WHITE PAPER

LEO VS GEO SATCOM: WHAT'S BETTER FOR YOUR AIRCRAFT FLEET?

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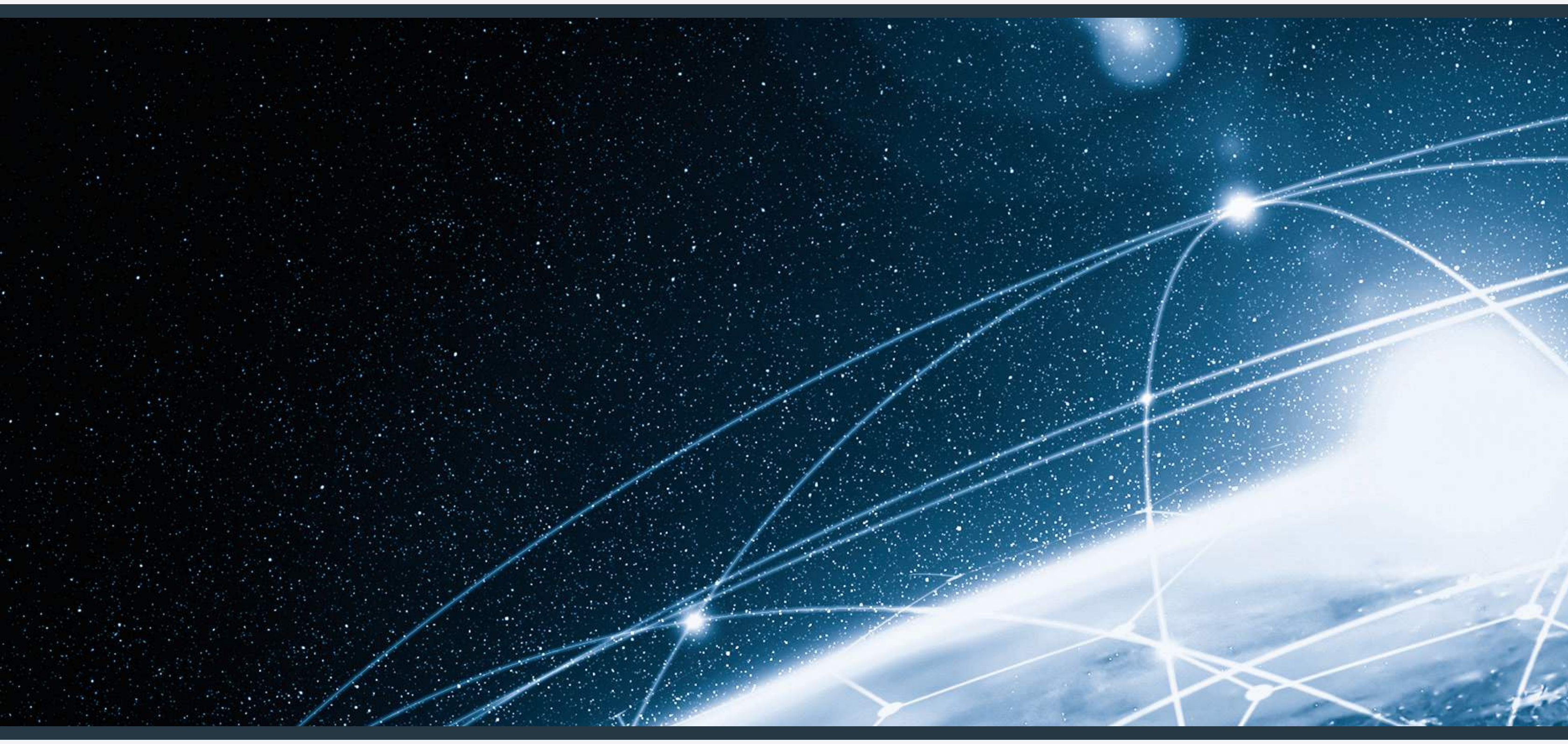


1.0 A BRIEF HISTORY OF SATCOM

The First Satellite Constellation in History was Launched by Telstar in 1962

The original Telstar satellite operated in a non-geosynchronous orbit, which meant that the availability of transatlantic signals was limited to 30 minutes in each 2.5-hour orbit when the satellite passed over the Atlantic Ocean. Although a true milestone for communications, Telstar's intermittent availability limited its usefulness, but it was nonetheless an engineering marvel that set the stage for future generations of satellites and constellations. Approximately one year after the launch of Telstar, the first Geosynchronous Equatorial Orbit (GEO) was achieved in August of 1963 by Syncom3.

GEO satellites are in sync with the Earth's rotation, meaning they are always pointing to the same location as the Earth rotates. This ensures that the satellite is always in a fixed position over Earth so that connectivity can be provided 24 hours a day to a particular region. After Syncom3, successive generations of GEO communication satellites were developed for television, military applications, telecommunications, and internet purposes. However, due to the geometry of GEO orbits, service is centred at the equator, with no coverage provided in the Northern and Southern latitudes of the Arctic and Antarctic regions, respectively.

To provide truly global coverage including the polar regions, Lower Earth Orbit (LEO) satellite networks were proposed. Of several early LEO constellations launched in the 1990s, Iridium proved to be the most robust, supporting commercial and military applications over the lifespan of its first constellation. In 2017, Iridium began launching the $3 billion upgrade of its 66-satellite constellation.

Today, Iridium NEXT, Iridium's recently upgraded constellation, offers up to 704 Kbps of bandwidth, nearly a 300x increase over the first-generation Iridium constellation.

Since 2014, numerous companies have announced satellite networks using LEO constellations due to their unique advantages. Because LEO satellites are roughly 1,000 km above the Earth's surface, while GEO satellites are 36,000 km above, radio modems that connect to them are small, lightweight, and use very small antennas. Critically for data and voice services, there is much lower latency or signal delays with LEO communications than with GEO.

SpaceX, OneWeb, and Amazon all plan to launch more than 1,000 satellites each in the coming years, signaling to the advantages of LEO networks. As evidenced by a slew of new constellations and heavy public and private investments, satellite technology is developing quickly.

SpaceX's Starlink, Amazon's Kuiper, and Iridium's NEXT constellations are all recently launched LEO networks poised to provide powerful, low latency connectivity to millions of consumers and organizations around the world.

In the aviation industry, applications that can benefit from low latency real-time LEO connectivity include Beyond-Line-of-Sight (BLOS) communications, Command-and-Control (C2) applications, real-time weather data, global mapping and fleet tracking, broadcasting, video and imagery communications, safety services, and artificial intelligence.

GEO satellite constellations serve a different role for aviation. While GEO satellites have higher latency and require more power and bigger antennas, they provide higher bandwidth for business and passenger jets with many simultaneous users. GEO satellite systems are heavier and costlier to operate, so balancing necessity with operational efficiencies is a key activity when selecting satcom networks. The right network will depend on the requirements of the aircraft and what missions are being served.

Table 1. Significant satellite constellations and their launch date.

Satellite Constellations	Launch Dates
Telstar	1962
Syncom3	1964
Iridium First Gen	1997-2002
Iridium NEXT	2017
Inmarsat's EAN	2017
OneWeb	2019
SpaceX Starlink	2019
Amazon Kuiper	2022

2.0 THE DIFFERENCE BETWEEN LEO AND GEO

What is a Geosynchronous Equatorial Orbit (GEO) satellite network?

GEO satellites are positioned at roughly 36,000 km above the Earth's equator and rotate in the same direction and speed as the Earth. This fixed positioning ensures that satellite transmission remains consistent and focused on a particular region on the planet. These GEO networks can provide a wide range of coverage to approximately 80% of the planet, limited due to the curvature of the Earth. Due to the distance from the planet, GEO satellites require a high-power directional antenna that must continually be aligned towards the satellite, which may pose a challenge for assets in continual motion. These antennas are typically large, expensive, and have many moving parts requiring maintenance and upkeep.

Benefit of GEO Satellites

GEO satellite networks can provide very high broadband data throughput, with up to 50 Mbps downlink and 5 Mbps uplink. New constellations being launched will provide up to 300 Mbps throughput. To put it into perspective, these speeds are equal to or greater than standard household internet networks.

Limitations of GEO Satellite Constellations

GEO constellations also come with their own set of limitations. One of the significant drawbacks to GEO satellite networks is that they do not provide truly global coverage. Operators seeking to fly in polar latitudes will oftentimes encounter blackout zones near the poles.

The size, weight, and power (SWaP) requirements of GEO satellite networks can also limit the type of aircraft that can support the larger terminals and heightened requirements. Rotorcraft and smaller fixed-wing aircraft oftentimes cannot install GEO satellite antennas due to their size. These aircraft are better suited to LEO Satcom.

> "One of the significant drawbacks to GEO satellite networks is that they do not provide truly global coverage. Operators seeking to fly in polar latitudes will oftentimes encounter blackout zones near the poles."

Although the pricing can vary depending on the provider, industry experience has found that GEO satellite network rates tend to be relatively high. Additionally, when using GEO networks, you will be billed for the bandwidth, not the throughput. With Iridium, operators are billed for the actual amount of data transferred. For example, if an operator is using a GEO network capable of 1 Mbps, but only transmits 0.25 megabytes of data, they will still be billed for the entire megabyte. With LEO networks, in particular Iridium, operators will only be billed for the 0.25 megabytes of data. These hidden costs can impact operational efficiency.

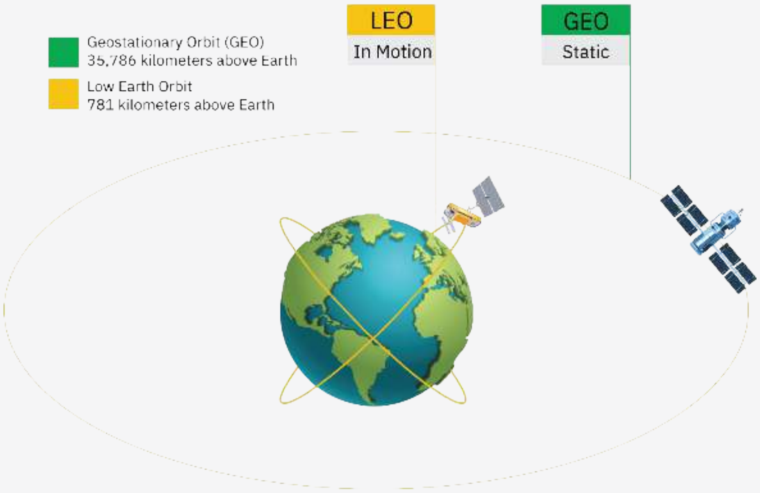


Figure 1. LEO versus GEO motion and distance from Earth (not to scale).

What is a Low Earth Orbit (LEO) satellite network?

Low Earth Orbit (LEO) satellites are located far closer to Earth than GEO satellites. LEO satellites are generally found within 500-1,500 km. LEO constellations continuously orbit the planet and are not fixed to one point like GEO satellites. Due to this differentiation, LEO constellations such as Iridium NEXT can provide true pole-to-pole connectivity at all times.

The close proximity to Earth also ensures minimal lag, or latency, providing near real-time responsivity. This reduction in latency enables real-time voice communications, data transmission, tracking, and other functions requiring immediacy. Because LEO satellites are much closer to Earth, operators can utilize simple, non-directional antennas, smaller Satcom terminals, and command an overall lower power consumption - neccessary considerations for operators of smaller aircraft.

Table 2. Comparison of GEO and SKYTRAC LEO antenna attributes

Attribute	GEO Satcom	SKYTRAC LEO Satcom
Dimensions	10" X 10" X 9.7"	8.9" X 4.1" X 2.0"
Weight	1.80 kg (4.00 lbs)	1.80 kg (4.00 lbs)

Strengths of LEO Satellite Constellations

LEO constellations feature stronger resiliency against severe weather events. The radio frequencies used by Iridium NEXT, for example, can penetrate thick smoke and storms to ensure continued connectivity for mission-critical operations. LEO satellites' close proximity to the surface of the Earth also reduces the degradation of signals caused by solar events, which more commonly disrupt GEO satellite communications.

Additionally, LEO constellations contain numerous satellites. For example, Starlink has launched 1,740 satellites to date. Their second generation of satellites is expected to have more than 30,000 satellites in the overall constellation. Iridium NEXT houses 66 satellites in its constellation, an astonishing 22-times more than Inmarsat's GEO constellation. These satellites can also be cross-linked in a mesh network. This means that each satellite can communicate with each other and transfer data between satellites. In the event one satellite goes offline, the other satellites in the network can compensate for the offline satellite, adding additional resiliency to the network.

Another strength of the LEO networks is their incredibly low latency. This attribute enables real-time Command-and-Control (C2), Beyond-Line-of-Sight (BLOS) communications, voice telephony, and Iridium satellite Push-to-Talk (PTT).

The network's close proximity to Earth also optimizes SWaP considerations for operators, featuring smaller antennas, lighter terminals, and lower power consumption. The omnidirectional antennas also enable communication on-the-move and allow aircraft to pick up the strongest signals automatically, as elements continuously scour the sky for the best, strongest signals. This trait is particularly useful to rotorcraft, as rotor shadow effects are mitigated due to antennas connecting to satellites at the horizon instead of directly through the rotor blades.

LEO constellations can also provide complete global coverage. Iridium NEXT, for example, provides the only true pole-to-pole satellite connectivity on the planet, which sets it apart from all other networks.

Limitations of LEO Satellite Constellations

LEO constellations have their challenges. Due to lower bandwidths when compared to GEO satellite constellations, operators transporting large numbers of passengers will be unable to provide high-speed internet browsing and video streaming. For business jets or helicopters with just a few connected devices, LEO satellites can support most requirements.

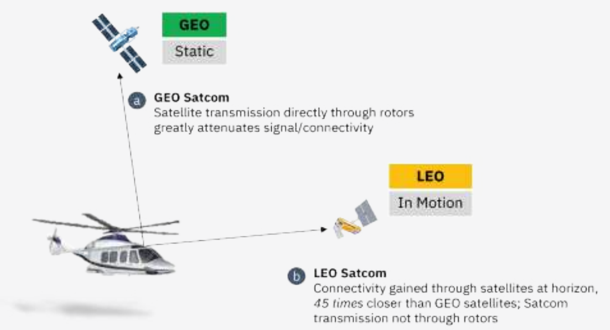
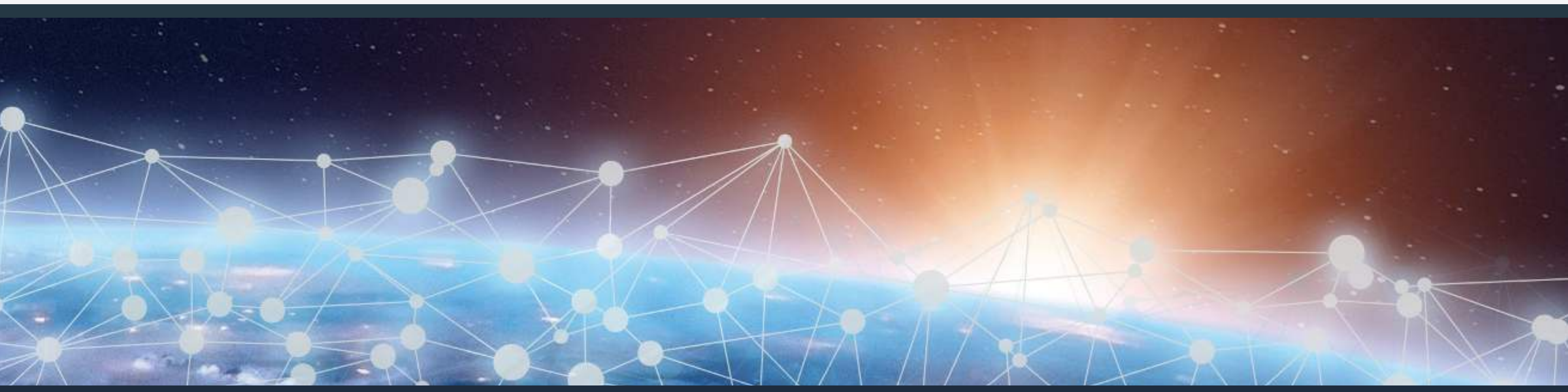


Figure 2. LEO versus GEO satellite connectivity comparison.



What's the difference between Ka, Ku, and L Band spectrums?

A key difference between satellite networks is the frequency bands employed by a particular constellation. GEO satellite networks more frequently employ K_a or K_u bands while LEO satellite networks typically employ L band spectrums. However, this isn't always the case, as evidenced by Teledesic's attempt at providing K_a band Satcom through a LEO constellation. Each satellite frequency band has its own characteristics and are beneficial for various scenarios.

Ka/Ku/L Band Spectrums

Ka and Ku bands have higher frequencies (26.5-40 GHz and 12-18 GHz, respectively) which provide access to wider bandwidths. These higher frequencies, however, are more susceptible to signal degradation. Additionally, due to their predominance on GEO constellations, these bands typically feature higher latencies than their L-band counterparts.

L-band frequencies operate in the 1-2 Ghz range and are more resistant to signal degradation and rain fade. Because LEO networks are much closer to Earth, the terminals and antennas are also smaller in comparison to Ka/Ku alternatives.

Additionally, L-band frequencies are typically more cost-effective when compared to Ka and Ku bands. As LEO networks become more popular, new technologies like AnsuR's ASMIRA are providing high quality video compression to enable high fidelity HD video transmission with minimal degradation.

As L-band satcom networks advance and technologies such as AnsuR's ASMIRA continue to enhance compression, Ka and Ku band throughput is becoming less of a deciding factor for operators when selecting a satellite communications network.

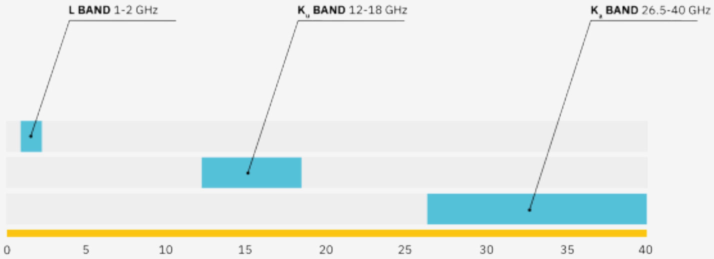


Figure 3. Satcom spectrum bands by GHz profile.

GEO & LEO Comparison Table

As satellite networks continue to evolve to deliver higher bandwidth and throughputs, operators must consider the best option for their aircraft fleet. Chapter 3 outlines the benefits for various classes of operators.

Questions to consider for your aircraft fleet:

- Do you need access to real-time connectivity?
- Do you require connectivity in Northern and Southern regions?
- Do you require connectivity in severe weather events such as heavy wildfire smoke or natural catastrophes?
- Do you need to be aware of Size, Weight, and Power (SWaP) considerations?

Table 3. Comparison of LEO and GEO attributes to operators.

Attribute	GEO Satcom	LEO Satcom	Notes
L-Band Broadband Bandwidth	✓	✓*	*LEO has much less latency
Ka/Ku Broadband Bandwidth	✓		LEO not yet available for aircraft
Terminal Size		✓	LEO requires lower SWaP
Antenna Size		✓	LEO requires smaller antennas
Truly Global Connectivity		✓	Complete polar coverage
Signal Resilience		✓	LEO more resistant to solar/rain fade
Low Latency		✓	LEO latency imperceptible to users

3.0 INDUSTRY APPLICATIONS OF LEO AND GEO

All Segments of Aviation Can Benefit from Truly Global Connectivity

Satellite communications can be applied differently within all segments of aviation. Commercial airline operators may require connectivity for Inflight Entertainment (IFE), credit card validation, and cockpit safety services. Air medical operators may improve patient outcomes with telemedicine and medical data transfer capabilities. Aerial firegfighters can leverage real-time video transmission to report back to Ground Command Stations with regards to quickly changing conditions. All of these applications are ultimately to improve the safety for civilians. While both LEO and GEO networks may be suitable, operators also consider operational efficiencies within their respective lines of business to determine the best solution.

COMMERCIAL AIRLINE APPLICATIONS

While GEO may be an appealing option to commercial aircraft for their bandwidth capabilities, such as for providing high speed internet browsing to multiple passengers at once, there are also benefits to supplementing costly GEO systems with powerful L-band capabilities in the cockpit. With L-band, connectivity can be guaranteed globally, providing an effective safety mechanism for pilots and flight operations.

Global Aeronautical Distress and Safety System (GADSS)

One example is GADSS, which requires commercial airlines to send position reports throughout the globe when distress scenarios are detected. For polar flights, LEO constellations such as Iridium NEXT can meet the requirement due to its globally available connectivity. By supplementing the cockpit with an Iridium L-band Satcom terminal, airlines can satisfy position tracking requirements around the world.

Voice and Text Communications

L-band Satcom can also be used for low-latency communication with Air Traffic Control (ATC) as a secondary communications system to VHF and HF radio systems to provide guaranteed global voice communications.

Electronic Flight Bag Automation

Airlines, business jets, and helicopters can ensure cockpit connectivity with L-band bandwidth to automatically

transfer data used in electronic flight bags and other process automation tasks. The truly global connectivity of L-band ensures aircraft data is effectively routed to the right sources, under any conditions.

Weather to the Cockpit

Pilots can enhance their situational awareness with moving, real-time weather maps. Commercial and cargo airlines rely on accurate, real-time weather to make safe flying decisions. For airlines flying in regions of extreme weather, guaranteed connectivity is a key resource for pilots and passenger safety.

PUBLIC SAFETY APPLICATIONS

Public safety agencies rely on mission-critical capabilities to power their success. Law enforcement, search and rescue (SAR), aerial firefighting, and emergency medical service (EMS) operators all leverage Satcom connectivity for a variety of applications. With reliability and resiliency being a chief concern.

Public safety agencies are also typical of mixed-fleet operators. These operators generally have both fixed-wing and helicopter assets. For fixed-wing aircraft, larger GEO systems are not an issue due the larger airframes. For helicopters, however, larger GEO systems have challenging to adapt due to size and weight constraints. Additionally, rotor shadow effects, illustrated in Figure 2, can greatly reduce potential bandwidth due to signal attenuation.

With multi-satellite L-band constellations such as Iridium NEXT, rotor shadow effects are largely eliminated due to the ability for LEO antennas to connect with satellites low on the horizon.

As technology continues to evolve, operational reliance on data will require enhanced connectivity. Remaining connected will become a priority to users, and reliable, weather-proof connectivity will pace industry adoption rates of LEO satellite connectivity.

Figure 4. Critical components relying on Satcom on a modern SAR helicopter.

Law Enforcement

Law enforcement agencies rely on reliable satellite connectivity for applications including live video streaming for surveillance, satellite Push-to-Talk (PTT), and fleet/position tracking. Additionally, operators equipped with flight data monitoring (FDM) can benefit from automated post-flight downloading, saving valuable technician time.

With the advent of technologies like AnsuR's ASMIRA, which enables powerful video compression to reduce the amount of data usage, L-band video streaming has recently generated considerable interest.

Law enforcement operators have already started to make the transition to L-band networks, and interest from the community has greatly increased since Iridium Certus became a viable solution.

In addition to surveillance, Law Enforcement operators are also leveraging satellite Push-to-Talk (PTT) capabilities to enable inter-fleet communications over long distances.

Aerial Firefighting

As aerial firefighting technologies advance and firefighting seasons become more pronounced, operators must find new ways to effectively combat wildfires. Aerial firefighting aircraft also require connectivity and communication technology when flying in extremely smokey conditions. L-band LEO satellites are the most resilient against these kinds of interference patterns and are preferable to operators seeking reliability under less than ideal circumstances.

Equipping fleets with live video transmission capabilities, whether with GEO or LEO satcom, can provide useful insights to command and control on how fires are advancing, providing valuable strategic insights. With the advent of artificial intelligence and sensor fusion, multiple sensors and video feeds can now be integrated to provide detailed, layered insights with low latency. This data is critical to command-and-control centers and can help them make data-driven decisions in real-time to reduce risk while combating wildfires. Previously reserved to GEO networks, live video streaming is now possible through more efficient LEO networks like Iridium NEXT.

Air Medical

One of the operations most impacted by newer, lighter Satcom networks are medevac operators. Previously restricted due to considerable SWaP restrictions, medevac operators are now able to outfit their fleets with smaller, lighter LEO systems capable of providing broadband throughout at up to 704 Kbps. These new broadband capabilities enable telemedicine applications, medical data transfer capabilities, and more.

Medical data transfer in particular is a useful capability that enables operators to send onboard patient vitals directly to receiving hospitals in real-time. Additionally, transport physicians can also view patient data live through secure, remote servers to make critical care decisions. This capability was previously limited to onboard paramedics and flight nurses relaying patient vitals by radio or phone. Now, with medical data transfer and telemedicine connectivity, the in-air and on-ground medical staff can work together more effectively.

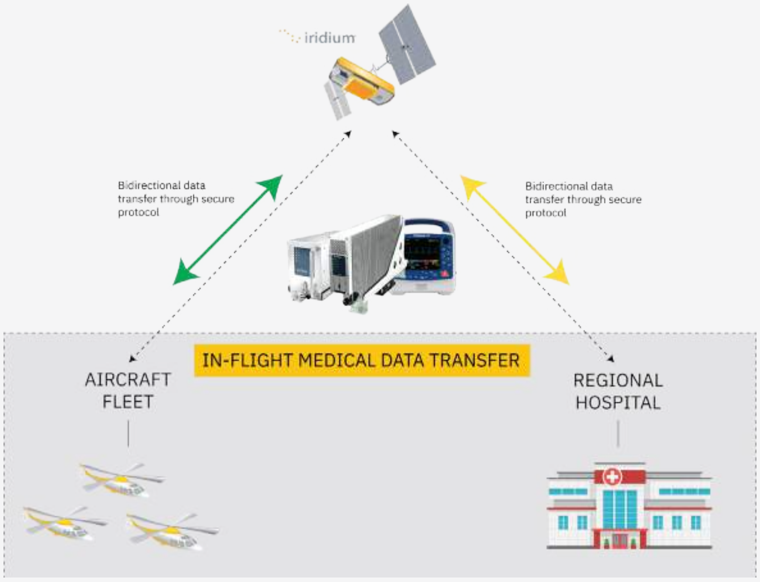


Figure 5. Transmission of medical data through LEO (Iridium) network.

MILITARY AND GOVERNMENT APPLICATIONS

For military and government operators that rely on guaranteed connectivity for effective communications, the choice between GEO and LEO depends on the use case. For governments that rely on global connectivity, LEO is often the primary choice. Since the start of the Iridium constellation, Iridium's primary contracts were from the United States military needing secure, high-reliability connectivity. With L-band networks, fleet tracking, voice communications, text messaging, and satellite Push-to-Talk (PTT) were all capabilities enabled through the global L-band networks.

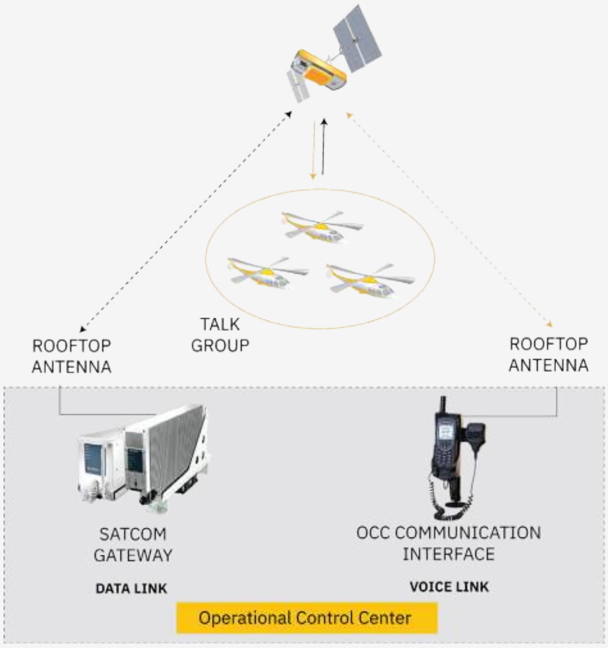


Figure 6. Encrypted Satellite Push-to-Talk through LEO (Iridium).

UNMANNED AVIATION APPLICATIONS

Unmanned aviation is currently the fastest growing segment in aviation and certain operations depend on reliable connectivity. Unmanned aerial vehicles (UAVs), which rely on Satcom for Beyond-Line-of-Sight (BLOS) and Command-and-Control (C2) applications. GEO or LEO satcom can be used.

However, larger Satcom systems, such as those that utilize GEO networks, cannot be used on small to medium UAVs due to size and weight constraints. Smaller UAVs, often employed by industry, will be better suited to both midband and broadband L-band networks centered around L-band connectivity. These networks can enable BLOS flights and Command-and-Control applications under limited bandwidth within a variety of industries.

For operators who seek to conduct missions around the world, L-band LEO networks provide the best opportunity for guaranteed connectivity. Additionally, the low latency of LEO constellations ensure that operators have minimal delays responsivity when updating UAV flight parameters.

Figure 7. Satcom Beyond Line of Sight Communications with UAV.

For some segments of aviation, LEO satellite connectivity is really the only feasible option, such as for small to mid-size unmanned aerial vehicles and rotorcraft operators. For other segments, LEO satellite connectivity can function as a critical secondary system to improve pilot situational awareness and thus safety of your operations.

LEO satellite connectivity is applicable to all segments of aviation while GEO satellite connectivity is more better for high bandwidth/throughput applications.

4.0 SKYTRAC LEO SATCOM SYSTEMS

SKYTRAC LEO Satcom Systems by Bandwidth Capability

SKYTRAC is aviation's platform of choice for intelligent connectivity solutions centered around LEO L-band Satcom and global cellular connectivity. With three different Satcom connectivity options, SKYTRAC offers operators mission-critical capabilities to a variety of market segments within aviation.

BROADBAND (UP TO 704 KBPS)

SKYTRAC offers several truly global Satcom systems for operators in all segments of aviation. The latest systems use all the new Iridium Certus midband and broadband services.

SDL-350

SKYTRAC's flagship SDL-350 satellite transceiver with on-board server harnesses the world's only true pole-to-pole satellite network, allowing operators 99.9% global uptime. This reliability allows mission-critical operations in EMS, SAR, offshore oil and gas, business aviation, scientific exploration, military, and airline industries to perform when the mission gets tough.
The SDL-350 meets all current requirements, provides advanced capabilities, and **352/704 Kbps** to and from the aircraft.

IMS-350

The IMS-350™ is SKYTRAC's Certus satellite transceiver for lightweight, low-power Satcom connectivity with onboard server capabilities for operators looking for reliable, robust, and proven global communications. Enhance your flight ops with Wi-Fi, cellular, and Satcom connectivity with **352/704 Kbps** of bandwidth to and from both manned and unmanned aircraft.

MIDBAND (UP TO 88 KBPS)

SKYTRAC's midband offering enables operators to utilize up to 22/88 Kbps to and from an aircraft, providing low-frame rate video capabilites, telemetry, credit card validation, as well as command and control capabilities for UAV operators.

DLS-100

SKYTRAC's compact DLS-100 is the smallest midband Satcom transceiver enabling command and control,

telemetry streaming, and GPS connectivity for both manned and unmanned aviation. It's lightweight, slim profile make it ideal for smaller airframes and UAVs seeking global connectivity. The ruggedized, IP67 compliant modem ensures worry-free connectivity under any weather conditions.

ISAT-200A-08

SKYTRAC's ISAT-200A 08™ is an Iridium Certus midband transceiver that follows in the footsteps of the original ISAT-200A. The latest generation ISAT-200A, upgraded fr the Iridium NEXT constellation features the same capabilities and features installed on over 5,000 global aircrafts.

The lightweight ISAT-200A 08™ data acquisition and satellite communications terminal boasts all new capabilities, improved processing speeds, and a 10x multiplier in Satcom bandwidth compared to narrowband alternatives, and is set to enable the next generation of pole-to-pole connecitivity.

NARROWBAND (UP TO 2.4 KBPS)

SKYTRAC's ISAT-200A is a unique, all-in-one platform designed for fixed-wing and rotor-wing aircraft. Operating on the Iridium satellite network, the ISAT-200A supports 2.4 Kbps of bidirectional bandwidth. It's flight data acquisition capabilities enable operators to satisfy flight following and FOQA/MOQA requirements cost-effectively, as well as voice, text, and Satellite PTT communications.

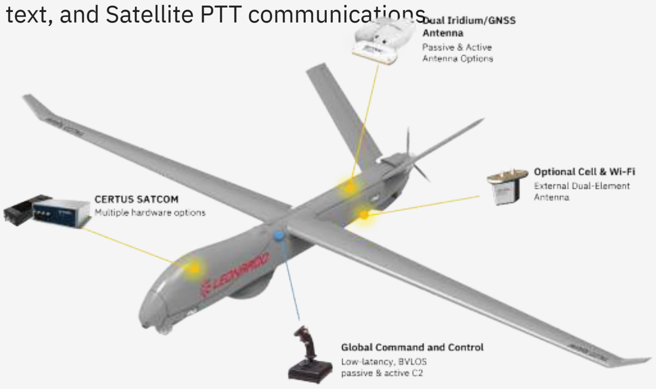


Figure 8. DLS-100 and IMS-350 UAV Satcom configurations.

SKYTRAC offers numerous products, solutions, and capabilities for all segments of aviation, and is a leading Iridium Certus Value-added Manufacturer, Reseller, and Service provider.

To learn more about SKYTRAC's LEO Satcom systems, connect with a SKYTRAC Technical Expert at sales@skytrac.ca.

Table 4. SKYTRAC Satcom solutions for broadband, midband, and narrowband LEO Satcom.

BROADBAND SATCOM (capable of up to 704 Kbps of truly global connectivity)		
SDL-350	**Capabilities**	**Interfaces**
	Live HD Video and Data Streaming Server with VM and AI-based Application Support Safety Services (FANS 1/A) Satellite Push-to-Talk (PTT) Real-Time Alerting, Monitoring, and Weather Aircraft Tracking and Monitoring Electronic Flight Bag Automation Wi-Fi and Cellular Connectivity	GPS/GNSS Audio Interfaces Ethernet Interfaces ARINC 429 Tx/Rx Interfaces RS-232/485 Serial Interfaces Discrete I/O Interfaces
IMS-350		
	Live HD Video and Data Streaming Beyond Line of Sight Communications (BLOS) Real-Time Command and Control (C2) Unmanned Traffic Management and Remote ID Server with VM and AI-based Application Support Real-Time Alerting, Monitoring, and Weather Aircraft Tracking and Monitoring Wi-Fi and Cellular Connectivity	GPS/GNSS Ethernet Interfaces ARINC 429 Tx/Rx ARINC 717 Rx RS-232/485
MIDBAND SATCOM (capable of up to 88 Kbps of truly global connectivity)		
DLS-100		
	Live Photo and Data Streaming Beyond Line of Sight Communications (BLOS) Real-Time Command and Control (C2) UAS and Payload Health Monitoring Unmanned Traffic Management and Remote ID Aircraft Tracking and Monitoring Wi-Fi Connectivity	DB25 Custom Pin-Out 100BASE-T Ethernet RS-232 SMA for Wi-Fi and GPS TNC for Iridium
ISAT-200A-08		
	Live Photo and Data Streaming Server with VM and AI-based Application Support Satellite Push-to-Talk (PTT) Real-Time Alerting, Monitoring, and Weather Aircraft Tracking and Monitoring Electronic Flight Bag Automation Wi-Fi and Cellular Connectivity	GPS/GNSS Audio Interfaces Ethernet Interfaces ARINC 429 Tx/Rx Interfaces ARINC-717 Rx Interfaces RS-232/485 Serial Interfaces Discrete I/O Interfaces
NARROWBAND SATCOM (capable of up to 2.4 Kbps of truly global connectivity)		
ISAT-200A-07		
	Live Data Streaming Server with VM Satellite Push-to-Talk (PTT) Real-Time Alerting, Monitoring, and Weather Aircraft Tracking and Monitoring Electronic Flight Bag Automation Optional Wi-Fi and Cellular Connectivity	GPS/GNSS Audio Interfaces Ethernet Interfaces ARINC 429 Tx/Rx Interfaces ARINC-717 Rx Interfaces RS-232/485/422 Serial Interfaces Discrete I/O Interfaces

5.0 CONCLUSION AND CONSIDERATIONS

LEO constellations meet aviation's need for resilient, truly global connectivity.

Overall, both GEO and LEO constellations offer unique value to the aviation industry. Traditional GEO networks are now being challenged with the new and exciting capabilities of broadband LEO satellites.

For very bandwidth intensive applications that don't require low latency, GEO networks will continue to remain the operator's choice. However, for mission-oriented fleets needing connectivity for surveillance imagery with video compression technologies, AI and sensor fusion, VIP internet, and Command-and-Control (C2) applications, LEO networks are viable and cost-effective.

For operators that conduct missions around the globe, globally available LEO networks such as the Iridium NEXT constellation may be the best consideration from an operational standpoint.

LEO constellation networks provide the resiliency needed for demanding operations such as aerial firefighting, offshore oil and gas, and military missions. They are also better suited for new and rapidly growing segments of aviation such as unmanned aviation. With this, LEO constellations are able to offer unique benefits to aircraft operators around the globe.

To learn more about SKYTRAC's Satcom solutions and how they can improve your operational efficiencies, please contact a SKYTRAC Technical Expert at sales@skytrac.ca.

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