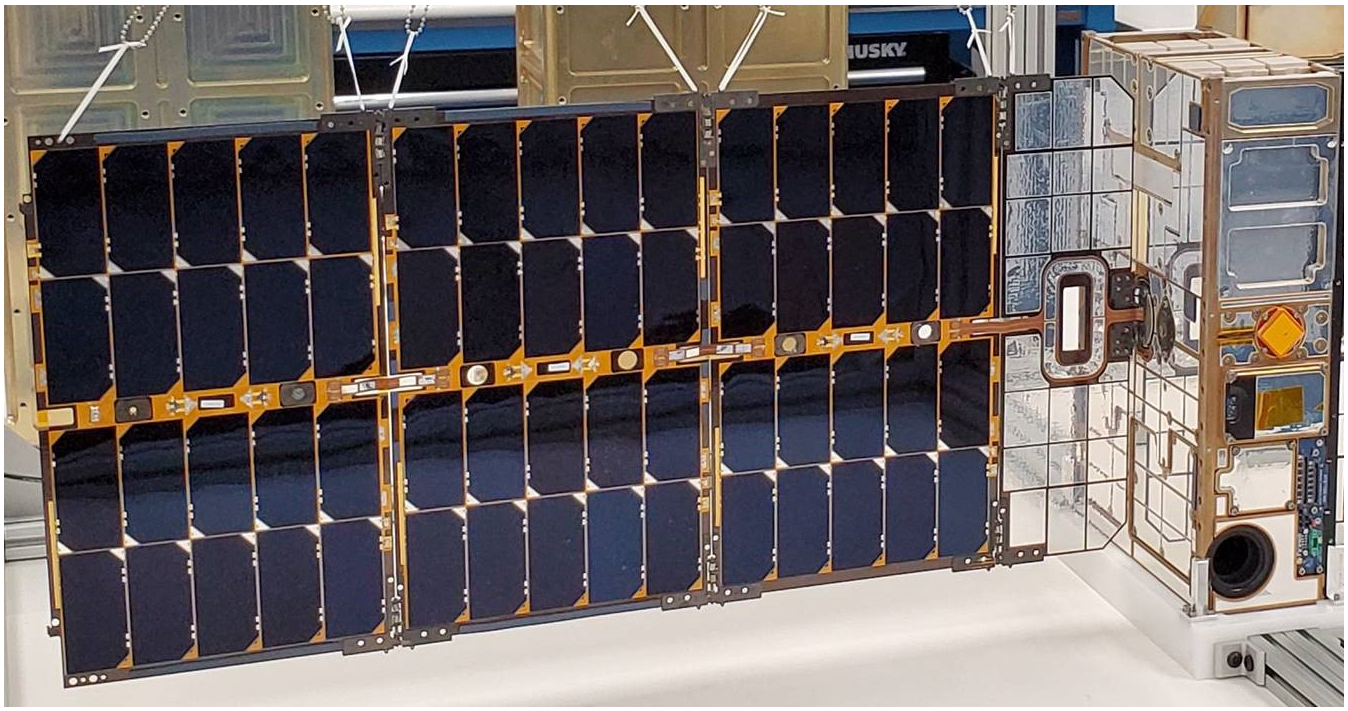
Lockheed Martin Launches First Smart Satellite Enabling Space Mesh Networking

Experimental nanosat payload developed in nine months tests new software-defined mission, on-board multi-core processing and orbital cloud communications



The Pony Express 1 mission is a hosted payload on Tyvak-0129, a next-generation Tyvak 6U spacecraft. Image Courtesy: Tyvak Nano-Satellite Systems, Inc.

DENVER, Jan. 16, 2020 /PRNewswire/ -- A new era of space-based computing is now being tested in-orbit that will enable artificial intelligence, data analytics, cloud networking and advanced satellite communications in a robust new software-defined architecture. Recently, Lockheed Martin (NYSE: LMT) launched the *Pony Express 1* mission as a hosted payload on *Tyvak-0129*, a next-generation Tyvak 6U spacecraft.

"Early on-orbit data show *Pony Express 1* is performing its important pathfinding mission very well. Lockheed Martin's HiveStar™ technology on board will give our customers unparalleled speed, resiliency and flexibility for their changing mission needs by unlocking even greater processing power in space," said Rick Ambrose, executive vice president of Lockheed Martin Space. "This is the first of several rapid, self-funded experiments demonstrating our ability to systematically accelerate our customers' speed to mission while reducing risk from new technologies."

Pony Express 1, an example of rapid prototyping, was developed, built and integrated in nine months, and was funded completely by Lockheed Martin Research and Development funding. This orbital proving ground is validating payload hardware and software, and is packed with new technology that fits into a satellite the size of a shoebox. Some of the key technologies being flight-tested include:

- HiveStar™ software validates advanced adaptive mesh communications between satellites, shared processing capabilities and can take advantage of sensors aboard other smart satellites to customize missions in new ways previously difficult to achieve in space.
- A software-defined radio that allows for high-bandwidth hosting of multiple RF applications, store-and-forward RF collection, data compression, digital signal processing and waveform transmission.
- 3D-printed wideband antenna housing developed by Lockheed Martin's Advanced Technology Center.

Pony Express 1 is a dual-use payload that enables mesh networks in space through HiveStar™ and a second function that tests space to ground remote sensing. Future research missions this year, like *Pony Express 2*, will further advance cloud networking concepts among satellites, as well as validating Lockheed Martin's SmartSat™ software-defined satellite architecture which enables streamlined hosting of flexible mission apps. This mission consists of two 12U cubesats with faster, more capable ultra-scale processors that unlock in-orbit data analytics and artificial intelligence. Equipped with miniaturized cross-link and precision timing, *Pony Express 2* is a trailblazer for autonomous teaming in space and true cloud networking.

About Lockheed Martin
Headquartered in Bethesda, Maryland, Lockheed Martin is a global security and aerospace company that employs approximately 105,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services.

About Tyvak Nano-Satellite Systems, Inc., a Terran Orbital corporation
Founded in 2013 and headquartered in Irvine, California, Tyvak Nano-Satellite Systems, Inc. is an industry leader, delivering optimized, end-to-end nano- and microsatellite solutions. Trusted by civil, defense and commercial organizations, the Company leverages expertise, low-cost operating infrastructure, and the limitless opportunities of satellite miniaturization to achieve timely and economical mission success. Through its global ground station network, Tyvak provides worldwide coverage for on-orbit operations around the clock. For more information, please visit https://www.tyvak.com/

Pony Express 1 Payload
A technician works on Lockheed Martin's Pony Express 1 payload.(156 KB)
