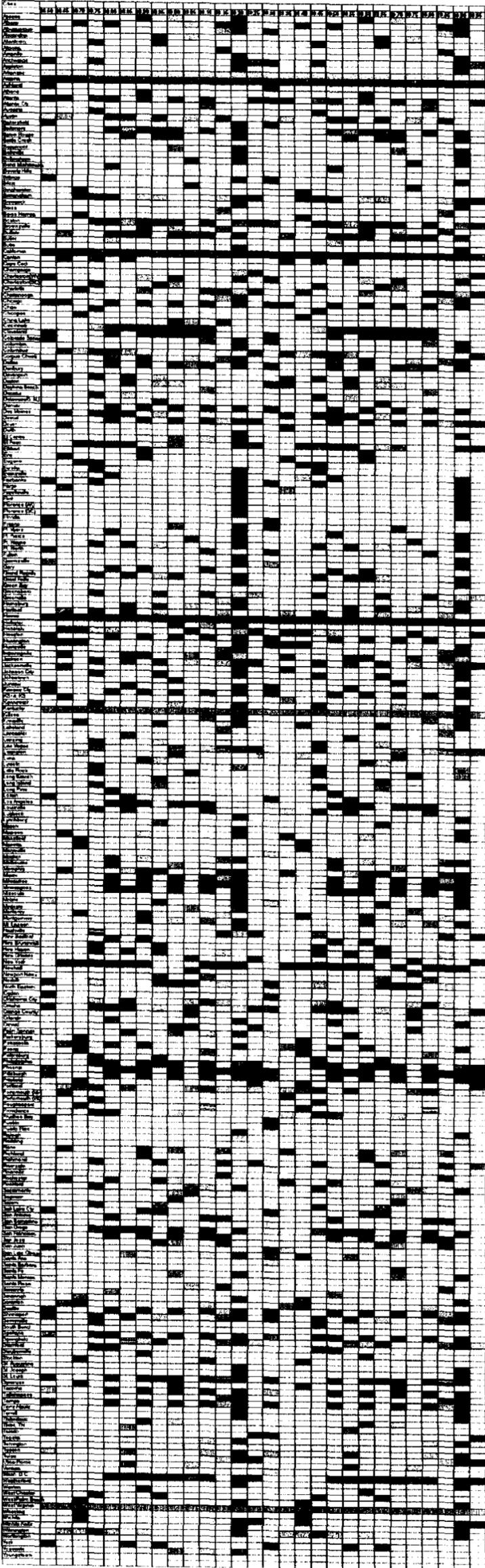
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SUMMARY

- **Important to Preserve Fixed Satellite Service Spectrum Above 30 GHz**
- **Satellite Technology is currently available to use the 40/50 GHz Bands**
- **Proposed Fixed Satellite Service/Fixed Service Sharing Rules are Feasible**
- **Significant Demand Exists for Global High Speed Data Networks**
- **Satellites are Uniquely Positioned to Serve This Market**

38 GHZ POINT-TO-POINT SPECTRUM USAGE



List of Companies	
Winstar	
Biztel	
Milliwave	
Advanced Radio	
AT&T	
Hicap Networks	
Cambridge Partners	
Alascom	
Linda Chester	
Altron Comm.	
Bachow Comm.	
Columbia Capital	
Columbia Millimeter	
COMMCO	
Kirkland & Assocs.	
Litchfield Cnty Cellular	
Local Area Telecomm.	
New England Digital	
GHZ Equip. Co.	
Elar Cellular	
DCT Comm.	
Pacific Bell Mobile	
Bay Area Teleport	
One World Telecomm.	
Pacific Telesis Wireless	
Extended Comm.	
American Cellular	
Paul Likins	
Microwave Partners	
OCOM Corp.	
Sintra Capital Corp.	
Cornelius T. Ryan	
Pinnacle Nine Comm.	
Plaincom Inc.	
Pacific & Eastern Digital	
SMC Associates	
Southfield Comm.	
Spectrum Comm.	
Telecom One Inc.	
Video Multipont	
Wireless T-1 Inc.	
Wireless Telco	
No Wire LLC	
Mountain Microwave Inc.	
Clear Comm. Group	
Wexler Video Inc.	
Citizens Utilities Co.	
Broadcast Sports Technology	

* CHART INCLUDES ALL LICENSES RECEIVED FROM ITS GETTYSBURG OFFICE
 ** STRIPED CELLS INDICATE SPECTRUM SHARED BETWEEN TWO FS LICENSES

