ThinKom unveils phased-array satellite antennas

The ThinKom Solutions next-generation antenna weighs in at 23 kilograms

ThinKom Solutions today announced development of a new phased-array user terminal specifically designed for operation in the higher millimeter-wave (MMW) frequency bands for evolving next-generation communication satellites.

The new low-profile antenna, based on ThinKom's patented VICTS (Variable Inclination Continuous Transverse Stub) technology, will operate in the Q- and V-band frequencies (37.5-42.5 GHz and 47.2-51.4 GHz). These bands have been designated for adoption by major satellite operators in low-, medium-, geostationary and highly elliptical orbits (LEO, MEO, GEO and HEO).

"This new phased-array development is timed to fully enable the upcoming frequency revolution that promises to unlock massive new available bandwidth at these higher MMW frequencies for next-generation LEO and MEO satellite constellations," said Bill Milroy, Chairman and CTO of ThinKom Solutions. "And it uses our proven VICTS architecture, ensuring it will deliver the efficiency, instantaneous bandwidth, reliability, resiliency and overall availability our customers have come to expect from ThinKom."

Similar Q-band MMW antennas have already been built and on-satellite tested by ThinKom for Q-band aeronautical and ground-mobile use.

"The new user terminals will include uninterrupted 'make-before-break' (MbB) and 'break-before-make' (BbM) connectivity options, depending on the requirements of a given application. The MbB terminals will support two simultaneous full-duplex beams that can be independently pointed at two different satellites," explained Milroy. "The LEO and MEO satellites move rapidly across the sky from horizon to horizon, so the multi-beam capability of the new ThinKom MbB terminal ensures uninterrupted services while switching between rising and setting satellites. It also allows multiple satellites or channels to be bonded, either within the same or even across different constellations,

doubling throughput capability. The antenna also supports full frequency and polarization diversity, which is another key enabler for maximizing satellite throughput.”

ThinKom’s full-duplex terminal is 75 centimeters square and less than 10 centimeters in height, weighing less than 23 kilograms and requiring less than 100 watts of prime power; yet providing the same functionality as two separate 50-centimeter diameter stabilized parabolic dish antenna radome enclosures.

Milroy noted the degree of difficulty in producing viable electronically scanned arrays (ESAs) that can operate in these higher MMW bands, especially in area efficiency, packaging, power density, thermal management and cost. In contrast, the new antennas from ThinKom will provide industry leading spectral efficiency, low power consumption, high power efficiency and low heat generation. They will be offered in configurations for aeronautical and ground-based fixed and mobile applications.