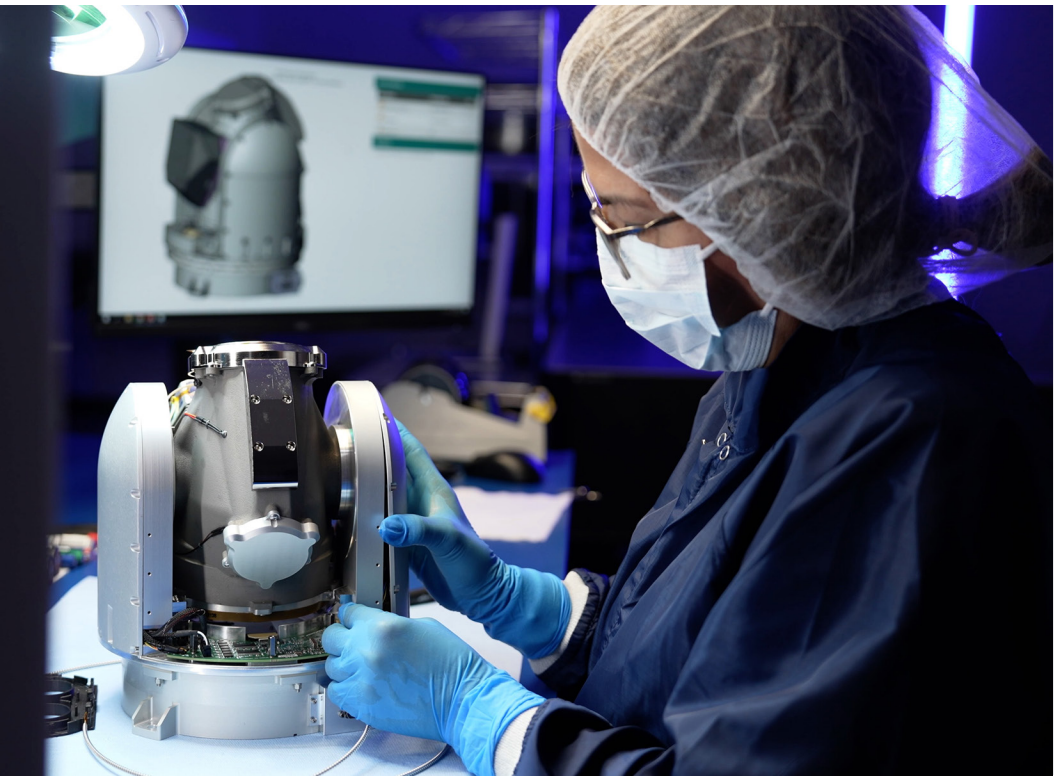
CrossBeam

Optical communication terminal



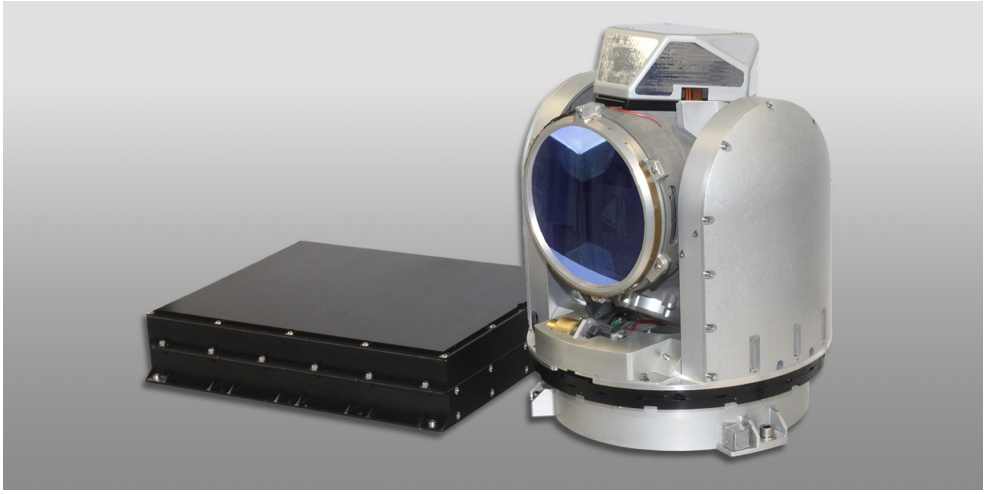
For more information about our expertise and technology, visit: **caci.com/optical-communications-technology**

Flexible free space optical (FSO) satellite crosslink system

CACI's CrossBeam is a fully integrated, compact, and robust FSO communication system designed to meet the Space Development Agency's (SDA) Tranche 0/1/2/3 crosslink requirements in low-earth orbit (LEO). Its common hemispherical beam steering optical head with a fine tracking mechanism supports the SDA's Proliferated Warfighter Space Architecture (PWSA) next-generation satellite network, and a range of other other LEO, medium-earth orbit (MEO), and geosynchronous-earth orbit (GEO) applications.

Designed for low-cost, high-volume manufacturing, CrossBeam uses a patented all-fiber-optic-based transmit/receive design, and CACI's high-performance FSO communications modem technology to provide reliable data communications for long-distance crosslink applications. CrossBeam's optical communication terminal (OCT) architecture is highly scalable and tailorable for other crosslink and other link applications for aircraft or ground terminals.

CACI



Flexible, adaptable, secure high-rate communications

CrossBeam terminals first supported DARPA's Mandrake 2 mission with two units launched in June 2021, successfully closing both space-to-space and space-to-ground links. CrossBeam also provided all 16 OCTs for DARPA's Blackjack constellation, which launched in June 2023, and are currently performing on SDA's Tranche 0/1/2 satellite crosslink programs.

Our FSO communications programs are conducted by CACI's multi-disciplinary Optical and Photonic Solutions team, composed of physicists and material scientists, as well as optical, electrical, and mechanical engineers. This team is focused on developing the most advanced photonics-based solutions, including optical modems, optical terminals, and high-power sources for communications. The team also conducts research and development of high-power optical sources for remote sensing applications and optical systems for space exploration.

CROSSBEAM SPECIFICATIONS				
Feature	**Cross-Beam-ST0**	**Cross-Beam-ST1**	**Cross-Beam-ST2**	**Cross-Beam-ST3**
SDA tranche	T0	T1	T2	T3
SDA standard compliance	2.1.2	3.0.1	3.1.0	3.2.0
Link distance	6,500 km	6,750 km		
Data rate	1.25 Gbps	2.5 Gbps		
Transmit optical power	1.25 W	2.5 W		
Power	50 W (typical)	75 W (typical)		
Field of regard	Full hemispherical			
Aperture size	10.5 cm			
Optical link margin	3 dB			
Position/ time accuracy	<1 ns			
Acquisition time	~10 sec after on orbit calibration			
Processing Chassis and Optical Head	10 kg combined			

FEATURES

- SDA Tranche 0/1/2/3 compliant
- Low cost and low size, weight, and power (SWaP)
- Designed for manufacturability
- High technology readiness level (TRL) and manufacturing readiness level (MRL)
- Variable data rate modem supports operation up to 2.5 Gbps
- Launched, deployed, and functioning on orbit with DARPA's Mandrake 2 and Blackjack programs, and SDA programs

BENEFITS

- Delivers highly secure communications that are immune to RF interference and jamming
- Very low probability of interception and detection
- Enables secure communication in a radio frequency (RF)-denied environment
- High-performance throughput for LEO space
- Effectively unlimited use of optical spectrum, unlike limited RF communication

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