Viasat

Future-proofing your in-flight connectivity system

Viasat Business Aviation

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"Forget airspeed, range, and rate of climb: the business jet performance metrics that matter most to executives now are often the bandwidth, speed, and coverage area of onboard connectivity equipment (aka the in-flight connectivity system)."

So says *Chief Executive*, a magazine read by CEOs who regularly buy and use business aircraft.

The National Business Aviation Association (NBAA) is similarly emphatic about the importance of in-flight connectivity systems in today's business aircraft.

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— World Economic Forum

"Travelers demand continuous connectivity while en route, from takeoff to landing, for both domestic and international travel," said the "Special Report on Connectivity" in a recent edition of the NBAA's *Insider* magazine. "And they expect connection speeds to be as fast as those they have at home or in their offices, which puts pressure on owners and operators to make sure their onboard connectivity systems are capable of meeting those demands."

Other experts agree. "Reliable high-speed in-flight connectivity has become vital to today's business aviation passengers," said James Person, Viasat's director of global business development for business and VVIP aviation. "If a business jet's in-flight connectivity system is down, fixing it before resuming service has become as pressing an AOG situation as repairing a faulty engine. You can't fly without it."

The fact that connectivity has become a must on business aircraft poses a dilemma to aircraft owners: How can they ensure that the in-flight connectivity systems they install today will remain useful five to 10 years down the road, as connection speeds and data throughput continue to expand exponentially?

A case in point: According to the World Economic Forum, "By 2025, the amount of data generated globally each day is expected to reach 463 exabytes globally. An exabyte is 1,000 bytes to the sixth power. Good luck doing the math to figure out the overall amount of data on the internet five years from now."

Most of this IP traffic is being and will be carried on terrestrial landline or cellular telephone networks, as opposed to the business aviation networks operated by Viasat and other satellite providers. And there's the rub: "Business passengers don't care how they get their in-flight internet connectivity," said Person. "All they care about is that it is as fast and reliable as what they get on the ground."

This expectation means that in-flight systems must deliver this quality of internet connectivity not just today, but in the years to come. This is why business aircraft owners need to future-proof their systems to keep up with increases in internet connection speeds and bandwidth.

Fortunately, this kind of future-proofing is possible. Here's how to do it in three easy steps.

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Step One: Watch the Trends

It is impossible to know what connection speeds and bandwidth passengers will expect years from now. But business aircraft owners can improve their equipment purchasing decisions by knowing what the progression path will be, because the standards of tomorrow are under development today. In turn, they can use this knowledge to guide their in-flight connectivity system decisions.

For instance, when it comes to advances affecting in-aircraft Wi-Fi connectivity, "802.11ac will be superseded by the 802.11ax standard," said Brandon Klisit, avionics manager with StandardAero Business Aviation. "There will be no change to existing frequencies, but [systems will be] capable of more channels and simultaneous use of 2.4 and 5GHz bands."

As for aircraft-satellite connectivity, the trend is from Ku-band to Ka-band, which offers far faster speeds for in-flight internet communications worldwide.

Viasat provides Ka-band service without speed limits[1] for the best in-flight internet experience, and offers the service to business jets in key traffic areas. To expand this coverage further, the company is building a global Ka-band satellite network. Known as ViaSat-3, the planned trio of ViaSat-3 geostationary satellites will provide hundreds of Mbps of bandwidth to business jets globally, which is far beyond what is available today. These satellites are now under construction, with the ViaSat-3 constellation planned to launch by the end of 2021.

"Once you understand the trends that are guiding advances in in-flight connectivity, you know what to look for in equipment and in-flight service providers," James Person said.

Step Two: Buy the Right Equipment

Even in the newest aircraft, an in-flight connectivity solution can quickly become yesterday's news. This is why a connectivity solution that can cope with technology changes can help keep costs and downtime to a minimum.

When it comes to connecting an aircraft to a satellite broadband network, it makes sense to buy a system that can support both Ku-band (mature and global) and Ka-band (much higher capacity) transmission technology. Doing so requires dual-band Ka-band/Ku-band antennas mounted under an exterior radome and a dual-band satellite terminal like Viasat's Global Aero Terminal 5510. Such a combination ensures that the aircraft's connectivity system will stay current for years to come as Viasat's high capacity global Ka-band comes into business aviation service, while affording service today — and redundancy — through Ku-band and ViaSat-2's Ka-band service to peak traffic areas.

"When change does come, it is easy to swap out the existing Viasat Ku-band terminal with the new Viasat Ka-band Global Aero Terminal," Person said. "This is because Viasat uses the same 3 LRU form factor and wiring used by our current terminals for our future units. This means the rest of your in-flight connectivity system is truly future-proof."

Of course, in-flight connectivity systems don't just support internet access; they also allow for in-flight TV. Unfortunately, the trend towards delivering television over the internet (IPTV) is not good news for aircraft operators, because IPTV devours bandwidth, thus driving up data expenses.

Viasat avoids these extra expenses by delivering satellite TV signals to business aircraft as a separate fixed-price service

that does not impact the aircraft's data allocation. This keeps data costs down while leaving the aircraft's internet access unburdened by IPTV data streams.

Step Three: Choose the Most Capacity

As one of the world's most capable satellite service providers, Viasat is dedicated to providing the best in-flight connectivity to business aircraft.

To make this happen, the company has examined the issue of connectivity from every possible angle. It has determined that the best way to maximize broadband speed and access for Viasat's customers is to maximize capacity on its satellites.

Viasat achieves this by ensuring that its satellites have enough bandwidth to support extreme levels of demand by multiple users simultaneously on each aircraft and flying in the same region. The company has also configured its satellite network to be flexible, so that unused capacity in parts of the network can be accessed by users in busier areas. And for the best in-flight internet experience possible, Viasat's high-capacity Ka-band satellites means the company can offer no hard speed limits on its service.[1]

"Capacity is the key to reliable, robust service," said Person. "It is like a highway: the more lanes you offer, the more cars you can carry at peak speeds without experiencing traffic jams and delays.

"The same is true for aircraft-satellite communications, particularly in busy air corridors," he continued. "The goal is to have enough capacity for everyone to get through, especially in zones of heavy traffic demand. We want to ensure that we provide every user with the same high level of service, whether they are traveling between New York and London or over a quiet stretch of the American Midwest."

By taking this stance, plus building the ViaSat-3 network, Viasat is future-proofing its business aviation communications network.

The improving global aviation market has resulted in fewer desirable preowned aircraft being offered for sale. Increasingly, people wanting business aircraft have to buy new, or be willing to pay top dollar for a used aircraft that already includes in-flight connectivity or can support it being added.

In this market, business aircraft buyers have to consider the long-term value of their investment. They need to calculate what it will cost to buy a new (or new-to-them) aircraft, how much it will cost to operate it over its lifespan, and its eventual resale value.

Given how important in-flight connectivity has become, it is vital for buyers to select onboard equipment and a satellite service provider that are truly future-proof. If not, they will either have to pay to replace obsolete equipment in a few years or else accept a decline in the aircraft's value.

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"Buying the most capable in-flight connectivity solution – such as Viasat's existing Ka-band terminals that will be compatible with ViaSat-3's advanced Ka-band services -- and choosing the best satellite service provider is the best way to future-proof your business aircraft," said James Person. "Given how much these aircraft cost to buy and support—and how important resale value is—you want to get this right the first time."

To learn more about Viasat's in-flight connectivity services for business aviation, go to www.viasat.com/business-aviation.