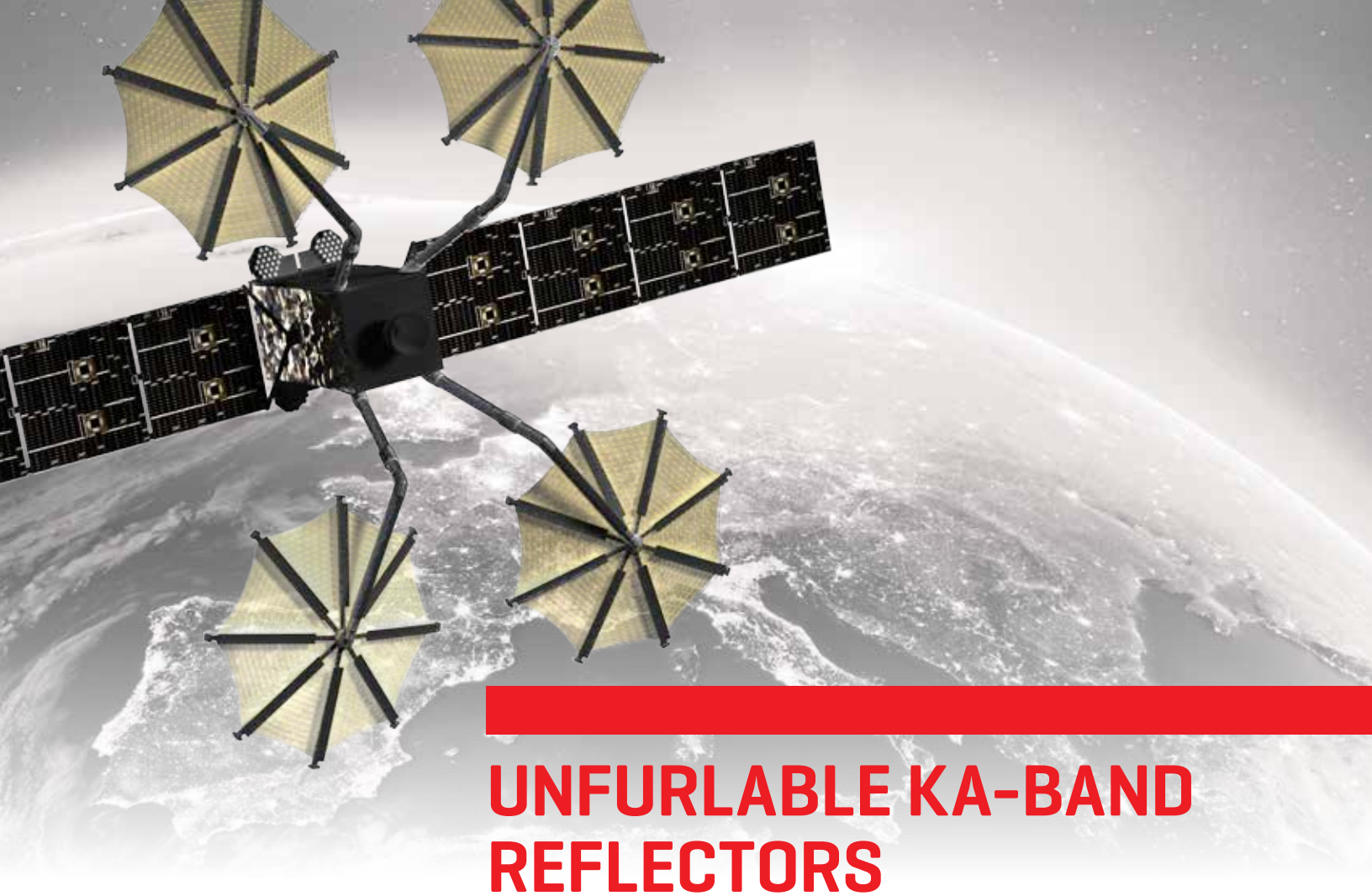


UNFURLABLE KA-BAND REFLECTORS

THE ONLY 5-METER KA-BAND UNFURLABLE REFLECTOR COMMERCIALLY AVAILABLE

With the increasing demand for high-throughput satellite (HTS) antennas that can operate at higher frequencies, Harris develops large, unfurlable mesh reflectors shaped to Ka-band accuracy that easily integrate into all spacecraft configurations.

BENEFITS

- Increases frequency reuse and capacity over a selected geographical area
- Enables reduced cost per bit
- Enhances mission performance through innovative surface-shaping technology
- Improves tracking performance through unique hub mounting configuration

PUSHING THE BOUNDARIES OF TECHNOLOGY

Harris has leveraged over 40 years of experience in designing unfurlable reflectors and internal research and development initiatives to produce never-before-achieved accuracy in unfurlable mesh reflectors. Our innovative surface-shaping technology improves mission performance by maximizing system capabilities, while our radial rib design accommodates a wide range of geometries and satellite configurations.

At less than 0.3 mm RMS, Harris' Ka-band unfurlable reflectors address the needs of the HTS communications segment with larger aperture reflectors that can operate at higher frequencies. Larger apertures result in smaller spot beam sizes that enable increased frequency reuse and capacity over specified geographical areas. Concurrently, they significantly increase satellite segment gain to allow smaller user terminals.

Harris has sucessfully flight qualified a 5 m Ka-band reflector design. Two of these reflectors have successfully completed protoflight testing, including vibration, thermal distortion, and RF range testing. They are scheduled for launch in late 2016.

FACTS

Harris unfurlable reflectors have logged over 800 years combined on-orbit service

More than 80 Harris unfurlable large aperture mesh reflectors are on orbit

Harris unfurlable reflectors offer unparalleled performance from UHF to Ka-band frequencies

Harris mesh reflector aperture sizes range from 2 m to 22 m

APPLICATIONS

Employing a state-of-the-art knit wire mesh designed specifically for the requirements of Ka-band and higher frequencies, Harris unfurlable mesh reflectors provide high-speed internet to unserved and underserved locations beyond the reach of terrestrial fiber. Our Ka-band reflectors meet today's market needs ranging from inflight internet connectivity on airplanes to broadband communications for battlefields and disaster areas.

ABOUT OUR 5-METER UNFURLABLE REFLECTOR

Harris' 5 m unfurlable reflector operates up through Ka-band (30 GHz) to meet HTS market demands. Compared to conventional solid reflectors in the 2 m to 3 m class, the 5 m unfurlable reflector provides an increased number of small spot beams for more efficient frequency reuse for greater capacity.

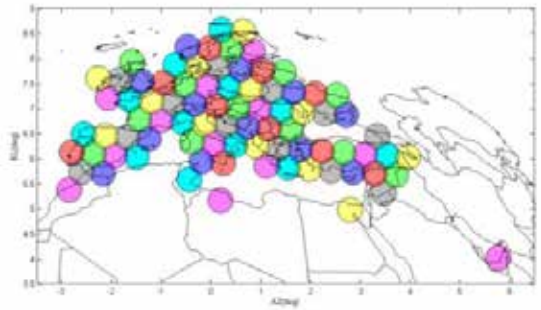
Additionally, the reflector can be incorporated into a hybrid approach, in which a set of smaller reflectors provide lower gain beams over a broad coverage area and a single unfurlable reflector provides high gain beams over a specific area requiring enhanced coverage.

Figure 1 illustrates the improved spot beam pattern that can be achieved by replacing four smaller 2.6 m solid reflectors with four 5 m unfurlable reflectors.

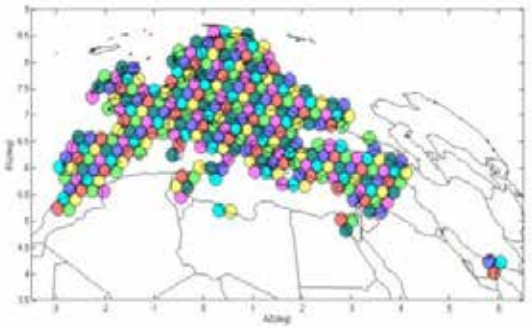
5-METER REFLECTOR SPECIFICATIONS

- 5 m diameter aperture size
- RF reflectivity specifically for Ka-band
- < 0.3 mm RMS on-orbit surface accuracy
- Accommodation of any focal ratio (f/D) requirement
- Up to 85% optical transparency
- Hub-mounted or edge-mounted rib reflectors for prime focus or offset antenna geometries, respectively
- Fully integrated deployable boom assembly
- Compatible with gimbal actuators and fine-pointing mechanisms.

FIGURE 1: HTS SPOT BEAM PATTERN



Four 2.6m reflectors; 82 beams; 7-cell reuse; Frequency reuse factor=11.7



Same Coverage Area with four 5m reflectors results in 286 beams 7-cell reuse Frequency reuse factor=40.8

About Harris Corporation

Harris Corporation is a leading technology innovator, solving customers' toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports government and commercial customers around the world. Learn more at harris.com.

FLORIDA | NEW YORK | VIRGINIA | BRAZIL | UNITED KINGDOM | UAE | SINGAPORE

HARRIS® TECHNOLOGY TO CONNECT, INFORM AND PROTECT™