Photo courtesy of Gogo

Delivering seamless inflight connectivity

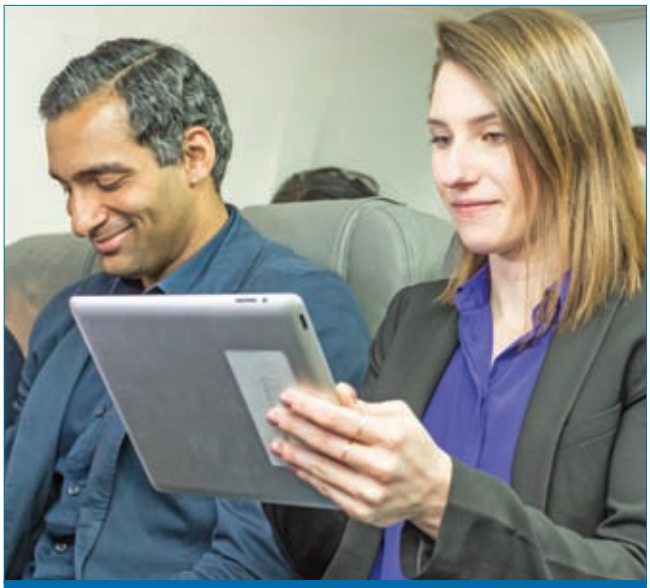
The mobility market is broadly expected to be one of the greatest growth drivers in satellite communications in the near future, with aeronautical connectivity the largest growth market within that sphere. Providing seamless inflight connectivity (IFC) is no easy task, yet there are quite a range of companies around the world successfully delivering high-quality, in-demand services.

Inflight connectivity (IFC) may not be a particularly new service, but demand has boomed in recent years with the proliferation of mobile devices throughout the population. According to the *'Sky High Economics: Quantifying the commercial opportunities of passenger connectivity for the global airline industry'* report from the London School of Economics and Political Science (LSE) in association with Inmarsat, inflight broadband has the potential to create a US$130 billion market within the next 20 years, resulting in US$30 billion of additional revenue for airlines by 2035. The report predicts that broadband-enabled ancillary revenues for airlines will come from four main revenue streams:

- Broadband access charges: Providing connectivity to passengers inflight
- E-commerce and destination shopping: Making purchases onboard aircraft with expanded product ranges and real-time offers
- Advertising: Pay per click, impressions, sponsorship deals with advertisers
- Premium content: Providing live content, on demand video and bundled W-IFEC access

Considering how often we discuss IFC, it's important to remember that uptake is still quite low. Indeed, according to the report, only around 53 airlines of an estimated total of 5,000 currently offer IFC, although it's broadly expected to be ubiquitous on commercial airlines by 2035 off the back of passenger demand. *'Sky High Economics'* also reported that airlines currently receive an additional US$17 per passenger from traditional ancillary services such as duty-free purchases and inflight retail, food and drink sales; broadband-enabled connected ancillary revenues are expected to add an extra US$4 by 2035.

Full service carriers are expected to generate US$19 billion in revenues by 2035, or approximately 63 percent of expected airline revenues during the period. Capitalising on longer flight times, additional revenue will come from the ability to maximise e-commerce platforms and making deals with content providers to offer premium packages. The study predicts that low cost carriers will generate US$11 billion by 2035, the bulk of which will come from selling connectivity to passengers. The '*Sky High Economics'* report also identified the greatest opportunity for broadband-enabled ancillary services lies in the Asia-Pacific. Airlines in that region are



Passengers using Gogo

expected to gain US$10.3 billion of revenues through 2035, while airlines in Europe and North America can anticipate US$8.2 billion and US$7.6 billion respectively.

"The opportunity available to airlines is enormous. The Sky High Economics study predicts the creation of a US$130 billion market within the next two decades," wrote Dr Alexander Grous, Department of Media and Communications, LSE and Author of *Sky High Economics*. "Globally, if airlines can provide a reliable broadband connection, it will be the catalyst for rolling out more creative advertising, content and e-commerce packages. We will see innovative deals struck, partnerships formed, and business models fundamentally changed for new players to lay claim to the US$100 billion opportunity away from airlines. Broadband-enabled ancillary revenue has the potential to shape a whole new market and it's something airlines need to be planning for right now."

A word from the operators

"The IFC market is one of the fastest growing markets for broadband satellite communication," confirmed Doreet Oren, Director of Product Marketing and Corporate Communications at Gilat Satellite Networks. "According to an NSR report issued last year, the number of connected aircraft is expected to grow by an order of magnitude within a decade. In 2016, 3,800 aircraft were connected and in 2026, the total connected aircraft are projected to be 28,400. NSR further reports that the annual aero satellite equipment market-size is expected to more than double within this decade, from $280M in 2016 to $590M in 2026."

Don Buchman, Vice President and General Manager of Commercial Aviation at Viasat, agreed that there's still a long way to go: "The IFC market is quickly growing and the competition to offer the best on board Wi-Fi service is rising," he said. "However, there is still a disparity on the services offered, simply because of the capacity, speeds and coverage available by each IFC vendor. While some carriers, like JetBlue or Qantas, are offering unrestricted, high-speed connectivity at no additional cost, others are still providing slow speeds, often at a substantial premium for the passenger. In this environment, it's perhaps unsurprising that passengers aren't so fast to take advantage of the service—meaning we haven't yet seen IFC reach its full potential." Anecdotally, we'd tend to agree with Buchman here – services on most flights are still so poor that it seems an exercise in futility to hand over cash for such patchy connectivity.

Aditya Chatterjee, SVP of Aero Segment Market Solutions at SES Networks, added: "In a word, the IFC market is booming. IFC is fast becoming a must have for passengers and airlines across the globe." He went on to discuss regional variations: "North America is certainly leading the market, where the majority of passengers are increasingly selecting airlines based on WiFi availability. As travellers throughout the rest of the world see the types of IFC services being delivered aboard airlines serving North America, more and more airlines in Europe, the Middle East and Africa are being pressed to provide the same levels of capacity and applications. The Middle East and African aeronautical satcom market, for example, will generate US$320 million in retail revenues by the end of 2026. Demand for more passenger and crew connectivity on routes within the Middle East and Africa is the biggest driver of that revenue jump."

In such a fast-growing market, where are the best opportunities and what are the greatest driving forces? SES' Chatterjee outlined the five primary driving forces behind today's soaring IFC demand:

- The sheer volume of air travel continues to grow at record levels, and this is an indisputable driving force. In fact, IATA projects 7.8 billion people will travel by air in 2036, nearly double the four billion air travellers expected to fly this year, with Asia becoming the biggest driver of that unprecedented growth in air travel.
- The number of connected passengers is driving the number of connected aircraft globally. The number of connected aircraft will triple between 2010 and 2026, offering up an incredible opportunity for SES and the satellite industry to blanket the globe in high-powered capacity to enable IFC services virtually anywhere.
- Increasingly ubiquitous global coverage. SES continues to invest in big quantities of high-powered capacity around the globe, enabling all the leading IFC service providers

	Broadband access	E-commerce	Advertising	Premium content	Total
2018	$822 million	$36 million	$26 million	$39 million	$1 billion
2028	$9 billion	$3 billion	$2.9 billion	$731 million	$15 billion
2035	$15.9 billion	$6.8 billion	$6 billion	$1.4 billion	$30 billion

Forecasted airline share of the US$30 billion broadband enabled ancillary revenue opportunity. Credit: 'Sky High Economics: Quantifying the commercial opportunities of passenger connectivity for the global airline industry.'

and ultimately the airlines and passengers they serve around the world. SES is the first global solution provider with multiband, multi-orbit capacity in both GEO and MEO. SES is band and orbit agnostic when it comes to working with our customers and IFC partners, which positions us to enable new IFC capabilities tailored to the exciting aero market.

- Another fundamental driving force is the rising number of passengers who are bringing their portable electronic devices (PED) on board commercial and business aircraft. One in three passengers brings at least three devices on board and is willing to pay for Wi-Fi. Passengers expect to have all the capabilities they have at home, including email browsing, social media and video streaming. Other drivers that are becoming increasingly important will be the ability to stream on demand HD video directly to their own device and use virtual reality.
- The demand for connectivity that enables airlines to run their aircraft and overall operations far more efficiently. The number of sensors aboard new commercial airliners is mind boggling, and airlines are using connectivity to track everything from fuel consumption and engine data to the impact of weather on operational efficiencies. Airlines are expected to save billions by monitoring and managing operations via satellite connectivity – money that could help fund part of the next generation of passenger and crew IFC offerings.

Oren, too, opined that several driving forces have converged to facilitate the fast growing IFC market: "First, the consumer expectation to stay connected everywhere all the time with high throughput broadband has expanded to both domestic and overseas air-travel. Second, satellite communication, the only technology capable of such global coverage during flight, has taken significant steps forward, both on the ground and space segment; the abundance of HTS capacity has driven costs down, making satellite a feasible option for IFC; and in terms of the ground segment, there have been significant achievements to the aero modems in utilizing HTS, optimizing performance and efficiency for IFC. Thirdly, airline travel has never been more popular, and competition among the airlines never more fierce. A growing competitive advantage today is for those airlines who offer high quality high throughput connectivity."

Buchman believes that the opportunities for IFC are significant: "Today, Viasat is providing high-quality, IFC and streaming that is similar to what we provide to hundreds of thousands of people in their homes. We're able to deliver this type of premium service because we have the most capacity on orbit at the most affordable cost as we own our own satellites. Our service is generally available in the North American market, and once the infrastructure is in place globally, we will be able to deliver IFC - with the highest speeds - to every airline across the world. This will in turn transform how IFC is viewed as a service, becoming an intrinsic part of the inflight experience. For instance, entertainment, retail and even destination planning will be transformed – with offerings no longer limited to what movies, duty free goods and travel guides are carried on board an aircraft."

Delivering IFC is not without considerable challenges, of course. Buchman highlighted the greatest challenge as providing enough resources to meet demand. "Currently, there isn't the global coverage to provide an uninterrupted, high-speed signal wherever an aircraft is flying to and from. However, with new satellites, like ViaSat-3 - offering more than 1Tbps of network capacity - launching in the 2020 timeframe, we should begin to see the reality of an uninterrupted, high-speed connection spanning the globe," commented Buchman. "With this in place, the next challenge will be agreeing on standards and the best business models for each airline. Eventually the market will decide, but until

Panasonic's eXO showing HD overhead video

Aditya Chatterjee, SVP of Aero Segment Market Solutions at SES Networks

then, we will see competition between different technologies and how passengers pay for IFC e.g. does it remain as an additional cast? Is it limited to just messaging and light browsing? Is it part of the ticket price, or only offered to certain passengers? Or will it be paid for by integrated marketing partnerships and sponsorship, leaving it free to the passenger?"

Gilat's Oren agrees that the challenges are far from over, and that capacity remains a threat to growth. "Due to passenger's growing demand for continuous high performance broadband connectivity, delivery of sufficient high throughput capacity to the aircraft continues to be a challenge. To this end, we have seen new aero modems, such as Gilat's Taurus, delivering aggregate rates of 400Mbps, enabling Internet and multimedia applications for all airplane passengers," said Oren. "In addition, there is a lot of work going on for next-generation Electronically Steered Array (ESA) antennas. Traditional mechanically steered antennas will not be sufficient and efficient enough to address the market transformation. The characteristics of ESA antennas such as very low profile, instantaneous bandwidth, beam agility, multi-beam connectivity, scalability/modularity and longevity – are imperative for unlocking new business opportunities and for the performance of satellite networks."

"Deciding whether IFC is a free or paid service remains a challenge for many of the airlines today. Ultimately that decision will have a big impact on the delivery of popular video streaming and social media applications aboard some airlines," observed SES' Chatterjee. "As satellite operators bring more HTS to the aero IFC market, antenna developers are also bringing more effective platforms to market as well. At the same time, Netflix and others are working on software solutions that enable the delivery of HD, even 4K content to passenger devices using a fraction of the bandwidth required today aboard commercial and business aviation flights."

It seems that everyone is fully-expecting the IFC market to boom in the future, developing into a more mature market in the decades to come. Gilat's Oren agrees: "As the technology matures and demand increases, the market will evolve to include new business models and additional aircraft types. Mobility applications and NGSO satellites pose major challenges and opportunities to the performance and economics of satellite connectivity." Oren continued: "Therefore, we see significant industry investments in ESA antennas for the aero market to meet a set of imperative requirements. It is critical to deliver higher antenna gain with lower profile and lower add-on drag."

Viasat's Buchman is anticipating increasing competition as the IFC market develops: "We are already seeing airlines change their IFC provider as they get a better understanding of which technologies offer the best performance, and the best experience for passengers and in turn deliver the best value to the airline. We are on the cusp of IFC breaking into the mainstream and becoming an expected component of international flight, rather than a nice-to-have extra service. This will mean increasing competition, but also increased collaboration – as satellite providers and airline partners work together to ensure an uninterrupted connection for flights."

Meanwhile, Chatterjee from SES sees 'blue skies ahead with capacity demand soaring' to meet passenger appetite for connectivity in flight that compares with what they expect on the ground. "SES is building a global ubiquitous network, much like the cellular networks on the ground that offer up seamless connectivity virtually anywhere around the world. SES has launched multiple HTS satellites in recent years – much of that capacity tailored to meet the growing passenger IFC demands as well as the airlines' increasing efforts to operate more efficiently on a global basis," said Chatterjee. "Just look to Europe and you'll get an accurate glimpse of IFC in the near future. There were just short of 550 connected aircraft in Europe a year ago, and forecasters expect there to be more than 6,300 connected aircraft over Europe by 2026. As the number of connected aircraft skyrockets to meet the insatiable appetite for connectivity across a mind-boggling number of air travellers – expected to double from four billion currently to nearly eight billion over the next 18 years, satellite capacity in space combined with antenna, modem and application services innovations will play a huge concerted role in meeting very high expectations for inflight connectivity." North America continues to set the expectations and drive the demand eastward to Europe, the Middle East, Africa and Asia. "Of the four billion new air travellers expected to take to the skies over the next 18 years, more than half will come from Asia," added Chatterjee.

Panasonic Avionics upgrades services across the board

Panasonic Avionics Corporation is inarguably a world-leader in delivering inflight entertainment and connectivity (IFEC) solutions across the globe. Today, more than 1,800 aircraft use Panasonic Avionics' global high-speed IFC service, and more than 10,000 aircraft are expected to be connected with Panasonic Avionics by 2025.

Upgraded services

November 2017 was an incredible month for Panasonic Avionics in terms of upgrading its service offerings, with two major developments announced.

Panasonic introduced a major advance in IFC with the start of service of its first HTS capacity over the Pacific Ocean.

Utilising the EUTELSAT 172B satellite, Panasonic will deliver enhanced inflight broadband connectivity, live TV and mobile phone services to aircraft flying high traffic routes across the Asia-Pacific region spanning the West coast of North America to Asia, and down to Australia and the Pacific islands.

Panasonic is layering HTS capacity over key air traffic areas across its global satellite network to meet the growing connectivity demands of airlines and their passengers. It will continue to introduce HTS in every region of the world, since the combination of spot beams and high-level frequency re-use provide improved economics, more bandwidth and faster data speeds as passengers. HTS also use a broad overlay beam, which is used to economically deliver up to nine channels of live TV to passengers in flight. Notably, EUTELSAT 172B is the first HTS to use a multi-port amplifier, which allows power to be dynamically moved among the HTS beams to meet demand. The ability for the HTS beams to 'follow' aircraft and other mobile users enables Panasonic to better meet customer demand and cost-effectively ensure consistently high levels of service.

Long-time partners Panasonic and Singapore Airlines have also announced eight new innovations in personalisation with the launch of a new IFEC offering, myKrisWorld. The new system embraces Panasonic's vision for IFEC, which centres around the concept of 'the Internet of Me,' taking all of the things that people care about and bringing them together to deliver personalized and contextualized experiences. Each of these features is made possible by Panasonic's ability to deliver actionable analytics, where data is used to improve the quality of the passenger experience.

With myKrisWorld, the experience starts before passengers even board their flight. Passengers can use Singapore Airlines' app or website to preview content and set up their customized playlist. Once on board, they can either synchronise their mobile device or log in at their seat to access their pre-selected content. Crowd-sourced data will offer up alternative titles that are popular. It can ask passengers if they want to finish the movie that they started on the previous flights and make recommendations based on a passenger's individual habits and what content is trending inflight at that moment in time.

"Last year, we helped Singapore Airlines introduce their award-winning companion app. Today, we're taking that personalized experience to even greater heights with a series of innovative features that include passenger log-in at their seat; playlist, bookmark, language preference storage and wallpaper customization between flights; customized and personalized entertainment spotlights; popular, trending and recommended content; and exclusive content based on frequent flier tier," said Hideo Nakano, Chief Executive Officer for Panasonic Avionics Corp. "By embracing the culture of mobile, we can increase the rate of evolution in the passenger experience, transforming what was once a passive entertainment system into another digital channel that airlines can leverage to better serve their customers."

What's NEXT?

There was a major flurry of activity in April as Panasonic announced the launch of NEXT Marketplace in response to the growing demand of airlines to increase ancillary revenue, and to enable a new generation of revenue-generating inflight

eX3 premium configuration with Altus monitors

services. NEXT Marketplace provides a complete end-to-end digital retail solution that incorporates a flexible set of shopping channels for passengers through seatback screens and mobile devices. It also provides airlines with tools for the creation of dynamic retail offerings and inventory management that can be tailored to a variety of retail models and promotional scenarios. Panasonic's strategy with NEXT Marketplace is to partner with industry leaders like gategroup, which serves more than 700 million passengers annually with its retail and catering operations. Gategroup's involvement will include its technology partner Black Swan, which will provide its extensive data analytics capabilities, enabling airlines to develop increasingly targeted and effective inflight offerings.

Panasonic is also setting up a new office in Silicon Valley and has selected Amazon Web Services (AWS) to help deliver data analytics and insights from Panasonic's NEXT Marketplace. The new Silicon Valley operation will focus on delivering Internet of things (IoT), cloud and data analytics for Panasonic's NEXT platform, while also managing operations-focused data, such as maintenance and the health monitoring of aircraft IFEC systems. Working with AWS, Panasonic Avionics will provide airlines with crucial data analytics capabilities, leveraging its Avionics Specific Data Lake. The Lake will provide data of any type securely in one place, enabling advanced machine learning and deep learning algorithms to provide airlines with near real-time insights into their connected passengers and operations. Panasonic's new data operation has been established to enable airlines to overcome the challenges posed by current data collection and analysis methods, which often took place manually and post-flight leading to unreliable and outdated insights.

"The establishment of our Silicon Valley operation represents a major step forward in the cloud and data-based solutions we are able to offer our airline partners. More than ever before, it enables Panasonic to connect the business and pleasure of flying, enhancing the passenger experience through the connected aircraft," said David Bartlett, Chief

Technology Officer of Panasonic Avionics Corporation. "The convergence of enabling technologies has set the stage for transformational data analytics, giving Panasonic the ability to provide airlines with invaluable passenger and operational insights, which in turn allows them to build brand loyalty and increase efficiency."

Many elements of NEXT Marketplace can be leveraged and enhanced by NEXT Cloud-based data analytics. These include NEXT Theatre, which enables passengers on connected aircraft to access airline content anywhere across the globe, opening up avenues for new business models such as near-real time content licensing and usage-based payment. NEXT Marketplace utilises the secure NEXT Cloud in providing a global secure payment platform, secure reliable and convenient shopping via a dynamically updatable catalogue. It also opens up possibilities for airlines to offer cloud-based services such as music, transportation and more to deliver an enhanced passenger experience and the potential for airline revenue sharing.

During the same month, Panasonic announced the debut of its new airline on board loyalty platform, NEXT Loyalty, with Singapore Airlines as the launch customer. NEXT Loyalty is Panasonic's new suite of solutions for enabling personalized inflight experiences for passengers and allowing airlines to extend their loyalty programs into their onboard services. It allows passengers to login or to pair their mobile device at the seat via the airline app. Once signed in, passengers will be recognized and provided with a variety of familiar personalized features including: Resuming unfinished movies from previous flights, receiving recommendations based on viewing history, unlocking exclusive content and offers based on loyalty program status, viewing a customized look-and-feel of their interactive associated with their profile, saving settings for language/subtitle preferences, preferred genres and accessibility, and more. Airlines will further benefit from the opportunity to understand usage patterns and activities inflight and utilize those data analytics to better tailor future inflight services.

Airline deals

Panasonic hasn't slowed down its announcements this year, either, with April being a particularly prominent month for arranging new deals with airlines following the announcements on the NEXT platform.

Panasonic and Turkish Airlines announced a major deal for IFEC solutions to be line-fit installed on 50 wide-bodied aircraft the airline has on order, with options for a further 10. Panasonic's X-Series IFEC system, along with its rivetMEDIA solution and a suite of connectivity services including inflight Wi-Fi, mobile phone use, and global live TV, will be fitted on 25 Boeing 787-9s and 25 Airbus A350-900s, with the first aircraft due to be delivered to Turkish Airlines in June 2019.

The system will further enhance Turkish Airlines' passenger experience with a personalized home theatre experience that includes HD screens for each passenger, audio and video entertainment on demand, capacitive multi-touch screens, inflight shopping and hospitality features, route-based IFE, passenger survey functions and USB charging facilities. It will also include Panasonic's unique Passenger Data Integration (PDI) service, which will allow Turkish Airlines to add higher levels of personalization to its inflight experience, and to seamlessly recognize the travel preferences of their guests and recommend content, services and amenities specific that will enhance their experience both in flight and in their destination city. PDI will leverage a custom-designed Companion App that will enable passengers to securely pair their mobile device to the IFE system and personalize and enhance their entertainment experience through capabilities that include custom playlists and a 'second screen' environment.

rivetMEDIA, which combines one of the aviation industry's most advanced inflight marketing platform with a dedicated sales and service team, will deliver all the key advertising services needed by Turkish Airlines, their external partners and paying advertisers. The technology enables airlines to target by seat class, route, device, language, and passenger data. This will allow Turkish Airlines to optimize promotions for a wide range of optional services, partnerships, loyalty programs, and paid advertising all within a comprehensive passenger experience. The platform delivers video, native display, and sponsorship options for high-impact, fraud-free marketing with best-in-class targeting and results.

Turkish Airlines' aircraft also will be fitted with Panasonic's new satellite modem, which offers bandwidth up to twenty times greater than previously available, enabling a host of next-generation IFC benefits from high quality live TV programming to fast Internet, video streaming, inflight mobile phone service and greater bandwidth for crew applications. The new modem and connectivity solutions are an integral part of Panasonic's third-generation network, which uses advanced satellites to cover all high air traffic areas across the globe with high throughput and extreme throughput spot beams and wide overlay beams that support Panasonic's global television service.

As part of the contract, Turkish Airlines has the option to equip the A350 aircraft delivering beyond 2022 with its own direct affiliate's IFE system, pending line fit offerability. The connectivity for those aircraft will still be equipped by Panasonic.

Panasonic also announced a new deal with EGYPTAIR which will see six Boeing 787-9 aircraft fitted with Panasonic's eX3 IFE system and its IFEC system. In Business Class, each seat will feature an 18-inch screen, a video touch handset, a USB jack for high power charging in-seat and a noise cancelling audio jack. In Economy Class, passengers will each have a 12-inch screen and shared access to power outlets. Each aircraft will also be fitted with overhead 16-inch screens throughout each cabin. EGYPTAIR has also opted for a range of additional software applications across the fleet that include passenger surveys, onboard shopping, 3D moving map and OneMedia - Panasonic's advertising platform.

Inmarsat – A truly global player

Inmarsat is another major player in the global IFC arena with its Global Xpress (GX) network of four Ka-band HTS. GX has delivered seamless high-speed broadband connectivity the world over since 2015. GX Aviation is the world's first IFC solution with seamless, reliable high-speed global coverage provided through a single operator. It is reportedly the only service in the market that guarantees minimum data rates, ensuring that airline passengers can browse the Internet,

stream videos, check social media and more during flights, with an onboard connectivity experience comparable to the mobile broadband services they may receive on the ground.

In April 2018, Inmarsat announced a major milestone for its GX Aviation service after completing the 250th installation worldwide. Within the first year of commercial service, GX Aviation has been installed in a variety of aircraft, including Airbus A320s, Boeing 777s, and Airbus A380s. Customers have included Lufthansa, Austrian Airlines, Eurowings, Qatar Airways, Singapore Airlines, Air New Zealand and Air Astana.

GX Aviation has also won a string of prestigious awards for offering state-of-the-art, uninterrupted, global IFC. The service enables passengers to browse the Internet, stream videos, check social media and more during flights, with connectivity that is comparable to the mobile broadband services they may receive on the ground.

"GX Aviation continues to be a major success story, not only for Inmarsat, but for the global inflight connectivity market. We're still within our first year of commercial service, so the fact that the service has been installed on 250 aircraft speaks volumes for its acceptance as the gold standard by airlines worldwide," said Philip Balaam, President of Inmarsat Aviation. "Reaching this milestone so early in the launch of GX Aviation is testament to the industry-leading service levels that airlines and their passengers are experiencing with the service. We celebrate this milestone with our world-class value-added resellers (VARs), Rockwell Collins, SITAONAIR and Thales, and ecosystem partners such as Honeywell and Zodiac Inflight Innovations. Together, we are committed to keep developing GX Aviation, keeping us ahead of other aviation connectivity solutions in the market."

Delivering GX Aviation to global airlines

It's been a busy few months for Inmarsat as its GX Aviation service goes from strength to strength, surging in popularity across the world.

In September 2017, Inmarsat was selected by AirAsia Group to deliver its GX Aviation service to more than 120 aircraft, covering all existing and future Airbus A320 and A330 aircraft operated across the group. The agreement also has the scope to include any additional aircraft types due for delivery in the coming years, such as the Airbus A350. The first installations and the launch of commercial service are scheduled to commence in the first half of 2018, with connectivity enabled by the JetWave terminals produced by Honeywell Aerospace.

In the same month, Air Astana became the first airline in the world to offer GX Aviation to passengers on board a

"In April 2018, Inmarsat announced a major milestone for its GX Aviation service after completing the 250th installation worldwide. Within the first year of commercial service, GX Aviation has been installed in a variety of aircraft."

Photo courtesy of Pexels

widebody aircraft after the service went live on the airline's initial Boeing 767. GX Aviation will eventually be available on all three of Air Astana's Boeing 767s. Air Astana passengers will be able to choose from three connectivity packages: The Light option will cover 15Mb, the Business option will cover 50Mb, and the Super option will cover 100Mb. All services are estimated to operate at an average speed of between 2-5Mbps..

In November 2017, Emirates announced plans to install Inmarsat's GX Aviation high-speed inflight broadband service on its Boeing 777X aircraft fleet. The new agreement is part of Emirates' and Thales' plans to develop state-of-the-art IFEC on the airline's new Boeing 777X fleet. Emirates has 150 Boeing 777X aircraft on firm order, with deliveries currently scheduled from 2020.

Meanwhile, in April 2018, Inmarsat signed a Memorandum of Understanding with Turkish Technic and HAVELSAN on integrated IFEC solutions. As part of the collaboration, the three companies will offer a joint solution for emerging markets, which integrates Inmarsat's award-winning GX Aviation inflight broadband solution with the Turkish Technic-HAVELSAN IFE system.

Later in April, Inmarsat's GX Aviation service was reportedly being rolled out to Qatar Airway's Boeing 777 and Airbus A350 aircraft. Qatar Airways is the first airline in the Middle East and North Africa (MENA) region to offer GX Aviation. In total, the service will be equipped on more than 130 of the airline's Boeing 777 and Airbus A350 aircraft. As part of the service offering, passengers will be offered one hour of free access to GX Aviation, after which full-flight access can be purchased.

Jet Connex advancements

In addition to its GX Aviation service, Inmarsat also offers Jet Connex, the only global, high-speed Wi-Fi option available for business jets today, delivering the same fast and reliable onboard connectivity experience comparable to the mobile broadband services they may receive on the ground.

With Jet Connex, business travellers can join a video conference while flying over the Atlantic, catch the latest market reports *en route* to the next business meeting, or download tomorrow's presentation from the company server. The service reportedly offers passengers the highest speed and most extensive coverage of flight routes available to the market and is the first worldwide Ka-band network available to business aviation from a single operator. Operating over Inmarsat's Global Xpress network of Ka-band satellites, Jet Connex provides data speeds capable of supporting video-streaming, Voice over IP (VoIP), live TV, file transfer and VPN.

The service has proved incredibly popular; October 2017 saw the announcement that Inmarsat and Honeywell completed the 100th installation of the JetWave system, which powers Jet Connex. Honeywell, Inmarsat and their installation partners have received more than 25 type certificate and supplemental type certificate (STC) approvals for JetWave from the Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA) to date across 24 platforms. The two companies are securing an additional nine STCs for five other platforms in the coming months, meaning Jet ConneX will be available for installation on over 29 business jet platforms. Platforms currently supported by JetWave and Jet Connex include Bombardier, Dassault, Embraer, Gulfstream, Boeing and Airbus.

In October 2017, Inmarsat's Jet ConneX business aviation inflight Wi-Fi service received a Supplement Type Certificate (STC) for the popular Gulfstream G550 aircraft. Awarded by the Federal Aviation Administration (FAA), the certificate approves Gulfstream G550 business jets to be equipped with the exclusive JetWave antenna and terminal, produced by Inmarsat partner Honeywell. The system enables seamless access to Jet ConneX high-speed Wi-Fi across major flight routes and islands off the beaten path, allowing passengers to browse the web, stream live television, video conference and more.

Following more than a year of investment in development and testing, initial installations on G550 aircraft are now underway. Gulfstream, in cooperation with Inmarsat and Honeywell, is currently conducting in-service evaluation and final terminal Type Approval activities.

"The Gulfstream G550 community has been eagerly awaiting this Jet ConneX installation approval and has told us about their desire to have a powerful global high-speed Wi-Fi solution for their principals. Many are heavy users of Inmarsat's SwiftBroadband solution and are happy with the service reliability but are now looking to upgrade to a next-generation network that is fast enough to handle the demands of today's applications," said Kurt Weidemeyer, Vice President of Business Aviation at Inmarsat.

In the same month, Inmarsat made additional data plans for its Jet Connex service available on Dassault business jets, providing Dassault customers with five-tiered data plans to choose from using their existing non-Ka-band radomes. The highest data plan offers speeds up to 11Mbps. Business aviation customers are usually required to install the Honeywell JetWave hardware for Jet ConneX with a fully approved Ka-band optimised radome. However, that requirement has been waived while Dassault Aviation finishes development of a fully approved Ka-band radome, which is expected next year. With the installation of an approved Ka-band radome, Dassault customers will become eligible for the entire Jet ConneX data plan catalogue, which currently offers tiered plans up to 15Mbps.

The European Aviation Network

We've been hearing a lot about the European Aviation Network (EAN), the world's first integrated S-band satellite and complementary LTW-based terrestrial network build for Europe, in the last couple of years. As of 5 February, partners Inmarsat, Deutsche Telekom Nokia have completed a key technological step in the development of the EAN, readying the network for launch. Some 300 base stations have been established across all 28-member states of the EU, as well as Switzerland and Norway, marking it as the first ever Europe-wide integrated LTE network.

The EAN is a pioneering technological achievement and a truly innovative European project, providing seamless connectivity over land and water, and offering a high bandwidth service to passengers – currently over 75Mbit/s connection speed to the aircraft – as airlines using the service do not share network capacity with any non-aviation customers. Passengers will be able to use social media, share pictures and stream high-bandwidth content at speeds they

are used to experiencing at home. The EAN is also designed to fulfil not only current but also future passenger demand for IFC as the integrated LTE ground network is fully scalable to meet increasing connectivity needs in the coming years.

The EAN is expected to be available for airlines to offer commercially from the first half of 2018. The service has been trialled during several flights to test the integrated satellite and complementary LTE ground network; the test flights have confirmed that the EAN meets its design performance in practice, providing an unmatched low-latency performance of less than 100ms. Airlines will be able to install the small and light-weight EAN equipment quickly and easily, typically during overnight breaks for individual aircraft and turnaround times for entire fleets of just a few months. International Airlines Group (IAG), which includes airlines such as British Airways, Iberia, Aer Lingus and Vueling, is the launch customer for the new service, and has already commenced installations of EAN equipment on aircraft.

"With the completion of the first ever integrated pan-European LTE ground network component we are now able to fully support EAN's satellite connectivity and maximize the performance of the EAN system," said Rolf Nafziger, Senior Vice President, International Wholesale Business at Deutsche Telekom. "The network is specifically designed to meet future capacity demands for connectivity in the European airspace, with passenger volumes expected to double in the next 15 years."

But not everyone is happy about the EAN's impending launch. Shortly after Ofcom granted Inmarsat a licence for its EAN in October 2017, Viasat announced plans to pursue legal action against the deal. According to reports, the relevant radio spectrum was initially awarded to Inmarsat in 2009 to create a mobile satellite system that could be used by the emergency services. As a result, the change of use of the spectrum into a commercial opportunity allegedly creates an unfair competitive advantage and could create a monopoly in the European IFC market. Viasat argues that, ultimately, consumers will be the ones who lose out as they end up restricted to a good-but-not-great service, at best.

Viasat has frequently opposed this claimed misuse and is looking to pursue legal action against Ofcom as a result of its decision. Viasat's President and Chief Operating Officer Rick Baldridge has issued the following statement:

"We are extremely disappointed by Ofcom's decision to grant Inmarsat authorization to operate its EAN. The facts are clear: Inmarsat is abusing the initial grant of the 2GHz spectrum, as set forth by the European Commission (EC) by changing the original tender granted to them with their intent to deploy a Pan-European terrestrial wireless network; and admittedly missing numerous deadlines as related to the original award.

This blatant misuse of spectrum needs to stop now. It establishes precedent for any organization to use spectrum without following the rules. As we've publicly stated: We believe the EAN violates the original decision of the EU legislature that the S-Band be used for mobile satellite systems - not a terrestrial wireless network (also known as an Air-to-Ground or ATG). We remain diligent in our efforts to have the EC halt Inmarsat's ATG deployments in the S-Band; declare Inmarsat's ATG plans as inconsistent with EU law and the original S-Band spectrum award; and retender the spectrum. And we're not alone. A number of regulators have shared their own frustration with the EC's failure to act, despite requests for the EC to address this critical legal question. If the EC does not do the right thing and make clear that Inmarsat's ATG deployment is not a permitted use of the original granted spectrum, we will be left with no other option: We will fight the decision in each country that authorizes an illegal ATG network deployment.

In recent weeks, Viasat has taken a strong stand in fighting the EAN across Europe. We have advanced our legal actions against Belgium and the European Commission; and filed challenges with German and Italian regulators, making clear that we will take further legal action in Germany and Italy if they allow Inmarsat to implement EAN as advertised. We now fully expect to pursue legal action against Ofcom as a result of their decision this week."

According to the latest news, Viasat is not backing down over the EAN. In December 2017, the company took legal action against Ofcom over its decision to approve the network. Since then, Inmarsat has received permission to intervene, and on 24 January, the Honourable Mr Justice Roth, President of the Competition Appeal Tribunal, has made a further order establishing an interim confidentiality ring in the proceedings. Inmarsat has commented that it believes Viasat's claims 'to be entirely without merit.'

There are more recent troubles on the horizon as well. In March, the Market Court of the Brussels Court of Appeal revoked approval for the EAN in Belgium following Viasat's legal challenge. Eutelsat, which is also fighting against the EAN in selected countries, has spoken up in support of the decision. However, Inmarsat has stated that it doesn't believe the court's decision will be a significant problem in the roll-out of the EAN, claiming that the decision was made 'purely on procedural grounds,' and that the complementary ground network will be shown to comply with certain conditions in the EC framework.

Frederik Van Essen, Inmarsat Aviation Vice-President of Strategy and Business Development, made the following statement to *Aviation Week:* "The European Aviation Network is on track, and we believe that these claims are intended solely to undermine Inmarsat's legitimate business interests and strengthen our competitors' positions in the competitive tender processes currently under way with European airlines. Although at this point it is highly speculative to predict time frames against Viasat's legal challenge, we are confident that the courts will ultimately reject Viasat's claims against the regulators, and so we do not expect a knock-on impact on the commercial deployment of EAN."

Viasat deploys IFC with EL AL Israel Airlines and United Airlines

Global communications company Viasat has long delivered IFC solutions to aircraft around the world, increasing its offerings as the mobility market has boomed. The company has specialist products and services dedicated to all aspects of the market; commercial aviation, business aviation and solutions for helicopters and light aircraft.

In addition to its roles as a very active participant in the challenge of Inmarsat's EAN, Viasat has had a pretty busy few months of deals in the IFC arena. In September 2017, EL AL Israel Airlines selected Viasat's inflight Internet system

to power the airlines' onboard Wi-Fi experience across all its new Boeing 787 Dreamliners. Viasat's technology will deliver Ka-band capacity from Viasat-2 to provide coverage across North America, the Atlantic Ocean and Europe, as well as capacity from KA-SAT satellite, jointly-owned between Viasat and Eutelsat, for additional European coverage.

Meanwhile, in February 2018, Viasat signed a new contract with United Airlines to install Viasat's latest IFEC system on more than 70 aircraft, including at least 58 of the airline's new Boeing 737MAX aircraft. Viasat will serve as the direct inflight Internet service provider to United Airlines, deploying its most advanced IFEC system, in order to provide United customers access to fast, reliable Internet connections from the air, utilising capacity from VaiSat-1, ViaSat-2 and ViaSat-3. Passengers will be able to browse the web and connect with key business applications such as a corporate VPN and secure email. Viasat's IFEC system will also power United Airline's Private Screening entertainment option, which offers customers access to hundreds of entertainment titles from its onboard library direct to their own devices.

Yahsat succeeds in 50Mbps inflight test

UAE-based Yahsat provides a variety of satellite capacity and services through its Al Yah 1, Al Yah 2 and Al Yah 3 satellites, as well as a hosted payload on board the IS-32e/SKY-B1 satellite. The company serves the Middle East, Africa, Central and Southwest Asia regions with a range of solutions, including IFC.

In October 2017, Yahsat announced the successful trial of a 50Mbps inflight connection in partnership with du, Etihad Airways Engineering, Hughes Network Systems and Carlisle Interconnect. The high-speed broadband is expected to be available for airlines within the next few months. The test utilised Ka-band capacity on Yahsat's Al Yah 3 satellite in combination with a simulated environment of an Airbus A320 aircraft in Abu Dhabi. Yahsat and partners plan to complete the next key steps in the following 12 months to enable commercial roll-out of the service across the Middle East and beyond. The new service will deliver the ultimate in IFC – an experience comparable with the service customers receive in their own homes, including streaming HD content, accessing social media, online shopping and messaging apps.

"We are incredibly proud to have brought together leading Emirati and global companies to achieve this milestone. It paves the way for Yahsat to bring further breakthrough technologies to the markets and segments it serves, adding another key pillar to Yahsat's portfolio of market leading services and solutions," said Masood M. Sharif Mahmood, Chief Executive Officer of Yahsat.

SES Networks announces major deal with STECCOM

Global satellite operator SES has, in recent years, become more actively involved in service provisions, utilising capacity from its GEO and relatively new MEO satellite network. From secure cockpit communications to cabin applications such as inflight HD entertainment or virtual office connectivity, SES Networks provides the next-generation, satellite-enabled mobility solutions trusted by industry-leading service providers such as Global Eagle Entertainment, Gogo, Thales and Panasonic Avionics.

In April 2018, Sputnik Telecommunications Entertainment Company (STECCOM) announced plans to elevate the passenger and crew IFC experience across the Commonwealth of Independent States (CIS) region and Europe by utilizing SES satellite capacity and associated services via SES Networks.

Under the agreement, STECCOM will leverage a high-capacity, global managed services platform built on an open architecture. SES Networks' global mobility solution will enable the service provider to customise and efficiently distribute bandwidth, adapting their offerings according to the needs of commercial passenger aircraft and business jets operating on their network. Additionally, STECCOM's customers will benefit from high-speed, high-throughput connectivity. SES Networks and STECCOM will use each other's ground facilities, opening up opportunities for

THE MAKING OF GOGO'S HIGH-SPEED 2KU IFC NETWORK

Gogo's 2Ku IFC service performance was significantly enhanced by upgrading from the existing platform to Gilat's aero modem and satellite ground segment, according to Timor Blau, Director Commercial Aviation, Gilat Satellite Networks. With this new technology, Gogo now has the best-performing IFC system delivering seamless high-speed connectivity from take-off to landing. Driving Gogo's demonstrated achievements in the areas of user experience and performance is Gilat's SkyEdge II-c satellite system and its aero modem – known as the 'Taurus' modem manager (MODMAN).

The high-speed IFC challenge

Today, airline passengers want more than simply staying connected to the Internet during their flights. Recent surveys show that passengers expect their online experience at 30,000 feet to be the same as what they have on the ground. This has put the pressure on airlines to improve the performance of their IFC systems in order to offer passengers a flawless gate-to-gate online experience.

The main challenge for IFC service providers such as Gogo is to enable a best in class broadband Internet service to passengers on global commercial flights who seek uninterrupted connectivity on international, trans-oceanic flights. Modem performance was the key to enabling an outstanding passenger experience for global passengers.

Gilat's high-performance IFC solution selected by Gogo

To enhance the 2Ku service experience for hundreds of concurrent passengers, Gogo decided to replace its existing iDirect Evolution platform with Gilat's IFC solution. The components of this solution include a high-performance aero modem (MODMAN) and the SkyEdge II-c multi-service hub platform, which was deployed in 15 locations worldwide and utilizes bandwidth capacity from over 25 satellites.

Reflecting the success of its new service, the majority of Gogo's fleet was already upgraded to Gilat's modem during the past year, with the remainder expected to be completed by the end of 2018. Gogo announced that the modem is capable of delivering more than 16 times the throughput of its previous modem, thus easily supporting the increased capacity of next generation HTS as they come online.

Speed, coverage and availability

Gogo advertises three numbers that define its high-quality standard for inflight Internet: 15/98/98. These numbers correspond to three essential elements of IFC - speed, coverage and availability. With respect to speed, Gilat's solution enables delivery of minimum throughput of 15Mbps per passenger device on the airplane. The 98 percent coverage of flight routes means virtually nonstop Internet service across the globe. The other 98 percent relates to constant uninterrupted service availability. Gilat's newest satellite technology, featuring seamless satellite and beam switching, ensures the continuous service operation under complex and changing conditions.

Key differentiators of Gilat's IFC solution

With support for HTS and wide beam satellites, Gilat's next-generation modem has enabled it to optimize the performance and efficiency of Gogo's 2Ku service while maintaining full interoperability with existing avionic IFE systems. The data signal to and from the aircraft is received and transmitted via a flat panel satellite antenna, processed by Gilat's modem and the data traffic is then distributed via Wi-Fi inside the cabin, allowing passengers to connect via their personal devices such as laptops, tablets and phones. The speeds supported allow for a diverse variety of applications, such as live TV and special services for the flight crew. Particularly on long flights, streaming video (e.g, Netflix) is a favourite passenger pastime, now made available with high quality broadband.

> "With the upgraded modem, we're able to take advantage of the new generation HTS satellites, increase the connection speed between the aircraft and the satellite, and open up additional bandwidth for new services like Gogo TV," said Gogo spokesperson.

As the plane travels along its route, Gilat's IFC solution uses advanced algorithms to perform beam load balancing and beam prioritization, thus ensuring transparent switchover between beams, satellites and gateways while maintaining user application sessions. This provides a seamless coverage regardless of the plane's location, enabling passengers to enjoy the

highest quality experience throughout their journey.

Gilat's IFC solution ensures the excellent proven user experience from gate-to-gate, providing passengers with connectivity as soon as they board and until arrival at the gate of their destination.

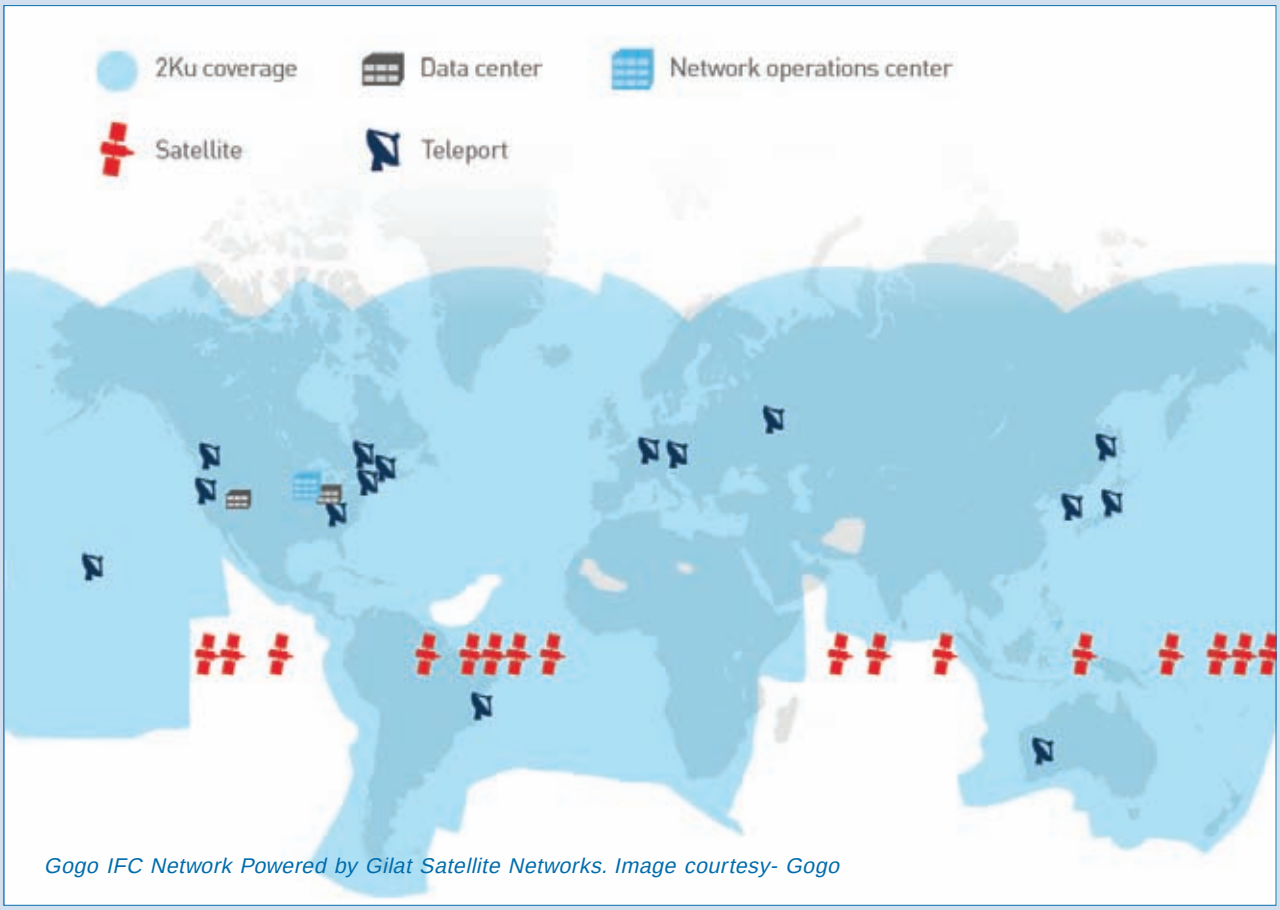
More improvements on the way

As Gilat's R&D labs continue to develop new features and technologies for its airborne VSAT equipment; new capabilities and functionality will become available.

For example, via a simple software upgrade the forward and return waveforms can be optimized to improve spectral efficiency and dynamic allocation of carriers, making the network the most advanced global DVB-S2X network. Gilat's modem can further be enhanced to process passenger traffic in concurrence with live TV broadcast via a dual-demodulator capability, enabling the modem to process two carriers at the same time. These industry leading technologies and capabilities will enable to achieve the highest efficiency and space segment utilization.

Today, Gogo operates the largest of its kind global satellite network for IFC, built with Gilat's ground system and aero modems. The network's open architecture allows working with any satellite network operator, while a central global management system and QoS features enable it to provision and manage bandwidth across multiple teleports, satellites and user beams.

Looking ahead, with current backlog for 2Ku installations, over 2,000 aircrafts are expected to fly with Gilat's aero modem.



Gogo IFC Network Powered by Gilat Satellite Networks. Image courtesy- Gogo

enhanced connectivity across Europe, Russia and Central Asia. This ground infrastructure is key in ensuring efficient delivery of bandwidth to meet the rising demand for high-quality IFC services.

"Passengers today expect to have quality connectivity when they are up in the air, just like they do when they are at home," said Elias Zaccack, Executive Vice President, Global Sales, at SES Networks. "SES Networks is delighted to be supporting STECCOM in its ambition to reliably deliver the highest quality of connectivity and elevate the travel experience for air passengers in Russia and adjoining markets, and to help airlines in the region expand their number of connected aircraft."

Gilat readies new IFC terminals

End-to-end solutions provider Gilat Satellite Networks is also ramping up its presence in the IFC market as demand booms the world over.

In February 2018, Gilat's dual-band Ku/Ka aero terminal achieved unprecedented performance during a live demonstration in China. The terminal reached speeds of 130Mbps with dozens of concurrent users browsing, video streaming, video and voice calls as well as various chat applications. The demonstration took place in a cabin user environment together with Air Esurfing, operating with Gilat's fully integrated dual-band antenna terminal as well as the Taurus Modman. Gilat's high-performance Modman as well as the high-gain antenna panel in Ka-band were key factors in the outstanding results of the demonstration.

Gilat's fully deployed mobility baseband is already operational and in use on China's first domestic HTS Ka-band satellite. The deployed network not only improved end-to-end results, but also significantly reduced the complete IFC system deployment time. Gilat's Ku/Ka antenna will be undergoing supplemental type certificate (STC) in the coming months.

Meanwhile, March 2018 saw Gilat launch AeroEdge 6000, a highly efficient, high-performance terminal for commercial IFC. The dual-band terminal includes Gilat's Ku/Ka band antenna, MODMAN, and Wavestream transceivers. The AeroEdge 6000 high performance terminal operates in both Ka and Ku-band, providing aeronautical broadband satellite communication for high-speed Internet and multimedia applications. The terminal includes Gilat's ER 6000-A Ku/Ka antenna, SkyEdge II-c Taurus MODMAN, Ku/Ka Antenna Networking Data Unit (KANDU) and Wavestream's Ku/Ka Radio Frequency Unit (KRFU).

The terminal allows seamless transition between Ka-band and Ku-band coverage, thus utilizing the best available satellite resources for cost-efficiency and performance. In support of a high-quality passenger experience, the Taurus MODMAN is equipped with a full set of embedded protocol optimization and application acceleration features. High spectral efficiency is delivered via wideband DVB-S2X carriers in the forward direction and fast adaptive and spread-spectrum LDPC transmission in the return direction. Operated over Gilat's SkyEdge II-c multi-service platform, AeroEdge 6000 is a new addition to the family of SkyEdge terminals.

Gogo amps up its service offerings

Gogo specializes, quite simply, in delivering IFC services across the world. The company designs and sources innovative network solutions that connect aircraft to the Internet and develops software and platforms that enable customizable solutions for and by its aviation partners.

Gogo's 2Ku solution, which utilises two Ku-band antennas to deliver high-speed IFC, has proven effective in the years since its launch. As of December 2017, more than 500 aircraft are flying with its 2Ku technology, while total awards for 2Ku inflight connectivity solution have now surpassed 2,000 aircraft. Gogo added more than 550 aircraft awards in 2017 alone. Meanwhile, install times have been reduced down to 30 hours, less than half the time it typically takes to install a broadband satellite connectivity solution.

By February, more than 200 aircraft were equipped with Gogo's 2Ku solution utilising HTS capacity delivered by SES-15. Due to SES-15's high-powered HTS beams, all Gogo aircraft outfitted with its next generation modem will experience an even better customer experience with improved economics. All new 2Ku installations enter service with the upgraded modem, and all 2Ku equipped aircraft are expected to have the new modem by the end of this year.

"Gogo's 2Ku technology is delivering industry leading performance today, but we designed the technology with an open architecture, so it could take advantage of numerous enhancements over time," said Anand Chari, Gogo's Chief Technology Officer. "As we layer in more HTS capacity from satellites like SES-15, 2Ku's performance will get even stronger without having to touch the aircraft."

Indeed, the 2Ku service has proven popular across the world: Cathay Group selected Gogo's 2Ku solution for its wide-body fleet of Airbus A330 and Boeing 777 aircraft in November 2017. 2Ku will give Cathay Pacific and Cathay Dragon's customers a seamless experience across their existing fleet of aircraft once it goes live in mid-2018. Later in February, Aeromexico opted to install 2Ku on an additional nine Boeing 737-800NGs, on top of its 20 Boeing 737-800NGs the solution is already installed on. Air Canada, meanwhile, has more than 170 narrow and widebody aircraft committed to the 2Ku technology, and in April, the airline selected Gogo's 2Ku solution for its Bombardier CS300 aircraft. The technology will be installed as a line-fit option at Bombardier. Air Canada has 45 CS300 aircraft on order with an option for an additional 30 aircraft.

Developing new solutions

Always developing the next generation of services, October 2017 saw Gogo successfully complete its first test flight and begin nationwide rollout of its new regional air-to-ground (ATG) inflight network.

The next-generation ATG network combined with Gogo's proprietary aero antenna, in-cabin network and software platform will bring up to 30 times more bandwidth to an aircraft than its original ATG solution. Once the network upgrades are complete, Gogo will have a North American ATG solution that will deliver performance on the aircraft that is comparable to Gogo's 2Ku global satellite solution. Gogo's ATG network will have peak network capacity of more than 100Gbps. When combined with Gogo's global satellite network, Gogo will reportedly have the highest capacity network ever built that's dedicated to serving aviation.

The ATG network utilizes unlicensed spectrum in the 2.4GHz band as well as the licensed spectrum from Gogo's original ATG network to provide greater bandwidth and reliability. It also leverages Gogo's existing ATG network backhaul and infrastructure of more than 250 cell towers. On the aircraft, Gogo has developed a proprietary new antenna and modem that will produce peak speeds of more than 100Mbps per aircraft.

Gogo advances AVANCE

In January, Gogo unveiled Gogo AVANCE L3, an innovative new IFC system that delivers the benefits of the Gogo AVANCE platform to passengers in a small, lightweight form factor, with (reportedly) the most affordable pricing options in business aviation. Gogo's breakthrough technology platform lets users customize their inflight experience based on their unique needs and can be installed on business aircraft of all types and sizes but is an ideal solution for smaller aircraft including turboprops and light jets. Later in February,

AVANCE L3 received Supplemental Type Certification (STC) and Parts Manufacturer Approval (PMA) from the FAA.

The Gogo AVANCE platform integrates a full range of smart cabin features, allowing passengers to simply and reliably access and use all available data, voice, maps, entertainment and cabin management system (CMS) services. The new system includes a built-in smart router and allows for a variety of service offerings to best fit a customer's needs. It's a new level of flexibility not seen before in business aviation that allows operators to tailor their passengers' experience. With AVANCE L3, they can control and manage the number of devices they allow to connect and can scale their configuration up or down seamlessly as needs change.

Using AVANCE L3, anyone onboard the aircraft can stay connected to email; send text messages and make voice calls with Gogo Text & Talk (service plan required); access their favourite flight apps such as moving maps, weather and flight information; or watch movies and TV shows using Gogo Vision (service plan required). For customers looking for full Internet connectivity, AVANCE L3 can be enabled to connect to the Gogo Biz data network delivering a 3G experience.

Global Eagle Entertainment augments HTS capacity

Global Eagle Entertainment (GEE) is a leading provider of media, content, connectivity and data analytics to markets across air, sea and land with a fully integrated suite of rich media content and seamless connectivity solutions to airlines, cruise lines, commercial ships, high-end yachts, ferries and land locations worldwide.

In January, GEE tripled the amount of HTS capacity secured with SES Networks via its SES-15 satellite to enhance IFC for airline passengers travelling across North America. The major increase in Ku-band capacity will enable GEE to deliver high-speed broadband to passengers on board commercial flights throughout the USA, including the increasingly important US mainland to Hawaii routes. The multi-year agreement is the latest contract to be signed by Global Eagle: In the past several years, Global Eagle has doubled its capacity with SES Networks on an average of every eight months to meet the rising demand for high-quality inflight connectivity around the world.

Later in March, GEE agreed to a significant investment from funds managed by global investment firm Searchlight Capital Partners, L.P. Searchlight will invest $150 million of new capital into GEE and receive $150 million aggregate principal amount of the company's new second-lien notes due 30 June 2023. Global Eagle expects the net proceeds from the transaction to be approximately $142 million after payment of fees and expenses, which will significantly strengthen the company's balance sheet and liquidity. It intends to use a portion of the proceeds to repay the full $78 million principal balance on its revolving credit facility, following which the full $85 million facility will remain available, potentially for growth initiatives and other general corporate purposes.