Satellite Industry Overview

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Satellite Industry Overview

Services & Applications

Voice/Video/Data Communications
- Rural Telephony
- News Gathering/Distribution
- Internet Trunking
- Corporate VSAT Networks
- Tele-Medicine
- Distance-Learning
- Mobile Telephony
- Videoconferencing
- Broadcast and Cable Relay
- VOIP

Direct-To-Consumer
- Broadband
- DTH/DBS Television
- Digital Audio Radio

GPS/Navigation
- Position Location
- Timing
- Search and Rescue
- Mapping
- Fleet Management

Remote Sensing
- Pipeline Monitoring
- Infrastructure Planning
- Forest Fire Prevention
- Urban Planning
- Flood and Storm watches
- Air Pollution Management

Infrastructure / Support Services

Launch Vehicles | Ground Equipment | Insurance | Manufacturing
Satellite Orbits

- 3 most popular satellite orbits
  - LEO – Low Earth orbit
    - Below 1,250 miles above earth
      - Takes 90 – 120 minutes to rotate around earth
  - MEO – Medium Earth Orbit
    - 6,250 miles above earth
      - Approximately 6 hours to rotate around earth
  - GEO – Geosynchronous Orbit
    - 22,282 miles above earth
      - Approximately 24 hour to rotate around earth
Figure 3: Geostationary Satellites by Orbital Location
Fixed Satellite Services

- Data/Telephony Communications
- Internet Trunking
- Internet Backbone Connectivity
- Video Services/DBS/DTH
- Corporate Network Services
- Connecting “Unfibered”/Low Teledensity Locations
- Cable Distribution/ Restoration/ Redundancy
VSAT Satellite System

- Public Switched Network or Dedicated Circuits (Terrestrial or SATCOM)
- USER TERMINALS – Can range from single one meter diameter to multiple large (~30 meter); TELEPORTS
Typical DBS System
At the end of 2003, there were nearly 22 million U.S. Satellite Television Subscribers—over 20% of U.S. Television Households

- DBS- 21.4 million subscribers
- C-Band- 430,000 subscribers

TOTAL U.S. TELEVISION HOUSEHOLDS: 106.6 Million (source: Nielsen Media Research)
**DBS Penetration**

Top Ten States--Highest DBS Penetration

- Vermont - 30%
- Montana - 28.7%
- Idaho - 26.5%
- Utah - 26.1%
- Wyoming - 26.1%
- Missouri - 24.4%
- Mississippi - 23.8%
- Arkansas - 23.2%
- New Mexico - 21.8%
- Colorado - 21.4%
Mobile Satellite Services

- Anytime, anywhere telecom critical to homeland security
- Most reliable service for first response disaster recovery
- Remote data telemetry monitors US infrastructure
  - Utilities – oil/gas/water pipelines, electrical distribution
  - Trains/trucks – location/status monitoring
- Remote telephony key to infrastructure safety
  - Repair/maintenance of dams, bridges
  - Fiber restoration
- Maritime/Aeronautical communication
  - Lifeline for ships/planes
  - Emergency communications
  - Tracking dangerous shipments
  - Broadband commercial and government services
Satellite Telephony
Remote Sensing

- Provides scientific, industrial, civil, military and individual users with high-resolution images for:
  - natural resource monitoring
  - urban and utility/telecom planning
  - agricultural assessments
  - insurance and risk management
  - oil and gas exploration
  - mapping
  - natural disaster/emergency response
  - national/regional security

- Sub Meter commercial imagery
Navigation – GPS

• A military system that is now central to the lives of millions of civil and commercial users
  • Public safety dispatch – improves response time
  • Search and Rescue – locates emergency calls
  • Air Traffic Control – guides planes in all weather
  • Telecommunications – primary timing source, E-911 enabler
  • Transportation – tracks trains, trucks, vital shipments

• Underpins US Warfighting
  • Precision Munitions
  • Cruise Missiles
  • Unmanned Aerial Vehicles
Emerging Services/Applications

- Satellite Radio
- Satellite Broadband
- Broadband Aeronautical
- DBS
  - Interactive TV
  - PVR
  - HDTV
Consumer Satellite Broadband

Existing Services

500 + Kbps to User
40 - 60 Kbps from User

Future Services

2+ Mbps to User
400+ Kbps from User
Satellite Radio

Subscriber Growth

How a Satellite Radio System Works
**Critical To The Economy**

- Backbone of national TV, radio, and print media distribution
- Billions of data, credit, banking transactions daily
- Allows decentralized telecommunications and document storage for a variety of financial institutions and global trading operations
- Broadly used for inventory management, point of sale data collection, credit-card validation and e-mail delivery.
- Examples cut across every major US industry:
  - WalMart – every location
  - US Postal Service – every post office
  - Ford, GM - every supplier, dealership
  - RiteAid – every drugstore
  - Texaco, Exxon – every station
Satellites in Every-Day Life

Pump Gas
Eat Out
Watch TV

Shop

Transact Financially
Stay at Hotels
Buy & Service Automobile
Critical to Broadcast Industry

• Newsgathering – First choice for live coverage, providing high-bandwidth video links from remote locations to capture “breaking news”

• Program Delivery – Primary feeds for network TV and radio broadcasts to affiliates and cable TV head-ends
Telecommunications Back-bone
Critical to Homeland Security

- Not subject to physical damage that terrestrial networks are exposed to
- Lifeline for emergency workers, first responders, government and military planners
- News organizations rely on satellite phones and satellite trucks to report from the scene
- Enable data telemetry which monitors US infrastructure in remote areas
- Public safety dispatch – improves response time by locating emergency calls
- Primary information source to millions of Americans
Emergency Preparedness Users

Bureau of Indian Affairs
Centers for Disease Control
Environmental Protection Agency
Federal Aviation Administration
Federal Bureau of Investigation
Fish and Wildlife Service
Food and Drug Administration
General Services Administration
Internal Revenue Service
National Institutes of Health
National Park Service
National Weather Service*
Nuclear Regulatory Commission
Transportation Security Agency
Social Security Administration
White House

U.S. Senate
U.S. Navy
U.S. Army
U.S. Air Force
U.S. Coast Guard
U.S. Marine Corps
U.S. Forest Service
U.S. Customs Service
U.S. Geological Survey
Department of Commerce
Department of Agriculture
Department of Justice
Department of State
Department of Homeland Security
Department of the Treasury
Department of Veterans Affairs
Agency for International Development
Rural Satellite Applications
Telemedicine Via Satellite

- Remote medical diagnosis system for:
  - isolated sites (rural and remote hospitals, work sites, etc.)
  - mobile sites (ships, aircraft, etc.)

- Allows the user to identify patient identity, blood pressure, temperature, etc. collected in situ by non-medical personnel

- Avoidance of unnecessary evacuation or flight diversion for emergency treatment
Distance Learning

- Satellites provide distance learning for schools and students anywhere and everywhere
  - Live, two-way communication over Internet connections, including audio, video and online collaboration
  - Instructional tools (bulletin boards, online testing, homework postings, syllabus and course management software)
  - Collaboration tools (shared white boards, application sharing, specialized document cameras)
Rural – Satellite Phones

• In the vast state of Texas, satellite radios are used to support a regional council that oversees trauma response in 22 counties with rural EMS and hospitals, the Texas Forest Service and the state’s only urban search-and-rescue team.

• All rely on satellite dispatch radios to communicate when a catastrophe hits – whether it’s a flash flood, tornado or explosion.
Rural - Hybrid Networks

- Internet backbone distribution using satellite – local distribution using 2.4 GHz wireless
Entertainment in Rural America

- Digital Television
- Advanced Services - Digital/Personal Video Recorder
- High-Definition Television — Cable networks, pay-per-view sports and movies, original programming
- Satellite Radio
Enabling Ubiquity

Satellites Are The Only Viable Option For Rural America