Gilat Defense

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White Paper

Mission-Ready Multi-Orbit Aero Solutions for Modern Defense Aviation Operations

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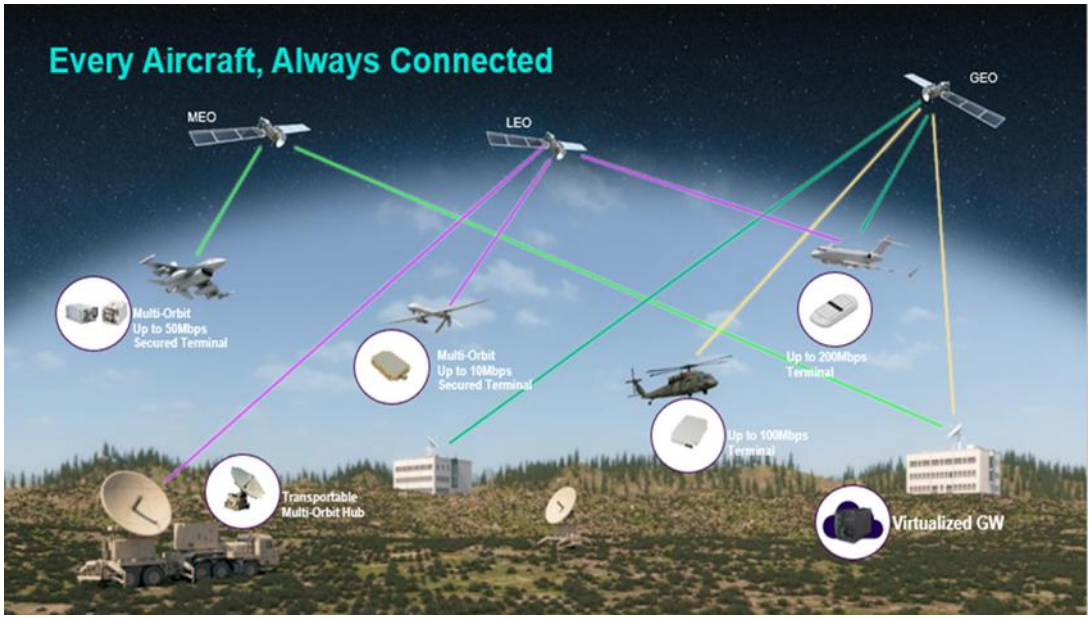
Executive Summary

Modern aviation missions spanning defense and government operations require resilient, high-throughput communications that perform reliably across diverse environments and operational profiles. Manned and unmanned aircraft must maintain secure beyond-line-of-sight (BLoS) connectivity while operating globally, often in remote or RF-contested airspace where terrestrial networks are unavailable or unreliable.

Gilat Defense delivers advanced, mission-ready airborne satellite communications solutions purpose-built for these demands. Leveraging electronically steered antenna (ESA) technology, high-performance modems, and multi-orbit compatibility, Gilat enables seamless connectivity across GEO, MEO, and LEO constellations. These low-profile, ruggedized systems are engineered for minimal size, weight, and power (SWaP) and are trusted by leading defense and government organizations worldwide.

Built on decades of operational experience and field-proven deployments, Gilat's aero SATCOM portfolio supports intelligence, surveillance, and reconnaissance, border protection, in-flight connectivity, and emergency response across both manned and unmanned aerial platforms, ensuring reliable communications wherever the mission takes flight.



The Operational Challenge

Aviation platforms today are expected to operate farther, longer, and with greater autonomy than ever before. Aircraft must support bandwidth-intensive applications including real-time video, sensor data fusion, and secure command-and-control, while maintaining operational flexibility across changing mission phases and satellite availability.

Legacy airborne SATCOM systems often create tradeoffs between performance, size, weight, power, and coverage. Orbit-specific or mechanically steered solutions can limit mission agility, increase maintenance burden, and complicate fleet integration. For unmanned platforms in particular, the ability to maintain secure BLoS connectivity with low latency and high reliability is mission critical.

To meet these challenges, operators require airborne SATCOM solutions that:

- Support multi-orbit and multi-constellation networks
- Minimize SWaP consumption
- Enable continuous global coverage
- Deliver secure, high-throughput communications
- Integrate seamlessly into both new and existing platforms

Gilat Defense Aero SATCOM Solutions

Gilat Defense addresses these challenges with a comprehensive portfolio of airborne SATCOM solutions designed specifically for aviation applications. Combining ESA terminals, advanced modems, and scalable ground infrastructure, these solutions deliver reliable, mission-ready connectivity for both manned and unmanned aircraft.

Aero Terminals

Gilat's ESA technology enables high-speed, low-profile airborne connectivity without mechanical movement. Designed for seamless airframe integration, these terminals reduce installation complexity and maintenance requirements while delivering superior performance across GEO, MEO, and LEO orbits.

Key attributes include:

- Multi-orbit operation for operational flexibility and resilience
- Low-profile, ruggedized designs suitable for demanding aviation environments
- High-throughput performance to support bandwidth-intensive applications
- Compliance with strict aviation and defense standards

Proven in real-world deployments, Gilat's aero terminals provide continuous connectivity for mission-critical operations, even in remote or RF-contested environments.

Operational Applications

Gilat Aero solutions are field-proven, ruggedized technologies, trusted by leading defense organizations and validated in real-world operations.

Intelligence, Surveillance, and Reconnaissance (ISR)

Secure, real-time transmission of data, imagery, video, and voice enables tactical and strategic decision-making. Ensures persistent ISR connectivity regardless of geography or operational conditions.

Persistent Surveillance

Continuous monitoring of an area, target, border, battlefield, or moving object over extended periods without interruption. Enables continuous coverage, real-time intelligence, long-endurance observation, and immediate detection of changes or emerging threats.

Border Protection and Homeland Security

SATCOM-integrated aerial platforms support real-time situational awareness, surveillance, and rapid response. Encrypted, private networks provide resilience and operational continuity for border and homeland missions.

In-Flight Connectivity

High-speed, reliable broadband connectivity for passenger aircraft, business jets, and government platforms supports live video streaming, secure communications, and efficient crew operations.

Rapid Deployment and Emergency Response

Portable and airborne terminals enable first responders and military units to establish communications rapidly in disaster zones or austere operational areas, independent of terrestrial infrastructure.

Maritime Patrol Aviation

Secure, high-throughput links support surveillance, search and rescue, and law enforcement operations over open seas, maintaining connectivity far from shore.

Custom Defense Applications

Gilat supports specialized requirements including tri-band terminals, sovereign hub infrastructure, and tailored system integrations aligned with unique operational demands.

Aerial Platforms Supported

Gilat Aero solutions support a wide range of manned and unmanned aerial platforms, delivering secure, reliable connectivity across diverse mission environments.

Unmanned Aerial Systems (UAS)

Low-SWaP SATCOM solutions enable multi-orbit connectivity for tactical, medium- and high-altitude platforms, supporting BLoS command and control, constellation handover, and real-time payload data.

Rotary-Wing Aircraft

Adaptable SATCOM solutions ensure continuous connectivity for helicopters operating in low-altitude and demanding environments, supporting mission coordination and real-time data exchange.

Aerostats and Tethered Platforms

Persistent connectivity supports long-endurance surveillance missions, enabling continuous monitoring and real-time detection of changes or emerging threats.

Innovative UAV SATCOM Solutions

Gilat Defense offers a dedicated portfolio of SATCOM solutions for unmanned systems, purpose-built for both HALE/MALE and tactical UAV operations. These solutions ensure reliable beyond-line-of-sight operations through robust, multi-orbit connectivity.

Key capabilities include:

- Rugged, low-SWaP airborne terminals for UAV integration
- Real-time video, telemetry, and data transmission
- Modular, plug-and-play architectures for rapid deployment
- Seamless integration with commercial and military satellite networks

Advanced modems provide dynamic bandwidth allocation and robust cybersecurity, including TRANSEC and FIPS 140-3 compliance, all managed via the SkyEdge IV platform. Ground infrastructure, including gateways and portable terminals, supports scalable, multi-UAV operations.

With extensive field-proven experience, Gilat enables UAV operators worldwide to execute complex missions with confidence.

Conclusion

Gilat Defense stands out as a leader in advanced airborne SATCOM, delivering mission-ready, multi-orbit connectivity for modern defense aviation operations. Through ESA antennas, high-performance modems, and scalable ground systems, Gilat provides secure, high-throughput communications across GEO, MEO, and LEO constellations.

With a legacy of innovation, proven deployments, and deep operational expertise, Gilat Defense enables manned and unmanned platforms to maintain reliable connectivity across mission environments, wherever and however they operate.