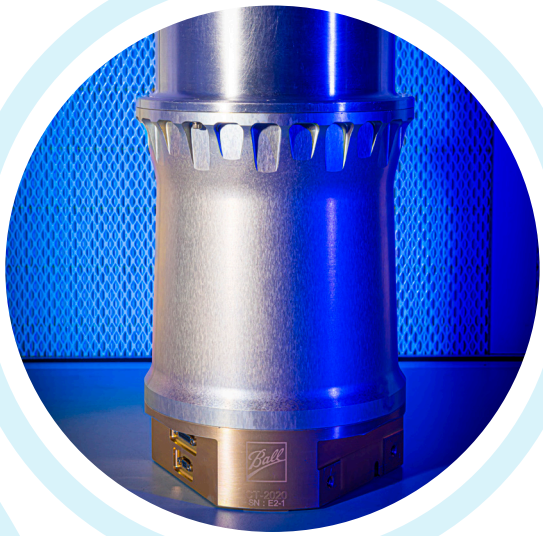
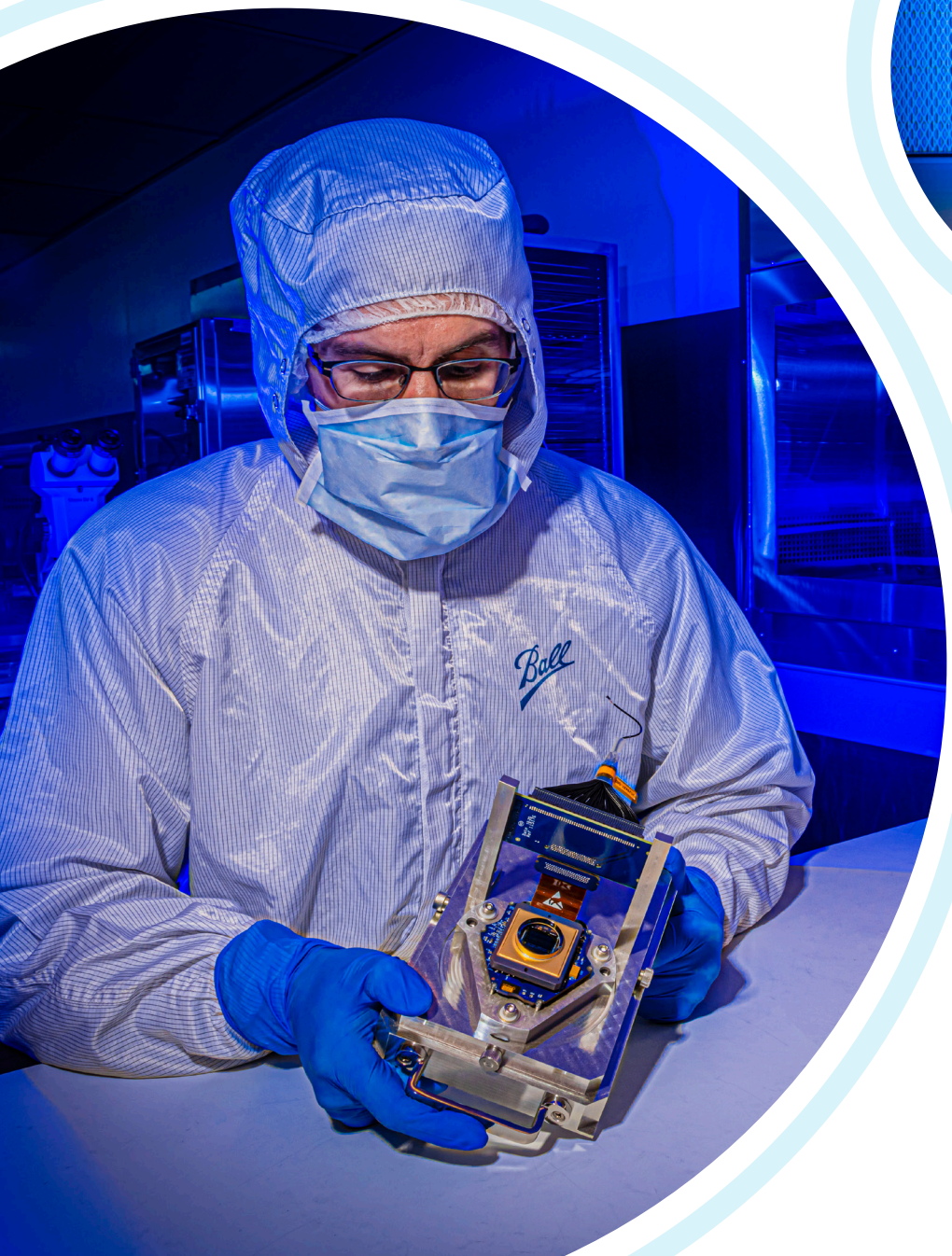
CT-2020

Star Tracker

Leveraging its heritage in producing advanced star trackers, Ball Aerospace is developing the CT-2020, a low-cost, high performance, fully U.S.-sourced, commercial star tracker.





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Overview

Under a grant from the Defense Production Act Title III, Ball is developing a new line of affordable, fully-domestic, commercial star trackers called CT-2020.

Domestically-sourced, secure solution

Utilizing all U.S. trusted suppliers, secure systems and flight software, the CT-2020 is compliant with the Buy American Act, providing an assured, fully U.S.-sourced solution for the nation's most important missions. The CT-2020 uses the USNO star catalog, complying with DoD instruction 4650.06.

Low cost, high performance

Blending medium and high accuracy star tracker heritage in a compact, fully-integrated package, CT-2020 offers high performance and operational flexibility at a commercially-competitive price point.

CT-2020 integrates the latest high-efficiency Complementary Metal Oxide Semiconductor (CMOS) detector technology developed in the U.S. specifically for star trackers, enabling the CT-2020's cost-effective small mass and volume design.

Operational flexibility, on-orbit upgrades

Featuring operational flexibility, CT-2020 provides customers two modes of operation. The modes are fully autonomous attitude and directed search, in which the user can select certain regions of interest. In autonomous attitude mode, the tracker can achieve single head accuracies in the realm of 1 arcsec, with even higher accuracies in directed search mode.

CT-2020's robust software features an on-orbit environment simulator, allowing the tracker to emulate mission-specific integration and operations for risk reduction. In addition, the tracker's software can be upgraded while on-orbit, allowing updates to the star catalog, spatial/intensity calibration and software algorithms.

Heritage

For more than 50 years, Ball has delivered the highest-reliability, highest-performance star trackers available to support civil, commercial and defense missions. We are leveraging this heritage to optimize the CT-2020 for cost and performance to bring a commercially-competitive, affordable, domestic star tracker solution to the U.S. market.

Ball is now accepting orders for the CT-2020.

Specifications

Performance for Standard Light Shade (33 deg)

- 1.5 arcsec performance stand-alone unit
- Provides full three-axis <1.5 arcsec performance with typical two units on a spacecraft
- Full performance with a 33 deg sun angle
- Tracks with moon in field of view
- High rate capable (up to 8 deg/sec) with reduced performance to enable track-through-slew

- 1553, RS-422 command and data interfaces, SpaceWire option
- Simultaneous attitude output and full frame image output at 10 Hz over high speed LVDS
- On-orbit upgradeable software, star catalog, algorithms and spatial re-calibration
- Uses USNO star catalog complying with DoD instruction 4650.06
- TEC provides efficient, stable detector temp control, on-orbit adjustable
- Hardware-in-the-loop testing with built-in focal plane simulator enables end-to-end mission simulations
- Integrated LED polarity tester
- Two modes of operation: fully autonomous or directed search
- Dimensions: 5.8" diameter x 12" tall (with standard sunshade)
- Mass: 3 kg
- Power < 8 W; Peak Power <12 W at standard 28V input
- Modular options:
  - 33 deg standard sunshade (custom designs available)
  - QML Q- or V-Level EEE parts with full traceability
- Radiation-hardened-by-design CMOS and ASIC
- Meets all relevant MIL-STD and SMC requirements
- Complete set of documentation and analysis available with product
- Compliant with Buy American Act

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