Managed Communications for the World’s Most Critical Operations
Harris Corporation At-A-Glance

Mission Critical Communications For Commercial & Government Markets Worldwide

Leader in design, development and operation of highly-reliable, secure communications systems and information networks for voice, data, imaging and video

- $5.5 Billion U.S. company based in Melbourne, Florida
- Publicly listed on NYSE (ticker: HRS)
- 15,000+ employees located in 50+ countries around the world
The End-to-End Communications Solutions Arm of Harris Corporation

RF Communications
Tactical and land mobile radios, systems and networking applications for global Defense, Security and Public Safety markets

Government Communications Systems
Technology and systems integration for Defense, National Intelligence and Federal/Civil markets

Information Technology Services
Systems design, professional services, and operations and maintenance for large scale government IT programs

Harris CapRock Communications
End-to-end managed communications services to critical operations in remote and harsh locations for Energy, Maritime, and Government

Trusted at the Intersection of Life & Data
Harris CapRock Communications is the world’s most trusted provider of fully managed, end-to-end communication solutions for operations in remote and harsh environments.

- Mission-Critical Communications
- Converged Voice, Video and Data
- Highly Reliable and Secure Connectivity
- Global Coverage and Support
- Rapid and Mobile Deployments
Self-Owned & Operated Infrastructure
Supports Customers Globally

World’s Largest Facilities-based Provider
- Over a dozen teleports on 6 continents
- Five 24x7 Customer Support Centers
- Local presence in 23 countries
- 1200 employees worldwide

Global Satellite & Terrestrial Network
- 4 GHz capacity across 60+ satellites
- Multi-band services C, Ku, Ka, X, UHF, etc.
- 83 network points-of-presence worldwide
- Industrial & military grade services
True End-to-End Communications
Putting It All Together Into a Managed Network

- Highly Specialized End-to-End Solutions
- Self-owned & Operated Infrastructure
Each Solution is Tailored to the Remote Site Application Environment

Managed Communication Services
- Satellite communications
- Subsea fiber management
- Terrestrial connectivity
- Microwave & wireless services
- Disaster recovery solutions

Professional and Technical Services
- Robust IT services
- Certified specialists
- Contract/dedicated labor
- Teleporting services
- On-site maintenance

Specialized Communications Equipment
- Integrated products
- Ruggedized electronics
- Proprietary VSATs
- Dedicated R&D team

Integrated Solutions
- Communication networks
- Information technology solutions
- Turnkey project management
- Design through commissioning
- Remote assets, onshore/offshore

Single Source for Solutions Designed for Unique Site Requirements

- Secure multi-tenant capabilities
- New build outfitting
- Satellite license facilitation
- Crew morale solutions
- Asset tracking
- Automatic beam switching
- COTM systems
- Follow me networking
- Rugged electronics packages
- Man-packable systems
- Military-grade services
- LMR radio solutions
Why Harris CapRock is the Right Communications Partner

Harris CapRock:

- **Supports** more than 4,000 VSAT sites at operations worldwide, making it the world’s largest provider of fully managed VSAT services to extreme environments.

- **Leverages** its status as the single largest commercial buyer of satellite capacity, with a portfolio of 4 Gigahertz across 60+ satellites.

- **Connects** more government customers to the Global Information Grid than any other service provider.

- **Manages** end-to-end communications services on more than 300 vessels worldwide.

- **Delivers** reliable communications to every ocean region using the industry’s largest and most comprehensive platform of satellite and terrestrial services.

- **Provides** turnkey voice, video & data applications for vessels ranging from tankers to large cruise ships.

- **Designs, Deploys & Maintains** subsea environmental & oil field monitoring solutions, with power and communications networks operating at over 3,000 meters of depth.

- **Owns & Operates** extensive global infrastructure including teleports on six continents and 83 terrestrial points of presence (POP).

- **Manufactures** more stabilized antenna systems than almost any other equipment provider.
The Harris CapRock Difference
A Trusted Partner in Remote Communications

• Industry Leading Solutions for When *Communications Are Not Optional*
  – Complete end-to-end satellite, wireless, and terrestrial communications
  – Custom designed networks and pre-packed off-the-shelf services
  – Exclusive dedication to industrial and military-grade solutions

• Facilities-Based Service Provider *Invested in Customer Mission*
  – World’s largest self-owned and operated infrastructure for remote communications
  – Resilient global network with built-in redundancy and diversity for peace of mind
  – In-house design, engineering, manufacturing, and integration for quality control

• Reputation for Performance, Stability and *Delivering Results*
  – 30+ years past performance in world’s most difficult environments
  – Unmatched *AssuredCare™* customer service program
  – Two time award winner for World Teleport Association’s “Operator of the Year”
Vertical Market Solutions and Customer Case Studies
## Different Antenna Types for Different Application Environments

<table>
<thead>
<tr>
<th>Type</th>
<th>Portable</th>
<th>Deployable</th>
<th>Stabilized</th>
<th>Fixed</th>
<th>C</th>
<th>Ku</th>
<th>X</th>
<th>Ka</th>
<th>UHF</th>
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</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
<td></td>
<td>.96 – 2.4 Meter &quot;Auto Aquire&quot;</td>
<td>1.4 – 2.4 Meter SeaTel or SpaceTrack &quot;Radome&quot;</td>
<td>2.4 – 11.3 Meter Satellite Earth Station</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Government</strong></td>
<td>.45 – 1.3 Meter &quot;Man-pack&quot;</td>
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<td><strong>Maritime</strong></td>
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*Images of different antenna types are shown at the bottom of the page.*
Energy Case Study: Transocean
World’s Largest Fleet of Deep Water Drilling Vessels

• Requirement
  – 150+ vessels operating worldwide
  – Large scale semi-submersible drilling rigs and ships
  – Complete voice, video and data applications

• Challenges
  – Support global operations
  – Frequent moves, adds and changes
  – Tough marine and industrial environment
  – Extreme temperatures and conditions
  – Zero down-time tolerance

• Harris CapRock Solution
  – Complete turn-key managed service solution
  – All shipboard equipment included
  – Stabilized satellite antenna systems
  – On board IT system integration
  – Installation and on-site maintenance
  – C and Ku satellite bandwidth
  – 24 x 7 proactive network management
Maritime Case Study
Deployed Oceanic Data Collection Service

• Requirement
  – Implement surface and undersea monitoring system
  – Collect complex array of acoustic and seismic measurements
  – Uplink data collected in real-time

• Challenges
  – Survive and perform under all ocean conditions
  – Solution must be self-sustaining for extended periods at sea

• Harris CapRock Solution
  – Developed turnkey solution providing communications technology, engineering services and operations support, leveraging capabilities of multiple sub-contractors:
    – Tyco – cable manufacture and deployment
    – OceanWorks – subsea junction box
    – ODI (Ocean Design) – subsea optical and power connectors
    – Schaffer – power supply development
    – OSI (Ocean Specialists) – submarine cable consultants
    – Phoenix Intl – ROV and diver support
Case Study: U.S. Marine Corps
Rapid Deployments with Portable SATCOM

• Requirement
  – Broadband communications for deployed units
  – Support for forward operating bases
  – Converged voice, video, and data
  – High resolution aerial surveillance imagery

• Challenges
  – Multiple theaters of operations from CONUS to SWA
  – Rapid deployments with little advanced notice
  – Traditional government procurement too slow
  – Security requirements associated with mission

• Harris CapRock Solution
  – Custom “bandwidth pool” specific to USMC
  – Bandwidth can move across regions and bands
  – Online portal enables procurement in 5 days or less
  – Monitoring tracks usage, pool availability, response time, and overall bandwidth efficiency
Case Study: Unmanned Aircraft Systems

General Overview of Services Provided

Harris CapRock’s satellite communications solutions support Department of Defense unmanned aerial system missions across the globe. Harris CapRock provides more than 610 MHz of commercial Ku-band capacity to the DoD in support of UAS missions, enabling aerial photography, videography and air attacks without risking troop casualties.

• Requirements
  – UASs require increasing throughput to support high-definition video transmission
  – Most UAS platforms require two-way communications
  – Today’s COMSATCOM-enabled UASs rely primarily on commercial Ku-band

• Challenges
  – Uplink sites and UASs must reside in the footprint(s) cast by the same satellite.
  – Not all satellites have footprints that overlap, so uplink sites are limited in the quantity of satellites they can connect to
  – Because UAVs have small antennas and large throughputs, only a small percentage of satellites are capable of fulfilling the requirement
  – Although there is an over-supply of global capacity, there are bandwidth shortfalls in many locations, e.g., Ku-band in SWA

• Harris CapRock Solutions
  – Provide more than 610 MHz of commercial Ku-band capacity to the DoD in support of UASs
  – Awarded a contract to provide services to lower ground station look-angles for UASs
  – Awarded a contract to identify Ku-band COMSATCOM gaps across the globe for UASs and recommend ground station locations for mitigating the gaps
  – Honored with a U.S. flag flown at the home base for some of the Army’s Warrior Alpha UAS; Given in recognition of Harris CapRock’s perseverance, dedication and commitment to the customer
**Terrestrial Case Study: DATS**

*Delivering DISN/GIG Terrestrial Circuits to DoD Customers*

The U.S. Government's DISN Access Transport Services contract is a network built on Harris CapRock's global terrestrial infrastructure. Harris CapRock developed a purpose-built network that integrates Defense installations onto the DoD's backbone network, interconnecting DoD and intelligence facilities throughout the world in as few as three hours.

**Requirement**
- Provide DISN/GIG interconnection circuits to all DoD customer site in eastern United States
- Bandwidth (3KHz to OC-192) to 400+ MILDEP sites
- 4 Regions, collectively valued at $3B over 10 years

**Challenges**
- Rapid turn-up and turn-down of circuit services
- On premise installation coordination
- Management of multiple terrestrial circuit providers
- Cohesive network management across thousands of circuits

**Harris CapRock Solution**
- Develop a Managed Aggregation Solution
- Create a “private network” design for optimal performance
- Rapid provisioning with flexible reconfiguration
- Improve overall availability and reduced provision costs