



Solutions brief

KU VS. KA

WHY THE RIGHT SATELLITE TECHNOLOGY MATTERS FOR AIRBORNE CONNECTIVITY

When selecting a service provider for onboard internet, most aircraft owners rightfully focus on product features, business benefits, and cost. These factors play a critical role in choosing the best inflight Wi-Fi service, but are not the only considerations. Technology matters, too; specifically, whether your service provider has the right technical systems in place to support your business now and in the future.

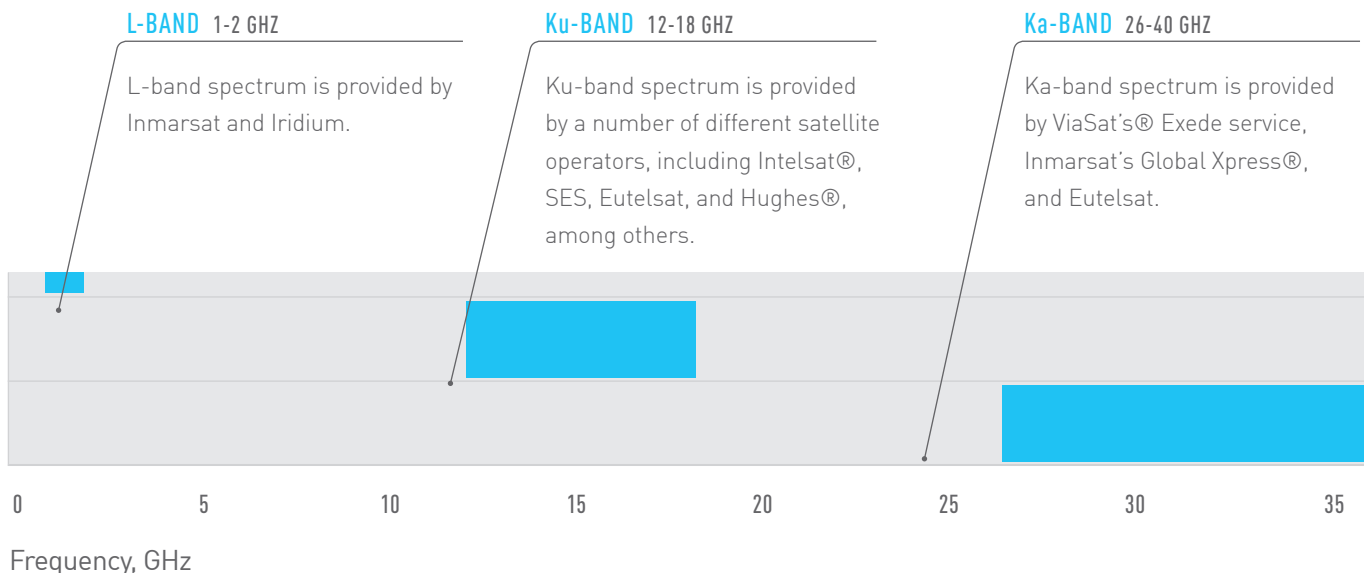
That's where Ku vs. Ka comes in. These abbreviations refer to frequency bands on the radio spectrum that are used by inflight internet providers to deliver Wi-Fi to aircraft via satellite. They sound similar, but they're not created equal – and the difference can make or break your onboard internet experience.

KU AND KA DEFINED

Ku and Ka are abbreviations used to designate particular ranges, or bands, of the global radio spectrum. The names come from German; the "K" from Kurz, which means "short" – a reference to the wavelength used by the signal that travels between the satellite and the antenna – and the "u" and "a" from "Unter" (under) and "Above", respectively. Ku, or Kurz Unter, is the frequency band under the original K-band satellite frequency, while Ka, or Kurz Above, is the band above it.

- The Ku band covers the radio frequencies from 11.7 to 14.5GHz
- The Ka band covers the radio frequencies of 26.5-40GHz

Why does this matter for inflight connectivity? There are two ways to get internet on an airplane: an air to ground network and via satellite. Air to ground is less technically complex, but satellite offers far greater coverage, including over the ocean. It works by transmitting data to and from satellites over designated frequency bands that vary depending on the satellite operator, including Ku and Ka. Which band an internet service provider uses can make a significant impact on the quality of the satellite connection.



KU-BAND VS. KA-BAND: WHAT'S THE DIFFERENCE?

From a technical perspective, neither Ku or Ka is necessarily better than the other; they simply refer to different parts of the radio spectrum. The differences between the two bands become relevant when you look at factors other than frequency range that relate to usage and infrastructure. These include:

- **Capacity:** Is there enough capacity on the satellite network dedicated to aviation that will serve my passengers today AND in the future?
- **Coverage:** Are there enough satellites covering ALL of my flight routes?
- **Availability:** Can I ensure my passengers stay connected if something goes wrong?

IS A KU OR KA NETWORK BETTER?

There is a common perception that when it comes to satellite networks, newer must be better. This is not necessarily the case. While there are pros and cons of each network, the emphasis for business aviation should be on capacity and coverage. In these respects, Ku delivers: it is a mature satellite network with an existing worldwide constellation of satellites and high capacity beams.

CAPACITY

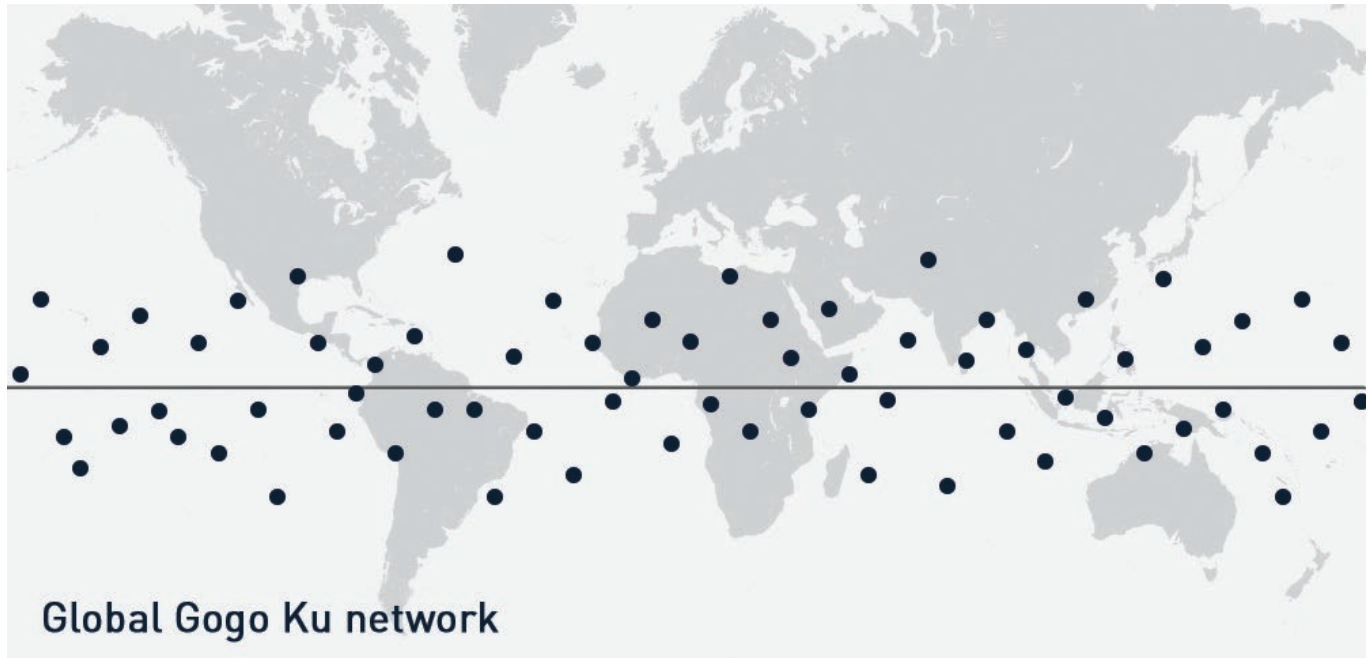
When it comes to capacity, the winner is clear: Ku offers much more capacity to serve aviation because there are so many more Ku than Ka satellites. Major hub cities like Chicago, New York, London, Tokyo, and other areas of heavy aircraft concentration rely on multiple Ku satellites to ensure redundancy, while the same regions are only served by a small fraction of one satellite on the Ka band.

Redundancy is the key word here. Ku satellites can operate high throughput satellite (HTS) beams or wide regional beams. HTS uses spot beams to concentrate a high bandwidth Ku beam into a small area where aviation traffic is high as well as wide regional beams across lower use routes. These beams typically overlap, providing redundancy in coverage.

At Gogo, for instance, we have access to more than 100 Gbps of capacity on our Ku-band network, which is exclusively dedicated to the aviation market. Ka satellite providers share bandwidth with numerous other markets. In fact, one operator of Ka band satellite internet in the United States also serves an additional 675,000 residential customers. That puts a significant dent in its capacity capabilities.

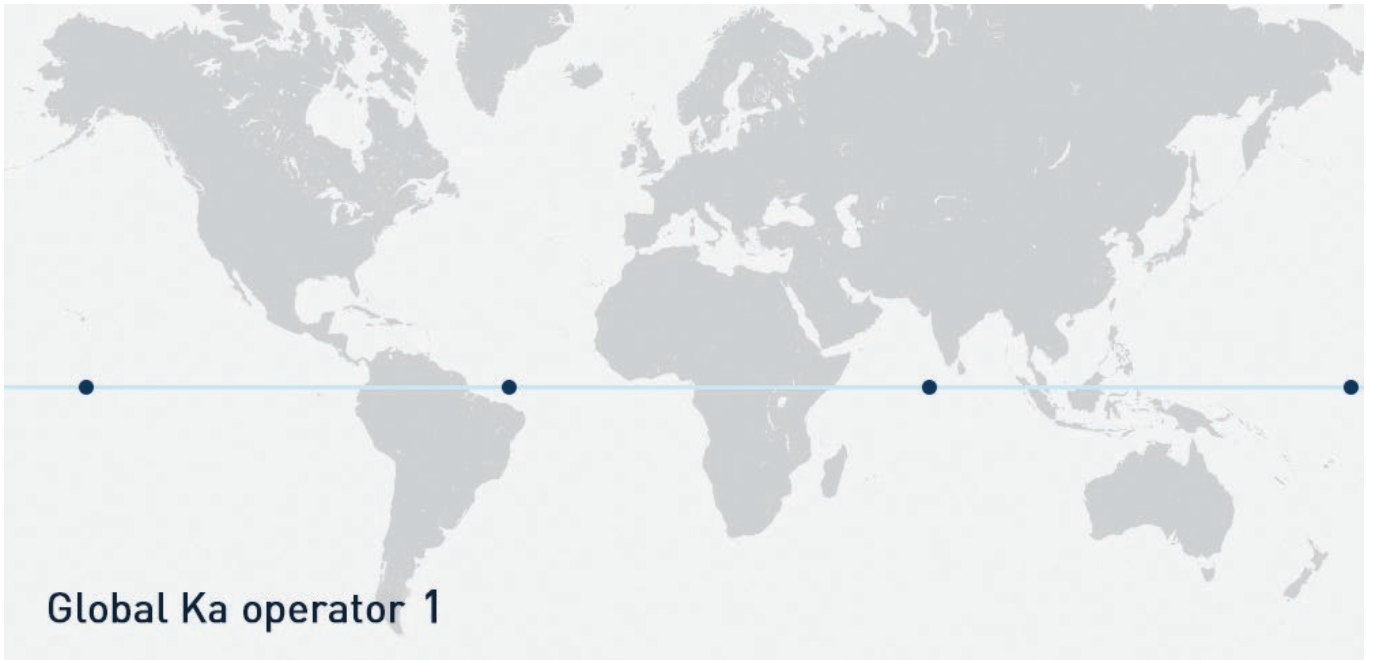
COVERAGE

Ku outperforms Ka on coverage for the same reason: there are many more Ku satellites positioned around the globe that can provide dedicated resources to aviation. That means that organizations like Gogo can source airtime from multiple satellite operators to build a network with greater capacity and a high level of redundancy. By using the hundreds of existing Ku band satellites orbiting the Earth, Gogo covers 98% of global flight hours today.



Service providers that use the Ka band, on the other hand, must rely on far fewer satellites, with predictable results. There are currently two Ka satellite providers serving aviation, both of whom only use satellites in the network that they own.

- **Ka Provider 1** has four satellites in orbit providing near global coverage. However, capacity is shared across each region with land and maritime terminals, which are usually located in the same high demand areas for aviation.
- **Ka Provider 2** has no global coverage. They have two satellites in orbit covering different portions of North America, coverage over the Atlantic and Europe, and plan to add three more by 2022 for a total of five satellites. This will still be insufficient to provide high quality global coverage and meet the capacity needs of hub cities for aviation.



Ka Provider 1



Ka Provider 2

AVAILABILITY

The third consideration, availability, results from the previous two. With the better capacity and coverage of more satellites, a Ku band system can deliver greater bandwidth, consistency, and reliability.

- An abundance of supply ensures consistent satellite handoffs and optimal service for passengers and crew.
- Diversity of supply means the Ku network is highly redundant, with more than 180 satellites providing Ku service, so if one satellite fails, a different satellite can take over coverage.
- Interoperability of the Ku network allows service to easily scale as demand increases, even with future Ku satellites, like HTS and LEO satellites.

These features translate to a connection that your passengers and crew can trust, whether they are streaming YouTube or browsing the internet.

GOGO KU VS. KA SATELLITE PROVIDERS

	GOGO KU	KA SATELLITE PROVIDERS
Number of satellites	Hundreds	2-4
Redundancy	High	Low
Satellites dedicated to aviation?	Yes	No
Proprietary satellite network?	No; greater flexibility	Yes; limited coverage
Uniform, high-quality global coverage?	Yes	Yes
Ability to scale with demand?	Yes	No
Takeoff-to-landing coverage?	Yes	Yes

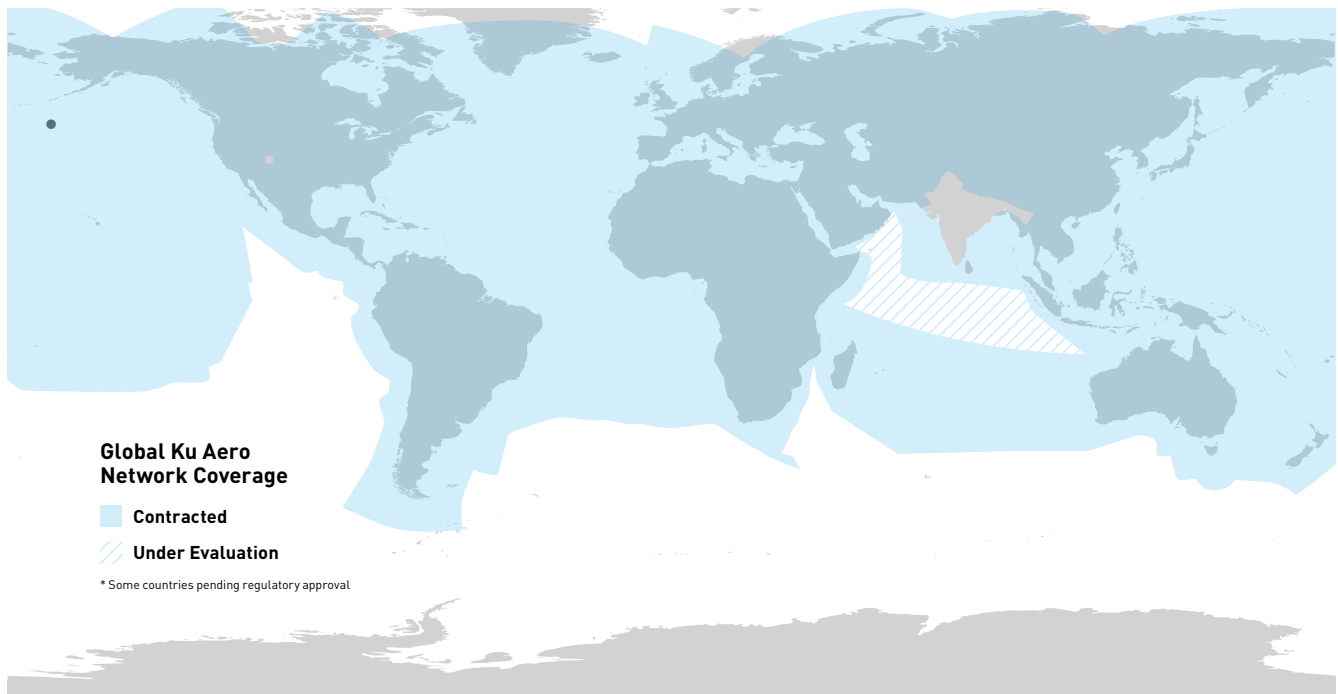
GOGO KU: KEY REASONS TO INVEST

Gogo has provided commercial airlines with the power of a Ku-based network for years. Now Gogo Business Aviation can offer this same satellite-based solution to VVIP business jet owners.

With new antennas designed specifically for private aircraft, next-gen modems that enhance performance and speed, regulatory approvals in 200+ countries, and over 180 satellites and two data centers, Gogo Ku provides the infrastructure and service you need for high-speed connectivity with zero compromise.

- **Comprehensive.** 180+ satellites deliver reliable, redundant coverage around the globe.
- **Scalable.** The rapidly growing network of Ku satellites and forward-compatible technology ensure supply now and in the future.
- **Exclusive.** A network dedicated exclusively to aviation eliminates performance issues from sharing capacity with other industries.

- **Proven.** Gogo Ku powers more than 1000 commercial aircraft today, meeting high consumer demand without issue.
- **Differentiating.** Takeoff-to-landing connectivity means executive passengers won't miss a minute.



The Gogo Ku network is built on an open architecture, supporting high-throughput satellite (HTS) platforms and future Ku satellites.

READY TO LEARN MORE?

For more information about Gogo Ku for business aviation, [visit our website](#) or get in touch with a [Gogo inflight connectivity consultant](#) today.



Connect with us:

105 Edgeview Drive, Suite 300
Broomfield, CO 80021
USA

+1 888.328.0200 *Toll-free*
+1 303.301.3271 *Worldwide*
connect@gogoair.com *Email*

business.gogoair.com