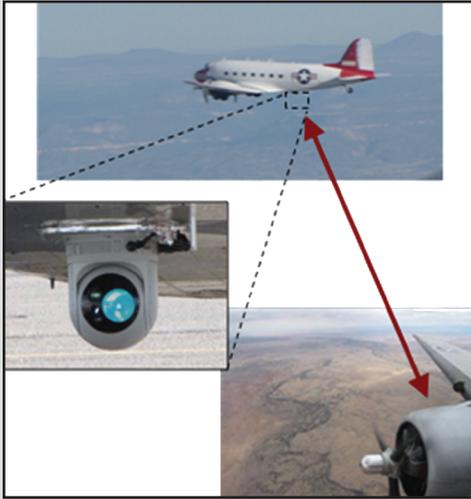


FALCON Fast, Far, and First



DC-3 flying with FALCON, the Fast Airborne Laser Communications Optical Node, during demonstration testing conducted over Albuquerque, New Mexico (AFRL image)



High-mobility multipurpose wheeled vehicle equipped with FALCON, the Fast Airborne Laser Communications Optical Node, for demonstration testing in Albuquerque, New Mexico (AFRL image)

Working with industry partner ITT Advanced Engineering & Sciences, AFRL sensors scientists demonstrated FALCON, an operationally capable Fast Airborne Laser Communications Optical Node. The long-awaited capability, which culminates decades of research into this technology, comprises a high-data-rate, long-range, free-space optical communication link. Initial flight testing took place aboard two DC-3 aircraft, with subsequent tests occurring on a pair of DHC-6 Twin Otters. During this rigorous test regimen, FALCON achieved a 2.5 Gbps full-duplex link over an incredible 130 km distance, with almost half of its available laser power still remaining.

Since 2004, AFRL and ITT have collaborated in developing a long-range laser comm system capable of delivering high data rates in both air-to-air and air-to-ground scenarios. This notable achievement required successful integration and validation

of several complex and interconnected mechanical, electrical, and optical subsystems. Accordingly, the team leveraged numerous laboratory and ground tests conducted—and models developed—along the way in establishing a baseline for system performance.

Wireless data transfer currently occurs via radio frequency (RF) technology, but operational RF systems are struggling to keep pace with the continuously increasing bandwidth demands of military consumers. Laser comm enables bandwidth delivery at speeds >10 times faster than current RF systems are able to achieve and, meanwhile, offers added bonuses such as extremely low probability of intercept, high jamming resistance, and no spectrum conflicts. The AFRL/ITT-developed FALCON represents the first successful demonstration of this powerful technology.