

Resume of Roger J. Rusch

EDUCATION

BS - Physics, Iowa State University. Electricity and magnetism, orbital mechanics, astronomy, optics, thermodynamics.

MS - Mechanical Engineering, University of Southern California Control systems, fluid mechanics, nucleonics, & heat transfer.

MS - Electrical Engineering, University of Southern California. Communication theory, random processes, & microwaves.

Post Graduate courses in business, finance, and management.

EXPERIENCE

TelAstra, Inc., President, Palos Verdes, CA 1996-present

Founder of TelAstra Inc., an objective management and engineering consulting firm dedicated to universal communications service. The company counsels service investors, operators, and system producers in business and financial aspects of the telecommunications industry. The firm has provided studies for more than 100 major space companies worldwide. Clients include U.S. Navy, NASA, U.S. Department of Justice, European Space Agency, COM DEV Ltd., Telespazio, Raytheon E-Systems, Mitsubishi Electric, Daimler Benz Aerospace, Astrium Space, Orbcomm, Lockheed Martin, and Alcatel Espace.

Assisted debt holders in bankruptcies of ICO Global and Loral Space and Communications. Provided expert witness testimony on Direct Broadcasting Satellites, valuation of orbit slots, and insurance disputes.

Prepared business and financial appraisals of satellite systems including Investing in Mobile Satellite Services, Investing in Broadband Satellite Services, Investing in DARS, Investing in Launch Vehicle Services. More than 200 copies of these reports have been sold to members of the space community.

Compiled comprehensive data on satellite cost, schedule, anomalies and failures. Published standard reference works including COMMUNICATION SATELLITE DATABASES, for 21 years. These data provide comprehensive records of the cost, schedule, technical, and operational performance of all the communications satellites, under contract, built or launched.

Participant in advisory panels including the National Academy of Sciences, keynote speaker for several major industry conferences, author of numerous papers on satellite communications, and regular columnist for Satellite News.

Director on the Board of COM DEV International, a Canadian company since 2000.

TRW Space & Defense, Redondo Beach, CA 1985-1996

Odyssey Vice President, Systems Engineering and Deputy Managing Director.

Creator and architect of the medium Earth orbit concept for satellite based personal communications. Recipient of several patents for inventions in the field of space communications. The Odyssey patents were sold to ICO Global for US\$150 M. Managed preparation of FCC application, led WARC'92 & WRC-95 regulatory staff, promoted the Odyssey concept throughout the world, convinced Inmarsat to select MEO as the baseline for I-CO Global. Persuaded Teleglobe to become a strategic partner in the Odyssey program. Assembled international team of subcontractors. Advanced Systems Manager: Evaluated all U.S. Domestic and International Communications Satellite new business opportunities. Catalyst for TRW cost reduction studies; explored all opportunities for reducing the cost of doing business. Deep Space Relay Satellite Study. Proposal Manager for AMSC/MSAT.

Systems Engineering and Integration Manager, Director of Systems Engineering and Integration for the TRW Federal Systems Division which managed the NASA programs including TDRSS. Grew the engineering staff by 50%. Developed a better-trained and educated system engineering staff through a series of career development seminars. Expanded the usage of personal computers. Cut the average labor rate by 5% in one year while reducing the average staff age by 3 years. Increased the burdenable labor while reducing the overhead budget. Managed the division IR&D program and obtained the highest review scores in 8 years.

Ford Aerospace, Palo Alto, CA 1975-1985

Program Management (INTELSAT V, FORDSAT, SUPERBIRD)

First program manager and Technical Director for the highly reliable INTELSAT V series of satellites (included in Key Personnel Clause, IS 796). These satellites were first launched in 1980 and were the workhorses of the fleet for more than 15 years. Integrated all engineering activities on the program. Managed technical interfaces between Ford subsystems, six international subcontractors and numerous domestic subcontractors. Directed all system level analyses including structural dynamics, thermal, attitude control dynamics, mission operations, and mass properties. Controlled launch vehicle interface for Ariane, Atlas-Centaur and Shuttle. "By any criterion, the entire INTELSAT V fleet has demonstrated extraordinarily high levels of in-service reliability."- John L. Stevenson and Robert Strauss, AIAA-92-1947-CP.

Served as INTELSAT VI Program Manager during the proposal and head start phases. Achieved a superior proposal evaluation for the technical and management aspects of the program. Responsible for the SUPERBIRD program. Created and managed the company funded project to develop the next generation communications satellite. Shaped the

program plan and made the day to day decisions. Annual budget was \$15M. FORDSAT Program Manager.

Systems Engineering Management

Established and strengthened the Systems Engineering Activity (120 Professionals, 65 Technicians) which included Advanced Systems, Systems Analysis, Program Engineering, Systems Test, and Launch Systems Departments. Organized a series of weekly seminars for continuous training of systems engineers. Reduced operating costs by \$2M and developed a \$1M reserve through streamlined organization and 4-day/40 hour workweek. Allocated and controlled an annual budget for Independent Research and Development and Special Projects of \$10M per year. Held direct budget responsibility for \$12M/year.

Business Development

Served as a founding Director of the Direct Broadcasting Satellite Association from 1984 to 1985. He also designed TV broadcasting satellites for DBSC, one of the original winners of an FCC license. Responsible for marketing and sales of new satellite programs. Managed the current programs for international cooperative ventures. Developed and negotiated new agreements with European and Japanese team members. Directed proposals for new business. Controlled and allocated resources for new business expenditures. Prepared annual long range Strategic Business Plan.

Persuaded Ford Aerospace to bid on INTELSAT V. Established the international strategy, designed the spacecraft, directed technical proposal preparation, and wrote the management proposal for INTELSAT V. Designed and sold the Maritime package for INTELSAT V. Devised the domestic service feature for INTELSAT VA. Developed the strategy that avoided a "Hybrid" satellite competition and led to a sole source award of INTELSAT VA. Total award value \$636M.

Headed the Review Team for the GOES I, J, K proposal. Managed technical proposal efforts for Telstar 3 and Palapa B. Reviewed the FCC filings for Land Mobile Satellite Service and Radio-determination Satellite System.

Hughes Aircraft Company, El Segundo, CA 1969-1975

Chief Systems Engineer (COMSTAR I)

Negotiated technical specifications and comprehensive test plan. Directed research with polarization grating for antennas. Prepared subsystem specifications. Chaired design reviews. Negotiated technical contract changes. Delivered written and oral quarterly progress reports. Prepared Satellite Operating Procedures. Edited and published Systems Summary.

Spacecraft Manager (INTELSAT IV)

Managed the construction and launch of INTELSAT IV satellites, including the satellite that was used to relay the first television pictures of President Nixon's visit to China in 1972. Led the manufacturing and test activities for three flight spacecraft. Expedited schedules to ensure delivery in record time. Staffed system test team. Directed spacecraft operations at Cape Canaveral. Presented Launch Readiness Review. Prepared despin test plan and despin test facility. Programmed HP 2100 computer to perform automated tests of spacecraft. Prepared telemetry calibrations. Participated in control center tests of all spacecraft subsystems. Contributed to communications receiver tests in Andover, Maine. Tracked investigations of receiver gain reduction.

TRW Space Vehicles Division, Redondo Beach, CA 1965-1969

Member of the Technical Staff. Contributed to the testing of all TRW spacecraft including special government programs. Invented, developed, and patented Krypton-85 Radiotracer Leak Detector for measuring small spacecraft leak rates in ambient pressure enclosure. Project manager for Zero Gravity Propellant Gauge sponsored by U.S. Atomic Energy Commission. Designed propellant gauge used on Naval Research Laboratory Explorer Satellites. Contributed to the DSCS II proposal.

U.S. Air Force Rocket Propulsion Laboratories, Edwards, CA 1962-1965

1st Lieutenant. Procurement and management of Research and Development programs.

PROFESSIONAL ACTIVITIES

Member of the COM DEV International Board of Directors (2000 to present)

Delivered workshops on Broadband and Mobile Communications Investment for ACT Conferences and IIR Ltd. In Washington, Paris, London, and San Diego (1998 to present)

Member of the FCC "Big LEO" and Ka-band Negotiated Rule Making Committees (1993/4)

U.S. Delegate to WARC '92 in Torremolenos, Spain (1992) and WRC-95 in Geneva (1995).

Affirmative Action Program Manager, TRW Federal Systems Division (1987-1988)

National Academy of Sciences: Satellite Committee Chairman, Panel for Voice of America use of space for broadcasting (1985-1986)

Advisory Panel for NASA Office of Aeronautics and Space Technology (1985)

Director, Direct Broadcast Satellite Association. (1984-1985)

Professional lecturer for TMSA "Systems Engineering, Advanced Techniques", presented in California and Europe. (1983)

Steering Committee for Ford Aerospace Employee Involvement Program.

TECHNICAL PAPERS (for the past 15 years)

- 1) "Broadband Satellite Service Demand – A New Forecast", 12th Ka-band Conference, Naples, Italy 29 September 2006.
- 2) Notes from 10th Satellite Finance Conference, Paris, 11 Sept. 2006.
- 3) "North American Commercial Satellite Business with Opportunities for Finnish Industry", Helsinki, Finland, 4 April 2006.
- 4) Notes from Satellite 2006, Washington, DC, February 6-9, 2006
- 5) "Ka-band: The Industry's Next Wave Continues", Satellite 2006, Washington DC, February 9, 2006.
- 6) "Preparing for the Future of Satellite Communications", 11th Ka-band and Broadband Communications Conference, Rome, Italy, 26-28 Sept. 2005.
- 7) Notes from 9th World Summit for Satellite Financing, Paris Intercontinental Hotel, September 5 - 8, 2005
- 8) "Trends that Foreshadow the Future of Satellite Communications"
- 9) 3rd World Symposium on Market Forecasts, Paris, September 5, 2005
- 10) "Satellite Communications Industry Status", Aerospace Corporation, El Segundo 28 April 2005
- 11) "Invisible Highways: Transporting Video From Media Sources to Viewers", Satellite 2005, Washington, D.C. 24 March 2005
- 12) "Satellite Statistics: Life After The Military?", Satellite 2005, Washington, D.C. 24 March 2005
- 13) "Managing Satellites Services for Profit", Satellite News, November 2004, vol. 27, No. 32.
- 14) "Predictions for the Next 20 years of Satellite Communications", 10th Ka-band Conference, Vincenza, Italy, October 2, 2004.
- 15) VSAT Conference Notes, Singapore, 29-30 Nov. 2004
- 16) "Satellite Services for Remote Communities", Satellite News, July 19, 2004, vol. 27, No. 28.
- 17) "Beating the Satellite Broadband Blues", Satellite News, June 28, 2004, vol. 27, No. 26.

- 18) "The Future of Broadband / Multimedia Systems", 10th Satel Conseil Symposium, Paris, June 16, 2004.
- 19) Advanced Technologies and Applications: Do They Work? Do They Make Money?, ISCe 2004, Long Beach, CA, June 2, 2004.
- 20) "The ITAR Handicap: Bureaucracy Strikes Again", Satellite News, March 15, 2004, vol. 27, No. 11.
- 21) "Satellite Statistics: Is Recovery A Mirage?" Satellite 2004, March 3, 2004.
- 22) "Exchange-Rate Fluctuations Affect Industry Players", Satellite News, February 23, 2004, Vol. 27, No. 8.
- 23) "The Plausible Impossible", Space News, February 16, 2004, vol. 15, No. 7, page 12.
- 24) "Searching for the Satellite Broadband Market", 9th Ka-band Utilization Conference, Isola d'Ischia, Italy, 5-7 November 2003.
- 25) "HDTV: The Next Opportunity for Satellite Growth?" Satellite News, Sept. 29, 2003, Vol. 26, No. 37, page 2.
- 26) "The Stupid Rich: The Untapped Satellite Phone Market?" Satellite News, Sept. 22, 2003, Vol. 26, No. 36, page 2.
- 27) Presentation to the "Symposium on Market Forecast", World Summit for Satellite Financing, Paris, Sept. 8, 2003.
- 28) "The Illusory ATC Opportunity", Satellite News, June 16, 2003, Vol. 26, No. 24, page 2.
- 29) "Spot Beam Satellites for Broadcasting Television", 21st AIAA ICSSC, Yokohama, Japan, April 17, 2003.
- 30) "Launch Demand Forecasts Skew Upward", Satellite News, March 24, 2003, Vol. 26, No. 12, page 2.
- 31) "Unintended Consequences of Flawed Policies", Satellite News, March 17, 2003, Vol. 26, No. 11, page 2.
- 32) "2003: A Satellite Industry Odyssey", Satellite News, February 17, 2003, Vol. 26, No. 7, page 2.
- 33) "Rockin' From Space... A Satellite Radio Update", Satellite 2003, Washington, February 27, 2003
- 34) Introduction to Session 8 - Satellite Manufacturers, Palais des Congrès – Paris, France, December 12, 2002
- 35) "Lack of Corporate Candor Carries a High Price", Satellite News, November 18, 2002, Vol. 25, No. 44, page 2.
- 36) "New Directions for Broadband Satellite Systems", 8th Ka-band Utilization Conference, Baveno/Stresa, Italy, September 27, 2002.
- 37) "The Past and Future of Mobile Satellite Service", Satellite News, July 22, 2002, Vol.

25, No. 28, page 2.

- 38) "To Merge or Not to Merge? That is the Question", Satellite News, June 24, 2002. Vol. 25, No. 25 page 2.
- 39) "A Death in the Family: Satellite Industry Faces Reality", Satellite News, May 27, 2002.
- 40) "New Dimensions in Satellite Communications", Satellite News, April 22, 2002.
- 41) "Leadership: Vision or Tenacity?" Satellite News, April 1, 2002.
- 42) "Satellite Predictions for 2002 and Beyond", Satellite News, February 18, 2002
- 43) "Results for 2001: Calibrating Our Predictions", Satellite News, January 14, 2002
- 44) "U.S. Government Should Assist The Space Industry", November 12, 2001.
- 45) "Industry Empires and Overcapacity Pose Threats" Satellite News, October 29, 2001
- 46) "Shifting Market Shares for Satellite Manufacturing", Satellite News, August 6, 2001
- 47) "America Boldly Prepares for the Future", Satellite News, September 24, 2001.
- 48) "Assessing the Damage Caused by LEOs", Satellite News July 2, 2001.
- 49) Internet Via Satellite, Workshop, "Building the Business Case for Broadband Systems and Services," San Diego, California, December 5, 2001
- 50) Internet Via Satellite, Workshop, "Building the Business Case for Broadband Systems and Services," San Diego, California, June 11, 2001
- 51) Broadband Satellite 2001, Workshop, "Building the Business Case for Broadband Systems and Services," San Diego, California, June 25, 2001
- 52) "Success Factors For Broadband Satellite Systems," 7th Ka-band Utilization Conference, Santa Margherite Ligure, Genoa, Italy, Sept. 28, 2001.
- 53) Communications Satellite Databases, Parts I: Prices, Schedules, Mass. Power, 16th edition for the year 2001, privately published annually by TelAstra, Inc., April 2001.
- 54) Communications Satellite Databases, Parts II: Subsystems and Anomalies, and 15th edition for the year 2001, privately published annually by TelAstra, Inc., April 2001.
- 55) Communications Satellite Databases, Parts III: Launch Vehicles, 12th edition for the year 2001, privately published annually by TelAstra, Inc., May 2001.
- 56) "Providing In-Flight Broadband Services", 19th AIAA ICSSC, Toulouse, France, April 17-20, 2001.
- 57) "Satellite Niche Businesses", Satellite News, April 16, 2001.
- 58) "Transformation through Innovation", Satellite 2001 Daily, Day Three, March 29, 2001, Page 34.
- 59) "Will It Be A Hit or A Miss?", Satellite News, March 19, 2001.
- 60) "Specific Predictions for 2001 and beyond", Satellite News, February 19, 2001.

- 61) "Just Wait, Satellites Will Find Place in Broadband", Office.com February 16, 2001.
- 62) "Next Generation Telecom Strategy, Mobile Systems (MSS, In-Flight, DARS)", ESTEC, Noordwijk, The Netherlands, 7 February 2001.
- 63) Inmarsat Sales & Marketing Conference, "State of the Satellite Industry", Dubai, U.A.E., 3-4 February 2001.
- 64) "2001: A Year to Remember", Satellite News, January 15, 2001.
- 65) "Study of the Next Generation of Mobile Satellite Services", January 16, 2001.
- 66) "Financial and Business Evaluation of the New MultiMedia Satellite Systems", January 15, 2001.
- 67) "Study of the Next Generation of Digital Audio Broadcasting Satellites", January 14, 2001.
- 68) "Lessons Learned from Iridium, ICO, and Globalstar – Part 6", Mobile Satellite News, December 2000.
- 69) "Investing in Satellite Communications", Earth Space Review, Vol. 9, No. 3, Fall, 2000.
- 70) "Lessons Learned from Iridium, ICO, and Globalstar – Part 5", Mobile Satellite News, November 2000.
- 71) Internet Via Satellite, Workshop, "Investing in Broadband Satellite Services", San Diego, California, November 8, 2000.
- 72) APSCC 2000 Conference "What is the financial justification for Broadband Satellite Services?", Hotel Lotte, Seoul, Korea, 8 November 2000.
- 73) "Lessons Learned from Iridium, ICO, and Globalstar – Part 4", Mobile Satellite News, October 2000.
- 74) "What on Earth is going on with satellite communications?", Office.com, October 2, 2000.
- 75) 7th Satel Conseil Symposium, "Overview of the Past 2 Years", Maison de la Chimie, Paris, September 5-7, 2000
- 76) "Lessons Learned from Iridium, ICO, and Globalstar – Part 3", Mobile Satellite News, September 2000.
- 77) "Lessons Learned from Iridium, ICO, and Globalstar – Part 2", Mobile Satellite News, August 2000.
- 78) "Lessons Learned from Iridium, ICO, and Globalstar – Part 1", Mobile Satellite News, July 2000.
- 79) "Enterprise Value and Hot Spot Capability", Mobile Satellite News, June 2000.
- 80) "What can we learn from the Big LEOs?", 5th Space and Finance Conference, WorldSat 2000, Marriott East Side Hotel, New York City, June 16, 2000.
- 81) "Forcing Mobile Satellites to Provide Data Services", Mobile Satellite News, May

2000.

- 82) "Examining the Current Status of the Commercial Satellite Industry", Next Generation Broadband Satellite Systems 2000, Paris, 10-12 May 2000
- 83) Next Generation Broadband Satellite Systems 2000 Workshop, "Making the Business Case for Broadband Satellite Systems", Paris, May 9, 2000.
- 84) "Making the Business Case for Investing in Broadband Satellite Systems", Workshop presented for ACT Satellites and the Internet v.4, April 25, 2000.
- 85) "Excellence Awards and Human Folly", Mobile Satellite News, April 2000.
- 86) "Estimating the Demand for Launch Services", 18th AIAA ICSSC, Oakland, CA, April 10-14, 2000.
- 87) "10 Steps To Save Globalstar", Commentary, Space News, March 27, 2000, Vol. 11, No. 12. Page 15.
- 88) "Introducing new satellite services" Mobile Satellite News, March 2000.
- 89) "Trends and Opportunities in the World of Satellite Communications" ,HTSI Strategic Planning Meeting, Columbia, MD, March 22, 2000.
- 90) Investing in Mobile Satellite Services. A Complete Multi-Client Report, privately published by TelAstra, Inc., February 2000.
- 91) "Assessment of Alternatives for the U.S. Navy MUOS", Aerospace Corp., El Segundo, February 14, 2000.
- 92) "Trends and Opportunities in the World of Satellite Communications", Norwegian SatCom Conference, Oslo, February 3, 2000 (videoconference).
- 93) "Growth Statistics", Satellite 2000, Washington Convention Center, February 2, 2000.
- 94) Satellite 2000, "View of the Experts MSS & Broadband", Washington Convention Center, Feb. 1, 2000.
- 95) "Will LEO Constellations Survive?" Launchspace magazine, February 2000.
- 96) "Investing in Satellite Communications, Exploring the Business Case", AIC Workshop, Millennium Chelsea, London, November 3, 1999.
- 97) "Exposing the myths of LEO, MEO, and GEO satellite constellations", Space Technology, Volume 19, Number 1, fall, 1999.
- 98) "The Case for Providing Satellite Services in Ka-band", 5th Ka-band Utilization Conference, Grande Albergo Capotaormina, Taormina, Italy, October 19, 1999.
- 99) NASA Launch Demand Study, October 15, 1999.
- 100) Study of Next Generation: Audio Broadcasting Satellites for the European Space Agency, November 15, 1999.
- 101) Study of Next Generation: Non-Geostationary Ku-Band FSS Systems for the

European Space Agency, November 15, 1999.

- 102) Study of Next Generation Mobile Satellites for the European Space Agency, November 1999.
- 103) "Current Trends in Broadband and Narrowband Satellite Communications", NERA, Oslo, Norway, October 4, 1999
- 104) "Alternatives for the Next Generation of MSS", IMSC #5, Ottawa, Canada, June 17, 1999.
- 105) "Appraisal of Tangible & In-kind Assets for Andesat SA", Miami Radisson Mart Plaza, November 13, 1998.
- 106) Financial and Business Evaluation of the New Multimedia Satellite Systems, Part 2, A Complete Multiclient Report, privately published by TelAstra, Inc., September 1998.
- 107) "Evaluation of the New Broadband Satellite Systems", Study Report for the European Space Agency, June 1998.
- 108) "Key Regulatory & Licensing Issues: Challenges & Obstacles Up Ahead", Third Annual Space & Satellite Finance: Worldsat 98", Plaza Hotel, New York, May 20, 1998.
- 109) "Evaluation of the New Multimedia Satellite Systems", 17th AIAA International Communications Satellite Systems Conference, Yokohama, Japan, February 26, 1998.
- 110) "Satellite Communications Growth Statistics", Satellite 98, Sheraton Washington Hotel, Washington, DC, February 19, 1998.
- 111) Financial and Business Evaluation of the New Multimedia Satellite Systems, A Complete Multiclient Report, privately published by TelAstra, Inc., August 1997.
- 112) "Antennas for the next generation of mobile satellite services", 10th IEE International Conference on Antennas and Propagation, Edinburgh, Scotland, April 14-17, 1997.
- 113) "Future Application of mm Waves for Space Communications", Keynote Address, International Conference on mm & Sub-mm Waves and Application III, Denver, August, 1996
- 114) "Personal Communications Via Satellite", Keynote Address, International Conference on GaAs MANTECH, San Diego, April, 1996
- 115) "Selecting the Best Constellation for Mobile Satellite Services", 16th AIAA International Communications Satellite Systems Conference, Washington, February, 1996.
- 116) "The Market and Proposed Systems for Satellite Communications", Applied Microwaves and Wireless, Fall 1995.
- 117) "Moving Cellular Communications into Space", Keynote Address, 1995 IEEE

MTT-S International Microwave Symposium, Orlando, Florida, May 15-19, 1995.

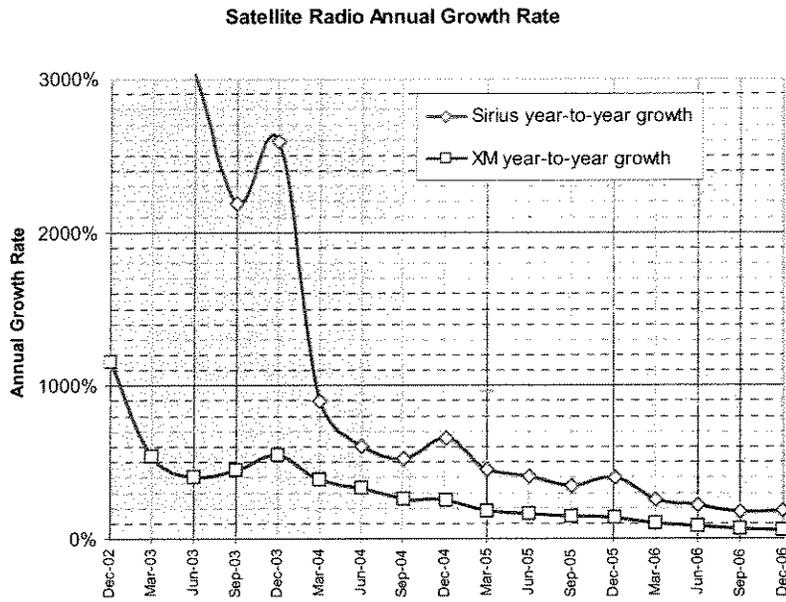
- 118) "Status Report on the Odyssey Satellite System", 15th AIAA International Communication Satellite Systems Conference, San Diego, CA, March 1994.
- 119) "Odyssey, An Optimized Personal Communications Satellite System", 44th Annual IAF Congress, Graz, Austria, October 1993.
- 120) "Comparison of Personal Communications Satellite Systems", Satellite XII, Washington, March 1993.
- 121) "Odyssey, A Constellation for Personal Communications", 14th AIAA International Communications Satellite Systems Conference, Washington, March 1992.
- 122) "Design and Price of Audio Broadcasting Satellites", Symposium on Digital Audio Broadcasting, Washington, March 1990.

PATENTS

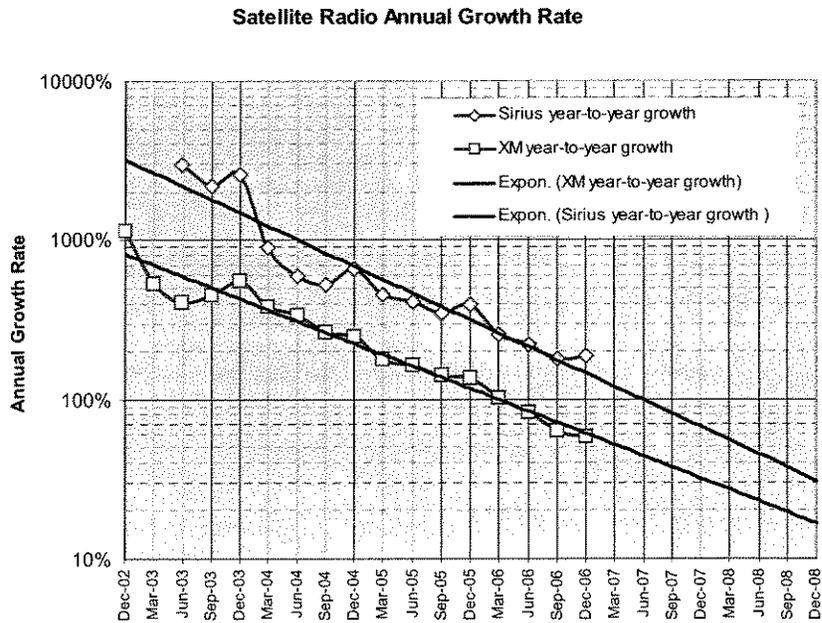
Medium-Earth-Altitude Satellite-based Cellular Telecommunications, U.S. Patent 5,433,726 (July 18, 1995), 5,439,190 (Aug. 8, 1995) 5,551,624 (Sept. 3, 1996)

Radiotracer Leak Detector, U.S. Patent 3,597,611, Aug 3, 1971

Figure 1. Satellite Radio Growth Rates

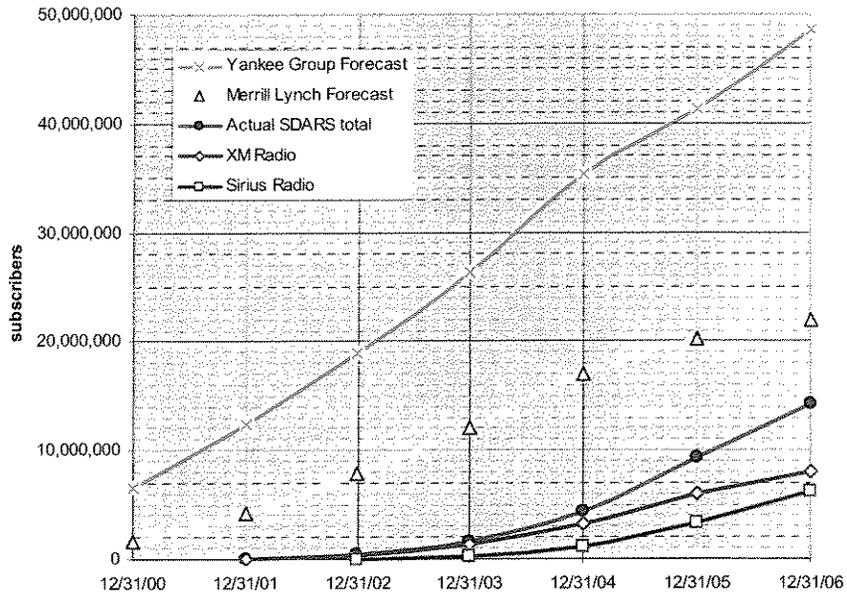


Version 1A – Linear Scale

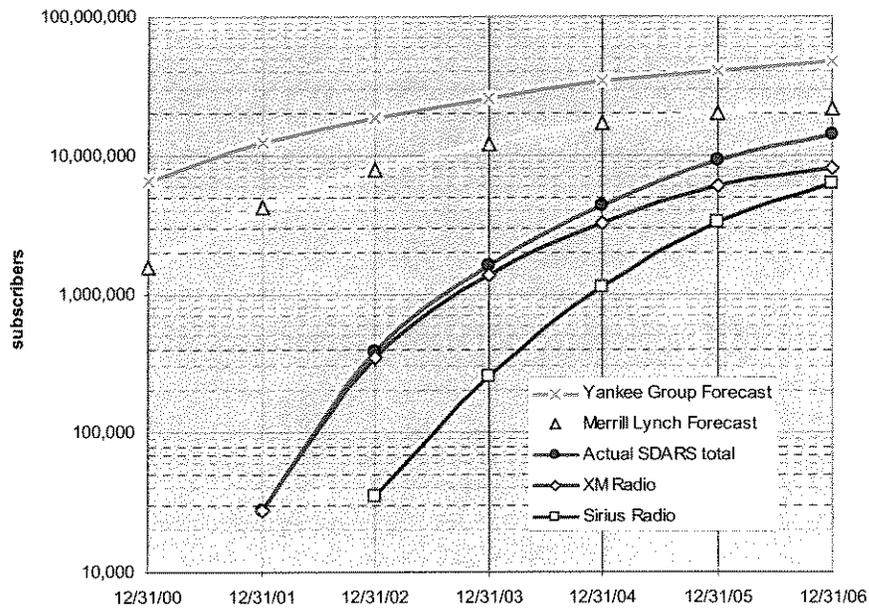


Version 1B – Logarithmic Scale

Figure 2. Satellite Radio Subscriber Growth



Version 2A – Linear Scale



Version 2B – Logarithmic Scale

Exhibit 1
Curriculum Vitae

J. ARMAND MUSEY, CFA
215 E. 80th Street, Apt 7J
New York, NY 10021
amusey@alumni.uchicago.edu
917-514-2132

**CAREER
HIGHLIGHTS**

Recognized finance and strategy expert on issues related to the satellite communications industry and associated telecommunications sectors:

- Built Near Earth LLC, over a three year period, into a leading boutique investment bank focused on the satellite communications industry.
- Regularly quoted in trade publications as well as national and international publications such as The Wall Street Journal, The New York Times and others.
- Frequent speaker at major satellite industry conferences as an expert in satellite finance and strategy.
- Achieve coveted ranking in the Institutional Investor poll for equity research in the satellite communications industry three continuous years (from 2000 until 2002, the last year it was ranked as a separate category)
 - Achieved first ranking in first full year of coverage as senior analyst.
- Ranked #1 analyst covering satellite communications industry by Greenwich Associates poll in 2000.
- Rated as Top Broadcasting Industry Stock Picker in the Wall Street Journal's "All Star" Analyst Survey of 2000.
- Appeared numerous times on national television as an expert on the satellite communications industry, including Bloomberg, Fox and CNN.
- Winner of Salomon Smith Barney research department's internal "Report of the Month" Award, June 2002 and the "Call of the Month" Award, November 2001.

EXPERIENCE

2003 – Present

NEAR EARTH LLC

New York, NY

President and Partner, November 2003 – Present

- Originate and execute transactions in boutique investment bank focused on the satellite, media and telecom industries. Primary services are merger and acquisition and private equity placement advisory.
- Oversee maintenance of the firm's client base, investor relationships and new business prospecting.

2001 – 2003

SALOMON SMITH BARNEY (CITIGROUP SECURITIES)

New York, NY

*Director and Senior Satellite Communications Research Analyst
Satellite Communications and Towers, March 2001 – February 2003*

- Primary coverage responsibility for fifteen companies in the satellite communications and tower industries.

- 1999 – 2001 **BANC OF AMERICA SECURITIES** New York, NY
Managing Director and Senior Satellite Communications Research Analyst
Satellite Communications, April 1999 – March 2001

 - Primary coverage responsibility for twelve companies in the satellite communications industry.

- 1998 – 1999 **C.E. UNTERBERG, TOWBIN** New York, NY
Senior Analyst – Satellite Communications, October 1998 – April 1999

 - Primary coverage responsibility for eleven companies in the satellite communications industry.

- 1997 – 1998 **MERRILL LYNCH & CO.** New York, NY
Industry Analyst – Satellite Communications, September 1997 – October 1998

 - Assisted senior analyst in initiating and maintaining coverage for 11 companies in the satellite communications industry.
 - Given primary company coverage responsibility after only nine months.

- 1995 – 1997 **INVESTMENT BANKING** New York, NY
Associate – Investment Banking at PaineWebber (August 1995 – November 1995)
and Nesbitt Burns (March 1996 – September 1997)

 - Member of corporate finance generalist teams.

EDUCATION

- 1992 – 1995 **J. L. KELLOGG GRADUATE SCHOOL OF MANAGEMENT** Evanston, IL
NORTHWESTERN UNIVERSITY
Master of Management degree (MBA) , June 1995

 - Majored in Finance and Marketing; 3.7/4.0 GPA.
 - Worked full-time as regional manager for Zacks Investment Research while completing degree.

- 1985 – 1989 **UNIVERSITY OF CHICAGO** Chicago, IL
Bachelor of Arts Degree in Sociology with Honors, June 1989

 - Significant coursework in Economics and Mathematics.

PROFESSIONAL ACTIVITIES

Chartered Financial Analyst (CFA). Holder of Series 7, 63 and 24 licenses. Member of the New York Society of Security Analysts and the CFA Institute. Vice-Chair of New York Society of Security Analysts Corporate Governance Committee.

Publications

While working in a research capacity from 1997 to 2003, I published analysis on the industry virtually every week, usually multiple times a week. Below are some of my major publications. I was the senior analyst and lead author on all of the reports except where noted.

- 1) IPTV – The Future of Television?, Near Earth LLC, July 2006 (41 pages)
- 2) Analysis of the Fixed Service Satellite Industry, Near Earth LLC, July 2006 (38 pages)
- 3) Analysis of the GEO Satellite Manufacturing Industry, Near Earth LLC, July 2006 (27 pages)
- 4) DBS Industry Update; Revisiting the Hughes EchoStar Merger, Salomon Smith Barney, June 13, 2002. 39 pages.
- 5) Equity in the Balance, Aligning Balance Sheet Risk with Equity Valuations, Salomon Smith Barney, May 23, 2002. 50 pages.
- 6) The Guide to Fixed Satellite Service, Salomon Smith Barney, November 2001. 136 pages
- 7) DARS Duopoly; The Dawn of a New Age in Radio, Banc of America Securities, October 1999. 107 pages.
- 8) The Big 3; Hughes, Loral and Orbital Sciences - The Role of Diversified Satellite Operators at the Turn of the Millennium, Banc of America Securities, October 1999. 336 pages.
- 9) The Satellite Book, C.E. Unterberg Towbin, First Quarter 1999. 54 pages.
- 10) The Satellite Report 1999, C.E. Unterberg Towbin April 1999. 457 pages
- 11) Pegasus Communications, C.E. Unterberg Towbin, January 19, 1999. 53 pages.
- 12) The Global Satellite Marketplace, Merrill Lynch, April 1998 246 pages. Thomas W. Watts was the senior analyst on this report.
- 13) Hughes Electronics; SatCom Blue Chip, Merrill Lynch, March 20, 1998. 83 pages. Thomas W. Watts was the senior analyst on this report.
- 14) CD Radio, Inc. Merrill Lynch, July 14, 1998. 10 pages. Thomas W. Watts was the senior analyst on this report.

Periodicals

- 1) "From the Group Up", Near Earth LLC. Monthly Newsletter from November 2005 to Present.
- 2) "Heard From the Street", Via Satellite Magazine. Monthly column from late 1999 until early 2003.
- 3) The Satellite Model Book, Salomon Smith Barney, Second Quarter 2001 – Third Quarter 2002.
- 4) Payload Monthly. Banc of America Securities. October 1999 – February 2001. 50-100 pages.
- 5) The Bus Tour; A Quantitative Overview of the Satellite Industry, Banc of America Securities, Third Quarter 1999 – First Quarter 2000. 150-200 pages per edition
- 6) Hotbird Monthly; Monthly Satellite Industry Update, CE Unterberg, Towbin December 1999-April 2000. 30-50 pages per edition.

Exhibit 2
Information Considered in Developing this Analysis

Wall Street Analyst Reports

Date	Firm	Research Analyst	Title
Sirius Satellite Radio			
10/4/2006	Deutsche Bank*	James G. Dix, CFA	XMSR misses subs by more than SIRI, but not changing ests
10/3/2006	CIBC World Markets*	Jason Helfstein	Reducing 3Q sub estimate on weaker retail trends; FY unchanged
10/3/2006	RBC Capital Markets*	Ryan Vineyard	Expect 3Q retail headwinds
9/14/2006	Credit Suisse*	Bryan Kraft	Lowering 3Q Net Adds on OEM production cuts
9/11/2006	Bear Stearns*	Robert S. Peck	Stiletto pre-orders halted... still expects summer release
8/1/2006	Credit Suisse	Bryan Kraft	Sirius Reported a strong (but in-line) quarter
8/1/2006	Deutsche Bank	James G. Dix, CFA	2Q beat & higher guidance despite US OEM risk
8/1/2006	Wachovia Securities	Jeff Wlodarczak	SIRI: Results and guidance in line with expectations
5/16/2006	Morgan Stanley	Benjamin Swinburne, CFA	Raising contribution from Ford in 2007; comfortably FCF positive in 2008
XM Satellite Radio			
10/3/2006	Bear Stearns*	Robert S. Peck, CFA	Channel Checks Point to higher Q3 Adds...Part 1
7/27/2006	CIBC World Markets	Jason Helfstein	No Confidence in NPV model, Removing Target and Downgrading to SP-Spec
5/25/2006	Citigroup	Eileen Furukawa	XMSR: XM Cuts Subs to Reset Bar-But, Expect Better News Lies Ahead
10/11/2006	Credit Suisse*	Bryan Kraft	XM Addressing a New Market Segment
7/21/2006	Deutsche Bank	James G Dix, CFA	2Q Preview: lowering XM ests on retail uncertainty
10/04/2006	Deutsche Bank*	James G Dix, CFA	XMSR misses by more then SIRI, but not changing ests
10/4/2006	Lehman Brothers	Vijay Jayant	3Q update
5/16/2006	Morgan Stanley	Benjamin Swinburne, CFA	Long-Term, The Song Remains the Same
10/04/2006	RBC Capital Markets*	David Bank	3Q Net Sub Adds Below Consensus on Rental Car Accounting Change
7/27/2006	Wachovia Securities	Jeff Wlodarczak	XMSR Q2: Below Expectation; Reducing Valuation Range

*Indicates report was only used for Target Prices. These reports are only updates to previous full length reports and thus, can only provide limited information such as the price target.

Exhibit 1



INTERNATIONAL

JOHN R. WOODBURY

Vice President

Ph.D. Economics,
Washington University

M.A. Economics,
Washington University

B.A. Economics,
College of the Holy Cross

Dr. Woodbury's principal fields of expertise are industrial organization, regulation, antitrust, law, and economics. He is an expert in and has published on the economics of antitrust and regulation in broadcasting, cable, telecommunications, and other industries.

PRIOR PROFESSIONAL EXPERIENCE

1989–1992 *Principal*, Microeconomic Consulting and Research Associates, Inc.
(formerly Competitive Analysis Group, ICF Consulting Associates)

- Responsible for providing antitrust and regulatory advice to clients.

1989 *Research Associate*, Analysis Group

- Responsible for providing antitrust and regulatory advice to clients.

1985–1989 Federal Trade Commission

Associate Director for Special Projects, Office of the Bureau Director, Bureau of Economics

- Responsible for initiating, conducting, and reviewing economic studies on Commission and other regulatory policies (including telecommunications); drafting speeches for the chairman; and reviewing Bureau participation in Federal Trade Commission cases.

Assistant Director for Rulemaking, Division of Policy and Evaluation, Bureau of Consumer Protection

- Responsible for managing the Commission's rulemaking agenda and drafting recommendations to the Commission from the Bureau director. Rules reviewed include holder-in-due-course, vocational schools, cooling-off, and funeral rules.

-
- Deputy Assistant Director, Regulatory Analysis, Bureau of Economics*
- Responsible for conducting or supervising studies or filings before regulatory agencies, including the Federal Communications Commission, the International Trade Commission, and the National Highway Traffic Safety Administration.
- 1983–1985 *Vice President, Department of Research and Policy Analysis, National Cable Television Association*
- Responsible for conduct or supervision of studies related to cable television, including consumer costs of the franchising process, deregulation of cable prices, effects of copyright fees on consumers, and the extent of competition with cable television.
- 1982–1983 *Senior Economist, Regulatory Analysis Division, Bureau of Economics, Federal Trade Commission*
- Responsible for broadcasting and telecommunications.
- 1979–1982 *Federal Communications Commission*
- Chief, Economics Division, Common Carrier Bureau*
- Senior economic advisor to Bureau and Commission on common carrier policy. Directed 25 subordinates in policy analysis.
- Industry Economist, Network Inquiry Special Staff*
- Responsible for the analysis of the program supply industry and the competitive impact of new broadcast technology.
- 1978–1979 *Assistant Chief, Policy Analysis Division, Brookings Economic Policy Fellow, assigned to Office of Economic Analysis, Civil Aeronautics Board*
- Responsible for the development of merger policy, international aviation policy, and service to small communities.
- 1977–1978 *Assistant Professor of Economics, State University of New York at Albany*
- 1975–1977 *Economist, International Research Department, Federal Reserve Bank of New York*
- Responsible for assessing bank-reported capital flows and exchange-rate movements.
- 1974–1975 *Lecturer, Southern Illinois University, Carbondale*

EXPERT WITNESS ACTIVITIES

Expert witness in a BMI rate setting proceeding on behalf of Music Choice, Second District Court of New York (expert report, supplemental report, direct case report, data affidavit, deposition testimony, and trial testimony), November 2003-April 2004.

Expert witness in a conspiracy/monopolization matter on behalf of IBEW Local No. 3. Expert report and deposition testimony. October–December 2002.

Expert witness before the Copyright Arbitration Royalty Panel, Direct and rebuttal testimony, regarding the determination of reasonable license fees for digital performance right in sound recordings and ephemeral recordings of music performed on public radio websites. Prepared on behalf of National Public Radio/Corporation for Public Broadcasting. April and October 2001.

Expert witness before the Illinois Commerce Commission, regarding the proposed SBC/Ameritech merger. Prepared on behalf of Sprint Communications Company, L.P. July 1999.

Expert witness before the Commonwealth of Virginia State Corporation Commission, regarding the proposed Bell Atlantic/GTE merger. Prepared on behalf of Sprint Communications Company, L.P. March 1999.

Expert witness before the Ohio Public Utilities Commission, regarding the proposed SBC/Ameritech merger. Prepared on behalf of Sprint Communications Company, L.P. December 1998.

Expert witness before the Illinois Commerce Commission, regarding the proposed SBC/Ameritech merger. Prepared on behalf of Sprint Communications Company, L.P. October and December 1998.

Expert witness to Copyright Arbitration Royalty Panel, Direct and Rebuttal Testimony, regarding the determination of reasonable rates for the digital performance of sound recordings. Prepared on behalf of Music Choice and DMX. June and July 1997.

Expert witness to Copyright Arbitration Royalty Panel, Rebuttal Testimony, regarding the shares of royalties due copyright claimants. Prepared on behalf of the Motion Picture Association of America. March 1996.

Expert witness before the Copyright Royalty Tribunal, rebuttal testimony on the value of distant signal sports programming. Prepared on behalf of the Motion Picture Association of America, December 1991.

Expert witness preparation in five antitrust investigations, 1988–1992, on behalf of the FTC.

Expert witness, FTC v. Elders Grain, Preliminary Injunction Proceeding, Sixth District Court. Testimony prepared on behalf of the FTC, June 1988.

Expert witness before the International Trade Commission and Department of Commerce, imports of Japanese semiconductors. Testimony prepared on behalf of the FTC, 1986.

Expert witness, Texas International/National/Pan American Acquisition Case and Continental/Western acquisition case. Testimony prepared on behalf of the Civil Aeronautics Board, 1978-1979.

Expert witness, iPCS Wireless Inc. v. Sprint Corporation, Circuit Court of Cook County, Illinois, on behalf of Sprint Nextel Corporation, January 2006.

Expert witness, Horizon Personal Communications and Bright Personal Communications v. Sprint Corporation and UbiquiTel Inc. v. Sprint Corporation, Court of Chancery of the State of Delaware In and For New Castle County. Testimony on behalf of Sprint Nextel Corporation, April-May 2006.

OTHER SELECTED CONSULTING ACTIVITIES

Submitted a report, "In the Matter of Implementation of Section 621 (a) of the Cable Communications Policy Act of 1984 as Amended by the Cable Television Consumer Protection and Competition Act of 1992, MB Docket No. 05-311." With Stanley M. Besen. To the Federal Communications Commission on behalf of the National Cable & Telecommunications Association, 2006.

Submitted a report, "Attachment B to, In re Applications of Nextel Communications, Inc., Transferor, and Sprint Corporation, Transferee, for Consent to the Transfer of Control of Entities Holding Commission Licenses and Authorizations Pursuant to Sections 214 and 310 (d) of the Communications Act." With Stanley M. Besen and Steven C. Salop. To the Federal Communications Commission on behalf of Sprint Nextel Corporation, 2005.

Submitted a report, "Economic Analysis of the DOT's NPRM Proposals—Reply Comments." With Professor Steven C. Salop. To the Department of Transportation on behalf of Sabre, Inc., 2003.

Submitted a report, "Economic Analysis of DOT's NPRM Proposals." With Professor Steven C. Salop. To the Department of Transportation on behalf of Sabre, Inc., 2003.

Submitted a report, "Cable Television Subscriber Limits: A Critique." With Carl Shapiro. To the Federal Communications Commission on behalf of National Cable and Telecommunications Association, 2002.

Submitted a report to the Justice Department regarding unilateral effects related to a merger in the personal care industry, 2001.

Submitted a report to the European Commission on the effect of partial ownership interests in the luxury goods industry, 2001.

Submitted a report, "The Incentives of Cable Operators to Carry Multiple ISPs." With Stanley M. Besen and Patrick J. DeGraba. To the Federal Communications Commission on behalf of The National Cable Television Association, 2000.

Submitted a report on a media merger to the European Commission, 2000.

Submitted a report, "The Staff's Flawed Economic Analysis of Harm from Control Over 'Inactive' Programs" With Steven C. Salop. To the Federal Communications Commission on behalf of CBS Corporation and Viacom, Inc., 2000.

Submitted a report, "An Economic Analysis of the Effects of the AT&T-MediaOne Merger on Competition in the Supply and Distribution of Video Program Services: Response to the Critics." With Stanley M. Besen and Serge X. Moresi. To the Federal Communications Commission on behalf of AT&T, 1999.

Submitted a report, "An Economic Analysis of the proposed Bell Atlantic/GTE Merger." With Stanley M. Besen and Padmanabhan Srinagesh. To the Federal Communications Commission on behalf of Sprint Communications Company, L.P., 1998.

Submitted a report, "An Economic Analysis of the proposed SBC/Ameritech Merger." With Stanley M. Besen and Padmanabhan Srinagesh. To the Federal Communications Commission on behalf of Sprint Communications Company, L.P., 1998.

Submitted a report, "An Economic Analysis of the FCC's Cable Ownership Restrictions." With Stanley M. Besen. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1998.

Submitted a report, "Comments on Dertouzos and Wildman, 'Programming Access and Effective Competition in Cable Television.'" With Stanley M. Besen. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1998.

Submitted a report, "An Economic Analysis of the Effects of Partial Ownership Interests in Cable Systems." With Stanley M. Besen, Daniel P. O'Brien, and Serge X. Moresi. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1998.

Submitted a report, "A Response to Ameritech's New Media's 'Allegations of a Price Squeeze' by Vertically Integrated Cable Operators." With Stanley M. Besen. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1998.

Submitted a report, "A Further Analysis of the Effects of Cable Diversion, Premium Service Buy Rates, and Volume Discounts on Primestar's Competitive Incentives: A Response to Dr. Rosston." With Steven C. Salop, Stanley M. Besen, and E. Jane Murdoch. To the Federal Communications Commission on behalf of PRIMESTAR Partners, L.P., 1998.

Submitted a report, "An Economic Analysis of the Impact of the WorldCom-MCI Merger on the Provision of Internet Backbone Services." With Stanley M. Besen and Padmanabhan Srinagesh. To the Federal Communications Commission and the European Commission on behalf of Sprint Corporation, 1998.

Submitted a report, "A Comparison of Primestar's Costs with Those of a Standalone Entrant." With Steven C. Salop, Stanley M. Besen, and E. Jane Murdoch. To the Federal Communications Commission on behalf of PRIMESTAR Partners, L.P., 1998.

Submitted a report, "An Economic Analysis of Primestar's Competitive Behavior and Incentives: Reply to the Oppositions." With Steven C. Salop, Stanley M. Besen, and E. Jane Murdoch. To the Federal Communications Commission on behalf of PRIMESTAR Partners, L.P., 1998.

Submitted a report, "An Economic Analysis of Primestar's Competitive Behavior and Incentives." With Steven C. Salop, Stanley M. Besen, and E. Jane Murdoch. To the Federal Communications Commission on behalf of PRIMESTAR Partners, L.P., 1998.

Conducted statistical and other analyses of anticompetitive allegations surrounding a major media merger and submitted to the Federal Trade Commission, 1996.

Submitted a report, "Competitive Market Considerations in the Licensing of the 37-40 GHz Band." With Steven R. Brenner. To the Federal Communications Commission on behalf of WinStar Wireless, Inc., 1996.

Conducted statistical and other analyses of anticompetitive allegations surrounding a major media acquisition and submitted to the Justice Department, 1995.

Assisted in the preparation of testimony for the D.C. District Court regarding the competitive effects of the "must-carry" rules imposed on cable systems, 1996.

Submitted a report, "A Competitive Markup Approach to Establishing Rates When Adding Cable Program Services." With Stanley M. Besen. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1994.

Submitted a report, "Exclusivity and Differential Pricing for Cable Program Services." With Stanley M. Besen and Steven R. Brenner. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1993.

Submitted a report, "An Analysis of Cable Television Rate Regulation." With Stanley M. Besen and Steven R. Brenner. To the Federal Communications Commission on behalf of Tele-Communications, Inc., 1993.

Evaluated the prospects for Direct Broadcast Satellites on behalf of a potential investor, 1992.

Assisted in the preparation of testimony on the value of distant signal programming to earth station owners on behalf of the Motion Picture Association of America, 1992.

Prepared estimates of the supply elasticity of crude oil production and a paper, with F. Warren-Boulton and K. Baseman, on the alternatives to traditional pipeline regulation for a pipeline client, 1991-1992.

Prepared analyses of liability and damage estimates, with F. Warren-Boulton, on behalf of NEC in a bid-rigging allegation and presented those analyses to Justice Department officials, 1991.

Prepared a report, "Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule." With F. Warren-Boulton. On behalf of the Motion Picture Association of America, 1990.

Submitted a report, "Assessing The Effect of Rate Deregulation on Cable Subscribers." With Sherman and Baseman. To the Federal Communications Commission on behalf of the National Cable Television Association, 1990.

Submitted an affidavit, "Economic Implications of the Pac Tel/Chicago Waiver Request." To the Department of Justice on behalf of the National Cable Television Association, January 1990.

Submitted an analysis of sham litigation allegations to the Justice Department on behalf of a software client, 1989.

PUBLICATIONS

"Analyzing Vertical and Horizontal Cross Ownership in Cable Television: the Time Warner-Turner Merger (1996)," in J.E. Kwoka and L.J. White, *The Antitrust Revolution: Economics, Competition, and Policy*, Scott, Foresman. With S. Besen, E. Murdoch, D. O'Brien, and S. Salop. Third Edition, Oxford University Press, 1999.

"Telecommunications in the U.S.: Evolution to Pluralism." With S. Besen and S. Brenner. In B. Lange (ed.), *ISDN in the USA, Japan, Singapore and Europe*, 1996.

"Market Structure, Program Diversity, and Radio Audience Size." With R. Rogers. *Contemporary Economic Policy* 1996.

"Rate Regulation, Effective Competition, and the Cable Act of 1992." With S. Besen. *Hastings Communications and Entertainment Law Journal*, 1994.

"Assessing Competition and Deregulation in Telecommunications: Some Observations on Methodology." In B. Cole (ed.), *After the Breakup: Assessing the New Post-AT&T Divestiture Era*. New York: Columbia University Press, 1991.

"Deterrence and Justice." With J. Bilmes. *Research in Law and Economics*, 1991.

"The First Amendment, Cable MTV, and the Must-Carry Rule: Towards a Cost-Benefit Analysis." *Proceedings of the Airlie House Conference on Telecommunications*, 1987.

"Video Competition and Consumer Welfare." In E. Noam (ed.), *Proceedings of the Arden House Conference on Video Competition*. New York: Columbia University Press, 1986.

Misregulating Television. With S. Besen, R. Metzger, and T. Krattenmaker. Chicago: University of Chicago Press, 1984.

"Regulation, Deregulation, and Antitrust in Telecommunications." With S. Besen. *Antitrust Bulletin*, Spring 1983.

"Determinants of Network Television Program Prices: Implicit Contracts, Regulation, and Bargaining Power." With S. Besen and G. Fournier. *Bell Journal of Economics*, Autumn 1983.

"Advertising, Price Competition, and Market Structure." With A. Arterburn. *Southern Economic Journal*, January 1981.

"Exchange Rate Stability and Monetary Policy." With B. Putnam. Albany Discussion Paper #95 in *Review of Economics and Business Research*, Winter 1980.

"Capital Market Integration Under Fixed and Floating Exchange Rates: An Empirical Analysis." *Journal of Money, Credit, and Banking*, May 1980.

OTHER COMPLETED RESEARCH

"Empirical Evidence on Efficiencies in the Common Ownership of Broadcast Stations." With K. Anderson. Comments on FCC Proceeding, 1991.

"Do Government-Imposed Ownership Restrictions Inhibit Efficiency?" *Working Paper of the Bureau of Economics*, No. 169, 1988.

"Over-the-Air Television and Cable Prices: An Econometric Inquiry." With M. Bykowsky. Served as basis of FCC decision deregulating cable prices, 1985.

"The Effect of Rate Regulation and Franchise Delay on Program Availability." With D. Koran. Comments on FCC Proceeding, 1985.

"Pricing Flexibility and Consumer Welfare: The Deregulation of Basic Cable Rates." NCTA White Paper, 1984.

"Economic Assessment of the Financial Interest and Syndication Rules." With K. Anderson. Comments on FCC Proceeding, 1983.

"Domestic Fixed Satellite Transponders Sales." Comments on FCC Proceeding, 1982.

An Analysis of Television Program Production, Acquisition, and Distribution. With R. Metzger. Network Inquiry Special Staff, Preliminary Report, Federal Communications Commission, June 1990.

"Production Abroad: Theoretical Considerations and Empirical Analysis." Mimeo, 1978.

"Scale Economies in the Airline Industry: A Survey." Mimeo, 1978.

PRESENTED PAPERS

"Market Structure, Program Diversity, and Radio Audience Size." With R. Rogers. Meetings of the Western Economics Association, July 1993.

"The Effects of Rate Deregulation on Cable Subscribers." With K. Baseman. Policy Approaches to the Deregulation of Network Industries: An American Enterprise Institute Conference, October 1990.

"Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule." Telecommunications Policy Research Conference, Airlie House, October 1990.

"The Design and Evaluation of Competitive Rules Joint Ventures for Mergers and Natural Monopolies." With F. Warren-Boulton. American Economic Association Meetings, December, October 1990.

"Do Media Ownership Restrictions Reduce Economic Efficiency?" Telecommunications Policy Research Conference, Airlie House, November 1989.

"The Conflict Between Spectrum Efficiency and Economic Efficiency." With R. Rogers. Telecommunications Policy Research Conference, Airlie House, November 1989.

"Regulation versus Antitrust." Annenberg Conference: The Divestiture Five Years Later." March 1989.

"Regulating Cable Television." Telecommunications Policy Research Conference, Airlie House, September 1987.

"An Empirical Analysis of Television Program Prices." With S. Besen and G. Fournier. Meetings of the Southern Economic Association, November 1981.

"Flexible Exchange Rates and Market Integration." With B. White. Federal Reserve System Conference on Financial Market Research, June 1979.

"Advertising, Price Competition, Market Structure." With A. Arterburn. Meetings of the Southern Economic Association, November 1978.

"The Effects of Exchange Rate Systems on International Capital Market Integration." With B. White. Federal Reserve System Conference on International Research, November 1977.

OTHER PROFESSIONAL ACTIVITIES

Chair, "Competition between Cable Television and Telephone Companies." Telecommunications Policy Research Conference, September 1991.

Discussant, "Competition and Ownership in the Media." Telecommunications Policy Research Conference, September 1991.

Chair, "Spectrum Management Session." Telecommunications Policy Research Conference, Airlie House, September 1988.

Book Review, *Productivity in the United States* by John Kendrick and Elliot Grossman, *Southern Economic Journal*, April 1981.

Discussant, "Deregulation of Telecommunications." Meetings of the Western Economic Association, July 1981.

Referee, *Southern Economic Journal*, *RAND Journal of Economics*, Harvard University Press.

AWARDS

- Award for Excellence in Economics (FTC), 1988
- Competition Advocacy Award (FTC), 1987
- Brookings Economic Policy Fellow, 1978–1979
- SUNY Faculty Research Grant, 1978
- NSF Traineeship, 1973–1974
- *Finalist*, Woodrow Wilson Fellowship Competition, 1971

Exhibit 2: List of Documents and Materials Reviewed

I. Prior Decisions and Codes of Law

- 1 17 U.S.C. 801(b)(1)
- 2 "Digital Performance Right in Sound Recordings Act of 1995," Pub. L. No. 104-39, 109 Stat. 336 (1995)
- 3 Copyright Office 37 CFR Part 260, Docket No. 96-5 CARRP DSTR1A, "Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings," *Federal Register*, Volume 63, No 89, May 8, 1998
- 4 Copyright Office 37 CFR Part 260, Docket No. 2001-1 CARRP DSTR2A2, "Determination of Reasonable Rates and Terms for the Digital Performance of Sound Recordings by Preexisting Subscription Services," *Federal Register*, Volume 68, No 128, July 3, 2003
- 5 Copyright Office 37 CFR Chapter II, Docket No. RM 96-3A, "Notice and Recordkeeping for Subscription Digital Transmissions," *Federal Register*, Volume 62, No. 121, June 24, 1997
- 6 Copyright Office 37 CFR Part 261, Docket No. 2000-9 CARRP DTR1A 1&2, "Determination of Reasonable rates and Terms for the Digital Performance of Sound Recordings and Ephemeral Recordings," *Federal Register*, Vol. 67, No. 130, July 8, 2002
- 7 United States, *Music Choice v. Broadcast Music, Inc.*, 04-3444-CV (2d Cir., Oct. 6, 2005)
- 8 United States, *Music Choice v. Broadcast Music, Inc.*, Docket No. 01-6183 (2d Cir. 2003)
- 9 United States, *Music Choice v. Broadcast Music, Inc.*, No. 64 Civ. 3787 (LLS), 2001 U.S. Dist. LEXIS 10368 (S.D.N.Y. July 23, 2001)

II. Email

- 1 Promotion Emails from Artists
- 2 Promotion Emails from Subscribers
- 3 Promotion Emails from Record Labels

III. Sirius and XM Internal Documents

- 1 Sirius Financial Data
- 2 Sirius Satellite Radio Listener Study – Wave 2, June 2006
- 3 Sirius Satellite Radio Listener, Customer Satisfaction Monitor, 2Q'06 Results, August 28, 2006 - Final
- 4 Sirius Satellite Radio 2005 Annual Report and Proxy Statement
- 5 Sirius Subscriber Past Week Listening and Satisfaction, June 2006
- 6 XM Financial Data
- 7 Arbitron Custom Study 2005, Commissioned by XM
- 8 Market Segmentation Study of XM Subscribers by Data Development Corporation, May 2005
- 9 National Brand Tracking for XM Satellite Radio by Brandware, February 2005
- 10 XM Annual Shareholders Meeting, May 2006
- 11 What's the XM Nation Listening to, 2006
- 12 XM Radio Listener Segmentation Report by OTX, Fall 2005

IV. Publicly Available Data

- 1 2006 BIA Investing In Radio Market Report

V. News Articles and Press Releases

- 1 "FCC Announces Plan for Satellite DARS," *FCC News Report* No. IN 97-4
- 2 "Stern Is the Draw At Sirius Satellite Radio," *Business Week*, April 10, 2006
- 3 "Is Howard Stern Worth It?" *Business Week*, January 23, 2006
- 4 "Can Stern Make Satellite Radio Hum?" *CNNMONEY.com*, December 21, 2005
- 5 "Justice Department Agrees to Modify Broadcast Music Inc. 1966 Consent Decree," *DOJ Press Release*, June 30, 1994
- 6 "Justice Department Announces Agreement to Modify ASCAP Consent Decree," *DOJ Press Release*, September 5, 2005
- 7 "Sound Exchange Board Meets, Extends Deadlines for Artists/Labels to Receive Royalties from First Distribution, Votes on New Board Members and Receives Word on Latest Distribution," *Soundexchange Press Release*, June 4, 2005
- 8 "Universal Music Settles Payola Probe," *Office of New York State Attorney General Press Release*, May 11, 2006
- 9 "Executive fired amid charges of payoffs," *New York Times*, January 12, 2005
- 10 "Sony BMG settles radio payola probe," *Washington Post*, July 26, 2005
- 11 "Music labels say it costs too much to get songs on the radio," *The Wall Street Journal*, June 10, 2002
- 12 "Radio and labels at odds again," *Billboard*, May 12, 2001
- 13 "Start Me Up: satcasters go early on new artists," *Billboard*, March 17, 2006
- 14 "Smyrled by radio, veteran acts try new outlets," *Billboard*, January 29, 2005
- 15 "XM credited for band's worldwide exposure," *Richmond Times Dispatch*, August 10, 2006
- 16 "Fewer commercials on the horizon?" *CNNMoney.com*, August 15, 2005
- 17 "Satellite option forces traditional radio to alter format," *Newsday*, December 11, 2005
- 18 "Tuning In To Satellite Radio," *Technology Review*, January 25, 2002
- 19 "Major League Baseball Partners With XM Satellite Radio for 11-Year, \$650 Million Broadcast and Marketing Agreement," *XM News Release*, October 20, 2004
- 20 "NASCAR Selects SIRIUS As New Home on Satellite Radio," *Sirius News Release*, February 22, 2005
- 21 "Sony BMG Music Settles Spitzer's Payola Probe," *MSNBC.com*, July 27, 2005

VI. Academic Articles

- 1 Blackburn, D. (2004) "On-line Piracy and Recorded Music Sales," Harvard University Ph.D. Dissertation
- 2 Mortimer, J.H. and A. Sorenson (2005) "Supply Responses to Digital Distribution: Recorded Music and Live Performances," Working Paper
- 3 Oberholzer, F. and K. Strumpf (2005) "The Effect of File Sharing on Record Sales: An Empirical Analysis," Working Paper

VII. 10-Ks and other SEC Filings

- 1 Forms 10-K, XM Satellite Radio Holdings Inc., 1999-2005
- 2 Form 10-K Amendment, Sirius Satellite Radio Inc., 1996, 1998, 2001
- 3 Forms 10-K, Sirius Satellite Radio Inc., 1996-2005
- 4 Form 10-Q, XM Satellite Radio Holdings Inc., June 2006
- 5 Form 10-Q, Sirius Satellite Radio Inc., June 2006
- 6 Form 10-K, Microsoft Corporation, 2005
- 7 Form 10-K, Motorola Inc., 2005
- 8 Form 10-K, Sony Corporation of America, 2005
- 9 Form 10-K, Warner Music Group Inc, 2005
- 10 Form 10-K, EMI Music, 2005
- 11 Form 10-K, Adelphia Cable Communications, 2005
- 12 Form 10-K, Comcast Cable Communications, 2005
- 13 Form 10-K, Cox Communications, 2005
- 14 Form 10-K Time Warner Cable, 2005

VIII. Websites (as viewed on October 29, 2006)

- 1 <http://www.sirius.com>
- 2 <http://www.sirius.com/serve/ContentServer?pagename=Sirius/Page&c=Page&cid=1065475754125>
- 3 <http://www.sirius.com/serve/ContentServer?pagename=Sirius/CachedPage&c=Page&cid=1150907696769>
- 4 <http://investor.sirius.com/releaseprint.cfm?releaseid=205864>
- 5 <http://www.sirius.com/serve/ContentServer?pagename=Sirius/CachedPage&c=Page&cid=1018209032792>
- 6 <http://www.xmradio.com>
- 7 <http://www.xmradio.com/exclusivemusic/>
- 8 <http://www.xmradio.com/exclusivemusic/offstage.jsp>
- 9 http://www.xmradio.com/service_subscription/service_subscription.jsp?resrc=hp_gs
- 10 http://www.xmradio.com/corporate_info/fast_facts.html
- 11 http://www.xmradio.com/how_it_works/xm_studios.html
- 12 http://beradio.com/features/radio_today_radio_history/
- 13 <http://www.musicchoice.com/>
- 14 <http://www.orbicast.com/archives/oprah-joins-xm-satellite-radio.html>
- 15 http://www.hdradio.com/what_is_hd_digital_radio.php
- 16 http://www.stateofthenewsmedia.org/2005/narrative_radio_contentanalysis.asp?cat=2&media=8
- 17 <http://patft.uspto.gov/netahtml/PTO/search-bool.html>
- 18 <http://appft1.uspto.gov/netahtml/PTO/search-bool.html>

IX. Testimony

- 1 Testimony of Adam B. Jaffe, in the matter of Digital Performance Right Sound Recordings and Ephemeral Recordings on behalf of Digital Media Association
- 2 Direct and Rebuttal Testimony of Erik Brynjolfsson, in the matter of Digital Performance Right Sound Recordings and Ephemeral Recordings, on behalf on SoundExchange
- 3 Testimony of Michael Pelcovits, in the matter of Digital Performance Right Sound Recordings and Ephemeral Recordings, on behalf of SoundExchange
- 4 Direct and Rebuttal Testimony of John R. Woodbury in re: Determination of Statutory License Terms and Rates for Certain Digital Subscription Transmissions of Sound Recordings on behalf of DCR and DMX
- 5 Direct and Rebuttal Testimony of John R. Woodbury in BMI rate setting proceeding on behalf of Music Choice
- 6 Direct and Rebuttal Testimony of E. Jane Murdoch and John R. Woodbury before CARP on reasonable license fees for digital performance right in sound recordings and ephemeral recordings of music performed on public radio websites on behalf on NPR/Corporation for Public Broadcasting

X. Interviews

- 1 Interviews with Eric Logan, Executive Vice President of Programming, XM
- 2 Interviews with Mark Vendetti, Senior Vice President of Corporate Finance, XM
- 3 Interviews with John Kramer, Vice President of Corporate Finance, XM
- 4 Interviews with Stephen Cook, Executive Vice President, Automotive, XM
- 5 Interviews with Tony Mastello, Senior President of Operations, XM
- 6 Interviews with John Dealy, Senior Advisor to the CEO, XM
- 7 Interviews with David Frear, Chief Financial Officer, Sirius
- 8 Interviews with Michelle McKinnon, Director of Investor Relations, Sirius
- 9 Interviews with Douglas Kaplan, Senior Vice President, Business Affairs and Development, Entertainment and Sports, Sirius

XI. Other Materials Reviewed

- 1 Satellite Radio Outlook, Kagan Research, LLC, July 2005
- 2 Warner Music Group, 2005 Annual Report
- 3 Market Share Reporter, 2007, Volume 1, "Top Music Firms Worldwide, 2006
- 4 Hoovers Company records - Basic records, Music Choice, August 22, 2006
- 5 Morgan Stanley Analyst Reports
- 6 Bernstein Analyst Reports
- 7 Lehman Brother Analyst Reports

Exhibit 3: XM Radio Channels by Format

Non-Music Content	Music Content
<p><u>Especially for Women (2 channels)</u></p> <ul style="list-style-type: none"> Take Five Oprah & Friends <p><u>News (13 channels)</u></p> <ul style="list-style-type: none"> ABC News & Talk BBC World Service CNN Headline News CNN Quoi de Neuf Canada 360 XM Public Radio FOX News The Weather Channel C-SPAN Radio CNN en Español Bloomberg Radio CNBC <p><u>Talk & Entertainment (13 channels)</u></p> <ul style="list-style-type: none"> E! Entertainment The Power FamilyTalk XM Live Open Road FOX News Talk High Voltage Extreme XM Talk Radio Air America Radio Radio Classics America Right Sonic Theater <p><u>Regional Talk, News & Music (1 channel)</u></p> <ul style="list-style-type: none"> WLW 	<p><u>Christian (3 channels)</u></p> <ul style="list-style-type: none"> The Message Spirit enLighten <p><u>Classical (3 channels)</u></p> <ul style="list-style-type: none"> XM Classics Vox XM Pops <p><u>Comedy (4 channels)</u></p> <ul style="list-style-type: none"> Laugh USA XM Comedy Laugh Attack National Lampoon Comedy Radio <p><u>Country (7 channels)</u></p> <ul style="list-style-type: none"> US Country Willie's Place Bluegrass Junction America The Village Highway 16 X Country <p><u>Dance (5 channels)</u></p> <ul style="list-style-type: none"> Chrome The System XM-Chill BPM The Move <p><u>Decades (6 channels)</u></p> <ul style="list-style-type: none"> The 40s The 50s The 60s The 70s The 80s The 90s <p><u>Jazz & Blues (5 channels)</u></p> <ul style="list-style-type: none"> Beyond Jazz Real Jazz Watercolors Frank's Place Bluesville

(Exhibit 3 Continued)

(Exhibit 3 Continued)

Non-Music Content

Music Content

Traffic & Weather (22 channels)

Miami/Ft. Lauderdale, FL
Washington, DC
Dallas/Ft. Worth, TX
Chicago, IL
Tampa / St. Petersburg, FL
Boston, MA
St. Louis, MO
Seattle, WA
San Francisco, CA
Pittsburgh, PA
XM Emergency Alert
Atlanta, GA
Los Angeles, CA
Houston, TX
Detroit, MI
Phoenix, AZ
Philadelphia, PA
Orlando, FL
New York, NY
Baltimore, MD
San Diego, CA
Minneapolis/St. Paul, MN

Sports (42 channels)

XM Sports Guide
NASCAR Radio
FOX Sports Radio
ESPNEWS
ESPN Radio
XM Sports Nation
XM Deportivo
Home Ice
NHL Hockey Play-by-Play (5 channels)
College Sports - PAC-10 (3 channels)
MLB Play-by-Play Channels (14 channels)
College Sports - Big Ten (3 channels)
College Sports - ACC (3 channels)
MLB Play-by-Play en Español
PGA TOUR Network
Sport Plus
IndyCar Series Racing
MLB Home Plate™
Big East Football/Basketball

Pop & Hits (8 channels)

Top 20 on 20
On Broadway
Cinemagic
U Pop
The Blend
XM Hitlist
Flight 26
The Heart

Kids (2 channels)

Radio Disney
XM Kids

Latin (4 channels)

Caliente
Aguila
Viva
Fuego

Lifestyle (4 channels)

Audio Visions
Escape
Hear Music™
Fine Tuning

Regional News & Talk (5 channels)

Nashville (Today's Country)
KISS
WSIX (Nashville Country)
MIX
Sunny

Rock (14 channels)

Bone Yard
Deep Tracks
Fred
Top Tracks
XM Cafe
XMU
The Verge
XM Liquid Metal
Big Tracks
Lucy
Fungus
Squizz
The Loft
Ethel

(Exhibit 3 Continued)

(Exhibit 3 Continued)

Non-Music Content	Music Content
	<u>Hip-Hop & Urban (7 channels)</u> RAW The Heat Soul Street The City The Groove The Rhyme Suite 62 <u>World (3 channels)</u> Sur La Route The Joint Air Musique

Note:

Reported channel counts are based upon a complete listing of channels obtained from XM's website as of September 27, 2006. The channel formats in this exhibit reflect the channel classifications used by XM. The channels in the music, comedy, and kids formats are assigned to "music" content because they all use commercially released music.

Source:

XM website.

Exhibit 4: Sirius Radio Channels by Format

Non-Music Content	Music Content
<u>Family & Kids (2 channels)</u> RadioClassics Discovery Radio Channel	<u>Christian (3 channels)</u> Revolution Praise Spirit
<u>Financial News (2 channels)</u> CNBC Bloomberg Radio	<u>Classical (3 channels)</u> Symphony Hall Classical Voices SIRIUS Pops
<u>International News (6 channels)</u> BBC Mundo CBC Radio One Première Plus BBC World Service News Radio Korea World Radio Network	<u>Comedy (3 channels)</u> Blue Collar Comedy Raw Dog Laugh Break
<u>Public Radio (3 channels)</u> NPR Talk PRI Public Radio International C-SPAN Radio	<u>Electronic and Dance (5 channels)</u> Area 33 Boombox Chill The Beat The Strobe
<u>Religion (2 channels)</u> Christian Talk EWTN Global Catholic Network	<u>Family & Kids (2 channels)</u> Radio Disney Kids Stuff
<u>Talk (13 channels)</u> Howard 100 Howard 101 SIRIUS Stars E! Entertainment Radio Maxim Radio Court TV Radio SIRIUS Patriot FOX News Talk SIRIUS Left Road Dog Trucking SIRIUS OutQ Playboy Radio The Roadhouse	<u>Jazz & Blues (5 channels)</u> Planet Jazz Jazz Café Pure Jazz Spa 73 SIRIUS Blues
<u>US News (5 channels)</u> FOX News Channel CNN CNN Headline News NPR Now ABC News & Talk	<u>Latin & International (5 channels)</u> Universo Latino Rumbón Bande Á Part CBC Radio 3 Iceberg Radio <u>Country (5 channels)</u> The Roadhouse Outlaw Country New Country Prime Country Bluegrass

(Exhibit 4 Continued)

(Exhibit 4 Continued)

Non-Music Content

Traffic & Weather (12 channels)

New York
Boston/Philadelphia
Los Angeles
Chicago/St. Louis
Washington DC/Baltimore
Atlanta/Miami
Dallas/Houston
Detroit/Pittsburgh
San Francisco/Seattle
Phoenix/San Diego
Orlando/Tampa-St. Petersburg
SIRIUS Weather & Emergency

Lifestyles (3 channels)

Martha Stewart Living Radio
LIME
Cosmo Radio

NBA (1 channel)

NBA Radio on SIRIUS

NFL (1 channel)

SIRIUS NFL Radio

Sports News & Talk (6 channels)

Sports Play-by-Play 1
ESPN Radio
ESPNEWS
Sports Byline USA
SIRIUS Sports Action
ESPN Deportes

Music Content

Rock (19 channels)

Classic Rewind
The Vault
Jam_ON
The Spectrum
Buzzsaw
Octane
Alt Nation
First Wave
Hair Nation
SIRIUS Disorder
Underground Garage
Left Of Center
Hard Attack
Faction
The Coffee House
Radio Margaritaville
Reggae Rhythms
Rolling Stones Radio
Classic Vinyl

Standards (2 channels)

Standard Time
Broadway's Best

Hip-Hop/R&B (6 channels)

Backspin
Shade 45
Hot Jamz
Heart & Soul
Soul Town
Hip-Hop Nation

Pop (13 channels)

SIRIUS Hits 1
Star Lite
SIRIUS Love
Movin' Easy
SIRIUS Gold
'60s Vibrations
Totally '70s
Big '80s
The Pulse
The Bridge
BBC Radio 1
Super Shuffle
Elvis Radio

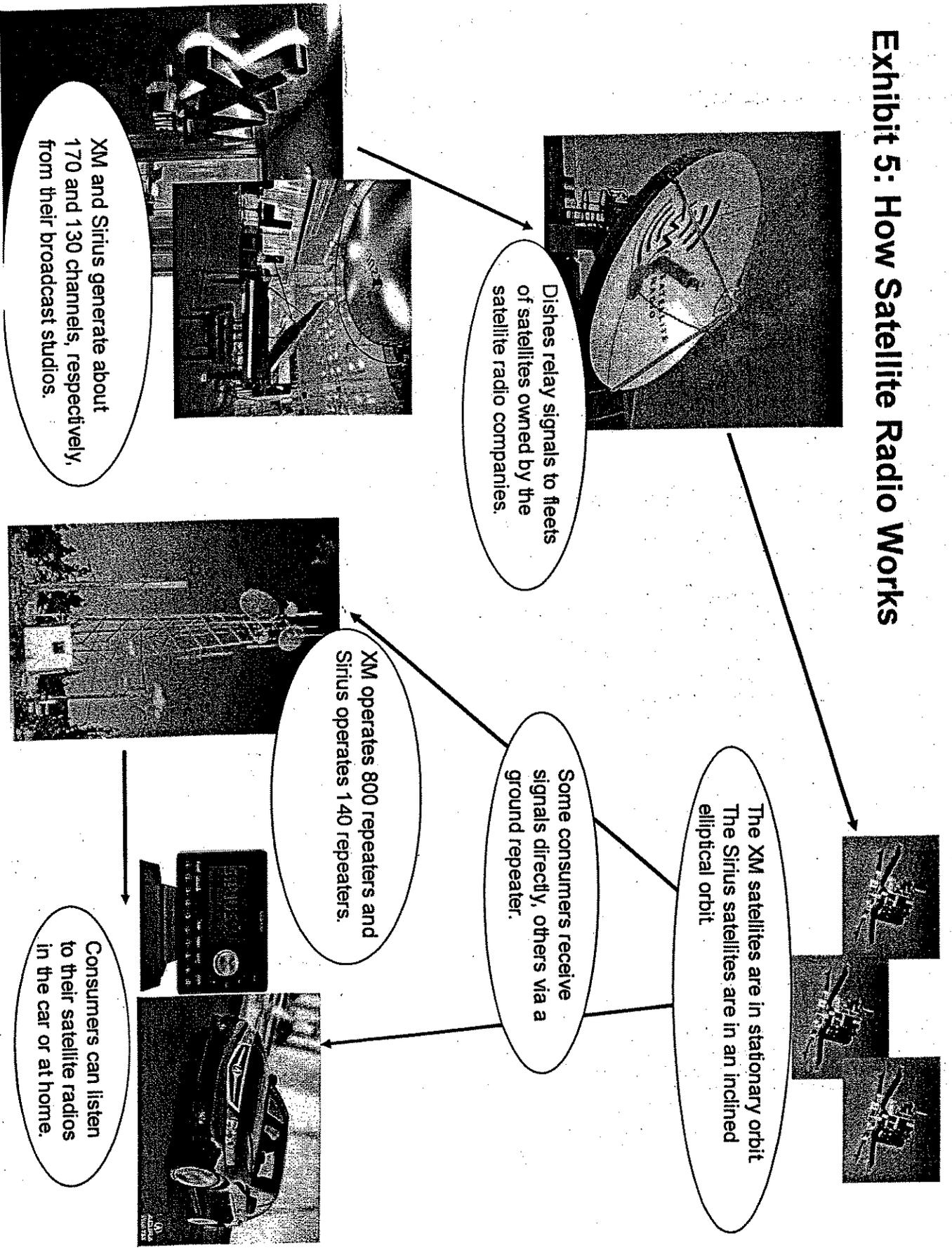
Note:

Reported channel counts are based upon a complete listing of channels obtained from Sirius' website as of September 27, 2006. The channel formats in this exhibit reflect the channel classifications used by Sirius. The channels in the music, comedy, and kids formats are assigned to "music" content because they all use commercially released music.

Source:

Sirius website.

Exhibit 5: How Satellite Radio Works



**Exhibit 6: Music Choice, XM Satellite Radio, and Sirius Satellite Radio
Music Channels by Format**

Format¹	Music Choice (Audio Content Only)	XM Radio	Sirius Radio
Urban ²	7	7	6
Rock	8	14	19
Pop ³	9	17	13
Dance ⁴	3	5	5
Country ⁵	4	9	5
Jazz & Blues	3	5	5
Classical	3	3	3
Religious ⁶	2	3	3
Kids ⁷	1	2	2
Comedy ⁸	0	4	3
Standards and Theatrical ⁹	3	0	2
Latin and International ¹⁰	10	7	5
Lifestyle ¹¹	0	4	0
Other Genres ¹²	5	0	0
TOTAL¹³	58	80	71

Notes:

1. These formats reflect CRA's categorization of the formats used by Music Choice, XM, and Sirius. Except where otherwise noted, CRA format classifications follow those used by Music Choice, XM, and Sirius.
2. Urban includes Sirius' Hip-Hop and R&B formats, and XM's Hip-Hop & Urban format
3. Pop includes Music Choice's Pop format and Party Favorites channel within its Variety format; XM's Hits, Decades, and parts of its Regional N&T formats.
4. Dance includes Sirius' Electronic and Dance formats.
5. Country includes XM's Country format and the two country channels from the Regional N&T format.
6. Religious includes the Christian format for both XM and Sirius.
7. Kids includes Radio Disney from Music Choice's Variety format; Sirius' channels within the Family and Kids format (depending on whether they were music or talk centered); and Radio Disney on XM and XM Children. These channels are treated as "music" channels because they use commercially released music.
8. The comedy channels are treated as "music" channels because they use commercially released music.
9. Standards and Theatrical includes Music Choice's Vocal/Theatrical format and its Big Band and Swing channel in its Variety format. Also includes Sirius' Standards format.
10. Latin and International includes Music Choice's Latin format and its Reggae channel from its Variety format. Also includes XM's Latin and World formats and Sirius' Latin & International format.
11. Lifestyle format is split depending on whether the channels are music or talk oriented. Music Choice carries no channels in the Lifestyles format. XM's channels in the Lifestyle format are music and Sirius' channels in the Lifestyle format are talk.
12. Other Genres include Music Choice's Instrumentals format and Showcase and Sounds of the Seasons from the Variety format.
13. XM's Regional N&T channels are not commercial free. The number of commercial-free XM music channels is 69.

Sources:

- XM website.
- Sirius website.
- Music Choice website.

Exhibit 7: Music Choice, XM Satellite Radio, and Sirius Satellite Radio Non-Music Channels by Format

Genre¹	Music Choice (Audio Content Only)	XM Radio	Sirius Radio
Sports ²	0	42	8
News ³	0	14	16
Traffic & Weather	0	22	12
Talk ⁴	0	14	13
Kids ⁵	0	0	2
Religious ⁶	0	1	2
Lifestyle	0	0	3
TOTAL	0	93	56

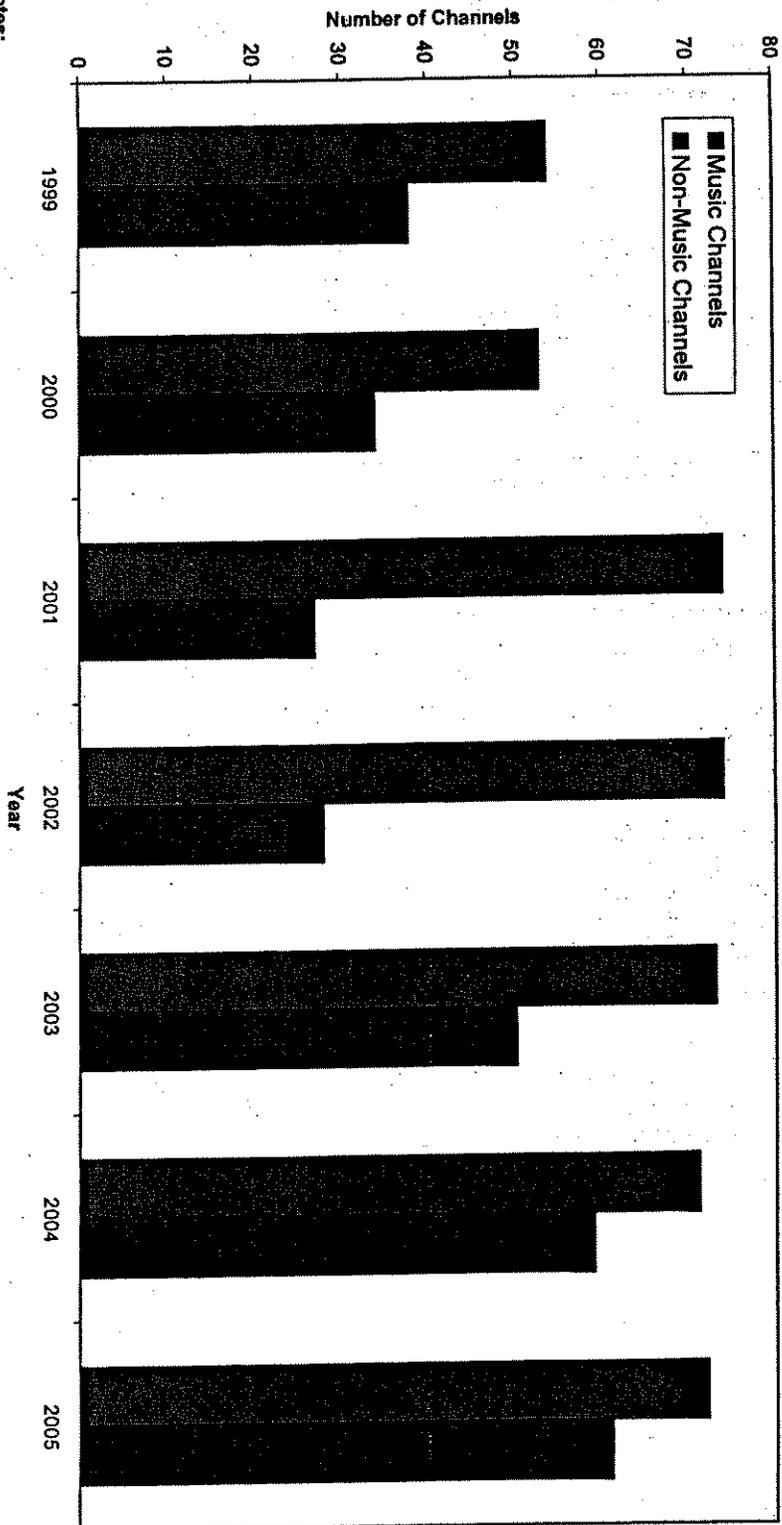
Notes:

1. These formats reflect CRA's categorization of the formats used by XM and Sirius. Except where otherwise noted, CRA format classifications follow those used by XM and Sirius.
2. Sports includes Sirius' NBA, NFL, and Sports News & Talk formats.
3. News includes Sirius' Financial News, International News, Public Radio and US News formats; and XM's News format as well as the WLW channel within the Regional News & Talk format.
4. Talk includes XM's Talk (except for the Christian Talk channel), Entertainment, and Especially for Women formats.
5. Kids includes Sirius' channels within the Family and Kids formats (depending on whether they were music or talk centered).
6. Religious includes Sirius' Religion format and the Christian Talk channel from XM's Talk format.

Sources:

- XM website.
- Sirius website.
- Music Choice website.

Exhibit 8.a: Number of Music and Non-Music Channels on XM, 1999-2005

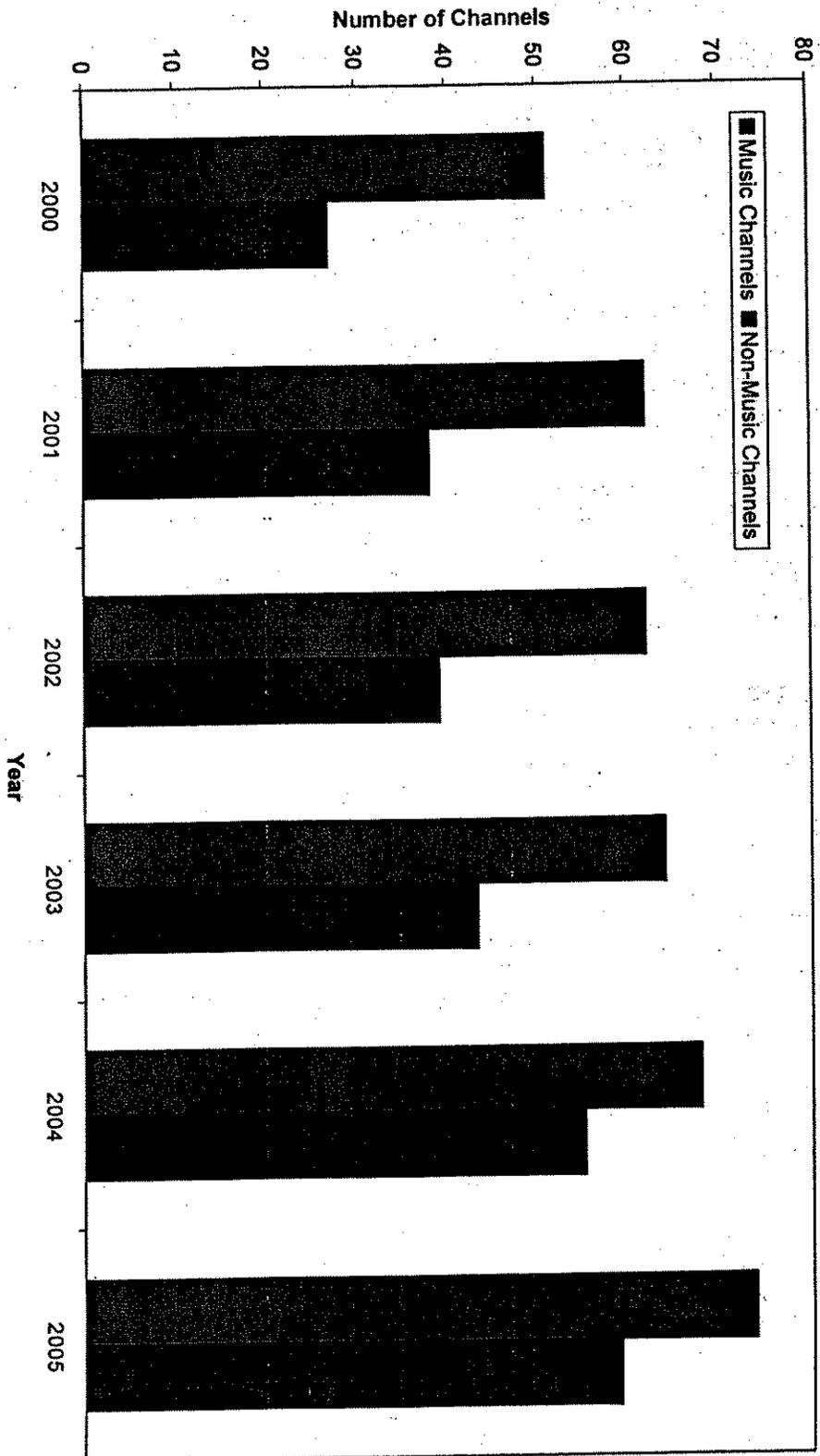


Notes:

1. 1999 and 2000 channel lineups were representative of what XM planned to offer at the time for future programming. These channel lineups included "Reserved Channels" for Special / Events programming.
2. XM channel lineups in 2001 and 2005 include the Preview channel as a non-music channel.
3. Play-by-Play channels are reported as one channel.
4. Kids and Comedy channels are counted as music channels.

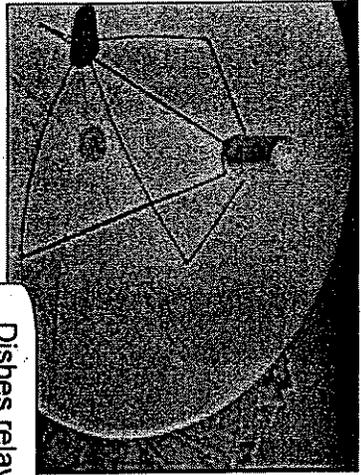
Sources: XM Form 10-K's, 1999-2005.

Exhibit 8.b: Number of Music and Non-Music Channels on Sirius, 2000-2005



Note:
Kids and Comedy channels are counted as music channels.
Sources: Sirius Form 10-K's, 1999-2005

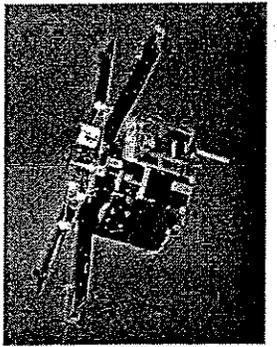
Exhibit 12: How Music Choice Works



Dishes relay signals to third-party satellites.

Music Choice programs approximately 58 music channels.

Music CHOICE



Cable providers receive signals and transmit them over their networks.

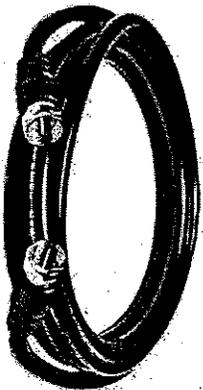
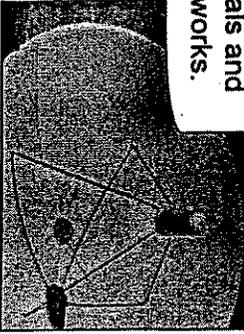


Exhibit 18: Music Channels by Format for XM, Sirius, and the Five Largest Over-the-Air Radio Markets

Format ¹	Over-the-Air Radio Markets ¹⁵						
	XM	Sirius	New York	Los Angeles	Chicago	San Francisco	Dallas-Ft. Worth
Urban ²	7	6	5	4	4	3	6
Rock ³	14	19	10	4	9	11	3
Pop ⁴	17	13	16	15	22	13	10
Dance ⁵	5	5	0	0	0	1	0
Country ⁶	9	5	0	0	3	2	11
Jazz & Blues ⁷	5	5	1	1	1	2	1
Classical	3	3	1	1	1	1	1
Religious ⁸	3	3	1	1	4	1	5
Kids ⁹	2	2	0	0	0	0	0
Comedy ¹⁰	4	3	0	0	0	0	0
Standards and Theatrical ¹¹	0	2	7	3	5	1	2
Latin and International ¹²	7	5	4	3	4	3	5
Lifestyle ¹³	4	0	3	0	0	2	0
Total Music Channels ¹⁴	80	71	48	32	53	40	44
Total Channels	173	127	73	75	86	68	67

Notes:

1. These formats reflect CRA's categorization of the formats used by BIA, XM, and Sirius. Except where otherwise noted, CRA format classifications follow those used by BIA, XM, and Sirius.
2. Urban includes Sirius' Hip-Hop and R&B formats; XM's Hip-Hop & Urban format; and BIA's Urban format (excluding Blues).
3. Rock includes BIA's Rock and Album Oriented Rock/Classic Rock formats.
4. Pop includes XM's Hits, Decades and parts of its Regional N&T formats; BIA's Oldies, Adult Contemporary, and Contemporary Hit Radio/Top 40 (excluding Dance) formats.
5. Dance includes Sirius' Electronic and Dance formats; and Dance in BIA's Contemporary Hit Radio/Top 40 format.
6. Country includes XM's Country format and the two country channels from the Regional N&T format.
7. Jazz & Blues includes BIA's Jazz/New Age format and Blues in its Urban format.
8. Religious includes the Christian format for both XM and Sirius and BIA's Religion format.
9. Kids includes Sirius' channels within the Family and Kids format (depending on whether they were music or talk centered); and Radio Disney on XM and XM Children. These channels are treated as "music" channels because they use commercially released music.
10. The comedy channels are treated as "music" channels because they use commercially released music.
11. Standards and Theatrical includes Sirius' Standards format; BIA's Nostalgia/Big Bands and Middle of the Road (excluding full services) formats.
12. Latin and International include: XM's Latin and World formats; Sirius' Latin & International format; and BIA's music stations under the Spanish format.
13. Lifestyle format is split depending on whether the channels are music or talk oriented. XM's channels in the Lifestyle format are music; Sirius' channels in the Lifestyle format are talk. Lifestyle also includes BIA's Easy Listening/Beautiful Music format.
14. Over-the-air radio stations with talk format or mixed format are not included in the count.
15. Largest markets determined by metro area population.

Sources:

- Sirius website.
- XM website.
- 2006 BIA Investing In Radio Market Report.

Exhibit 19.a: XM Patents

Patent Number	Filing Date	Patent Title
6,493,546	March 5, 1999	System for providing signals from an auxiliary audio source to a radio receiver using a wireless link
6,272,328	May 12, 1999	System for providing audio signals from an auxiliary audio source to a radio receiver via a DC power line
6,823,169	May 25, 1999	Low cost interoperable satellite digital audio radio service (SDARS) receiver architecture
6,735,416	May 25, 1999	Receiver architecture for SDARS full band signal reception having an analog conversion to baseband stage
6,724,827	May 25, 1999	Low cost interoperable satellite digital audio radio service (SDARS) receiver adapted to receive signals in accordance with advantageous frequency plan
6,295,033	May 25, 1999	Vehicle antenna assembly for receiving satellite broadcast signals
6,154,452	May 26, 1999	Method and apparatus for continuous cross-channel interleaving
6,640,085	September 1, 1999	Electronically steerable antenna array using user-specified location data for maximum signal reception based on elevation angle
6,584,003	November 4, 1999	Method and apparatus for composite data stream storage and playback
6,549,774	November 4, 1999	Digital audio service satellite receiver having switchable operating modes for stationary or mobile use
6,510,317	November 4, 1999	Satellite digital audio radio service tuner architecture for reception of satellite and terrestrial signals
6,442,385	November 4, 1999	Method and apparatus for selectively operating satellites in tundra orbits to reduce receiver buffering requirements for time diversity signals
6,347,216	November 4, 1999	Method and system for providing geographic specific services in a satellite communications network
6,229,824	November 4, 1999	Method and apparatus for concatenated convolutional encoding and interleaving
7,020,217	November 4, 1999	Satellite digital audio radio receiver with instant replay capability
7,123,875	November 4, 1999	System and method for multipoint distribution of satellite digital audio radio service
6,563,805	November 5, 1999	Digital radio prepaid music recording system
6,397,076	November 5, 1999	Method and apparatus for dispatch communications in a broadcast radio system
6,229,499	November 5, 1999	Folded helix antenna design
6,232,926	November 10, 1999	Dual coupled vehicle glass mount antenna system
7,010,263	December 14, 1999	System and method for distributing music and data
6,614,767	October 17, 2000	Method and apparatus for continuous cross-channel interleaving
6,876,835	October 25, 2000	Method and apparatus for providing on-demand access of stored content at a receiver in a digital broadcast system
6,834,156	October 25, 2000	Method and apparatus for controlling user access and decryption of locally stored content at receivers in a digital broadcast system
6,686,880	October 25, 2000	Method and apparatus for prompting a reverse channel response from receiver in a digital broadcast system
6,970,565	December 22, 2000	Apparatus for and method of securely downloading and installing a program patch in a processing device
6,538,609	April 30, 2001	Glass-mountable antenna system with DC and RF coupling
7,058,086	May 7, 2001	Method and apparatus for concatenated convolutional encoding and interleaving
6,785,656	June 5, 2001	Method and apparatus for digital audio playback using local stored content
6,483,471	June 6, 2001	Combination linearly polarized and quadrilateral antenna
6,470,058	June 11, 2001	System for and method of jointly optimizing the transmit antenna patterns of two geostationary satellites in a satellite broadcasting system
6,553,077	July 31, 2001	Method and apparatus for customized selection of audio channels

Patent Number	Filing Date	Patent Title
7 010,264	August 17, 2001	System and method for detecting the connections of two antennae to a radio receiver
6,421,020	September 17, 2001	Vehicle antenna assembly for receiving satellite broadcast signals
7,075,946	October 2, 2001	Method and apparatus for audio output combining
6,535,179	October 2, 2001	Drooping helix antenna
6,686,882	October 19, 2001	Apparatus and method for transferring DC power and RF energy through a dielectric for antenna reception
7,035,628	December 31, 2001	Method and apparatus for content blocking
6,661,386	March 29, 2002	Through glass RF coupler system
6,621,458	April 2, 2002	Combination linearly polarized and quadrifilar antenna sharing a common ground plane
6,806,838	August 14, 2002	Combination satellite and terrestrial antenna (Patent Jointly Held with Delphi-D Antenna Systems)
6,810,233	November 7, 2002	System for providing signals from an auxiliary audio source to a radio receiver using a wireless link
Pending	April 30, 2001	Glass-mountable antenna system with DC and RF coupling
Pending	May 7, 2001	Method and apparatus for concatenated convolutional encoding and interleaving
Pending	June 14, 2004	Antenna diversity system
Pending	December 15, 2004	Digital remodulation
Pending	January 14, 2005	Automatic on/off switch for vehicle power outlets
Pending	April 22, 2005	Method and system for converting streaming digital data to FM modulated data
Pending	September 22, 2005	Method and system for hierarchical modulation and demodulation for digital radio
Pending	September 22, 2005	Wireless satellite digital audio radio service (SDARS) head unit with portable subscription and cell phone abilities (Joint Filing with Interoperable Technologies and Sirius)

Note:
The Patent and Trademark Office's Patent Application Full-Text and Image Database only includes pending patents filed since 2001.

Sources:
United States Patent and Trademark Office, Patent Full-Text and Image Database, available at <<http://patft.uspto.gov/netahtml/PTO/search-bool.html>>.
United States Patent and Trademark Office, Patent Application Full-Text and Image Database, available at <<http://appft1.uspto.gov/netahtml/PTO/search-bool.html>>.

Exhibit 19.b: Sirius Patents

Patent Number	Filing Date	Patent Title
5,278,863	April 10, 1992	Radio frequency broadcasting systems and methods using two low-cost geosynchronous satellites
5,319,673	April 16, 1993	Radio frequency broadcasting systems and methods using two low-cost geosynchronous satellites
5,485,485	April 13, 1994	Radio frequency broadcasting systems and methods using two low-cost geosynchronous satellites and hemispherical coverage antennas
5,592,471	May 4, 1995	Mobile radio receivers using time diversity to avoid service outages in multichannel broadcast transmission systems
5,745,839	September 1, 1995	Satellite multiple access system with distortion cancellation and compression compensation
5,864,579	July 25, 1996	Digital radio satellite and terrestrial ubiquitous broadcasting system using spread spectrum modulation
5,720,039	November 1, 1996	Satellite multiple access system with distortion cancellation and compression compensation
5,794,138	February 26, 1997	Satellite broadcast system receiver
6,023,616	March 10, 1998	Satellite broadcast receiver system
6,223,019	May 20, 1998	Efficient high latitude service area satellite mobile broadcasting systems
6,564,053	October 19, 2000	Efficient high latitude service area satellite mobile broadcasting systems
6,892,987	July 25, 2003	Predicting, bounding and mitigating satellite attitude disturbances arising from infrared earth sensors for satellites in inclined, elliptical orbits
Pending	July 9, 2001	System and method for creating and receiving personalized broadcasts
Pending	September 22, 2005	Wireless satellite digital audio radio service (SDARS) head unit with portable subscription and cell phone abilities (Joint Filing with Interoperable Technologies and XM)

Note:

The Patent and Trademark Office's Patent Application Full-Text and Image Database only includes pending patents filed since 2001.

Sources:

United States Patent and Trademark Office, Patent Full-Text and Image Database, available at <<http://patft.uspto.gov/netahtml/PTO/search-bool.html>>.
 United States Patent and Trademark Office, Patent Application Full-Text and Image Database, available at <<http://appft1.uspto.gov/netahtml/PTO/search-bool.html>>.

Exhibit 19.c: Music Choice Patents

Patent Number	Filing Date	Patent Title
6,879,963	April 12, 2000	Cross channel delivery system and method
7,028,082	March 8, 2001	Personalized audio system and method
7,076,561	March 18, 2002	Personalized audio system and method
Pending	April 12, 2006	Media content delivery systems and methods

Note:

The Patent and Trademark Office's Patent Application Full-Text and Image Database only includes pending patents filed since 2001.

Sources:

United States Patent and Trademark Office, Patent Full-Text and Image Database, available at <<http://patft.uspto.gov/netahtml/PTO/search-bool.html>>.
United States Patent and Trademark Office, Patent Application Full-Text and Image Database, available at <<http://appft1.uspto.gov/netahtml/PTO/search-bool.html>>.

**Exhibit 20: Sirius Expenditures on Engineering, Design, and Development
and XM Expenditures on Research and Development**

Year	Sirius Engineering, Design, and Development ¹ ('000s)	XM Research and Development ² ('000s)
1994 to 1997	\$1,390	N/A
1998	\$2,150	\$7,311
1999	\$33,134	\$6,510
2000	\$70,690	\$11,948
2001	\$58,453	\$13,689
2002	\$30,087	\$10,843
2003	\$24,534	\$12,285
2004	\$30,520	\$23,513
2005	\$44,745	\$31,218
First and Second Quarters 2006	\$35,166	\$19,499
Cumulative Expenditures Since 1994 ³	\$330,869	\$136,816
Cumulative Expenditures Since 2003	\$134,965	\$86,515

Notes:

1. Expenditures reported for Sirius from 1994 to 1996 are for research and development. Expenditures for 1997 to 2006 are for engineering, design, and development.
2. XM research and development expenditures exclude depreciation and amortization.
3. Research and development expenditures for XM were not available prior to 1998.

Sources:

XM Form 10-Ks, 1999-2005; XM Form 10-Q, June 2006.
Sirius Form 10-Ks, 1996-2005; Sirius Form 10-K Amendment, 1996; Sirius Form 10-Q, June 2006.

Exhibit 23: Sirius and XM Net Losses Since Inception¹

Year	Sirius Net Losses ('000s)	XM Net Losses ('000s)
Prior to 1997	-\$18,536	N/A
1997 ²	-\$4,737	-\$1,659
1998	-\$48,396	-\$16,167
1999	-\$62,822	-\$36,896
2000	-\$134,744	-\$51,873
2001 ³	-\$235,763	-\$284,379
2002 ⁴	-\$422,481	-\$495,012
2003	-\$226,215	-\$584,535
2004	-\$712,162	-\$642,368
2005	-\$862,997	-\$666,715
First and Second Quarters 2006	-\$696,372	-\$378,330
Cumulative Net Losses Since 2003	-\$2,497,746	-\$2,271,948
Cumulative Net Losses Since Inception	-\$3,425,225	-\$3,157,934

Notes:

1. Sirius' inception was in May 1990 (as Satellite CD Radio), followed by an initial public offering (as CD Radio) in September 1994. XM's inception was in June 1992 (as American Mobile Radio), followed by an initial public offering was in October 1999.
2. Sirius and XM received licenses from the FCC in October 1997 to construct and operate satellite radio services.
3. XM service became available nationwide in November 2001.
4. Sirius service became available nationwide in July 2002.

Sources:

XM Form 10-Ks, 1999-2005. XM Form 10-Q, June 2006.
 Sirius Form 10-Ks, 1996-2005. Sirius Form 10-K Amendment, 1996. Sirius Form 10-Q, June 2006.