# INTELSAT

Satellite Connectivity Solutions for Commercial Airlines

Contents

Intelsat Connectivity Solutions

The global coverage and scalable capacity of the Intelsat Global Network enables streaming-quality Wi-Fi and Live TV to the entire cabin. Our access technologies include both single and multi-orbit antenna options for unsurpassed performance and industry-leading system availability. Intelsat's end-to-end managed services help you efficiently manage the bandwidth you need to provide the inflight experiences your passengers want.

Intelsat's open architecture design leverages today's Ku-band satellites and offers future-ready performance with high-throughput satellites (HTS). This allows Intelsat Commercial Aviation to deliver on the coverage and capacity needs for commercial airlines with global flight routes today—and tomorrow.

Aero Networks

Inflight Experiences

Onboard Systems & Software

Operational Support
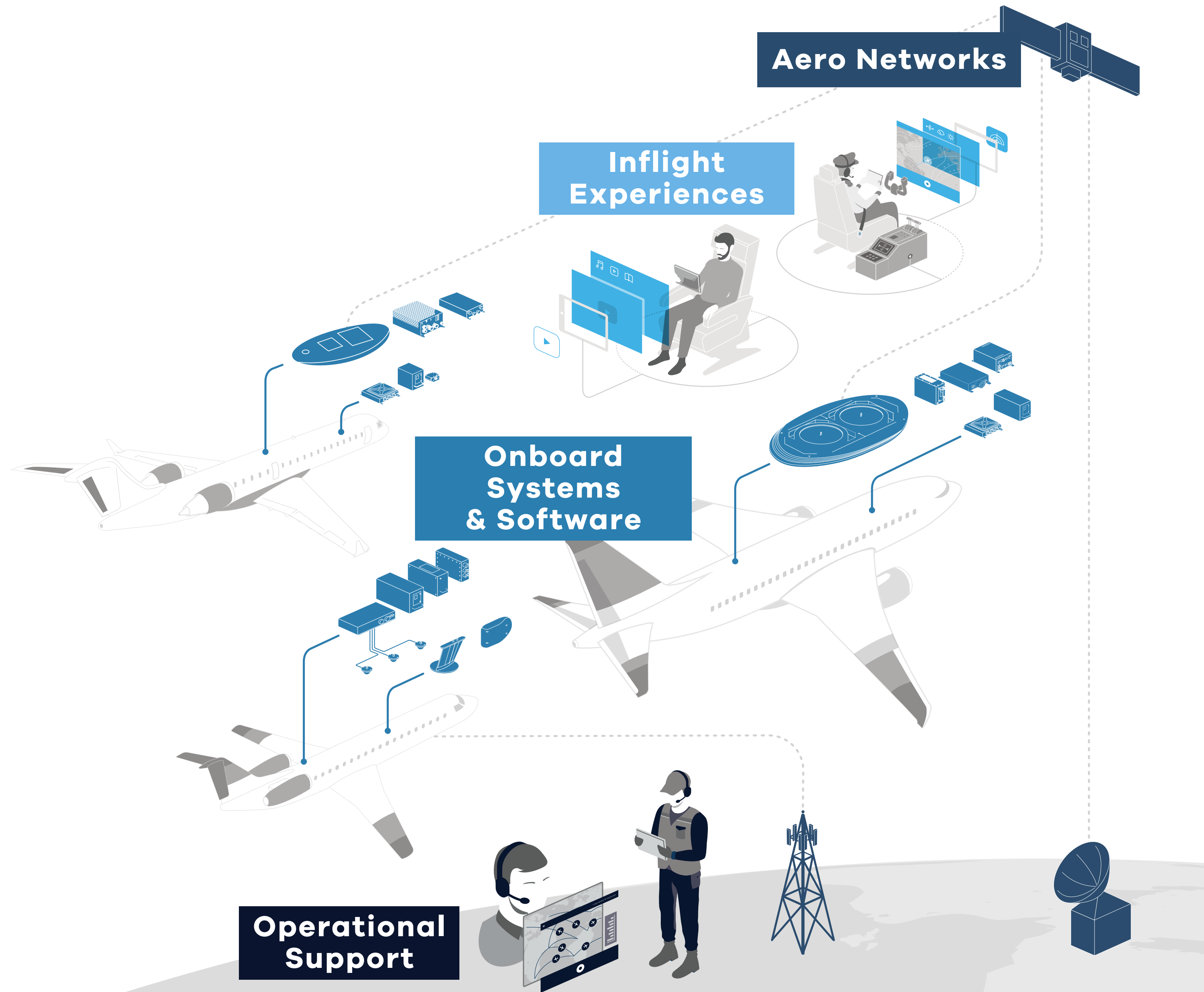
Portfolio Overview

Inflight Experiences

Connectivity Services
Wi-Fi Internet Packages

Onboard Portal / Portal Manager

IFC to Seatback Integration

Entertainment Services
Wireless Inflight Entertainment

Live TV

Connected Aircraft Services
eEnablement

Aircraft Data Access

Operational Solutions

Onboard Systems & Software

Access Technologies
2Ku GEO satellite access

ESA GEO/LEO satellite access

ATG4 North American ground access

Onboard Experience
Onboard Experience (OX) Platform

In-cabin Network
2Ku In-cabin Wi-Fi Network

ESA In-cabin Wi-Fi Network

ATG4 In-cabin Wi-Fi Network

Aero Networks

Global Ku Satellite
Global Ku Aero Network

NA Regional ATG
Regional North American Air-to-Ground Network

Operational Support

In-service Maintenance
Aircraft Technical Services (ATS)

Transmitting Portable Electronic Device (T-PED) Testing

Tools (Onboard Maintenance App)

Training (Line Maintenance Training, Train the Trainer)

On-site Line Maintenance Support (FSRs)

Operations Control Center (OCC) Support

Customer Care

Intelsat Sphere

Wi-Fi Onboard System Health

Prototype
Aircraft Technical Services (ATS) (STC, EO, De-mod)

Telecommunications Agency Certification

Production Installation
On-site Installation Support

Tools (Procedural Config and Testing (PCAT) Tool)

Training (Wi-Fi Crew Training, Installation Training)

Our Airline Partners

AeroMexico

Air Canada

Air Canada rouge

Airfrance

Alaska Airlines

American Airlines

British Airways

condor

Cathay Pacific

Delta

GOL

Iberia

J-Air

Japan Airlines

JTA

KLM

Latam

Level

Northern Pacific Airways

Qatar Airways

rex.

United

virgin atlantic

Virgin australia

01

Satellite Access Technologies

Intelsat offers both single - and multi-orbit access technologies depending on your needs.

Signal Transmission

2Ku Antenna

- Two large aperture phased-array antennas
- Advanced beam forming and steering

A791 (Taurus) MODMAN

Hosts the next-generation modem which modulates and demodulates L-band signals
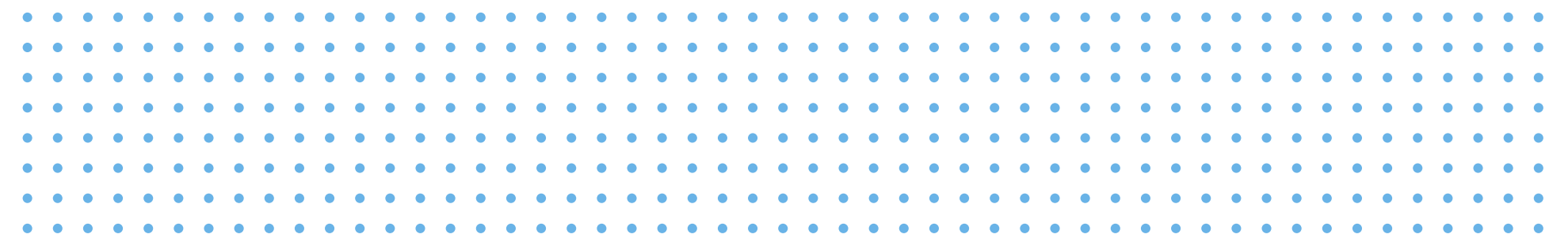
KANDU

Provides power to the satellite antennas and uses aircraft navigational data to control its movement

KRFU

Upconverts L-Band signals from the modem to Ku-band and amplifies them for transmission to the satellite

Signal Transmission

ESA Antenna

- Electronically-steered array

- Multi-orbit (GEO/LEO) antenna solution

- Coverage over every route

A791 (Taurus) MODMAN

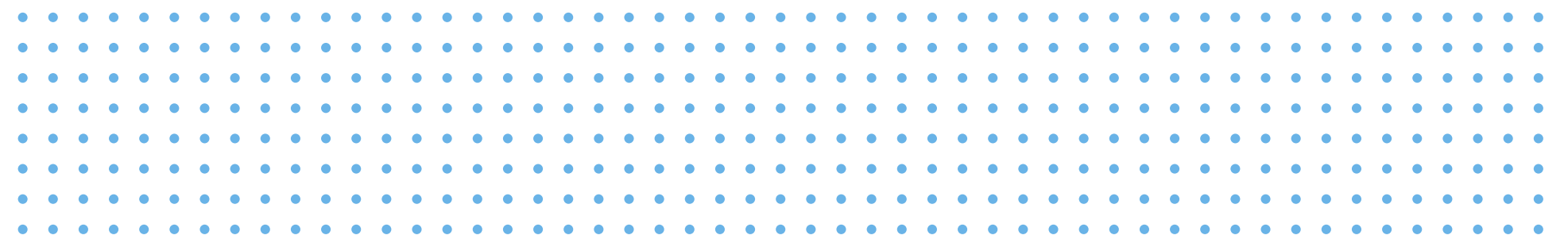Hosts the next-generation modem which modulates and demodulates L-band signals

PSU

Power supply unit. Supplies power to both the Rx and Tx antenna arrays

ACMU

Antenna-pointing and networking data unit

02

In-cabin Network

Configurations for any aircraft

Our satellite IFC solutions are suitable for large commercial aircraft with global flight routes, regional narrow-body fleets, and cargo aircraft. Linefit, SB, and STC retrofit options are available.

In-cabin Network

The In-cabin Network consists of the essential airborne hardware that interfaces with aircraft access technology to power the passenger experience. The Onboard Server enables wireless content access via any device, including seatback screens over the dedicated In-cabin Network.

ACPU-2 | A791 MODMAN

Onboard server options include the ACPU-2 or the A791 MODMAN depending on aircraft configuration.
The A791 MODMAN serves as both modem and onboard server in Service Bulletin (SB) and Linefit (LF) configurations.

In-cabin axWAP

Wireless Access Points provide the Wi-Fi signal to devices in the cabin and support the latest 802.11 standards, including 802.11ac.

Reliable, High-speed Inflight Internet — Everywhere, All the Time

The Intelsat 2Ku Onboard System includes all the onboard hardware and software needed to deliver inflight internet access to passengers around the globe.

The heart of the system is the satellite access technology that includes two antennas—one for the forward link, which transmits data to the aircraft, and one for the return link, which receives data.

Built to deliver significantly more bandwidth to aircraft, our high-throughput modem minimizes service disruptions associated with beam switching, allowing faster satellite handoffs and a more consistent passenger experience.

Consistency drives CSAT

The Satellite Onboard System helps deliver a seamless, consistent passenger experience—a key driver of higher customer satisfaction scores for airlines worldwide.

Enable unique inflight experiences

Connectivity and Entertainment Services

- Wi-Fi internet packages for messaging, browsing, and streaming

- The onboard system delivers the connectivity options your passengers expect, everywhere they go

- Live TV: With the high bandwidth delivered by Intelsat 2Ku access technology, your passengers can watch live sports, news, or other live broadcasts on their own devices or the seatback

- Seatback integration with existing third-party IFE systems: Integrate connectivity with existing seatback IFE systems to enhance the passenger experience
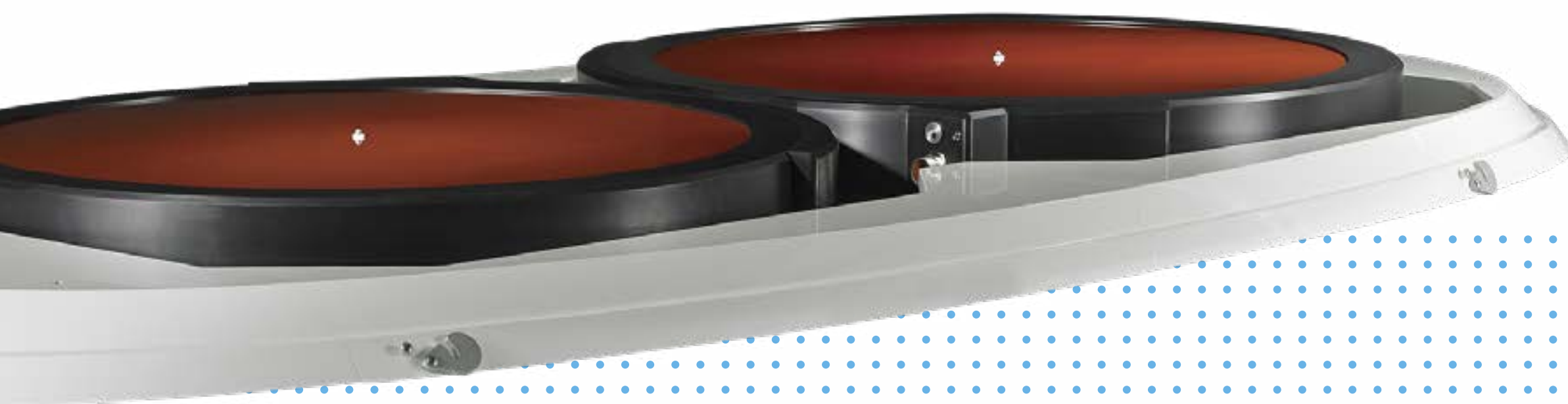
03 Connected Aircraft Services

eEnablement
Connect pilot EFBs and crew mobile devices with broadband internet

Aircraft Data Access
Bring aircraft data to pilot devices in real time

Operational Solutions
Integrate connectivity services with third-party applications

04

Intelsat
Global Network

The Intelsat global network offers a higher degree of flexibility that's ready for the future. The solution can leverage any Ku-band satellite.

ESA is supported by an integrated multi-orbit network that enables aircraft to switch between the GEO or LEO networks based on the coverage and relevant capacity needs of the aircraft.

2Ku leverages our GEO Ku-band network to deliver reliable, redundant coverage around the globe. Unlike other solutions which rely on only a handful of satellites, the 2Ku aero network is supported by an ecosystem of satellites, creating built-in redundancy.

As demand for capacity and coverage increases, our layered capacity strategy enables us to optimize throughput to the aircraft by layering-in NGSO satellites to complement our GSO satellite fleet and connectivity infrastructure.

Intelsat Global Network

Global Coverage, Scalable Capacity

We stand behind our Global Satellite network and its ability to deliver reliable inflight internet. We can layer-on additional high-throughput (HTS) capacity when needed, especially over hub cities and other congested areas. Our Service Level Agreements (SLAs) define everything from speed expectations to latency to network reliability.
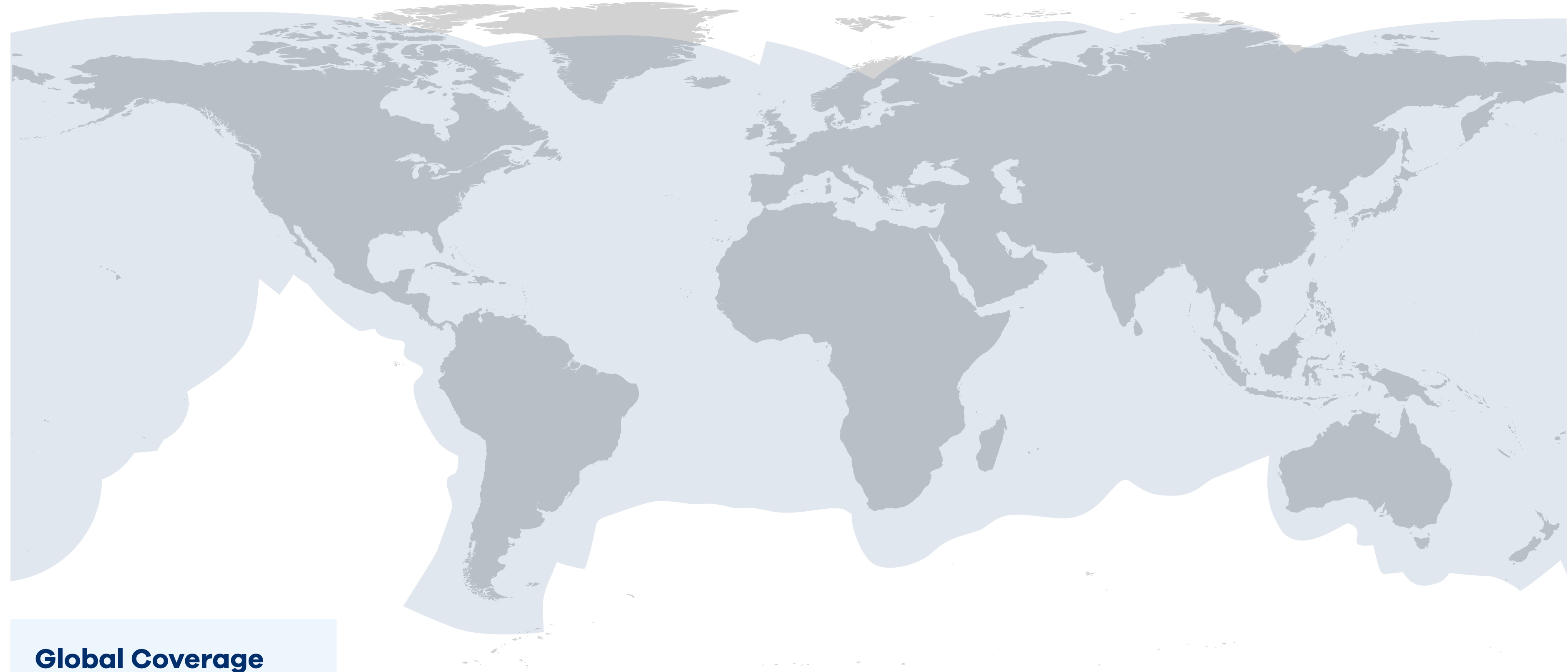
Global Coverage

■ **Wide beam**

Intelsat Global Network

Superior Equatorial Performance

Compared to conventional aero antennas, Intelsat CA access technologies are designed to provide strong connectivity in areas where other antennas suffer. This is particularly important for airlines traveling across certain areas of South America, Asia and Africa.

A typical south to north airline route will start out in a region with lower skew angle.

As the flight nears the equator, the oval-shaped beam produced by conventional aero antennas interferes with adjacent satellites (Fig A. shown in red). To avoid this interference, the conventional aero antenna lowers transmit power even further, reducing data rates both to and from the aircraft.

The Satellite Access antenna terminal projects a narrow beam, which avoids adjacent satellite interference and delivers a more consistent internet experience on flights near the equator.
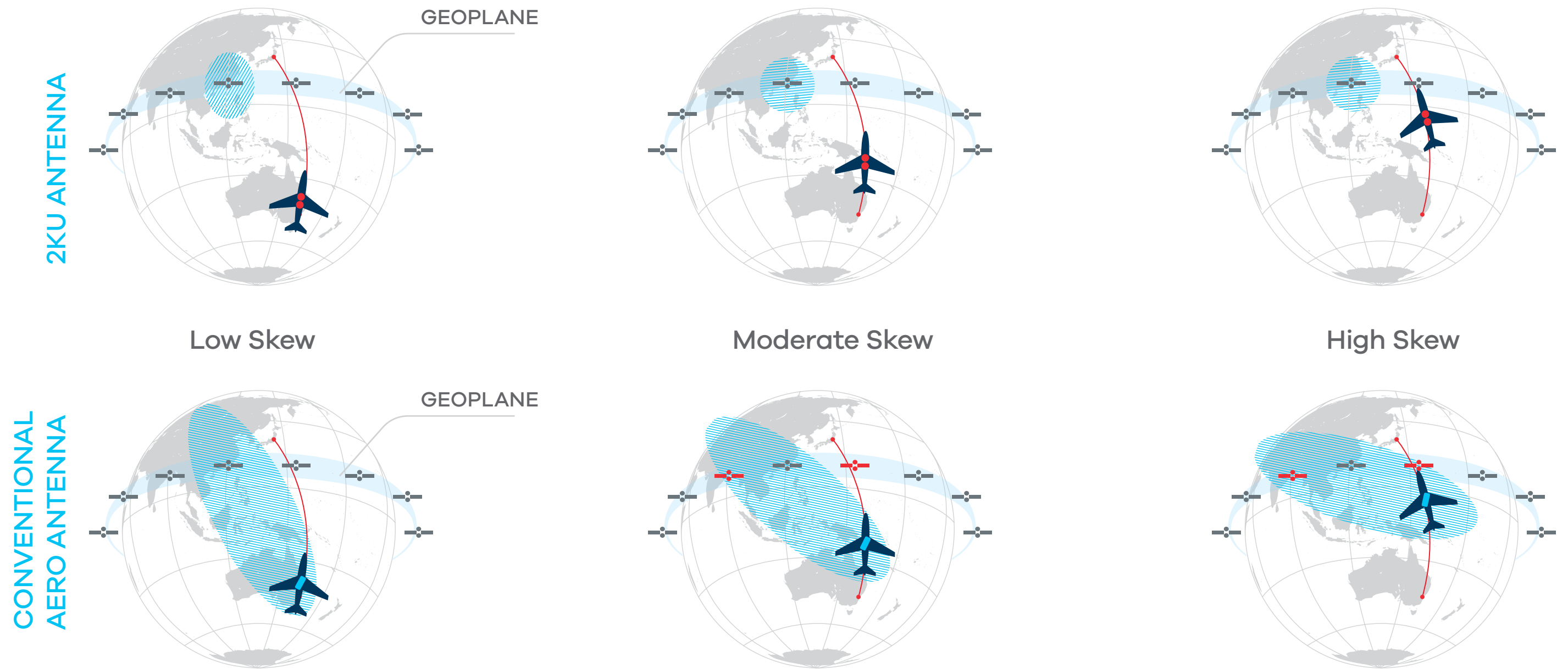

2KU ANTENNA

GEOPLANE

Low Skew   Moderate Skew   High Skew

CONVENTIONAL AERO ANTENNA

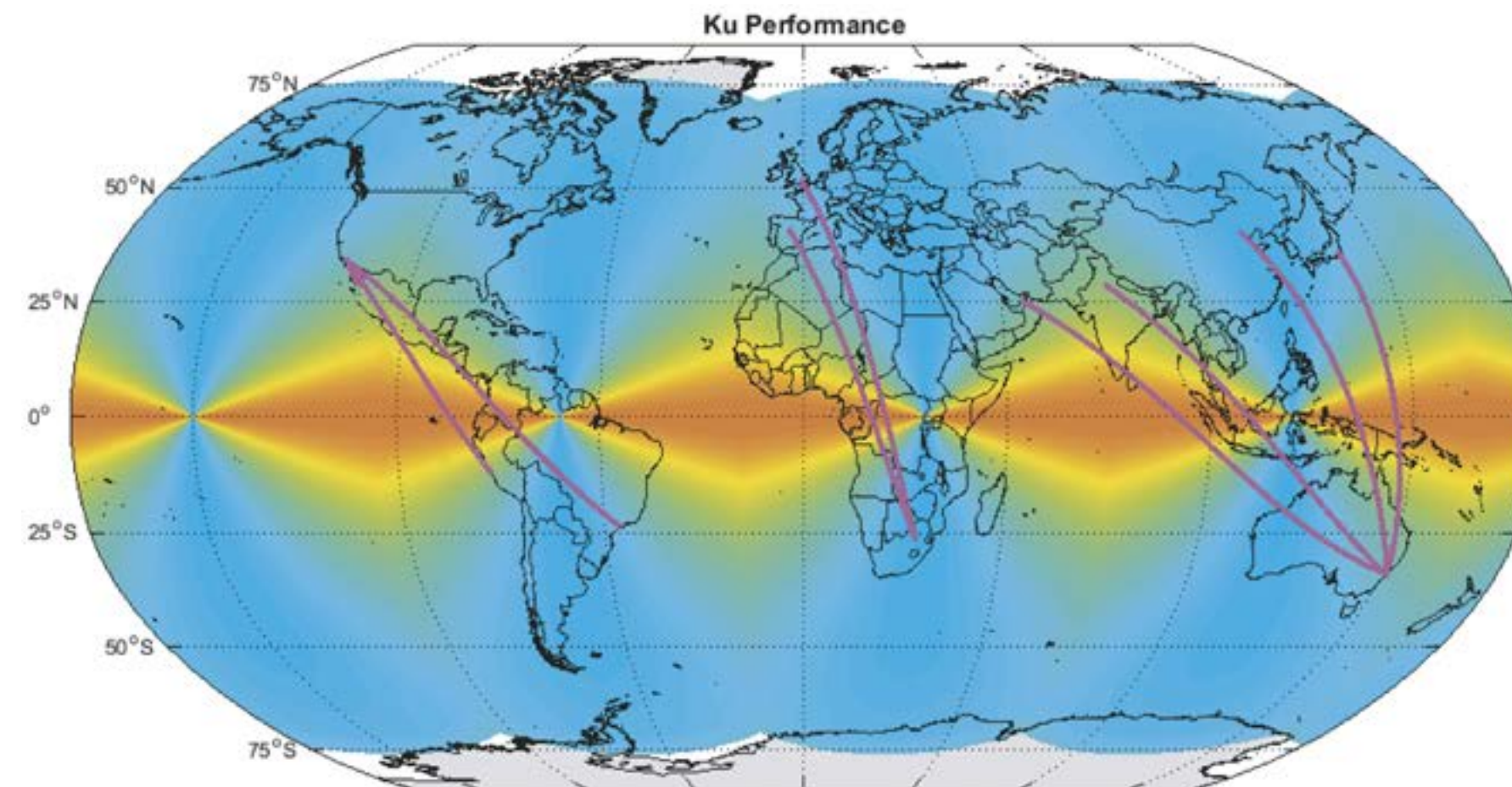GEOPLANE

Fig A. Skew angle performance

Ku Performance

Fig B. The performance of conventional aero antennas suffers in high skew angle regions (illustrated in yellow/orange on map). With conventional aero antennas, long-haul flights that operate in equatorial regions may operate with poor performance. For example, a flight leaving California headed to Peru, can suffer from outages of up to 76% of flight time.

05 Installation Options

As airlines replace aging aircraft and expand their fleets, linefit installation is an area of continued focus for us. We continue to progress with an expanding number of Service Bulletins (SBs) and Linefit options at major OEMs for the most in-demand aircraft.

In addition to our secured Supplemental Type Certificates (STCs), Intelsat also offers fleet survey, design substantiation and comprehensive engineering support for retrofit installations.

Talk to us about the best option for your specific aircraft needs and timing.

Intelsat can also provide the engineering and kits needed to remove third-party Outside Aircraft Equipment (OAE) to allow installation of the onboard system with minimal deviations.

Linefit deliveries

Crew Support

- Prepare flight crews with training on the inflight experience, connecting to Onboard Systems, and passenger service-issue interaction

- Train your airline technical operations and third-party partners on Onboard System maintenance

Maintenance Tools

- Increase visibility into the Onboard System with Wi-Fi Onboard System Health and enable flight crews to communicate system issues while in flight to resolve them quickly and efficiently

- Leverage Built-in Testing to help airline maintenance teams and/or third-party partners actively maintain and trouble shoot onboard systems

Retrofit installations

Prototype Phase

- Certify system hardware from telecommunications agencies in countries where an airline's aircraft are registered or based to ensure RF regulatory compliance

- Complete the process to obtain a new Supplemental Type Certificate (STC), make minor updates, or obtain an amendment from civil aviation authorities to install Intelsat Onboard Systems

Production Installation

- Receive on-site support for production installations or troubleshooting of Onboard Systems

- Train your airline technical operations and third-party installers on Onboard System installation
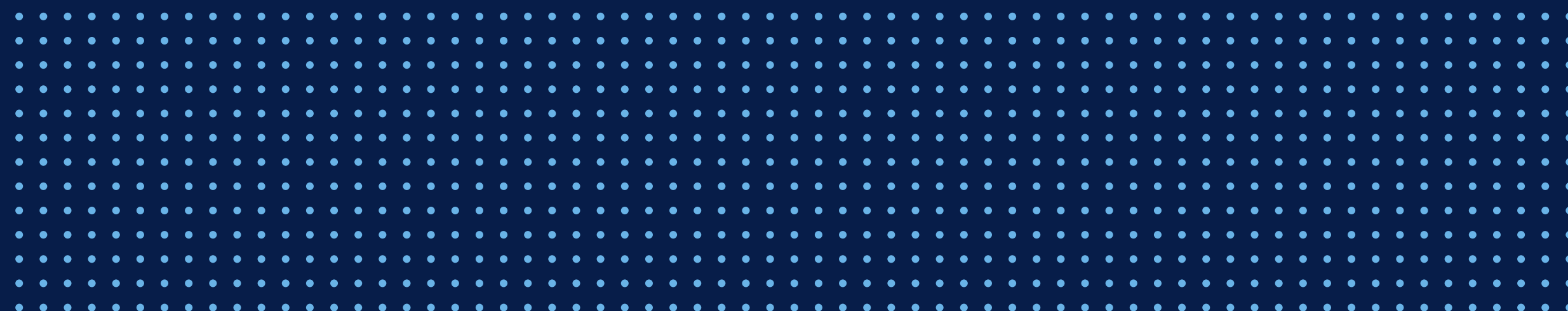
In-service Maintenance

- Intelsat supports retrofit installs with the same in-service maintenance support as linefit deliveries in addition to Aircraft Technical Services (ATS) support

Ready for the Bold,
New Future?

Meeting the high expectations of passengers and delivering more business to your airline begins by exploring Intelsat's unifying network of tomorrow. Only Intelsat delivers the size, scale and advanced technology to drive this global unification. It's a leap forward in flexibility, scalability, and world-class passenger experience.

See how Intelsat can help you shape the future of connected air travel.

Speak with an Intelsat expert today.
Intelsat.com/FutureOfIFC

INTELSAT®