L3HARRIS™
FAST. FORWARD.

SPACESENTRY

End-to-end tasking through dissemination chain for superior space domain awareness

L3Harris' SpaceSentry tasking, collection, processing, exploitation and dissemination (TCPED) system operates and maintains a global electro-optical sensor network to continually monitor the entire geo-stationary belt. We provide observation updates on all geostationary objects above the 14th visual magnitude. Our network of persistent and task-track optical sensors collect near-real-time data in support of space traffic management, safety of flight and anomaly investigation.

ALWAYS MONITORING, ALWAYS READY

L3Harris' SpaceSentry sensors do not require active tasking to track objects. The approximate data latency for observation files is five minutes, and the sensors are calibrated by a multistep verification and validation process, including comparison to the wide area augmentation system (WAAS). Global coverage allows for overlap between sites to minimize weather interference.

GLOBAL COVERAGE

Global coverage allows us to provide observations over the course of your mission track. With the data provided from our global network, L3Harris offers a range of available data products:

Astrometric observations

> Timestamped right ascension/ declination (RA/DEC) observations with uncertainty

Photometric observations

> Persistent, multidirectional, red-green-blue (RGB) photometry

Object custody

> Orbit estimate with uncertainty at a specified update cadence

Maneuver event

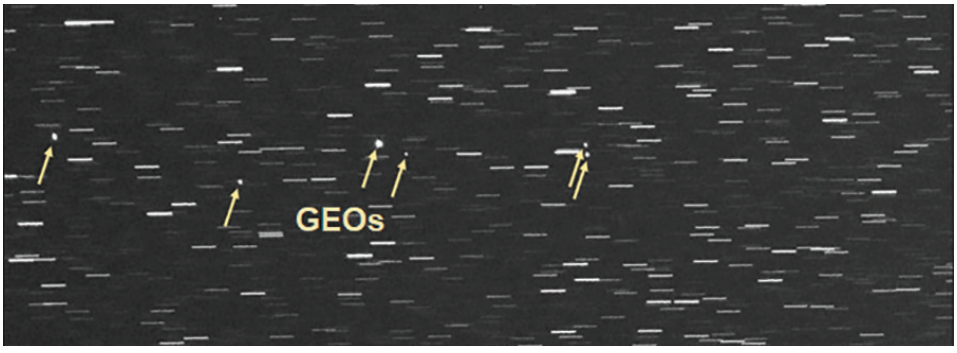
> Detection and detailed characterization of full maneuver events

Conjunction assessment

> Timestamped close approaches with relative geometry and collision probabilities

Patterns of life

> Long-term characterization of geostationary spacecraft behavior



Close up of an image (15 × 10°) taken from a single L3Harris persistent sensor. Each sensor monitors 5% of the entire geostationary belt during clear nights. Currently sensors are deployed globally, enabling L3Harris to economically capture large datasets.

BENEFITS

> Provides persistent "eye on the sky" tracking for orbit estimation of resident space objects (RSOs)

> Enables geostationary neighborhood watch services that allow commercial operators to protect revenue-generating assets

> Eliminates the need to actively task objects with autonomous and continuous updates to the RSO catalog

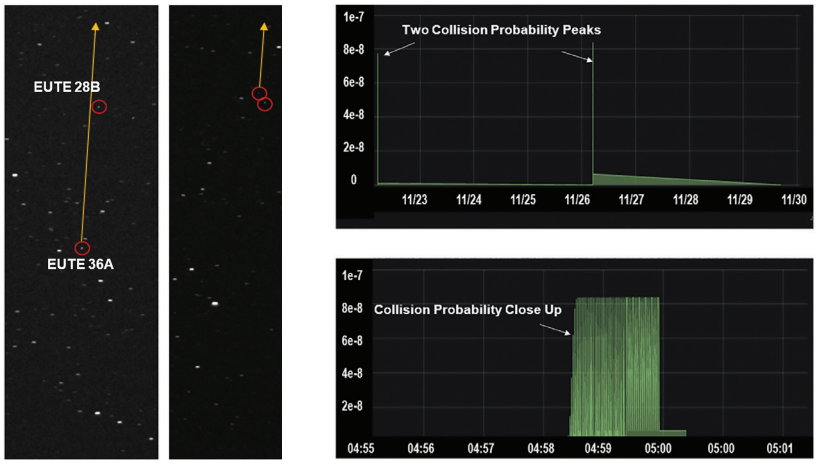
> Improves orbit accuracy and aids in maneuver calibration

> Provides observation data in standard formats ready for use by third party tools

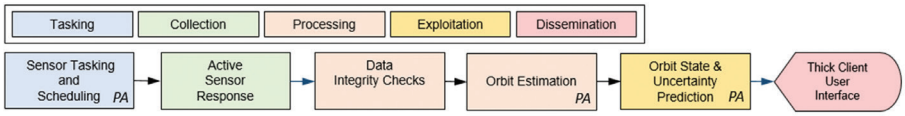
> Allows end users to use native algorithms across desired parts of the processing chain by adopting a modular TCPED system approach

A MODULAR TCPED SYSTEM FOR SPACE DOMAIN AWARENESS

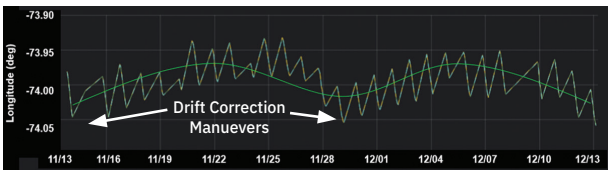
L3Harris has integrated its applied research background with SpaceSentry to form the foundation of a resilient space domain awareness (SDA) data analytics layer across all TCPED activities. We obtain persistent and high-cadence data that enables operational analysts to exploit a variety of techniques, including maneuver detection, tip-and-cue, improved track custody, conjunction assessment and pattern learning of RSO behavior. Our modular TCPED framework allows end users to adopt native algorithms for rapid indigenous innovation. Taking these steps will enable the learning, sharing and application of innovative techniques for global SDA sustainment.



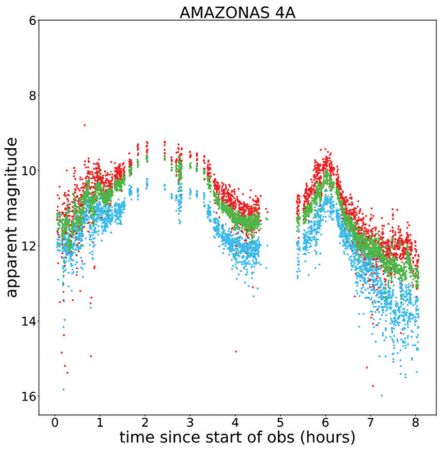
Visual correlation (0.8 × 3°) of a repeating close approach between a geosynchronous and geostationary spacecraft (between 11/23/2019 and 11/30/2019) and its corresponding collision probability risk (~8e-8). The frames on the left were captured on the L3Harris SpaceSentry network (for an eight-hour period) and the collision probabilities on the right are computed solely based on its measurements.



Input-output diagram for L3Harris modular TCPED system. Each 'PA' represents a platform-agnostic component on which end users can innovate.



Operational patterns of life for Amazonas-4A as observed by the L3Harris SpaceSentry network. Establishing station-keeping patterns of life allows the rapid identification of anomalous behavior.



L3Harris RGB light curves provide operational analysts with the ability to enact photometric change detection and characterize normal behavior of operational geostationary spacecraft.

SpaceSentry

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space and cyber domains.

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