



Resilient GNSS and Anti-Jamming Solutions

Tallysman heritage. Calian strength. Precision-built GNSS antennas engineered to perform in contested environments.

At a glance

In today's increasingly contested electromagnetic environment, the need for GNSS resilience and anti-jamming capabilities has never been more critical. Military and civilian systems alike depend on reliable positioning, navigation, and timing (PNT) data, but GNSS signals are inherently weak and vulnerable to intentional jamming, spoofing, and interference. These threats can degrade mission effectiveness, compromise safety, and disrupt critical infrastructure.

To ensure uninterrupted operations in denied or degraded environments, robust solutions such as controlled reception pattern antennas (CRPAs), signal authentication, and multi-layered mitigation strategies are essential. Enhancing GNSS resilience safeguards strategic advantage, operational readiness, and national security.

Engineered in North America for Mission Success

Engineered and built in Canada, Calian GNSS antennas carry forward the legacy of Tallysman, a trusted name in high-precision GNSS technology. With design and manufacturing rooted in our Ottawa facility, we continue to uphold a tradition of excellence in developing robust, high-performance antennas for mission-critical applications. Our RF and System Development Engineering teams—drawing on decades of expertise in GNSS, RF design, and signal integrity—craft solutions that meet the demands of maritime, aerospace, and industrial clients. Every antenna is designed, tested, and built in Canada, ensuring quality control and supply chain security. This commitment to in-house development and North American manufacturing reinforces Calian's role as a dependable partner in precision GNSS.

About XF+

Calian's XF+ incorporates several filtering techniques to mitigate interference from out-of-band LTE signals and other sources, providing clean and pure GNSS signals. The XF+ incorporates deep filtering such that out-of-band signals, in the range of 400 MHz to 3000 MHz are attenuated by approximately 80 dB or more. In addition, the '+' feature supports cross-band isolation throughout the entire LNA chain. For instance, if the upper band is jammed then the lower bands will continue to provide usable signals.

eXtended Filtering + LNA

- Isolated upper and lower bands
- LNA gain is 35 dB
- Noise figure is 3 dB
- Output P1dB is 10 dBm
- Deep filtering with 80 dB out-of-band rejection



About CRPA

CRPA technology uses multiple antenna elements and real-time null steering to enhance GNSS system resilience against jamming or interference. By dynamically steering nulls in the radiation pattern (see Figure 1), it suppresses interference, enhancing reliable PNT in challenging RF environments—important for critical infrastructure and defence applications.

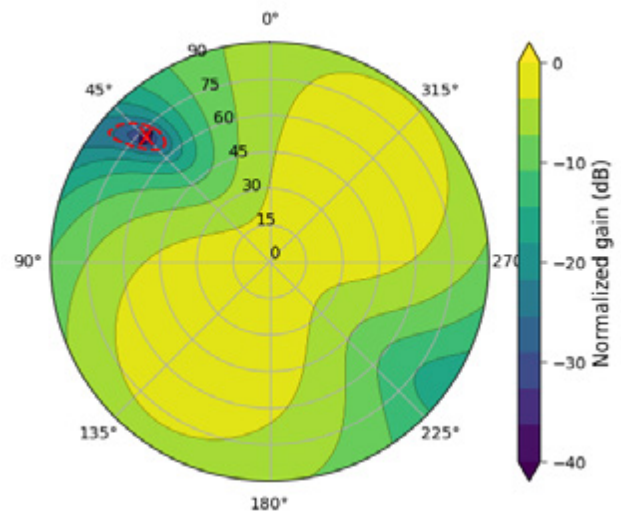


Figure 1 Null in Radiation Pattern





The Future of Anti-jamming Technology is Mission-ready.

Calian's new CRPA product line sets a new benchmark in low SWaP GNSS resilience. Purpose-built for critical infrastructure and defence applications, this advanced system delivers real-time interference mitigation and resilient PNT in the most challenging RF environments. Engineered for mission readiness—anywhere, anytime.

SWaP

Optimized for low Size, Weight, and Power consumption (SWaP), Calian's CRPA delivers high-performance anti-jam capabilities in a compact, lightweight package. Its low physical profile and small footprint enable seamless integration into UAVs, autonomous ground vehicles, and light vehicles while achieving mission objectives.

Situational Awareness

Calian's CRPA improves GNSS availability in contested environments using adaptive null forming and interference suppression. It provides situational awareness by sending Situation Reports (SITREP) messages via proprietary NMEA over RS232/RS422. These messages report jamming state, jammer direction, and power level—helping operators maintain accurate PNT and respond to electronic threats effectively.

CRPA Product Line

The Calian CRPA family includes a variety of different form factors suited for every user. This includes the surface mount CR8894SXF+, pole mount CR8894PXF+, and embedded CR8894EXF+—offering solutions tailored to diverse operational needs. With precision filtering, rugged construction, and proven RF performance, each model supports seamless deployment across land, air, and maritime platforms. Mission-ready by design, built to deploy.



Designed for Your Mission Environment

Calian's CRPA line is engineered for reliability and precision across diverse mission environments, where optimized SWaP is critical. The single frequency (L1/E1/B1) CR7712EXF 2-element single null adaptive beamforming antenna, is excellent for military navigation in contested GNSS-denied zones, ensuring continuous, and accurate PNT.

Calian's CR8894SXF+ CRPA supports GPS L1/L2 (M-Code) and Galileo E1/E5b signals. The CR8894SXF+ houses 4 antenna elements enabling it to mitigate 3 jammers per band for a total of 6. A serial interface provides proprietary NMEA messages that indicate the antenna's state information as well as indicating the estimated direction to the jamming or interference source. The CR8894SXF+ is compatible with all GNSS receivers that output 150 mA or more at 5 volts to the antenna. The antenna can also be powered through the serial interface.

The CR8894SDXF+ detector only provides interference or jammer threat identification. Through a serial interface the CR8894SDXF+ provides messages indicating the CRPA state and the direction to the jammer, providing the user with situational awareness.

To support a federated system CRPA installation, Calian GNSS provides the CA8894SXF+ (active) and CA8894SP (Passive) CRPA antenna arrays.

Complementing CRPA, Calian's Fixed Reception Pattern Antennas (FRPAs), such as the triple-band (L1/L2/L5, E1/E5A/E5B/E6, G1/G2/G3, B1/B2/B2a/B2b/B3) AJ977XF+ MAR, and the single-band (L1, E1, G1, B1) TW3742AJ are optimized to mitigate low-angle interference and ideal for timing and all resilient applications.

Together, these products deliver tailored, mission-ready solutions tested for environmental, mechanical, and electromagnetic extremes for a spectrum of applications—enhancing system resilience and situational awareness wherever your mission takes you.



CR7712EXF 2-element single null adaptive beamforming antenna

Explore Resilient GNSS Precision with Calian



CR8894SXF+ CRPA
Dual-band
(L/E1, L2/E5b)

20–40 dB Nulls
Direction finding
Low power (140 mA/5 V)



AJ977XF+
Triple-band GNSS

Low-elevation nulling
15–20 dB



AJ979XF+ MAR
Full-band GNSS

Proven Jamming Resilience (XF+)
Designed for Marine Environments
Spoofing Resilience/Protection



TW3742AJ
L1/E1 GNSS Coverage

Passive anti-jamming defence
Reduces impact of jammers
Simple, cost-effective
anti-jamming solution



For over 40 years, Calian has delivered mission-critical solutions when failure is not an option. Trusted worldwide, we empower organizations in critical industries to overcome obstacles, manage risks and drive progress. By combining the expertise of our people, proven industry insight, cutting-edge technology, bold innovation and global reach, we deliver tailored solutions that solve complex challenges. Headquartered in Ottawa, Canada, with over 6,000 people around the world, Calian's solutions protect lives, strengthen security, foster global connectivity and drive economic progress, making a lasting impact where and when it matters most.