Successful Launch of Formation-Flying Microsatellite Constellation Built by Space Flight Laboratory

TORONTO, Ontario, Canada, 7 January 2019 – Space Flight Laboratory (SFL) announced the successful launch of three formation-flying microsatellites built by SFL under contract to Deep Space Industries for HawkEye 360 Inc. The microsatellites were launched last year into low Earth orbit on December 3, 2018, from Vandenberg Air Force Base, California.

The HawkEye 360 Pathfinder microsatellites will detect and geolocate radio frequency (RF) signals from VHF radios, maritime radar systems, automatic identification system (AIS) beacons, VSAT terminals and emergency beacons. HawkEye 360 will apply advanced RF analytics to this data to help customers assess suspicious vessel activity, survey communication frequency interference, and search for people in distress.

“This is the first time a commercial company has utilized formation-flying satellites for RF detection,” said John Serafini, CEO of HawkEye 360, based in Herndon, Virginia.

SFL was selected for the mission by Deep Space Industries, the HawkEye 360 Pathfinder prime contractor, due to the importance of formation flying by multiple satellites for successful RF signal geolocation and analysis. SFL first demonstrated on-orbit formation control with smaller satellites in the 2014 Canadian CanX-4/CanX-5 mission.

“We have developed compact, low-cost formation flying technology that no other small satellite developer can credibly offer,” said SFL Director Dr. Robert E. Zee.

Precise formation flying is critical to the HawkEye 360 RF system because the relative positions of each satellite in the constellation must be known to accurately geolocate the transmission sources of the radio frequency signals. For the triangulation to be calculated correctly, each satellite must be located with sufficient precision in space and relative to one another.

“The core of our business is RF analytics, which is dependent upon high-quality, geolocated RF data,” said Chris DeMay, HawkEye 360 CTO and Founder.

SFL built the three Pathfinder satellites using its space-tested 15-kg NEMO microsatellite bus and incorporated several technologies that make on-orbit formation flying possible. Most prominent of these is the high-performance attitude control system developed by SFL to keep micro- and nanosatellites stable in orbit. Included in the formation flying system are a GPS receiver and a high efficiency Comet-1 propulsion unit developed by Deep Space Industries.

“By leveraging SFL’s highly successful formation flying technology demonstrated on orbit, along with DSI’s pioneering innovations and next-generation propulsion systems, the mission will deliver unparalleled performance in smaller, affordable satellites,” said SFL’s Dr. Zee.

Established in 1998 as a self-sustaining specialty lab at the University of Toronto Institute for Aerospace Studies (UTIAS), SFL has built more than 20 nano- and microsatellites with over 90 cumulative years of successful operation in orbit. SFL’s attitude control technologies have also

been applied successfully in several other microspace programs as well, including the 2016 GHGSat-D greenhouse gas emissions monitoring satellite and the 2013-2014 BRITE space astronomy constellation.

About Space Flight Laboratory (www.utias-sfl.net)
SFL generates bigger returns from smaller, lower cost satellites. Small satellites built by SFL consistently push the performance envelope and disrupt the traditional cost paradigm. Satellites are built with advanced power systems, stringent attitude control and high-volume data capacity that are striking relative to the budget. SFL arranges launches globally and maintains a mission control center accessing ground stations worldwide. The pioneering and barrier breaking work of SFL is a key enabler to tomorrow's cost aggressive satellite constellations. (www.utias-sfl.net)

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