SDA'S Space Data Center Enables Fast, Accurate RFI Geolocation and Conjunction Analysis

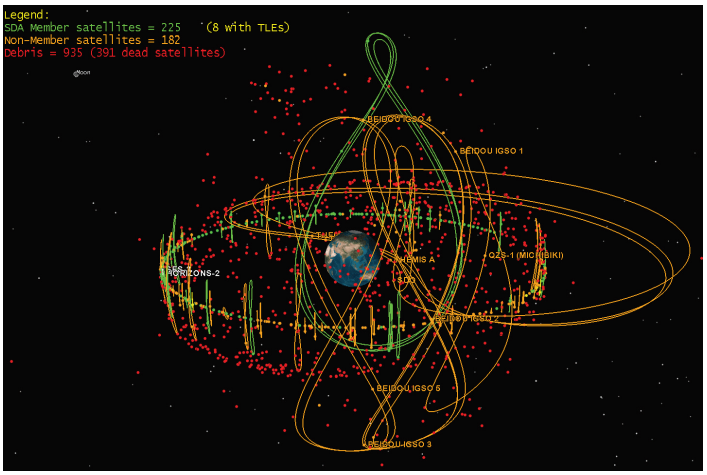
Situational Awareness and RFI Mitigation Improved with by AGI

THE SITREP: The increased number and complexity of satellites; growing user base; and cheaper, more powerful uplink equipment all contribute to Radio Frequency Interference (RFI). Effects from human error and equipment malfunction range in severity from service degradation to full outage. At the same time, debris presents a rising threat of collision.

DEPLOYMENT: The Space Data Association (SDA) —a formal association of satellite operators—offers solutions to both problems with the Space Data Center (SDC). This automated situational awareness system—built on AGI software—performs RFI mitigation; supports geolocation; and provides collision-avoidance notifications using ephemeris and RF data. The SDC provides members with satellite ephemerides and reference data to support RFI geolocation measurements and supplies historical data on other relevant events.

Removing errors due to format incompatibility, out-of-date data, and manual processes can improve conjunction analysis by drawing upon authoritative shared data. Predictions created from shared data proved considerably more accurate than any other public source. Owner-operator data used by the SDC is the only source to also include maneuver-planning predictions. Any data set based solely on measurement data is lacking proper SSA knowledge of object catalogues.

According to the Satellite Interference Reduction Group, interference costs the industry millions of dollars a year in interruption and mitigation—including specialist manpower.



SPACE DATA ASSOCIATION

Growing congestion poses risks of radio frequency interference (RFI) and on-orbit collisions for communications satellites. To combat this, the Space Data Association (SDA)—a formal association of satellite operators—works on effective solutions. Their Space Data Center (SDC) —built on AGI software—uses high-quality, operator-supplied ephemerides and Radio Frequency (RF) data for quick, efficient geolocation of RFI ground interferers and automated collision avoidance monitoring for members.

THE INTEL: An internal study of SDA data versus non-cooperative sources shows accurate input data can improve geolocation uncertainty up to two orders of magnitude. In the case of the Galaxy 15 anomaly, an SDC study found that 15% of the publicly available ephemeris data was corrupted by errors. Since the SDA formed, simulations and real-world experience reflect improvements over owner-operator data for situational awareness analysis. This reinforces the view that combining authoritative data into a common operating picture improves SSA timeliness, validity, and accuracy compared to alternatives.

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Phone: 1.800.220.4785 | 1.610.981.8000
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