Northrop Grumman Begins Integrating High-Speed Downlink Antennas for Fourth Advanced EHF Communications Payload

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SUNNYVALE, Calif., March 11, 2014 /PRNewswire/ -- Two downlink antennas that are the fastest of their kind to operate in space are being integrated into the protected communications payload built by Northrop Grumman Corporation (NYSE: NOC) for the fourth Advanced Extremely High Frequency (AEHF) satellite.

The company delivered the Super High Frequency Array Unit (SAU), as the antennas are called, in early March to AEHF system prime contractor, Lockheed Martin, in Sunnyvale.

These high-speed downlink phased array antennas, the first to operate at 20 GHz in space, provide assured point-to-point connectivity using electronically steerable beams that reach military users at fixed-site and mobile terminals.

Under a hybrid integration plan, Lockheed Martin is integrating the satellite bus unit within the system module while a team from Northrop Grumman simultaneously completes remaining payload integration.

Northrop Grumman produces phased array antennas, which are a new technology developed specifically for AEHF satellites. High-speed downlink phased array antennas are the first of their kind to operate at 20 GHz in space. High-speed uplink phased array antennas operating at 40 GHz provide direct radio frequency beams electronically rather than by moving reflectors mechanically.

Advanced EHF anti-jam payloads communicate via super high frequency downlinks, transmitting in the 20.2 to 21.2 GHz frequency band, and EHF uplinks, which also are the first to operate at 40 GHz in space.

"This allows one array to do the job of many reflectors, giving the flexibility to point-on-demand in fractions of a second to hundreds of coverage areas, greatly improving access and automatically countering signal jamming by adversaries," said Stuart Linsky, vice president, Communication Programs, Northrop Grumman Aerospace Systems.

This agility and flexibility of the beams formed by the phased arrays are critical to providing coverage to the dispersed tactical and strategic users on the AEHF system. The high-speed phased arrays are used to form multiple beam types concurrently including high gain earth coverage anywhere in the satellite field of view, super high gain earth coverage to up to 160 locations, and up to 24 medium resolution coverage area spot beams.

The next generation of protected military satellite communications satellites, AEHF provides vastly improved global, survivable, highly secure, protected communications for strategic command and tactical warfighters operating on ground, sea and air platforms. The system also serves international partners including Canada, the Netherlands and the United Kingdom.

With the more compact phased array, AEHF can process greater amounts of information. It will deliver 10 times greater total capacity and channel data rates six times higher than that of Milstar II communications satellites. AEHF is the successor to the Milstar system.

The SAU was built by Northrop Grumman's Antenna Products Center, which also provides EHF Uplink Phased Array unit, jam-resistant nulling antenna subsystems, crosslink antennas and steerable spot beam antennas for the AEHF Payload.

Previous ahead-of-schedule deliveries included the uplink phased array (UPA) high-efficiency converter that operates the payload's UPAs. Commercial application specific integrated circuits were also delivered on time, along with hardware consisting of electromechanical switches, passive microwave filters and beam select switch assemblies.

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