With the increase in Government-funded and industry small satellite missions, the need for a more robust communication infrastructure is critical for the CubeSat community. As part of the solution, the Space Dynamics Laboratory (SDL) provides the Cadet U and Cadet PLUS radios as powerful communications tools ideal for small satellites. These affordable solutions are available in both UHF (Cadet U) and UHF plus S-Band (Cadet PLUS) configurations. Cadet radios are compact, power-efficient, high data rate transceivers. SDL optimized the design, from the electronics to the modes of operation, for low power consumption.

SDL partnered with L-3 Communications to develop the Cadet U radio for the Dynamic Ionosphere CubeSat Experiment (DICE) mission, which launched in 2011. Cadet U provided the first high-speed communications system for a CubeSat and was proven on orbit to be robust and reliable. In 2016, SDL again partnered with L-3 Communications to improve the performance of the Cadet radio, resulting in the Cadet PLUS for next-generation CubeSats.

**KEY FEATURES**

- Up to 3.2 Mbps data rates, depending on configuration
- Scalable software-defined architecture
- Real-time & store-and-forward technique for downlink
- Low-power design for minimum power consumption
- Bandwidth-efficient modulation & FEC techniques
- Extensible to air, ground & maritime micro-platforms
- AES 256 encryption

**HOW CADET WORKS**

- Cadet radios use a real-time & store-and-forward architecture
- Ground users control data transmissions, downlink priority & data deletion
- A large 32 GB memory buffer stores mission data & telemetry
- Data is collected from the spacecraft & stored in the radio's non-volatile memory
- Optimized size, weight & power (SWaP)