

# Inflight

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March/April 2017  
Volume 8 / Issue 2

## Going wireless Is the future W-IFE?

**A nod to the future**  
Alaskan Airlines has more to love

**Plane food**  
Catering to the cabin

**The new oil**  
The value of data



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Cover: Singapore Airlines' Companion App not only ties in with Panasonic's data platforms, but allows passengers to use their personal electronic devices as a second screen.

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Alexander Preston Editor

## And **the winner** is...

**The** industry event season is now upon us.

The *Inflight* team is gearing up for the forthcoming Aircraft Interiors Exhibition (AIX), which we preview in this issue. Our diaries are already filling up as we await a series of announcements, both product and customer related, which will be made during the show. A flavour of the event can be found later in this issue, and we'll be reporting back every day via our popular e-newsletter show dailies during the event itself.

Our event season commenced with the fifth *Inflight* Middle East Pavilion, Workshop and Awards. With overall show attendance up by over 30% to 4,761, and a record number of delegates attending the *Inflight* Workshop, the two-day show had an extremely busy feel. *Inflight* exhibitors were quick to point to the quality of footfall, with several enjoying fruitful meetings with the region's major and regional carriers. In fact, 22% of the *Inflight* event delegates were senior airline representatives. Many of these airlines were represented in the *Inflight* Middle East Awards ceremony, which brought the event to a close. Read more about the Workshop and Award winners inside.

Speaking of awards, there is much anticipation surrounding this year's Crystal Cabin Award. A record number of submissions highlights the efforts taking place across the industry to bring the benefits of innovation to improving the passenger experience – whether materials, cabins, seating or other elements of the aircraft interior.

Good luck to you. As always, *Inflight* will be present to congratulate the winners.

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# American Airlines says 'no' to seat-back IFE

✎ American Airlines' (AA's) forthcoming Boeing 737 MAX aircraft will be delivered without seat-back video screens.

In a statement, the airline said, "We know in-flight entertainment is important to our customers, which is why we've committed to offering free, streaming high-quality movies and music, and to investing in fast satellite-based internet access and power at every seat across our domestic fleet.

"More than 90% of our passengers already bring a device or screen with them when they fly.

Those phones and tablets are continually upgraded, they're easy to use, and most importantly they are the technology that our customers have chosen. So it makes sense for American to focus on giving customers the best entertainment and fast connection options, rather than installing seat-back monitors that will be obsolete within a few years."

Passengers with personal electronic devices will be able to watch free movies and TV shows from an extensive on-board library, as well as free live television

channels, without purchasing an in-flight internet connection.

Those paying to get online will be able to access high-speed, satellite-based internet that is being installed on the MAX and other aircraft, enabling passengers to stream Netflix, Amazon, and other video on demand, as well as to text and browse the web.

Both the free streaming library and satellite internet connections will work gate to gate.

Despite this move, AA is committing to seat-back screens

on its widebodies and some of its narrowbodies used for specific flights, as well as its Boeing 777s, 787s, Airbus A330s, and A350s, which begin arriving next year.

The airline is also committed to seat-back screens on its three-class A321s, and 40 current-generation B737s, which will be delivered this year with power at every seat.

By the summer of 2018, AA will have completed installation of the faster satellite-based Wi-Fi on half of its narrowbodies, with all completed by the end of 2019.

## Emirates unveils A380 Onboard Lounge



✎ Emirates has announced a multi-million-dollar cabin interiors upgrade programme for its A380 and Boeing 777 fleet, and includes an enhanced Onboard Lounge for

its flagship Airbus A380 aircraft.

Sir Tim Clark, president of Emirates Airline said, "Since we first launched the product in 2008, our A380 Onboard Lounge has gone

through small but successive enhancements in line with customer feedback to increase the amount of space for our customers to interact in the lounge.

"In our latest revamp, we have taken inspiration from private yacht cabins, and amongst other thoughtful touches, we have increased the seating space, and also made it more intimate and conducive for our passengers to socialise or enjoy our lounge service," he added.

The new Emirates A380

Onboard Lounge will make its operational debut in July 2017.

Emirates will also introduce soundproof curtains to partition the Onboard Lounge area from the other cabins, put in additional soft ambient lighting options, new window blinds with integrated LED mood lighting, and subwoofers for surround sound. The lounge also features a 55-inch LCD screen so passengers can view the latest flight information, or enjoy live TV broadcasts of the latest news or sports updates.

## Gogo 2Ku exceeds 100 Mbps in test

✎ Gogo has achieved speeds in excess of 100 Mbps using its proprietary 2Ku antenna during its latest test flight.

"When we launched 2Ku, we knew that the performance would get better with our next-generation

modem and new high-throughput satellites," said Anand Chari, Gogo's chief technology officer.

"We have capacity on HTS satellites in orbit today and 2Ku's open architecture allows us to take advantage of satellite innovations

over time. We also continue to improve our aircraft hardware – servers, modems, antenna, and wireless access points. This performance achievement demonstrates the progress we've made on both fronts."

Installation of the new modem will begin in the second half of this year. Eventually, the product will be providing high-speed internet on more than 1,500 2Ku and 250 Ku aircraft across 13 leading airlines.

## Frankfurt airport uses VR videos for upgrades



Passengers could experience premium economy virtually and then for real.

✎ Lufthansa has used virtual reality (VR) glasses in Frankfurt's Terminal 1 with selected intercontinental flights as a way of offering economy-class passengers an upgrade (for an additional charge) to premium economy directly before their departure.

Lufthansa used the two-week promotional period to draw passengers' attention to the new travel class, including extra leg room and on-board services, as well as presenting the airline as 'a company which embraces innovation'.

Flights were selected for the promotion on a daily basis,

choosing those where there were still enough seats free in premium economy class. Up until 40 minutes before departure, passengers were given the chance to test out Lufthansa's new travel class in three dimensions by personnel from a promotion agency.

Passengers who decided to go for the upgrade could then pay the surcharge directly at the gate via a mobile payment device.

Lufthansa has already achieved considerable success in the US with upgrading passengers to premium economy through the use of VR.

## All-in-one contactless handheld MPoS

✎ London-based mobile point of sale (MPoS) specialist, ECR Retail Systems, has launched the ECRGo2, the first fully certified, all-in-one contactless, handheld MPoS device for the airline industry.

The terminal reduces the number of devices currently required to take payments and enables airlines to meet VISA and MasterCard's contactless mandate, requiring merchants that accept payments from these networks to establish contactless payments as standard by the end of 2019.

ECRGo2 is fully mobile- and web-enabled and is available with a host of features, including a 2D barcode reader; a card reader (PIN-entry device) that accepts all payment types including mobile wallet options such as Apple Pay, Google Wallet, and PayPal, plus chip and PIN, and swipe and sign payments; a 5-inch capacitive touchscreen, and an on-board, silent thermal printer.

According to the company, the ECRGo2 has been designed to

utilise the benefits of Microsoft Windows 10 Enterprise and can communicate via Wi-Fi, 4G and Bluetooth. It meets all necessary security and payment standards, and is EMV levels 1 and 2 and PCI certified. The terminal also runs ECR's unique AirPoS software and means that the system can be used as a wider strategic business tool that provides smart analytics about in-flight retail trends for marketing, logistics and customer service teams.

Simon Pont, CEO, ECR Retail Systems, said: "Enabling airline crews to work even more productively and efficiently on board will have a hugely profitable effect on airlines' businesses. We have put a lot of thought into the design of the ECRGo2 and believe that this first all-in-one contactless MPoS payment device not only improves the customer experience for the modern passenger, but that it will significantly help cabin crews be more effective and efficient with their in-flight duties."

## Airline hackathon event concludes

✎ Malaysia Airlines' inaugural MABHackathon event has culminated with a final 25-hour hacking session at Malaysia Airlines Training Academy, Kelana Jaya.

Led by the airline's IT Division, MABHackathon is a series of hacking labs and activities that began in November and culminated in Hack Day.

The two-day hacking event saw a total of 100 participants grouped into 21 teams, competing to develop

prototypes (mobile applications) from creative and innovative ideas utilising the application programming interface (API) and platform provided by Malaysia Airlines Berhad's IT Division, Amadeus, and IBM.

After 25 hours developing the mobile app solutions, the group presented their prototypes to a panel of judges from the airline's subsidiaries (MASwings, Firefly and Aerodarat Services), and industry experts as well as partners from IBM Asia Pacific, Greater China and Japan;

Maxis; and Malaysia Digital Economy Corporation (MDEC). All 21 applications were evaluated based on the user interface and experience, innovation, impact, resources sharing and overall quality, in categories including in-flight entertainment and in-flight Wi-Fi.

The Gravity WolfPack was recognised as first overall runner-up team and Paper Plane as second runner-up for their respective IFE apps.

Malaysia Airlines' CEO, Peter Bellew, said, "We hope that

participants benefit from this initiative and continue pursuing their passion for innovation.

As this will now be a yearly programme, we want to encourage more local talents to participate.

"We are optimistic that the MABHackathon will help position the airline to be more creative and innovative, and ultimately provide our customers with a more superior experience while improving the efficiency of the airline's overall operations," added Bellew.

## Qantas reveals premium economy seat



Flights between Perth and London begin in March 2018.

Qantas Group chief executive officer Alan Joyce has unveiled the airline's new premium economy seat to employees and media at the carrier's Sydney headquarters. The seat will debut on the airline's

fleet of Boeing 787-9 Dreamliners from October.

The new seat, which is 10% wider and has more functional space overall, has a unique recline motion. When the rear of the seat reclines,

several sections shift to support your body as you move into a more relaxing position.

Other features include a separate cabin of 28 seats, configured in a two-three-two layout to improve aisle access for middle passengers; an ergonomically designed headrest that can be fitted with a specially designed pillow and a re-engineered footrest that significantly increases comfort when reclining; high-definition Panasonic in-flight entertainment seat-back screens that are 25% larger, and five individual storage

compartments and two USB charging points per seat, as well as shared AC power and a personal LED light designed to minimise disturbance of other passengers.

"The Qantas Dreamliner will be flying some of the longest routes in the world, including non-stop from Perth to London, so we've focused on making each cabin the most comfortable in its class," said Joyce.

The new premium economy seat is based on a prototype by Thompson Aero Seating and has been heavily customised by leading Australian industrial designer David Caon.

## Air Côte d'Ivoire signs up for connectivity services

Air Cote d'Ivoire (VRE) has recently signed up for in-flight passenger connectivity services from SITAONAIR.

The new deal will deliver Internet ONAIR and Mobile ONAIR connectivity solutions to VRE's new A320s.

In June 2017, SITAONAIR's teams will begin activating Internet ONAIR and Mobile ONAIR

on five new Air Côte d'Ivoire A320s equipped with Airbus's Airline Network Architecture (ALNA) server platform. The services will make use of SwiftBroadband, an IP-based data service from Inmarsat that SITAONAIR, as distributor, will operate as service provider.

The project is set for completion in 2019, when Air Côte

d'Ivoire will take delivery of the last of the five new A320s.

Stephan Egli, commercial regional VP for the Middle East and Africa, SITAONAIR, said, "We are very proud to be helping Air Cote d'Ivoire to deliver a brand-new fleet of A320s with the quality in-flight connectivity services passengers increasingly demand. With the first five of

Africa's airlines to achieve in-flight connectivity in the continent using SITAONAIR as their service provider of choice, VRE is part of an in-flight connectivity revolution gaining momentum across Africa, as the airlines in the region look to offer the same quality of product for passengers as other regions like their Middle East neighbours."

## Restaurant delivery service takes to the skies



Dutch start-up company iFleat, and airberlin offer a unique catering service.

iFLEAT, a downloadable app-based service that simply requires passengers to fill in their name and booking number before allowing them

to pre-order restaurant food ahead of their flight, is now available across the airberlin network and is being rolled out across other airlines this year.

"There are no additional costs for the carrier or the caterers, it simply relies upon a partnership between the airline and ourselves to make it happen. Overall I believe it is a win-win situation for everyone involved – passengers are happy that they are getting a delicious meal, which in turn creates positive feelings towards the airline and hopefully generates loyalty," says founder Jaap Roukens.

airberlin launched the iFLEAT service in October 2016. The app can be used to pre-order food –

no later than 12 hours before the flight – from restaurants in the German capital, which is delivered to the aircraft on the day of travel.

To date, five Berlin restaurants are partnered with the service, each offering a different style of food, and iFLEAT is set to roll out in various other cities serviced by airberlin and its partner, Sky Catering, including Abu Dhabi in the UAE, and New York, Miami and Chicago in the US.

iFLEAT is also partnering with three other major global airlines in 2017.



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beyond frontiers

# PriestmanGoode reveals wide-body cabin designs for SAA

✎ New cabin designs for South African Airways' (SAA's) wide-body fleet of new A330-300 aircraft have been unveiled by PriestmanGoode.

PriestmanGoode's designs for the A330-300 fleet include business-class and economy-class cabins, as well as entrance areas, brand panels and cabin branding throughout the aircraft.

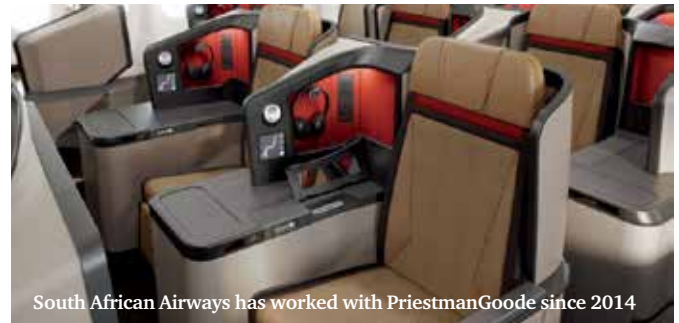
Luke Hawes, director at PriestmanGoode, says "This new phase in the programme provides SAA with a continued consistent, elegant design language with subtle detailing and highlights of vibrant colour and pattern."

The business-class cabin features a custom Thompson Vantage XL seat. The look is

designed in keeping with the business-class seat on the A320 programme, with fabric-upholstered seats to provide a more comfortable environment for long journeys.

Custom features of the seat include an upholstered personal stowage area, designed to store small, valuable passenger items such as watches, rings, earrings, mobile phones, and a specific area for personal notebooks and small laptops.

There is also a personal stowage shroud designed to create a distinct look for SAA, which focused on integrating seat features such as passenger reading light and seat controls; a monitor shroud designed to give



South African Airways has worked with PriestmanGoode since 2014

the seat a more domestic appearance, including a soft stowage/stand for tablet devices for dual screening as well as standard stowage purposes. The 15-inch monitor is a high-resolution touch screen for enhanced viewing, and a cocktail table seamlessly integrates with the rest of the seat.

The flat bed measures close to two metres with ample width. Each passenger has large personal

stowage areas as well as privacy and direct aisle access.

The economy-class cabin features a custom Geven seat upholstered in fabric with a bespoke pattern inspired by contemporary African crafts. The cabin retains touches of vibrant blue on headrests and in stitching details, carrying on the language of the A320 aircraft interiors.

The new A330-300 aircraft is now flying on selected routes.

## Delta 767 transformed into art gallery

✎ Delta and The Coca-Cola Company have teamed up to bring art to the tray table.

Together with 12 artists from around the world, Delta and Coca-Cola have created an art gallery in the sky – transforming the tray tables on one of the airline's 767 aircraft into one-of-a-kind works of art.

Each artist brought their own personal style and taste to their trays and drew inspiration from some of the airline's most popular destinations, including: Amsterdam, Atlanta, London, Los Angeles, Mexico City, New York City, Paris, São Paulo, Seattle, Seoul, Shanghai and Tokyo.

Each piece of art celebrates themes of optimism, travel, refreshment and happiness.

In addition to the in-the-air art gallery, Delta will be displaying the original trays in Concourse A, between gates A15 and A11 at Atlanta's Hartsfield-Jackson International Airport.

The promotion will be continued across social media with additional content, including video footage and other behind-the-scenes features, showing the artists in action.

Delta serves Coca-Cola products on all of its flights and in Sky Clubs, serving more than 354 million drinks per year.

Delta developed and implemented the concept of the flying art gallery in collaboration with creative agency Wieden+Kennedy New York and Coca-Cola.

## Pakistan International Airlines Wows

✎ Bluebox Wow, a portable wireless solution from Bluebox Aviation, has been deployed by Pakistan International Airlines (PIA). The airline unveiled its streaming wireless IFE on selected domestic flights in January, using Bluebox's iPad-based portable IFE solution on its long-haul flights for business-class passengers.

"We were delighted by the success of our portable IFE programme with Bluebox, which enabled us to provide preloaded iPad devices, but this takes us so much further in being able to delight passengers who wish to use their own devices but still access our licensed content," said Muhammad Aamir Memon, general manager, brand and in-flight entertainment at PIA. "The original

Bluebox Ai solution surpassed our expectations, and now we have a new way of delivering even more products and services to our passengers through the advertising options available on Bluebox Wow."

In the first phase of deployment, 30 hours of content will be available to passengers, including dramas, comedies, children's movies, Tilawat, documentaries, safety videos, Urdu feature films and music. The second phase will deliver further content, including western movies, interactive games for kids, moving maps and advertising options.

Initially, Bluebox Wow-powered wireless streaming will be available on selected flights on PIA's Karachi-Islamabad and Karachi-Lahore routes.



  
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# Experiential Aviation experience



✎ Luxury travel boutique DreamMaker has revealed Experiential Aviation as part of its US\$13.8 million private jet trip around the world – Passport to 50. The DreamMaker experience is scheduled for 11 August 2017, and will cover 20 cities in 20 days.

“DreamMaker has focused on

the experience for almost 30 years,” says founder Gregory Patrick. “Through Experiential Aviation, we are innovating and enhancing the experience from wheels up to wheels down.” Some key features include in-flight yoga sessions, spa services, fashion shows, and a hybrid of

hypnotherapy and sleep therapy by holistic health guru April Norris. The services of a photojournalist, videographer, and social media secretary are enlisted to document the trip for guests on board, leaving more bandwidth for clients to enjoy the many aspects of their vacation.

DreamMaker has appointed hypnotherapist April Norris to develop a holistic program that integrates cutting-edge wearable sleep technology with alternative wellness techniques such as hypnotherapy, Reiki healing, Ayurvedic medicine, and the attention of a Doctor of Acupuncture. “It is irrelevant how big and beautiful your private jet is if you are unable to relax

comfortably or get the required amount of sleep on the plane,” says Patrick. To ensure the utmost comfort for its guests, Passport to 50 will boast a one-to-one ratio of guests to staff, with a cast of 50 hand-picked professionals, each experts in their respective fields.

“Particular attention is paid to the optimum blend of sleep and enjoyment as one’s inability to properly rest will negate anything enjoyed in the air or on the ground,” says Patrick. “Certified sleep professionals are on board to orchestrate light, sounds, aroma, hypnotherapy, and even wearable sleep technology to ensure that guests are rested enough to optimise their awareness and wellbeing.”

## Luxaviation Helicopters launches

✎ Luxaviation Helicopters, part of the Luxaviation Group, has launched as the first VIP helicopter management company.

Luxaviation Helicopters will specialise in helicopter management, delivering services to helicopter owners including crew provision, training, maintenance co-ordination, charter services, sales and acquisitions. From spring 2017, Luxaviation Helicopters will become one of the first VIP

helicopter operators in Europe with EASA approval, allowing the company to operate charter flights to offshore yachts and cruise liners.

Charlotte Pedersen (pictured), formerly COO of Luxaviation Group, will lead Luxaviation Helicopters as CEO.

Pedersen says, “Modern helicopters have the ability to fly almost everywhere, in all-weather conditions, and can be even faster than jets on short distances. This,

however, requires highly trained crews, world-class maintenance and a professional and experienced back office to arrange customs, permits and security preparations for our clients whose end destinations might not be an established airport. Luxaviation Helicopters has the global ability to manage all these preparations to perfection, alongside the highest security precautions and confidentiality, which is of equal importance in today’s world.”



Luxaviation Helicopters will manage all helicopter activity within the Group. The business will continue to expand worldwide via organic growth, company acquisitions and joint venture agreements with existing helicopter companies.

## Management moves at Embraer



Left to right: Paulo Cesar, Michael Amalfitano, Marco Tulio

✎ Embraer has appointed Michael Amalfitano as president and CEO of its Executive Jets business unit, effective 1 March.

Amalfitano succeeds Marco Tulio Pellegrini who is moving into another, as yet unannounced, leadership position.

Paulo Cesar Silva, Embraer

CEO, stated, “We are thrilled that Michael has decided to join Embraer to lead our Executive Jets business. We are confident that as a very seasoned and successful executive he is qualified to take advantage of our position as a leading player in this highly competitive industry.”

“I’m honoured to assume the executive position Marco has held and privileged to lead an amazing team of dedicated employees and leverage our highly valued portfolio of aircraft to the benefit of our customers and shareholders globally”, commented Amalfitano.

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Alaska Airlines president and COO and Virgin America CEO Ben Mínicucci stands in front of a specially painted, co-branded 737-900ER.

# A nod to the future

**Regularly praised for its high customer satisfaction, Alaska Airlines continues to trailblaze. Ariana Khushal finds there is 'more to love' following its merger with Virgin America.**

**“For** over 75 years, Alaska Airlines, and the people who make us who we are, have been guided by integrity, caring, ingenuity, professionalism, and a unique spirit. A spirit that was and has grown out of our geographical roots,” declares Alaska Airlines on its website.

Alaska Airlines started service in 1932 as McGee Airways, with a three-seat Stinson aircraft. A merger with Star Air Service in 1934 created the largest airline in Alaska.

There followed several more mergers, and further name changes, until Alaska Airlines was finally adopted in 1944.

Over time, Alaska has grown from a small regional airline into an international carrier, which presently carries over 17 million customers a year, and a route system spanning over 60 cities and three countries. Its fleet of Boeing aircraft is one of the most modern in the industry, helping the airline acquire a reputation for outstanding services.

As a marker, it has ranked ‘Highest in Customer Satisfaction Among Traditional Carriers in North America’, nine years in a row in the J.D. Power *North America Airline Satisfaction Study*; it has also secured the number-one spot in the *Wall Street Journal’s* annual ‘Middle Seat Scorecard’ for the past four years; and been named the number-one on-time major North American carrier by FlightStats for seven years in a row.

## SERVICE INVESTMENT

In November 2016, Alaska announced a new premium class on its Boeing 737-800s and 737-900s, which it began rolling out on select routes at the beginning of January. Seat configuration for premium class will differ depending on the aircraft. Currently, Alaska Airlines’ 737-800, -900, and -900ER aircraft are being retrofitted with new seating. All 737-800s and Embraer E175s were scheduled to have premium class by 5 January, with all 737-900/900ERs due to be upgraded by the end of 2017. A decision on when the 737-700s will be retrofitted will be announced mid-2017.

The airline has announced it will retire its fleet of 737-400s during the coming year. The upgrade option will also be available on

Alaska Airlines and Virgin America employees wear commemorative t-shirts celebrating the merger.

the E175s operated by SkyWest Airlines and soon, Horizon Air.

The new section offers an additional four inches of legroom, with 35 inches of space between rows, compared to the 31 to 32 inches between rows in the rest of the main cabin. As well as the extra legroom, the Recaro seats have leather covers and a six-way adjustable headrest.

Power outlets are available throughout the cabin. Premium-class passengers will enjoy early boarding, complimentary snacks and alcoholic beverages.

More than 40% of Alaska's fleet has been retrofitted with the new section and by year end, more than 90% will feature it.

The aircraft retrofits will also result in significantly expanded legroom in the first-class cabin, which will increase from 36 to 41–42 inches, and be among the most spacious first-class cabins domestically.

According to the airline, "In addition to the increased legroom, first-class customers will continue to enjoy a seat that is four inches wider, free in-flight entertainment tablets, a complimentary selection of fine wines and spirits, and chef-inspired, locally-sourced snacks and meals."

In the past few years Alaska has made significant investments to improve its on-board experience.

By the end of this year, the airline aims to have outfitted nearly half its 737s with new larger overhead bins with 48% more capacity, to fit more carry-on items. Most of the mainline aircraft will feature new custom Recaro leather seating with 110 V of power and a USB connector at every seat. "The on-board product enhancements announced in early January are just the beginning of the new features and promotions passengers can expect to see us implement over the next year," comments Andrew Harrison, Alaska Airlines' executive vice-president and chief commercial officer.

#### CAPTIVE AUDIENCES

Alaska currently offers two options for in-flight entertainment. Alaska Beyond, its streaming entertainment system, allows



passengers to watch popular TV shows for free and pay-per-view movies on a personal electronic device from a large library of videos stored on the aeroplane, accessible via the Gogo Entertainment app.

The carrier offers over 200 titles, including around 40 movies and the latest episodes from popular channels including HGTV, Food Network and Travel Channel. Content is available after take-off on most Alaska flights.

The free title library is updated as close to the beginning of the month as possible, while pay-per-view content is updated continually depending on Hollywood studio release dates.

On most flights of 3.5 hours or more, customers have access to a Toshiba in-flight entertainment tablet. This premium product is free in first class and available for rent in the main cabin and premium class.

Tablets are pre-loaded with over two dozen new release and classic films, some still available in cinemas, and Xbox games such as Microsoft's classic Solitaire, as well as Microsoft Sudoku, Minesweeper, Mahjong, Jigsaw and Treasure Hunt. Available digital magazines include *National Geographic*, *Us Weekly* and *Wired*, among others. The battery lasts for about six hours of continuous video playback and, on some flights, a power cord is provided for convenience.

The music section has a custom playlist that features two albums from Sub Pop, the Seattle-based independent record label that popularised Nirvana, Soundgarden and The Shins. In addition, each month the airline offers a selection of kids' programming in its own dedicated area – Kids Zone.

Of great excitement, however, are the new offerings for 2017. As the airline explains, hot on the heels of its acquisition of California-based airline Virgin America, it has debuted a complimentary new service to "help fliers stay connected with friends and loved ones on the ground."

As of 6 January, passengers on Alaska's Gogo-equipped flights have been able to use iMessage, WhatsApp and Facebook Messenger to send greetings from 35,000 feet – for free.

As Harrison explains, "We know that staying in touch while on the go is essential to our guests, many of whom don't need full Internet access. Free Chat is a great way to keep that connection alive without breaking the bank. And yes, it's fully emoji-compatible."

Free Chat is the first of a variety of new in-flight products Alaska is rolling out in 2017. In addition to the brand-new premium-class service, Alaska is introducing a number of enhancements that passengers can enjoy from any class of service.

Alaska is rolling out a series of on-board product enhancements throughout 2017.



These products are currently limited to flights operated by Alaska Airlines. Customer response and feedback is important and will determine the future cabin enhancements and offerings on Alaska Airlines, Virgin America and Horizon Air-operated flights.

#### SHARE AND CARE

In December 2016, Alaska Air Group completed its acquisition of Virgin America, creating the fifth-largest US airline. Allaying fears that the merge could dilute the on-board passenger experience, Alaska Air has promised that there will be “more to love” in due course.

Commenting upon the acquisition, Brad Tilden, chief executive officer of Alaska Air Group said, “Our company is infused with a pioneering spirit that goes back to our founding in the state of Alaska. Today you can see it in our culture of innovation and the way our employees go above and beyond every day to delight and care for our customers. Those are values that I see mirrored in the culture at Virgin America, and are what will make us better together.

“Devoted to our customers’ is one of our leadership principles here at Alaska Airlines. We are relentlessly focused on making Alaska

Airlines the easiest airline in the world to fly through technology, process, and personal connections, and we look for people who share that passion. That’s what we found at Virgin America, and that’s what will carry us forward into the next chapter – together.

“Our employees have worked hard to earn the deep loyalty of customers in the Pacific Northwest and Alaska, while the Virgin America team has done the same in California. Together we will continue to deliver what customers tell us they want: low fares, unmatched reliability and outstanding customer service. With our expanded network and strong presence in California, we’ll offer customers more attractive flight options for nonstop travel. We look forward to bringing together two incredible groups of employees to build on the successes they have achieved as standalone companies to make us an even stronger competitor nationally.”

He added, “Alaska Airlines and Virgin America are different airlines, but we believe different works – and we’re confident fliers will agree. Together, we’ll offer more flights, with low fares, more rewards and more for customers to love, as we continue to offer a distinctive travel experience. The two

airlines may look different, but our core customer and employee focus is very much the same,” he concluded.

Alaska is conducting extensive customer research to understand what customers value most about the Virgin America brand. In the coming months, the business will begin to share ideas about the future decisions with regard to the Virgin America brand. “Regardless of the outcome, travellers should not expect to see any major changes to the Virgin America product or on-board experience within the next 12 months,” the airline comments.

#### ELEVATED EXPERIENCE

One immediate change has seen Alaska Airlines open a Mileage Plan to welcome Virgin America Elevate members. To celebrate its recent merger with Virgin America and the concept of ‘different works’, Alaska is offering free, unlimited access to its entire catalogue of entertainment available to stream on passenger devices, including Hollywood movies and popular TV shows until 31 March 2017.

From January, passengers have begun to see new food and drink options on the snack and beverage cart when they travel, including new premium wines from Washington State’s award-winning Chateau Ste. Michelle, as well as new premium craft beer, bourbon and a sparkling wine from La Marca.

“Alaska has long been an industry leader in both customer satisfaction and performance. Customers can expect operational and customer service excellence to continue throughout the integration with Virgin America,” the airline says.

“Culture has been a real challenge in many mergers, so we’re working to do things differently,” commented Ben Minicucci, Alaska’s president and COO, and CEO of Virgin America when the definitive merger agreement was confirmed. “We are being very thoughtful about culture and are working to create an environment that reflects who we are and where we’ve been, that also enables us to work together, be bold, and succeed in a rapidly evolving industry.” ■





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Hawaiian is deploying the latest electronic flight bag technology from UTC Aerospace Systems.



# A question of connectivity

**Electronic flight bags offer productivity, but require connectivity, says Thomas Tripp.**

It might not surprise you to learn that one of the first notions of how tablet computers might be used in flight came from science fiction. In this case, it was Stanley Kubrick's 1968 sci-fi classic, *2001: A Space Odyssey*.

But while fictional astronauts had them back when hippies still roamed free upon the Earth, it was likely the introduction in 2010 of Apple's iPad that heralded the first modern examples of devices that would evolve into today's ubiquitous electronic flight bag (EFB). And what started as literal replacements for the large leather cases, filled with flight-essential documents, that pilots carried onto the aircraft, have now further evolved into highly capable devices connected directly to aircraft sensors, power, and communications networks.

Here, then, is a brief overview of the development path, status and outlook for the modern EFB.

The classic pilot's flight bag used to be a bulky, rectangular leather case, typically scuffed a bit, and adorned with various aircraft stickers and airline logos, and perhaps the pilot's monogram. Along with the slight tilt of the captain's cap, the suntan and aviator glasses, it seemed a required part of the kit. It was stuffed with aircraft manuals, operations documents, charts, checklists and calculators, and, while something of a status symbol, was also an administrative nightmare. Once upon a time, airlines had entire organisations dedicated to updating all those manuals and charts with every revision, but it was still

incumbent upon the pilot to ensure they made it into the flight bag.

The EFB concept was notionally derived from laptops and pen-based tablets early in the first decade of this century. Regulatory schemes allocated EFBs to one of three classes, depending on their portability and level of integration with the aircraft.

Initially, the goal was simply to reduce or eliminate the paper documentation required on board. Boeing at one point estimated a 77 lb weight saving for a 777 using an EFB. Even for just this one task of digitising the old paper-filled cockpit, EFBs quickly became ubiquitous. The long-time chart provider Jeppesen, now a part of The Boeing Company, has said that it now annually prints barely a quarter of the one billion pages that it did before the advent of the EFB.

The earliest classes of these EFBs, however, lacked connectivity with the

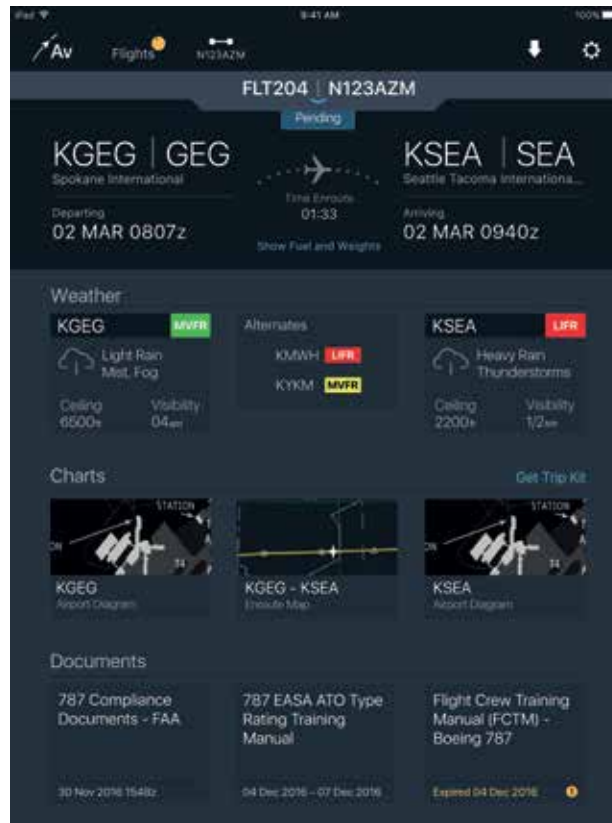
Jeppesen and Boeing's Aviator is designed to be scalable to allow airlines to manage the ever-increasing generation of data and apps.

aircraft's sensor and data systems and were basically reference tools, although the addition of embedded GPS allowed some EFBs to be used for taxiway guidance on the airfield, with detailed moving map displays. The earliest Class III EFBs were permanently mounted in the cockpits, often at knee level on the cockpit sidewalls, and were connected to aircraft power, sensor, and data systems, but utilised relatively limited display units that were discrete from their electronic brains, which were typically installed in the equipment bays.

EFBs resembling those in use today first appeared in the wake of the introduction of the Apple iPad. Pilots began experimenting with iPad-based EFB solutions in 2011 and American Airlines was one of the first major carriers to implement a fleet-wide iPad-based EFB program in 2012. The iPad, and later, Microsoft Windows-based tablets, provided compact units with multi-touch screens and thin form factors that required no discrete processing or power units. Several companies now supply EFB solutions based on these updated tablets.

The real key to further expansion and value of EFBs, however, is linked to significantly improving the integration of the EFB into the aircraft's sensor, data and, especially, communications resources. This connectivity enables EFBs to be much more than document and chart displays. Using real-time aircraft flight data, they can now calculate route and performance enhancements, monitor and improve fuel burn, and provide pilots with much-improved real-time weather information.

Connected EFBs may also be used to display real-time, crowd-sourced information, such as en route weather, gathered by other aircraft airborne in the same region.



Melissa Jacob, business leader, Aircraft Data Management, UTC Aerospace Systems (UTCAS) describes the process. "In simple terms, we envision an operational transformation in which our customers trade their current, static tablet EFBs, which are essentially simple chart and document viewers, into connected devices with real-time links to all areas of the operation, improving both operational efficiency and situational awareness."

To illustrate the maturation process of the EFB, Hawaiian Airlines' adoption of the latest EFB product from UTCAS is a good place to start. Late in 2016, UTCAS and Hawaiian announced that the airline would deploy the supplier's latest EFB technology to provide enhanced functionality, greater safety and stronger cybersecurity via a custom-tailored network security architecture. The airline says that, for passengers, the EFBs will mean a more efficient and comfortable flight overall. The

EFBs are modular, tablet based, and maximise aircraft in-flight data connectivity through satellite communications systems and the Aircraft Communications Addressing and Reporting System (ACARS).

### SITUATIONAL AWARENESS

For flight crews, the UTCAS connected EFBs enhance the ability to evaluate aircraft performance and weather conditions while also providing the airline with a cost-effective, low-risk means to upgrade the software. UTCAS EFBs allow a pilot's iOS or Windows tablet to receive real-time updates from the aircraft and airline network. Information transfer occurs through the aircraft's data connectivity and is received securely through UTCAS's Aircraft Interface Device (AID) and its patented Tablet Interface Module (TIM). The tablet EFB systems provide Bluetooth connectivity

between the tablet and TIM during all phases of flight.

Lufthansa Systems offers a suite of EFB applications used by more than 70 airlines around the world and recently announced the latest version of its fully integrated and connected mPilot for iOS. "The trend towards mobile solutions for a paperless flight deck and greater flexibility for pilots and airlines shows no sign of slowing down," said Igor Dimnik, director of products at Lufthansa Systems. "With our new Lido/mPilot 2.0 app, we are taking another step in the direction of connectivity on the flight deck."

Lufthansa Systems worked with UTC Aerospace Systems and their products to turn an iPad installed with Lido/mPilot 2.0 into a fully fledged connected EFB. Using a UTCAS Tablet Interface Module, which has a Bluetooth connection, the iPad is linked to the company's AID, which enables data management. This will provide access to relevant avionics data, such as GPS



**Lufthansa Systems' new Lido/mPilot 2.0 has improved performance and better connectivity.**

substantial help to airlines that are struggling to manage the increasing number of apps and content on their EFB devices.

**CYBER CONCERNS**

If connectivity is the hallmark of the latest generation of EFBs, then the key will be the interface systems such as those from UTC Aerospace Systems, and the satellite communications developers. Cobham SATCOM does not offer EFB products or applications, but, as designer and manufacturer of L-band satcom systems that support cockpit connectivity, Cobham SATCOM's new generation AVIATOR S products will combine ACARS data for flight safety purposes with internet protocol (IP) to provide the EFBs with improved connectivity. According to Willem Kasselmann, vice-president aero business at Cobham SATCOM, the system ensures more regular updates of time-sensitive data like weather maps and other real-time information for pilots while in flight.

The AVIATOR S value proposition is that it is a lightweight package, saving the airlines up to 30 kg in weight, with compliance to the latest security architectures, designed to resist cyber threats for the next 20 years.

With connectivity, however, airlines face a real cybersecurity challenge. Moving from expensive closed-circuit, narrow-band communication links to inexpensive broadband IP-based data communications offers airlines and the flight safety and operations community significant advantages through communication cost reductions and increased bandwidth. The problem is that IP-based open communication architectures attract hackers.

Says Kasselmann, "It is unthinkable to expose flight safety or even commercially sensitive flight operations data to such threats. This sets requirements for security architectures that not only protect each function with multiple security measures, but also segregate every function from others, so that a successful hack only compromises a small subset of the total number of system functions, retaining the

information and the aircraft's speed and heading. Together the hardware and software will facilitate navigation and contribute to improved situational awareness for pilots.

Lido/mPilot 2.0 also reduces the workload for pilots. Before a flight, one of the pilots selects the airport maps and route and stores them on his or her device. Thanks to a new import function, the other pilot can then import this data directly to their own iPad without having to repeat the procedure. This simplifies the administrative processes and frees up pilots for more important tasks.

Jeppesen's FliteDeck Pro is broadly used across the world – on over 250,000 portable EFB devices, including those used at over 350 airlines. It is used at the largest airlines in the world, from American Airlines with a fleet of over 900 aircraft, all the way down to airlines with just a handful of planes.

With this broad adoption and the continuous opportunity to supplement the navigation function with features that improve operational efficiency and increase safety margins, FliteDeck Pro remains a key focus area for the company. Jeppesen says new features in the system's latest release include layering in airline-tailored content, high-resolution airport moving maps blended seamlessly into the data-driven map, and a new feature called 'Smart Notes',

which organises all of the various important-but-hard-to-find operational notes, communication frequencies, airspace crossings notes and warnings, and instructional text, into a sequenced depiction on a ribbon that scrolls and updates as the aeroplane makes progress along the route.

Jeppesen says it is also improving support for oceanic operations and services into remote areas, with features including automated plotting and required Extended-range Twin-engine Operational Performance Standards information, as well as a function to easily offload the plotted information for required airline record keeping. Jeppesen says these features will not only further reduce the carriage of paper in the form of plotting charts, but will make the task easier and more intuitive for pilots.

For iPad/iOS and Windows tablet platforms, Jeppesen and Boeing are also introducing a product called Aviator, which brings together charting, electronic flight folder, aircraft performance calculations, and software development kits for airline and third-party apps. Aviator provides a common framework where information can be more effectively managed and shared across applications. Jeppesen sees the Aviator framework as something that will continue to grow and evolve, and provide

majority of the system functionality to ensure the safe return of the aircraft.” Cobham SATCOM employs such architectures, along with a certified secure operating system to ensure the integrity of data passed through the satcom terminal.

UTC Aerospace Systems also points out that specific airworthiness process specifications (such as DO-326, DO-355 and DO-356), in addition to the ARINC 811 commercial aircraft security framework, address cybersecurity concerns industry-wide. UTCAS says it ensures adherence to these stringent directives through rigorous design and process controls that include routine internal and third-party system audits, tracking of emerging threats through participation in industry working groups, such as the Aviation Information Sharing

and Analysis Center, and required periodic software reviews to ensure ongoing robustness. In addition, UTCAS continues to develop intellectual property related to cybersecure communication.

Upgraded (satellite) connectivity likely will provide benefits in the future that could help prevent some of the recent major service disruptions experienced by airlines in the US. UTCAS’s Jacob notes, “On at least one occasion, the cause is believed to be a significant reduction in traffic flow through ACARS, which permits the airlines operations centre to communicate with the pilot via text messages to finalise flight plans and complete pre-take-off safety verifications.”

According to Jacob, “While these airline operators have addressed the immediate

issues that precluded flight, updates of older on-board and ground-based computer systems could significantly reduce flight interruptions, improve flight safety and save operators money through increased operational efficiency.” Jacob points out that technology has evolved significantly since many aircraft in safe operation today originally entered service.

**IP FUTURE**

“Today, on-board solutions such as the EFB exist, enabling connectivity between the aircraft and the operations centre even when traditional systems such as ACARS over radio are not working.”

Jacob says the FAA’s efforts to modernise the exchange of information between pilot and air traffic controllers via its Data



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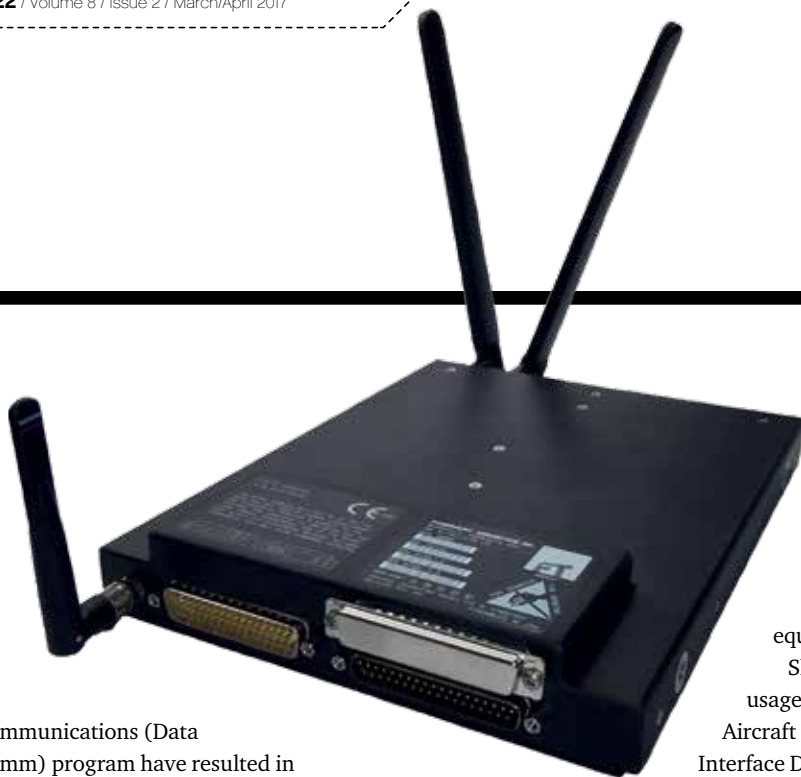


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Lufthansa Technik has recently selected UTC Aerospace Systems' Aircraft Interface Device solution.  
Photo: UTC Aerospace Systems

Communications (Data Comm) program have resulted in improved safety and operator savings. Continuing this effort with an additional focus on IP-based communications links could further enhance, complement, or even accelerate adoption of the Data Comm

equipage. She says usage of an Aircraft Interface Device solution offering real-time connectivity would have provided redundancy to the ACARS radio system, allowing aircraft to be dispatched. In addition to providing the means for pilots to

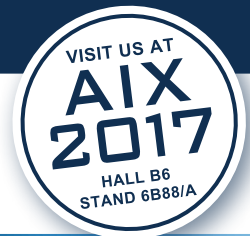
exchange flight data with the operations centre, connected operations via an AID enable pilots to receive near real-time weather and traffic updates as well as providing ground operations with flight-tracking capabilities.

The boxy old leather flight bags have seemingly gone the way of spruce and linen in modern aviation, replaced by svelte tablet computers that started out just as digitised chart and manual storage, but which are now being connected to both the aircraft and the rest of the world. Once the connectivity is fully implemented, the application developers will no doubt find even better ways to improve upon the already significant safety and performance enhancements delivered by modern EFBs. ■



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The A350 XWB is the first and only 'digital native' aircraft offering line-fit connectivity since its entry into service, with three connectivity solutions (L-Band/SwiftBroadband, Ku-Band, and Ka-Band).

# The new oil

## Emma Kelly taps into the high value of data.

**“Data** is going to be the next oil for us,” Dante Dionne, senior IT manager at Korean Air’s Innovation Technology Development Centre told delegates at the Airline Passenger Experience (APEX) Expo, which took place in Singapore last October. And he wasn’t joking.

With the advent of the nose-to-tail connected aircraft and connected passengers, airlines can collect data from

anything and anywhere. This allows them to efficiently manage their fleets, accrue cost-efficiencies in operations, gain valuable insights into their customers and hopefully adjust the service accordingly. Delivering a far more personalised service, both on the ground and in the air, ensures those passengers return time and time again.

Such a scenario was just a dream in the 1990s, when Rockwell Collins, Inmarsat and others envisaged a connected aircraft future. Inmarsat, for example, pushed for use of its global satellite system as a means of connecting every aspect of an aircraft to the

ground. Rockwell Collins’ pioneering project Integrated Information System (I<sup>2</sup>S), in conjunction with German carrier Condor, was aimed at connecting an aircraft-based intranet to airline terminal area databases, providing flight crew, cabin crew, maintenance and passenger applications through a variety of communication links, including satellite communications.

But the industry at the time wasn’t ready for such a bold plan and the connectivity solutions available didn’t make it commercially viable. Today, however, airlines are ready for the connected present



Panasonic's ZeroTouch provides real-time data of an aircraft including media consumption, system health monitoring, aircraft maintenance, and much more.

and future, thanks to the cost of satellite communications coming down, the emergence of new communication pipelines and the growing fleet of aircraft equipped to offer such services.

### COLOUR OF MONEY

"Finally, it has come together – global, low-cost connectivity that you can provide across any aircraft and every airline," says Dave Bruner, vice-president, Global Communication Service (GCS) at Panasonic Avionics. "This is a turning point. It's the gold at the end of the rainbow with how it empowers the airline and allows it to run more efficiently," he adds.

As of late last year, Panasonic alone claimed a 47% connectivity market share, with 77 customers, over 3,500 aircraft committed and 1,350-plus aircraft delivered with GCS.

The growth in its connectivity business has been fuelled by a dramatic drop in connectivity costs since Panasonic first entered the sector. "That changes everything and brings a whole new world," says Bruner, predicting that costs will continue to come down to make it even more attractive to airlines. Panasonic forecasts that some 12,000 aircraft will be committed to its connectivity services by 2025, driving more capabilities and bandwidth.

To capitalise on its growing connected fleet, late last year Panasonic launched its ZeroTouch service, which allows airlines to be fully connected to their fleet, via various communications links, providing passenger, maintenance, operational and flight crew applications. The possibilities with ZeroTouch are endless and will continue to grow, Panasonic believes.

### HOLISTIC APPROACH

To name just a few applications, ZeroTouch will allow airlines to deliver real-time passenger data to the aircraft to allow crew to deliver a more personalised in-flight experience; allow media and content updates in real time; provide airlines with real-time information on the performance of



aircraft systems; and enable critical operational data to be automatically downloaded in real-time during flight, allowing maintenance teams to prepare for an aircraft before it lands.

In terms of passenger experience, ZeroTouch will allow airlines to personalise and enhance the in-flight offering and the passenger experience. The service will operate over Panasonic's eXConnect broadband connectivity, 4G cellular, a terminal wireless LAN unit, or Wi-Fi at the gate. Airlines will access and manage information through a virtual dashboard.

ZeroTouch is solving an airline business problem, Panasonic believes, and while other players in the industry are offering pieces of the solution, Panasonic has a comprehensive one, says Bruner. "We've been more persistent to make it work," he adds. ZeroTouch tests are under way, with full commercial availability anticipated later this year.

In another development, Panasonic's recently launched Captify is a marketing and advertising capabilities platform that allows airlines to target their on-board marketing and advertising. Captify allows real-time media loading, targeted advertising, consumer marketing, surveys and sponsorship opportunities, making it a dynamic experience and bringing opportunities for ancillary revenue.

ZeroTouch and Captify also tie in with Panasonic's Companion App initiative, launched by Singapore Airlines (SIA) last year, which allows passengers to preview the IFE before they board, select a playlist, call it up on board and use their personal electronic device as a second screen and a means to control the IFE.

On the operational side, Panasonic is partnered with Teledyne on an integrated connectivity solution that allows real-time data transfers during flight, by combining Teledyne's Wireless GroundLink Comm+ product with Panasonic's GCS. The partners are working on a range of data automation solutions, including real-time weather, maintenance, flight, and cabin operations.

These elements are all part of a wider connected aircraft vision that Panasonic is bringing to reality.

"The whole model is changing with what we do in real-time... All of these pieces are coming together," says Bruner. But for airlines to make the most of e-enablement, they need a champion to bring the pieces together and exploit all of the opportunities available, he believes.

### BREAKING DOWN SILOES

SITAONAIR agrees. The airline communication specialist has for many years been promoting the nose-to-tail capabilities of the connected aircraft and its product and service offerings, including passenger, cockpit crew, cabin crew, operational, aircraft data and maintenance applications. Some 37% of airlines currently operate connected aircraft, with this figure expected to rise to 66% within three years.

According to Katrina Korzenowski, regional commercial vice-president, Asia-Pacific, there is "more joined-up thinking from airlines than ever before" in the area of e-enablement and the opportunities that nose-to-tail connectivity can bring.

Once airlines start their e-enablement journey, SITAONAIR works with them to deliver the benefits. "Now it's all about the



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roadmap and co-creation. We work with customers on products and services,” says Korzenowski.

The passenger experience is currently the principal driver for airlines committing to connectivity (46%), but maintenance and aircraft health monitoring (15%), cockpit benefits (12%) and improvements to cabin crew activity, such as tablet apps and credit card payments (7%) are all recognised by airlines as connectivity opportunities.

SITAONAIR expects even more e-enablement opportunities with Inmarsat’s recently launched Global Express broadband connectivity services.

Meanwhile, ViaSat’s acquisition of Irish software and mobile applications provider Arconics is designed to strengthen it as an e-enablement facilitator and not just a provider of passenger connectivity services.

Arconics’ products include the AeroDocs document management solution, AeroEFB electronic flight bag, Cloudstore wireless IFE system and PaxApp, a new cabin management app for flight attendants with tablet, smartphone and smartwatch connectivity.

The purchase of Arconics delivers ViaSat with broader expertise, aviation-grade software and mobile applications designed to make flying safer and more efficient for pilots, cabin crew and flight operations, as well as applications that entertain passengers and deliver new service and

revenue opportunities to airlines, says the satellite network company.

“We believe combining our strengths with Arconics will position ViaSat to be the market leader for connectivity, passenger services and flight deck applications and operations,” says Don Buchman, vice-president and general manager, commercial mobility business.

Through its acquisition of Arconics, ViaSat says it expects to offer airlines real-time insight, control and agility of aircraft and flight data with highly integrated, highly customisable aircraft operations tools that tap into the power of the ViaSat Ka-band satellite network.

Before news of the acquisition broke, Buchman told *Inflight* that ViaSat will use the “best of breed” to offer such e-enablement solutions. “We want to be the enabler and spur innovation,” he says.

#### **TRULY PERSONAL**

It’s all about connectivity in the future, according to Airbus, with e-enablement delivering benefits in terms of the passenger experience and crew applications, says Ingo Wuggetzer, vice-president cabin marketing.

The connected aircraft is providing “smart opportunities” for the airline business, he observes, pointing to ancillary revenue growth forecasts of US\$130 billion for 2020 compared with \$40.5 billion in 2015. As a result, Airbus’ latest aircraft, the A350X, is

fully connected, with all A350s delivered with connectivity “to serve the needs of the future”, says Wuggetzer. Airbus predicts a future in 2025 with seamless door-to-door connectivity, where passengers will be immersed in a multi-device and cloud content service environment, a truly personalised product and services, which will enhance brand loyalty at the same time.

Crew, meanwhile, will have an enhanced service platform that will allow personal interaction enriched by real-time passenger profile information and tools to drive efficiency, pointing to not just the use of iPads but smart glasses or even lenses. Crew will be “continually aligning to passenger DNA within a multi-device environment”, he predicts, which will lead to a personalised experience. Airlines will also benefit from interactive cabin health monitoring and real-time data transfer.

Such an e-enabled future is also predicted by the Future Travel Experience Onboard Connectivity 2025 Think Tank, which recently revealed its findings. The Think Tank comprises industry experts from airlines, suppliers and aircraft manufacturers, including Stephen Call, connectivity manager at Boeing; Joe Leader, chief executive officer of APEX; and Panasonic’s Bruner.

The Think Tank is intended to drive positive industry change and help the industry harness the full potential of the connectivity pipeline, including operational opportunities, crew empowerment opportunities, and passenger empowerment and personalisation opportunities.

It believes that by 2025 approximately 80% of aircraft will be connectivity-enabled, all new aircraft will be delivered with a connectivity system installed, that data costs will come down incrementally and that speeds of 100-plus megabits per second will be the norm.

The group believes that all things on board the aircraft will be connected and monitored in real time in 2025 – everything from engine performance to the IFE system, according to Call. Sensors in seats, lighting, IFE and other systems will automatically

**Arconics' PaxApp gives the cabin crew a way to communicate with other divisions about maintenance, catering or operational issues that need attention, improving quality of service on all fronts.**

detect faults and report them to maintenance teams on the ground, removing the need for crew to manually report them.

Airlines will also be able to make better use of real-time weather data to drive efficiencies. Weather events will be predicted accurately in real time, allowing crew to react quickly and cost savings to be accrued, through more efficient ascent and descent profiles, for example.

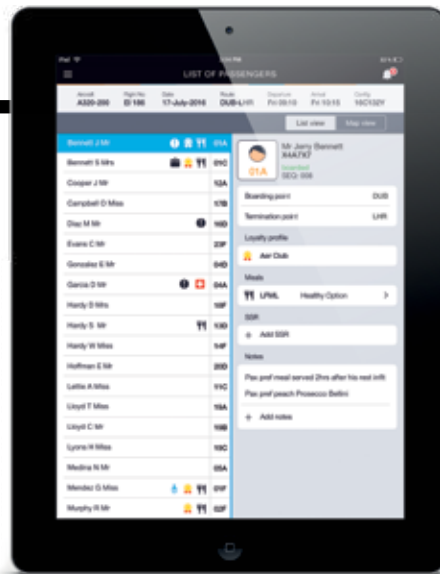
A connected aircraft will also allow crew and passengers to handle irregular operations more effectively, including providing passengers with the ability to troubleshoot their own problems, giving them more control.

In the case of a flight delay and a missed connection, for example, the passenger could use the airline's app or website on their own device to search for and book an alternative, with crew able to assist when needed.

In an e-enabled world, a connected crew will create huge opportunities for airlines, explains Bruner. Anything from a tablet to a brooch to a connected wristband will create efficiency benefits, the Think Tank believes.

Crew will be able to receive passenger-related notifications and be able to interact with passengers via their personal electronic devices, allowing airlines to deliver a far more personalised service to the economy-class cabin, at the same time as more efficiently allocating tasks among crew. Flight attendants will also be able to communicate seamlessly with each other in order to better serve the customer, while crew will also be able to control the cabin environment, including lighting and temperature, and sensors in the seats will allow them to monitor passenger wellbeing.

The connected passenger is at the heart of the connected future, with more than 80% of passengers carrying a smartphone today. The Think Tank sees a future where Wi-Fi synchronisation between the IFE system and the smartphone will allow passengers to preview IFE before they board, choose their selection, bring up the playlist when they get on board and even continue watching it



when they reach their destination – similar to SIA's Companion App. In flight, airlines will be able to make use of real-time, data-based, customer-centric personalisation.

The e-enabled aircraft will also allow airlines to rethink their on-board retail strategies and boost their ancillary revenues, with passengers able to order products in flight for delivery at the gate, for example. Airlines will be able to tailor offers to passengers based on their browsing habits.

With the increasing use of real-time data, however, come concerns over passenger privacy, who 'owns' the data, and exactly what is being done with it.

#### DATA MINING

As a result, the FTE Think Tank recommends the creation of a common, secure network architecture that wirelessly captures operational data from all aircraft to a secure central ground data repository. But Call questions whether the industry is willing to work together to share the data, and who owns the data. Such an approach would need a change in mindset in the industry, the Think Tank concedes.

"We need to collaborate and work out how to share and define the data. How do we tackle this? There has to be transparency to the passenger and between partners and it has to enhance the passenger's seamless experience," says Korean Air's Dionne. Then there is the issue of who should create the repository, says Call.

With so much data coming off an aircraft, airlines need to know what to do with it and how to make sense of it in order to improve business. Lufthansa Systems subsidiary ZeroG is just one of many companies working to do just that – harness the opportunities e-enablement brings. The company combines knowledge of airline processes and data with expertise in data engineering, exploration and mathematical modelling. It focuses on creating business value from data in order to increase customer satisfaction and loyalty, increase revenue and/or become more efficient.

ZeroG is currently only working within the Lufthansa Group, but is looking to extend its customer base this year, says Peter Ahnert, managing director. One of its current projects is a "major personalisation programme", while others include ways to deal with better operational stability in the face of disruptions and trying to understand, predict and avoid delays. These are all based on data-driven insights, says Ahnert.

Ahnert declines to go into specifics, but one project in the area of the in-flight passenger experience is in conjunction with Lufthansa Systems and looking at data generated from the BoardConnect wireless IFE platform.

Data analysis can improve the passenger experience in many ways, ZeroG believes, from giving flight attendants clues about passenger food and drink preferences, providing recommendations on IFE options or on-board shopping items. "Airlines can use data to customise the experience in flight and beyond," he says, adding that it will become increasingly important for airlines to deliver a more personalised service, beyond the limited work that many airlines are doing today.

Ahnert says: "Airlines are certainly looking at usage information from their IFEC systems in order to select the content that their passengers like most, but typically that's done on a very general level and fails to identify passengers' individual preferences that could be used to tailor future services and offers based on distinct relevance."

Data is indeed the next oil. ■

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Lufthansa Group features a 20-minute programme from yoga specialist Alexey Gaevskij.



# Flights of happiness

**Thomas Tripp asks if there is room for fitness and wellness programming on IFE.**

**Most** of us know we should get more regular exercise, and the experts all tell us that we just have to make it a part of our regular schedule. If we don't make sure it's on the daily plan, we know it's not going to happen. The second thing we know about the 2017 passenger experience is that we want our airborne experiences to match our lives on the ground. So, you won't be

surprised to find out that fitness and wellness programming is pretty much a hit-or-miss item on in-flight entertainment (IFE) media across the industry.

Currently, there are three affirmative approaches to the fitness and wellness topic. First is the actual regular fitness programming on a bare handful of carriers. Second is the example of many of the long-haul airlines who publish health and wellness tips either on the company website or in the in-flight magazine. Third is the most indirect approach, yet one that may eventually serve as the default, and that is 'bring your own

programming' (BYOP). I suppose we should identify a fourth approach to the topic of fitness education in flight because it is the dominant one. But simply ignoring the topic completely seems like it really isn't in the spirit of our search here.

Fitness and wellness as a topic for IFE is driven by two principal concerns. The first is the now well-understood (if modest) risk of health issues like Deep Vein Thrombosis (DVT) – essentially blood clots that form in at-risk people when normal movement is restricted for extended periods of time. To this first concern we can add an increasing



As flights become longer in duration in-flight channels are becoming a platform not just for entertainment but ensuring mental and physical wellbeing.

level of knowledge about the health disruptions of frequent, long-distance travel and the symptoms of jet lag and dehydration.

In 2015, Qantas became the first airline in the world to launch an exercise video on all its international flights to help prevent deep vein thrombosis (DVT).

The four-minute-plus exercise video in high definition was developed by academics at the University of Melbourne in partnership with global health-tech company Physitrack, which is Sports Medicine Australia's official exercise technology partner. Sports Medicine Australia has endorsed the exercise video.

#### OVERCOMING DVT

The video was developed by Professor Kim Bennell at the University of Melbourne Department of Physiotherapy. "These in-flight exercises are designed to provide a safe way to stretch and enjoy movement in certain muscle groups that can become stiff as a result of long periods of sitting. They may be effective at increasing the body's blood circulation and massaging the muscles," Professor Bennell says.

"It came as a bit of a surprise international airlines hadn't already introduced these exercise videos, given what we know about

DVT and long-haul travel. Hopefully, access to these videos will become standard on all international flights," she said.

Physitrack co-founder Nathan Skwortsow said Qantas was quick to embrace the concept. "Shot in high definition from different angles, each clip shows the correct exercise technique to motivate Qantas' five million annual international travellers to keep moving during their flight." In addition to being one of the safest airlines in the world, it is also great to see Qantas embracing exercise technology, even at 38,000 feet, he comments.

Sports Medicine Australia CEO Nello Marino said sitting still for long periods of time in cramped conditions, such as on an aeroplane, can lead to swollen ankles and occasionally DVT. "Whilst the risk of DVT is extremely low, it is always important to take preventive measures as the threat is always there," he said. "Through simple, regular stretching, mobility exercises, and walking around the cabin mid-flight your risk of DVT is dramatically reduced."

The second driver for audiences of fitness and wellness programming is simply the health awareness of our populations. Rising rates of morbid obesity and other complications of a sedentary society have

taught many of us not only to become more active but also more aware and educated about health and wellness in general. Globally, nearly a third of the population does not get enough exercise, and in several of the most technologically advanced countries the statistics are much worse. In the US, the Federal Centers for Disease Control says that more than 80% of Americans don't get enough exercise. The figures are somewhat better for the younger, active workforce – those most likely to be travelling significantly for business and pleasure. The biggest exercise challenge most of our cultures face is the fact that we aren't required to move, either on our way to and from the workplace, or while we are there. If it is true that "sitting is the new smoking," then air travel itself, at least the in-flight portion, is part of the problem.

#### ROUTINE EXERCISE

So what is the goal of fitness and wellness programming and content in IFE? Do we expect passengers to actually exercise in their seats or in the cabin? Is the goal really just to provide educational content that passengers can store in the grey matter and take home with them? Our informal survey suggests it is mainly the latter, although the former does exist. It's not hard to find in-flight exercise tips. Even the website WikiHow has an article on the topic and suggests a specific routine to undertake every 60–90 minutes.

The best example of actual in-flight exercise programming is probably the "FlightFit" programme on Lufthansa Group airlines Lufthansa, Austrian and Eurowings. The 20-minute programme features yoga specialist Alexey Gaevskij, who says on his Facebook page, "Connect to your breath, move your body and enjoy your flight!" The Lufthansa description of this IFE channel says, "FlightFit by Alexey Gaevskij enhances your seating comfort in only nine easy steps to ease your stay during the flight. Fuel your mind and body with fresh energy." The exercises are, as one might expect, modest in scope and designed to ensure one doesn't

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#### British Airways offers meditation courses through its partnership with Headspace.

both one's neighbour. Space constraints are the most obvious limitation to on-board exercising, but the advice demonstrates how to perform basic stretches and to reinvigorate breathing. FlightFit is available in English, German, Mandarin and Castilian Spanish.

Oman Air also has at least one fitness programme in the current IFE line-up. *My Diet Is Better Than Yours* is hosted by Shaun T, creator of the workout *Insanity*. The series features celebrity trainers coaching average people to lose weight and get in shape. This programme is in English.

#### RELAXATION GUARANTEED.

In the US, JetBlue has been talking with several wellness brands for possible inclusion in the carrier's IFE Hub portal, but nothing has been decided yet.

Last year, British Airways introduced the Headspace video channel, packed with content designed to help travellers unwind in the air, by practicing simple meditation and mindfulness exercises. The channel consists of nine meditation programmes, each no more than ten minutes long.

Guided by Headspace co-founder, and former monk, Andy Puddicombe, each exercise focuses on a different topic, such as enabling stressed parents and anxious travellers to feel happier and more relaxed, overcoming jet lag or simply helping passengers to get the most from every minute of their journey.

According to Troy Warfield, British Airways' director of customer experience, "We know our customers really value making the most of their time on our aircraft and the new Headspace channel on our in-flight entertainment system offers them a fantastic way to make their flight more fulfilling and relaxed.

The meditation course can also continue on the ground, as the Headspace app can be downloaded direct to a smartphone or tablet through the App Store or via Google Play.

The new channel adds to British Airways' existing and extensive wellbeing content on its High Life IFE system. This includes videos

offering general wellbeing advice, *Flying With Confidence* to help nervous flyers, and *Dawn Chorus: Sounds of Spring*, which features the sound of sunrise birdsong.

Puddicombe adds, "The content has been designed to enhance every stage of the journey, before, during and after the flight, with specific exercises to help passengers feel relaxed, refreshed and recharged.

"It is also an opportunity to learn a beneficial new skill, something you can use at your destination and beyond, for a healthier and happier life."

Load factors and seat pitch aren't the only limitations on flying calisthenics. The rightly ubiquitous advice to keep one's safety belt fastened at all times is based on the premise that unexpected air turbulence causes most injuries to passengers and cabin crew. Safety managers, not to mention flight attendants, would likely shudder at the prospect of an entire economy class performing Tai Chi movements in the aisles when the aeroplane hits a patch of clear air turbulence.

If actual fitness programming in IFE is relatively sparse, written advice on how to stay comfortable and healthy while sitting for long flights is more common. Many, if not most, of the long-haul carriers have a page or two in an in-flight magazine (where those still exist), or, less helpfully, on the

#### Global Eagle's new jet-lag recovery mobile app will augment its existing seat-back Airhealth passenger wellness programme.







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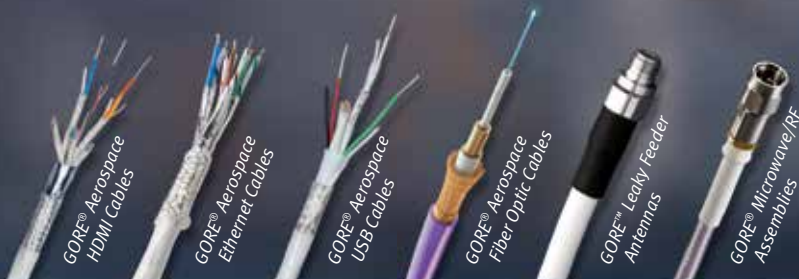


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Although it doesn't offer a specific wellness IFE channel, JetBlue has offered a series of innovations around yoga.

company website, typically under the 'while travelling' tab. Often accompanied by diagrams and specific exercise instructions, these tips are most often specifically aimed at comfort and reducing the risk of DVT.

The KLM webpage is a typical example of this. It offers general tips for in-flight comfort – eat lightly, stay hydrated, exercise in your seat. It also offers specific seat-bound exercises and information about DVT. If you happen to be on a KLM 787 or some of the 777s with Wi-Fi, you can reach this page from the airline portal in flight without having to purchase internet access. Qantas also has an extensive page with information about the health risks of inactivity and a detailed 'Inflight Workout'.

Many other airlines have similar website entries. Qatar Airways has some branded advice on its webpage: "Qatar Airways and The Chopra Center for Wellbeing offer you customised Ayurvedic techniques that you can use during your flight (and at home) to feel more balanced, healthy and relaxed."

### PERSONAL TRAINERS

Apart from actual in-flight fitness 'entertainment', there is a smattering of offerings on the broader topic of wellness, including some of the cooking and lifestyle programmes. Many audio components of the IFE offer include 'relaxation' channels and some include actual guided meditation. Some of the apps available from both airlines and suppliers have fitness and wellness components and that contribution might be growing.

Global Eagle recently announced that its new jet-lag recovery mobile app will augment its existing seat-back Airhealth passenger wellness programme. Encompassing flying-related health tips, in-flight exercises, and a quiz, Airhealth now features an optional mobile app to help passengers manage jet lag before and after the flight. Global Eagle says that by



entering their flight schedule, travellers receive a personalised jet-lag recovery programme with step-by-step instructions for managing their sleep-wake cycles and melatonin levels.

The actual IFE programming for fitness and wellness may be slim pickings for now, and the static online and in-flight magazine advice may be minimalist, but there is one medium that may supersede all of these – we'll call it BYOF (Bring Your Own Fitness), since it will come via the current and future VOD technologies on board. With large numbers of passengers bringing their own devices and looking to stream their own preferred content, it is logical to assume that this will include their chosen fitness video. Some of that may be streamed through corporate media channels and airline apps, but it seems more likely that the younger demographics will turn to one of their favourite VOD sources – YouTube.

Fitness and wellness topics are high performers on YouTube these days, with constantly improving production values – often the biggest criticism of YouTube channels – and subscriber lists often reaching into seven figures. In-flight-specific exercise routines are still somewhat hard to find, but that won't last long. These are high-

speed entrepreneurs and when they fully realise the size of that niche, they will jump on it with gusto.

### FLYING IN COMFORT

In fact, BYOF is a natural subset of all the BYO trends on board and fits the largest trend of all. Jovita Toh, the head of Encore Inflight Limited, says she hasn't yet seen a widespread trend in formalised IFE programming for fitness and wellness. "However, I do know that trends on the plane reflect trends on the ground and will not be surprised that programmes such as healthy eating habits, healthy cooking tips, exercising on the go, meditation and general wellness will gain in popularity as that is what is happening on the ground."

To this end, Envee has partnered with internationally renowned yoga life coach and motivational speaker Charlotte Dodson to bring her knowledge to passengers, creating an in-flight application which can help passengers fly in a healthier and more comfortable way. Dodson's guided wellness programme will provide passengers with feelings of comfort and ease throughout their journey.

An advocate of healthy lifestyle, Dodson has created a series of videos that will help business travellers and holiday makers feel more comfortable during flights and refreshed upon arrival. The series FLYWELL includes relaxation exercises, breathing techniques, guided meditations and gentle yoga sequences to practice before, during and after a flight. These videos have been available on Dodson's official website for download, but now they will finally be included in the seat-back screen of many airlines.

After all this, the best bet might be to simply tune the audio programme to Delta's Outlook Club Delta (Dance). Here's the description: "From house to techno, progressive to breaks, experience the dancefloor on Club Delta featuring: Hiatus Koyote, Letherette, Energy 52 and more." So, check for turbulence, unfasten your seat belt, and just dance. ■

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The future should herald more and more connected aircraft offering greater entertainment connectivity.



# Going wireless

**The** world is going wireless and so will passengers in aircraft cabins. That is the big picture, certain to emerge steadily over the years. But cabin wireless poses challenges not seen on the ground and so requires constant improvement in all the technologies necessary for getting data over each link, from ground sources to passenger devices and eyeballs.

For cabin wireless really has two dimensions: wireless within the cabin, to link passengers with on-board content, and

**A tethered Henry Canaday explores the future of wireless in-flight entertainment.**

wireless links to the ground, often simply called 'connectivity'. Both dimensions are ultimately important.

Commercial factors count as well. Producers need control over their content, passengers want easy access, and business models must pay for both content and equipment, either by charging or otherwise recouping costs.

## WOW FACTOR

Despite the difficulties, wireless providers are bullish on the future and working hard to make it happen. For example, Bluebox Avionics has deployed almost 19,000 iPad-based portable in-flight entertainment (IFE) systems with airlines and now offers enhanced accessibility in the new Bluebox Hybrid. Portable wireless streaming,

**Bluebox Wow helps airlines introduce wirelessly streamed content to passengers in any aircraft cabin. The system won best 'Handheld and/or wireless IFE system' at the prestigious *Inflight Awards* ceremony in Dubai.**

Bluebox Wow, has begun service with Pakistan International Airlines.

Chief executive officer Kevin Clark says Bluebox continues to innovate, deploying 12.9-inch iPad Pros in first class of Hawaiian Airlines' A330s. "Lie-flat seats get the best tablet devices on an innovative mounting." And Hawaiian can upgrade easily to better devices in the future.

Clark argues Bluebox Wow is highly advanced, with a single removable battery powering it for over 15 hours, and dual frequency supporting up to 50 passengers simultaneously. Unconnected to aircraft, Wow does not require certification, yet delivers moving maps.

Bluebox Hybrid connects to all approved wireless IFE solutions, not just Bluebox. So Hybrid users access early-release movies on the device while accessing later releases on their own devices from a streaming server. Clark says Hybrid is attractive to airlines offering a premium cabin and renting Hybrids to other passengers for ancillary revenue.

Clark predicts wireless cabin IFE will accelerate dramatically. Traditionally a long-haul amenity, wireless and portable systems will enable IFE on short routes. "Curated, short-duration content will become important, as well as destination-related information."

He argues that cabin wireless is a manageable step toward IFE connectivity with the ground. Connectivity requires a cabin network, but IFE does not require connectivity. Airlines can move forward on cabin IFE now, then add connectivity later.

Clark expects digital rights management (DRM) tools to become standard on portable devices and ease secure distribution of content. Encoding technologies will allow higher throughputs and support more passengers wirelessly. Connectivity capacity will increase and costs decline, increasing in-flight services.

#### USB'S USP

IFPL has been working on the plugs, sockets and other gadgets to enable cabin wireless more economically, more simply and more reliably. As new consumer devices adopt the

USB-C 24-pin, reversible plug, IFPL has been working on USB-C for IFEC and the transition from USB-A, explains marketing executive Jason Davies. Along with a base USB-C outlet, IFPL is developing a range of USB-C 3.1 peripherals and solutions. These include a rapid-fit version that allows for low-cost and easy replacements and a simple retro-fit USB-C outlet that replaces USB-A outlets. And IFPL is working on a USB-A and -C combination that allows older USB-A devices to transfer data to newer devices with USB-C connectors.

Davies stresses IFPL's new USB-C outlets handle both analogue and digital audio. So they support both low-cost analogue USB-C headsets and expensive digital audio headsets. "This in turn allows 3D and other next-generation digital audio experiences." And IFPL has extended its range of 110 V AC outlets that include both USB-A and -C capabilities.

IFPL has demonstrated high power and data on USB-A 2.0 and USB-A 3.0, ideal for delivering 2 A; 5 V direct current and data at up to five gigabits per second. Passengers can thus both charge personal devices and connect with in-flight entertainment.

The company has enhanced its 110 V AC Universal Remote Power Outlet, adding a high-power USB-A socket. It is working with industry partners to develop new power solutions for ergonomic and aesthetic seat integration. This approach will fully exploit seat space by seamlessly integrating USB outlets on seat arms and preserving passenger legroom.



The company is preparing for future trends in in-flight Wi-Fi, induction and charging, near field communications, Bluetooth mesh, and sonic and light transmission. IFPL can already deliver inductive charging, but airlines are wary of adopting it because Apple devices do not use it and Apple may choose another approach. IFPL is trying to figure out whether Apple's eventual approach will require a per-seat, per-seat group or per-cabin solution.

Another future possibility is mixed reality, such as Microsoft's HoloLens, which combines virtual and augmented realities. IFPL is considering how content will be available and how devices will be charged and powered.

Davies sees the hurdles to cabin wireless as predicting which technologies consumers will choose, passing regulatory muster and ensuring safety. "Developing NFC for contactless payment and personalisation took a huge amount of effort, knowledge and testing to overcome technological and regulatory challenges."

#### SEATS OF POWER

Another cabin component closely related to wireless IFEC is seating. Kelvin Boyette is CEO of Latitude Aero, one of the few players in the industry that specialises only in seating. He predicts that both embedded and bring-your-own-device IFE will endure. "I think there are plenty of aircraft out there for both options to grow rapidly over the next five years. Personal devices will be

allowed early content in the next few years, and that will require more in-seat power." Latitude is well positioned for the growing need for in-seat power.

Some carriers, like American, offer free wireless entertainment to personal devices, but most seats do not have power. This creates a dilemma for passengers who watch a movie, then land with a dead battery. Boyette sees bandwidth as an obstacle to increased on-board entertainment. A 737 with 154 passengers may have 200 connected devices, and current technology cannot support high-definition content to so many devices.

The Latitude CEO expects that faster, smaller wireless access points will allow more access points in aircraft and increase speeds. "Also, someone will create a way to prevent downloading or pirating of early content, making studios happy and allowing them to release more content at a quicker pace to airlines."

Principal business development manager Richard Nordstrom explains that Rockwell Collins offers a wide portfolio of hardware, software, connectivity and services to support all kinds of cabin entertainment and aircraft operations. Rockwell's PAVES is seat-centric IFE with all memory and processing within seats and connected to a mesh network in the cabin so there is only one point of failure, not many.

### SEAT-BACK SET BACK

Rockwell also supports TV and broadcast systems in the cabin, and wireless IFE, either free or paid for, on passenger devices. For connectivity, Rockwell works with Iridium and Inmarsat, whose Global Xpress should be on 400 aircraft by the end of 2017. The firm also sells SwiftBroadband and will sell the Safety version too.

So Rockwell supports cabin and flight-deck connections, as well as wireless connectivity for cabin crew to report defects



**With speeds up to ten times faster than conventional in-flight Wi-Fi, Qantas will offer customers video and audio streaming.**

in seat-back systems so these can be repaired or replaced quickly. Prompt reports can avoid losing revenue by deferring seats due to malfunctioning IFE, or losing business by ticking off passengers with broken IFE. Rockwell's own PAVES in-seat video can be replaced in about a minute.

"We provide connectivity nose to tail," Nordstrom stresses. And even if passengers do not care about non-entertainment connections, they benefit from these connections and there are efficiencies in combining cabin and crew communications.

Recently, Rockwell introduced its System Interface Unit (SIU), a highly flexible cabin server that supports seat-centric IFE, broadcast, wireless IFE and other connections. Compact and multifunctional, the SIU is now line-fit on Boeing 737s and 787s, retrofit on several aircraft and line-fit through a partner on Airbus models. The device is highly modular and designed to accept new technologies over a 25-year lifecycle.

Rockwell is moving towards certification of an electronic steerable antenna that will handle 350 to 450 megabits per second of

Ka- and Ku-band transmission from low-, medium- and high-altitude satellites.

The Rockwell executive predicts bandwidth will increase dramatically in the next three to five years as more and higher-throughput satellites are launched, antenna technology advances and on-board networks also improve in delivering signals. Nevertheless, "satellite systems will never be like ground-based systems to offices." Airlines will still have to figure out what they can give free and what they will charge for based on route, cabin class, demographics and their own business model.

And Nordstrom predicts both in-seat and passenger-device entertainment will continue to be important. "Wireless is getting better, and eventually movies will be released earlier to wireless systems, but there is nothing like seeing a big screen in front of you without pulling out a large-screen laptop."

### SMART CONNECTIONS

BoardConnect is Lufthansa Systems' platform for supporting wireless functions for cabin crew and passenger connectivity, advertising, chatting, games, movies, moving maps, music, shopping, payments and surveys.

Jan-Peter Gaense, director of project and certification, is proud of the test launch of the newest BoardConnect on Lufthansa and Austrian Airlines before full roll-out in the first quarter of 2017. Gaense says the platform has always been reliable, innovative and full of features, but is now "a truly digital platform". Aircraft can become flying data centres as BoardConnect enables application hosting with powerful application programming interfaces (APIs). Connections to the ground are provided by Global Xpress.

"Airlines will make use of smart systems such as ours to include in-flight in the digital

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Lufthansa's BoardConnect is designed to accommodate passengers' needs without the need for wires or certification.



Photo: Lufthansa Systems.

travel experience they create for customers," Gaense predicts. He expects the next five years to see more and more connected aircraft with great entertainment, connectivity and other services.

Lufthansa originally developed BoardConnect to make it easy for airlines to provide in-flight entertainment. Wireless IFE made that a lot easier, but transmitting personal devices, certification, installation and content costs remained challenges. "That is why we introduced BoardConnect Portable," Gaense says. He argues the portable version is the first streaming solution that provides great entertainment to passengers without installation or certification. "Real IFE systems must stream movies, TV shows and other great content, not just digital magazines."

Gaense expects connectivity will increasingly support passengers, cabin and flight crews. Open systems and powerful hardware will enable a ground-like service that was "unthinkable only a few years ago". Digital solutions along the entire travel chain will serve individual passengers as needed on a wireless IFE platform. And Lufthansa will be ready for all this with modern user interfaces, open platforms, APIs and integration with partners and systems.

Thales's newest wireless IFE customers include Royal Brunei Airlines and Royal Air Maroc, notes Scott Easterling, director of business development for connectivity. Thales IFE includes hassle-free digital rights

management that eliminates the need for an app when watching premium content and is now available on most new web browsers. Easterling stresses the advantages of accessing the latest content from global studios without downloading a separate DRM app. And Thales enables airlines to customise user experience for their brands without Thales's involvement.

Easterling says airlines now seek less friction in accessing wireless content, streamlined log-ins and wireless equipment that is intuitive to navigate and use. Carriers also want flexibility and control: "the ability to put their brand in front of customers fast with less involvement from suppliers".

The Thales executive says wireless penetration is being hindered by global variation in regulations and compatibility of different personal devices. "It is difficult to ensure new devices in emerging markets like the Far East are compatible with platforms like iOS, Android, Mac and Windows."

But Easterling sees hope in new infrastructure and new standards like 802.11 AX high-efficiency wireless streaming. The new standard will allow more users to reliably stream data in the midst of many other users, "perfect for commercial aircraft".

#### DOWNLINKS

And much more capacity will soon be coming from the ground to aircraft. ViaSat signed four airlines for its high-bandwidth passenger connections in 2016, including Finnair,

Qantas, SAS and American Airlines, which will replace Gogo with ViaSat on most domestic flights. American also announced it would not install seat-back IFE on its 737MAXs.

Don Buchman, vice-president and general manager of Commercial Mobility, says the American decision represents a vote of confidence in ViaSat's ability to bring all the streaming entertainment needed to the personal devices that are carried by 90% of passengers.

Next up is the launch in April 2017 of ViaSat 2 and then three more ViaSat 3 extreme-throughput satellites in 2019 to 2021 that will make the provider's service global. Some airlines have not wanted to wait for connectivity so ample they can offer it for free, so have gone with other providers initially, Buchman acknowledges. But he is confident they can switch to the better service when it becomes available in their markets. And he says the launches are on track, with ViaSat 3 having just passed its preliminary design review milestone.

Buchman predicts carriers will start exploiting bigger bandwidth for many more crew, operational and safety uses, functions that were once too expensive to implement. "When they see how cheaply the new pipes can move data, the new apps will snowball in the next five years to a whole new level."

On the passenger side, he expects free on-board connectivity to mimic trends in ground connections, with firms like Hulu and Amazon producing and distributing their own films, social media exploding and other uses as yet unknown expanding.

The only obstacles to all this happening are getting those bigger pipes in place and perhaps the scepticism of some airlines and passengers that have had bad internet experiences. "We can correct that bad impression," Buchman insists.

Other connectivity providers are of course not standing still. One way or another, those bigger pipes will connect aircraft wirelessly to the ground. Then all the in-cabin wireless providers will face the pleasant challenges of how to exploit all this connectivity for their on-board customers. ■



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flydubai's Daniel Kerrison gave this year's *Inflight* Workshop welcome address.



# Up for discussion

**Alexander Preston recaps a successful *Inflight* Middle East Pavilion, Workshop and Awards.**

**This** year marked our fifth collaboration with Aircraft Interiors Middle East (AIME), and the 2017 edition of the *Inflight* Pavilion, Workshop and Awards was without a doubt our most well-attended and well-received collaboration to date.

As Thales told *Inflight* ahead of the event, “As the Middle East’s only aircraft interiors event, the *Inflight* Pavilion at AIME 2017 provides Thales the opportunity to connect with over 90 global airlines and showcase its latest innovations in passenger and airline engagement.

“The Middle East is a key region for Thales InFlyt Experience in terms of customers, operations and business volume. Thales InFlyt Experience has established an important presence in the Middle East by continuing to develop strong partnerships with airline customers in this region. We are investing in technological innovation, big data management and cybersecurity to

strengthen our offerings. We have been able to expand our customer base, including our most recent contract with Emirates for its future fleet of Boeing 777X aircraft.”

The company has recently opened an office in Dubai to support the region.

As a full-service premium connectivity provider, Thales highlighted its wide range of technical solutions within the Pavilion area. The cloud infrastructure of its InFlytCloud service is designed for mobile access, allowing airlines to make smarter, data-driven decisions in real time. Representatives were on hand to show how with a single log-in, InFlytCloud offers airlines access to all business operations services ranging from InFlytAnalytics, InFlytBehavior, InFlytHealth, InFlytOperation, InFlytRevenue, content management, applications development and validation.

There was something of a buzz around the Thales InFlyt Experience, which introduced

booth visitors to the company’s User Experience Center of Excellence (UX CoE), which specialises in user-centred design to improve the usability, accessibility and enjoyment of interacting with Thales’s in-flight entertainment products. The UX CoE will partner with airline customers to help them differentiate their brand and to create a customised, seamless in-flight experience for their passengers.

Elsewhere, visitors had the opportunity to see the latest innovations and solutions from other Pavilion exhibitors – Astronics, digEcor, Gogo, KID-Systeme, Pascall, Rockwell Collins, SITAONAIR and Zodiac Inflight Innovations.

The two-day *Inflight* Workshop saw another diverse programme of topical issues, in which airline strategists and leading IFEC professionals discussed technical solutions, such as seamless global coverage, that support the needs of both passengers and airlines. The tone was set by a keynote presentation from Daniel Kerrison, vice-president, in-flight product, at flydubai (winner of Airline of the year 2016).

Interactive content was one of the topics eagerly discussed during the two-day programme.

Highlighting the carrier's "insatiable appetite for innovation" and a continued investment in research and development, Kerrison touched upon the difficult pricing and operating environment faced by the operator and its regional counterparts. In 2012, the third year of its operation, the airline carried 5.1 million passengers. In 2016, this increased to 10.4 million annual passengers. Driven by such increased passenger numbers, flydubai reported an operating profit of US\$8.6 million for the year, and total revenue of \$1.37 billion.

#### PASSENGER INVESTMENT

These are impressive financials when you consider that, according to the International Air Transport Association (IATA), due to the emulous nature of the region, Middle Eastern carriers were forecast to make an average profit per passenger of \$1.56. This contrasts to a per passenger profit of \$5.65 for European airlines, and \$19.58 for North American carriers. As Kerrison wryly noted, despite these tight margins, Middle Eastern airlines comprise four of the top seven places in Skytrax's World's Top 10 Airlines of 2016. In contrast, the top-placed North American airline is ranked 35th.

How airlines continue to invest in the passenger experience when faced with today's economic realities was a constant theme throughout the two-day agenda, which began in earnest with a discussion around in-seat power.

Moderated by Valour Consultancy's Craig Foster, *The balance of power* questioned whether currently deployed systems provide enough 'juice' for passengers to charge and run increasingly power-hungry personal electronic devices (PEDs).

With the growing prevalence of PEDs, Peter Schetschine, general manager of KID-Systeme, cautioned that passengers often don't board with a fully charged device, observing that it's ingrained behaviour to expect to be able to charge up at airports or on board. Pascall's Phil Brace agreed, stating that passengers need to be more organised. In-seat power offers convenience, he said,



adding that you need sufficient time to charge a phone on a flight.

Piquing most interest was the discussion surrounding USB Type-C connections and its potential to signal the end for AC power. For Brace, Type-C is an option but not a replacement for AC power. Other panellists agreed. For Dennis Markert, director of business development and technical services at Astronics, Type-C is coming, driven by the consumer market. Astronics, Markert said, will have a product that will be made available shortly. DigEcor's Paul Thorpe pointed to the fact that laptops are USB-C orientated, whereas mobile phones are generally not. The company has entered the sector with a 5 V USB source and a 110 V supply through Glide, its embedded seat-centric IFE solution.

The push of trends and technologies from the consumer market into the commercial aviation sphere also flowed into the second session, *4K and beyond*, which looked at next-generation screen technology.

The next generation of video displays will be 4K acceded by HDR (High Dynamic Range). In short, 4K displays have four times the number of pixels offered by an HD display. This higher pixel density results in a sharper and clearer picture. 4K screens also have improved colour depth and higher contrast ratios, providing a more dynamic and realistic viewing experience.

4K TVs have been available to consumers since 2013, and many in the consumer electronics industry expect to see a large increase in demand going forward. With the business aviation community responding to this demand, what experience can we expect from commercial airlines?

Some experts argue that 4K technology isn't a pure fit for in-seat IFE, particularly in

economy class, due to the distance between the passenger's face and the screen. digEcor's David Withers agreed that small seat-back screens give a poor viewing experience. The technical capabilities of 4K have been around and understood for a number of years, he said, pointing to the product portfolio of digEcor, which has scalability and flexibility built in to allow for changes in screen technology. Instead, he argued, the discussion needs to also cover the real versus the perceived benefits of 4K so there are some realistic expectations being set. You can say the display is 4K, but the content may not be. "You've got to remember most on-board content today is still standard definition (SD), so 4K is a long journey from where we are today," Withers said.

#### SCALABLE SOLUTIONS

The emphasis should be on improving the sound quality, Withers proffered, an opinion shared by Valour's Foster, who highlighted the work of Dysonics, which has partnered with Spafax to provide an immersive 360-degree sound experience to in-flight entertainment with Virgin America and Delta.

Satellite is set to play a huge role in 4K provision, providing the sufficient bandwidth necessary for HD video and advances in compression technology. Of the verticals SES is focusing its efforts on, 4K offers great potential, as Gez Draycott, vice-president, portfolio management, data mobility, explained. In September 2015, SES launched Fashion One 4K, the first global Ultra HD channel, and today the company broadcasts over 20 Ultra HD channels – more than any other satellite operator.

The problem of unruly passengers is constantly increasing within the airline industry. Although they represent only a

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# SAVE THE DATE

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The panels were well attended, with audiences keen to take home expert insights.

minute proportion of passengers as a whole, one aggressive passenger can jeopardise safety on board. A well-behaved panel of Peter Schetschine, Securaplane's Manuel Herrero, and Latecoere's Xavier Carrier provided insight into a rarely debated topic: cabin security and surveillance in *Eye in the sky*.

As Carrier explained, the Latvision brand has been adopted by more than 50 airlines internationally, while KID-Systeme's Universal Video Surveillance System is in use on the Airbus A350 XWB family.

The panel agreed it was important to help airlines define their security needs and requirements in the face of differing levels of regulatory interference, before the discussion moved on to the complexities of line-fit operations and the growing retro-fit market.

### PASSENGER SATISFACTION

Improvements in optical and electronic technology have enabled all three manufacturers to offer camera security systems that work in both low-light and bright conditions, which is vital when used as evidence of theft or incidents of passenger misbehaviour.

The first day concluded with an intimate talk about contactless payments and the changing on-board payment ecosystem. *Touch and go* saw IFPL's David Thomas and Cellpoint Mobile's Noel Connolly discuss the growing mobile marketplace. As passengers become more accustomed to using smartphones to pay for things from taxi rides to in-app retail purchases, they are also demanding access to the most popular digital wallet solutions and alternative payment methods.

The two shared observations around the phenomenon of bring your own device (BYOD), including the opportunities present in a mobile-first travel environment, before, during and after the trip, and what such a mobile-first travel experience looks like – starting with booking, all the way through to post-destination feedback.

Thomas and Connolly agreed that both the technology and passenger appetite exist for alternative payments but, in an echo of



the day's earlier discussion of 4K, took pains to point out that airlines need to give an incentive in the form of appropriate purchasing content (for example, high-end duty free, destination-related content and seat upgrades).

Joe Leader, CEO of APEX, attracted a large audience for his welcome address on day two. Leader spoke of the hyper-connected airline and the evolving marketplace of the passenger experience. The next two decades, Leader said, would signal the entry into a business-class privacy era. Other identified trends included aircraft mood lighting becoming more advanced, more prevalent Wi-Fi and a passenger expectation of connected intelligence, whereby they can interact with the aircraft via their own technology.

### BANDS OF CONFUSION

The satcoms session, *A hybrid connection*, on the viability of hybrid antenna technology proved particularly popular, with not a spare seat in sight.

Shahrokh Amiri, managing director, MENA at Intelsat, joined fellow panellists Ben Griffin, regional director, aviation at Inmarsat; Doug Murri, Global Eagle's VP operations; Gez Draycott from SES; and Mihir Thakkar, regional director, Global Airline Business Group at Gogo.

Providing an update on the recently introduced GX service, Griffin said decisions around a hybrid approach were dependent upon geography, type of aircraft, length of flight, and demographics. On the question of the nature of traffic routed through the S-band, the vast majority is expected to be for cabin Wi-Fi applications.

Gogo wants to give airlines options, according to Thakkar. The focus for the

company is on technology, with hybrid not the core element, but rather a consideration.

Draycott picked up on the confusion surrounding Ku- and Ka-band systems. SES's role is to help overcome this confusion, by offering the appropriate solution options for an airline's requirement.

Murri said the question was less one of 'what is the best technology', but rather one of cost per performance/throughput. "There does not exist today a scenario where the bandwidth is not available to support what an airline wants to do. It may be expensive, but it is there. Multiple solutions exist – it comes down to what is the best model for the airline and what it wants to do."

With an update on Intelsat's EPIC constellation, Amiri added the voice of the passenger. "At the end of the day, the passenger doesn't care what band is used, they just want consistency, without interruption." Ahead of Intelsat's recently proposed merger with OneWeb, Amiri argued that with a global connectivity service, there is no need for a hybrid solution.

Flydubai's Daniel Kerrison provided an airliner's insight. "This topic is one that is so confusing," Kerrison admitted, "that it is very easy to get lost in these technologies. Listening to this discussion, we continually hear about all these competing technologies. In my opinion, you need to back a technology and go with it."

"There is no right or wrong solution – it's whatever suits the airline's requirements." Flydubai selected Ku as it offered the bandwidth and services, including live TV, the airline wanted to deliver to its passengers.

From one interactive session to another, *Interacting up* was an opportunity to discuss the nature and benefits of personalised content. Joe Leader joined the panel, and

Mark Howells, HMG Aerospace (left), presents the 'Airline of the year' award to happy representatives of Emirates.



painted a picture of an immersive environment. Technology is available to track passenger behaviour, such as health and wellbeing – the challenge for airlines is how to make the best use of this data.

Interactive destination content is a growing area, as PXCOC's Cyril Jean explained. Airlines have to embrace our dependence on PEDs, especially mobile phones, and integrate them into their IFE services. It was a point SITAONAIR's Neale Faulkner picked up on, saying that airlines traditionally see IFC as a simple process of getting the passenger connected to the portal, allowing them to select from a number of chargeable plans and then connecting to the internet.

Airlines are not seeing a significant return on investment by purely using simplified pricing. You have to introduce new ways of engaging with the passenger throughout the connectivity journey, making it interactive to both personalise the experience and monetise it.

David Dicko of Skylights believes an immersive experience, as offered by VR headsets, opens up more possibilities to enable passengers to escape from where they are into other worlds or a cinema. The company has worked hard to improve the long-term viewing experience of its headsets to overcome feelings of nausea in prolonged use (4 hours in average). There are a lot of things you can imagine, said Dicko, but finding the right kind of content from the passenger's point of view, in which they can be immersed and feel comfortable, is important.

Duncan Abell, Global Eagle pointed to the obvious facet of interactive content – hyper-personalisation. Data is generated that allows airlines, content providers and advertisers new channels of engagement. Interaction is not confined to the flight itself, but at all touchpoints of the journey.

Babar Rahman, Qatar Airways agreed – content has to be relevant. Monetising that content is important but not a priority. If you don't have content that is used and wanted, you can't monetise it.

For Leader, interactive content is not a gimmick, but one of the very few ways an airline can start to recover the costs and even turn a profit with connectivity.

#### FAMILY FRIENDLY

Moderated by Becky Howells, a parent's view guided the final session, *Are we there yet?*, which focused on child passengers and families. A returning Joe Leader was joined by Mohamad El Assaad of Gulf Air, Qatar's Rahman, Etihad's Meaghan Murta and Global One Media's Martin Devereux, to

discuss an issue that regularly irritates cabin crew and other passengers alike.

Should airlines adopt child-free zones? For Rahman, children should not be treated like a smoke-free zone. In the presence of a crying child, your experience ultimately depends upon what side of the 'pain' you are on, he said – as a parent, or a bystander. This is where good IFE and other services help.

Kids range from 3–12, said Devereux, explaining that Global One Media approaches this difference in age range by working with the airline to provide age-appropriate content on its IFE service. "It's about having a range of content available," he said, adding that the company follows the latest trends in programmes and genres.

Both El Assaad and Murta spoke of how their respective in-air service towards childcare mirrors on-ground hospitality. Both Gulf Air (Sky Nanny) and Etihad (Flying Nanny) provide a palette of cabin services to help families placate and look after their children in flight. Both services have proved highly successful.

Providing a quality and memorable in-flight experience for all passengers is key, the airline representatives said, regardless of the age or size of that passenger.

With airlines focused on attempting to provide an at-home experience in the sky in terms of Wi-Fi and connectivity, perhaps this is one area where the at-home experience remains grounded.

Thanks to all our moderators and panellists for delivering such engaging and thought-provoking discussions.

See you all next year! ■

## Inflight Middle East award winners 2017

- Inflight airline of the year: Emirates
- Innovation in commercial airline cabins: Etihad Airways
- Handheld and/or wireless IFE system: Bluebox Aviation Systems
- Content Innovation: Qatar Airways
- Airline IFEC provider: Saudia in conjunction with KID-Systeme
- Connectivity provider: Panasonic Avionics Corporation
- Seat-centric IFE system: Zodiac Inflight Innovations
- Interior retrofit project of the year: flydubai



Near field communication technology has the potential to allow passengers to better track their luggage.

# Near and far

**Offering great promise, near field communication (NFC) technology has stumbled in its attempts for wider adoption by aviation companies, as Alexander Preston finds.**

**Near** field communication technology has long been touted as a step change for the aviation industry. Indeed, it has been identified by the Payment Technologies Working Group of APEX as the way forward.

NFC is a form of contactless communication between devices like smartphones or tablets. Contactless communication allows a user to wave the smartphone over an NFC-compatible device to send information without needing to touch the devices together or go through multiple steps to set up a connection.

The technology behind NFC allows a device – known as a reader, interrogator, or

active device – to create a radio frequency current that communicates with another NFC-compatible device or a small NFC tag holding the information the reader wants. Passive devices, such as the NFC tag in smart posters, store information and communicate with the reader but do not actively read other devices. Peer-to-peer communication through two active devices is also a possibility with NFC. This allows both devices to send and receive information.

Back in 2013, the NFC Forum, a non-profit industry association that advances the use of NFC technology, and the International Air

Transport Association (IATA), published the *NFC Reference Guide for Air Travel*.

The two organisations – specifically the NFC Forum's Air Transport Task Force and IATA's Fast Travel Working Group – collaborated extensively to develop content for the document, which seeks to help the global air travel industry better understand and evaluate the potential benefits and costs, use cases, and implementation options associated with adoption of NFC technology.

“IATA's Simplifying the Business programme aims to set standards and drive innovation projects that enable a seamless passenger journey. NFC holds substantial promise to provide a smoother and faster airport experience for travellers. The *NFC Reference Guide for Air Travel* will be a valuable guide to help stakeholders identify

Japan Airlines began offering NFC airline tickets and boarding passes from the summer of 2012.



potential opportunities from adoption of NFC technology,” said Stephan Copart, IATA head of strategy, industry services transformation, at the time of the announcement.

Elsewhere, Accenture Technology Labs is also working to take advantage of the potential of mobile phones in the airline industry. Like IATA, Accenture believes NFC can bring benefits across the pre-flight journey stage.

This includes booking, where an electronic ticket can be downloaded securely to the phone via an NFC reader or over the air, and stored on the phone. Here, NFC readers within the airport can be used for immediate local check-in, triggering issue of the boarding pass and delivery to the phone over the air.

Travellers can also perform a more classic mobile check-in and receive their boarding pass over the air. When boarding, unmanned boarding gates equipped with readers can automatically admit passengers with valid boarding passes on their phones. In future, this step could be enriched with biometrics and applied to access elite lounges.

Another potential benefit could be found in NFC tags coded and embedded in luggage tags to quickly access baggage information and better track bags’ progress.

To date, there has been little traction on board aircraft for NFC technology. Fresh on the heels of a 2016 study from Juniper Research, which found that the annual transaction value of online, mobile and contactless payments would reach US\$3.6 trillion in 2016, there were two high-profile product announcements. Both Panasonic and IFPL hope to capitalise on the growth in NFC-enabled devices.

#### BEYOND PAYMENTS

In April, Panasonic announced it had made its NFC reader available for in-seat production at multiple OEMs.

Panasonic expects its NFC technology to also be used by airlines for a wide range of non-payment applications, including more secure synchronisation of personal data; the recognition of a passenger’s Frequent Flyer status, giving access to benefits or promotions, such as free Wi-Fi for Gold members; crew check-in and check-out; and the pairing of NFC-enabled devices with the embedded IFEC system, allowing airlines to push information to passengers during their flight.

Speaking at the time of the announcement, Paul Margis, then president and chief executive officer for Panasonic

Avionics commented, “This significant milestone clearly demonstrates our continued leadership in developing technologies that create a seamless passenger travel experience. For airlines, EMV [Europay, Mastercard and Visa] payments on IFE platforms should help eliminate potential transaction liabilities that they face today. In addition, passengers will be able to synchronise their own trusted token to the IFE system and create unique ‘just for me’ experiences without compromising any of the personal data stored on their own device.”

#### ANCILLARY BENEFITS

During APEX 2016 in Singapore, IFPL demonstrated its new NFC ‘Pin-on-Screen’ solution that enables high-value offline transactions by removing the current low-value payment barrier. According to the company, “This step change will allow airlines to expand and sell high-value items thus increasing ancillary revenue.”

Its work with Mirus Aircraft seating has led to the joint development of a smart seat and the introduction of new technology into their economy seat. This includes integrating an embedded screen with NFC payment and IFPL’s latest magnetic audio jack.

However, it’s been gate-side where NFC has seen widespread adoption.

In 2013, Gemalto announced it was providing its Allynis Trusted Service Management (TSM) solution to KDDI, one of the leading mobile network operators in Japan, for the deployment of the world’s first commercial NFC airline boarding service for Japan Airlines (JAL).

The project aimed to boost usage of mobile boarding by providing increased speed and convenience to end users while reducing operational costs. Gemalto’s TSM allows KDDI to securely download the JAL application into the SIM, enabling passengers to just tap their mobile phone when required to present their boarding pass. The NFC solution that KDDI has implemented can easily expand using Gemalto’s TSM to include additional NFC



services and applications such as contactless payments, loyalty programmes, transportation and couponing.

“Gemalto’s TSM solution was a critical component in developing JAL’s NFC boarding service,” said Kenichi Bandou, senior manager, KDDI. “The level of security it provides ensures continued trust between JAL and our customers. Our touch-and-go mobile ticketing application allows passengers to complete their check-in conveniently and with minimum hassle.”

“This service demonstrates the potential of NFC beyond mobile payments and the value that NFC ticketing applications can provide by enhancing passengers’ flying experience,” said Martin Foo, vice-president of mobile financial services solutions at Gemalto Asia. “With NFC services leveraging

global TSM standards, touch-and-go ticketing can soon be introduced for international flights as well for KDDI subscribers who are abroad with roaming schemes. Airlines can offer a compelling value-add to their passengers, increasing loyalty and reducing operational costs.” In 2014, Air France, Orange, SITA, Toulouse-Blagnac Airport and RESA collaborated to provide the first seamless boarding experience in Europe with NFC technology. Over a period of six months, the Touch&Pass app allowed a panel of passengers travelling on Air France flights from Toulouse-Blagnac to Paris-Orly to use their Orange NFC-based smartphones to quickly and conveniently move through the airport, from the airport entrance until they boarded their plane.

Through the technology, passengers could automatically receive their NFC boarding pass on their smartphones using their usual check-in method. By tapping their mobile on dedicated readers in the airport, they were then able to quickly and easily pass through points such as priority lanes for security control, lounge access and boarding.

The boarding pass can be read automatically, even if the phone is locked, or the battery dead. By leveraging the technical specification developed by SITA, the RESA reader can retrieve the correct boarding pass, even if there are multiple boarding passes present on the phone.

Jean-Christophe Gaudeau, ground product innovation manager at Air France KLM, commented: “Air France’s participation in the testing of NFC

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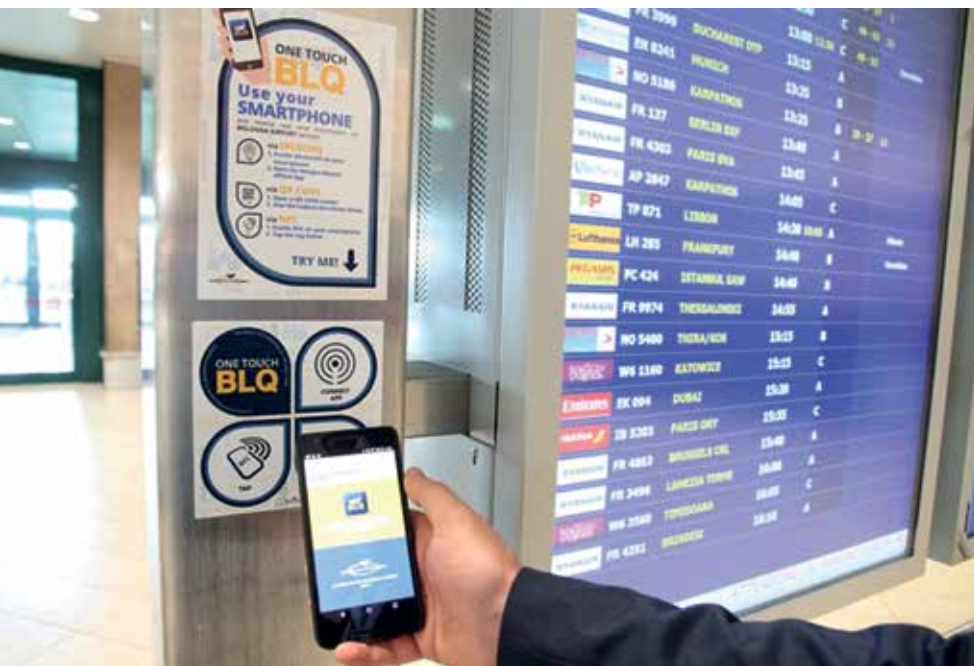
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Bologna Airport has deployed Connectings' integrated solution for Bluetooth beacons and NFC tags, to provide a dynamic, hyper-contextualised mobile service to the 19,000 travellers flowing daily through the airport.



technology at boarding illustrates its desire to be a pioneer in the field of innovation for the benefit of our passengers.”

Thierry Millet, vice-president of mobile payments and contactless programme at Orange, added, “NFC technology allows Air France passengers to test this new way to embark. It’s simpler and faster. The new solution relies on two industry standards: an IATA standard from the air transport industry and an NFC standard from the GSM Association for the mobile industry. This opens the door to a large-scale industrial roll-out.”

As Renaud Willard, sales and marketing director, RESA, said, “Making passenger facilitation its top priority, RESA has seamlessly integrated NFC technology into the daily operations of Toulouse-Blagnac Airport. NFC brings speed, easiness and a paperless experience to the airport environment. Passengers don’t have to think any longer about their boarding pass, the battery life of their smartphone or the rotation of their screen. They just walk through the airport, simply tapping their phone on the RESA readers.”

Fast forward, and in early 2016, Bologna Airport launched a high-tech information

service, ONE TOUCH BLQ, based on Beacon, NFC and QR code technologies.

ONE TOUCH BLQ was developed with the technical support of French company, Connectings, and delivers information like wayfinding at the entrance with the Airport’s maps, useful hints for security controls in the security control area, a shopping guide, and so on. Links to the information are conveyed through 50 beacons and 85 stickers positioned in different locations of the terminal.

Fifteen stickers were also shortly set on local buses and at the stops of Aerobus BLQ, connecting directly to the Airport’s real-time flight information. To share the Airport’s information, three technologies are available: QR code, NFC or Beacon.

#### MOBILE FIRST

More recently though, Spicejet became the first airline in India to launch check-in using NFC and Beacon technologies.

The smart check-in facility uses Bluetooth Low Energy and NFC technologies. This feature is available for all SpiceJet customers who have booked their tickets through the SpiceJet Mobile App.

The service has been initially introduced at Hyderabad Airport in close co-ordination

with GMR Hyderabad International Airport Ltd (GHIAL) and will soon be available in all airports supporting the e-boarding facility.

Customers who have booked their tickets using the mobile app will simply need to open the app and touch the mobile device on the NFC Check-in Poster available at the airport to retrieve their mobile boarding pass on their smartphones.

#### SIMPLIFIED CHECK-IN

Customers can also use a touchless beacon-based check-in to receive their boarding pass on the smartphone. Customers who have booked their tickets through the SpiceJet mobile app will receive an alert as they walk towards the SpiceJet Check-in area, provided their Bluetooth and SpiceJet Mobile App are activated. Following acknowledgement of the notification, the customer will immediately receive the boarding pass on their smartphone.

Ajay Singh, CMD at SpiceJet said, “Customer convenience is of utmost importance to us and we have always strived to enhance customer experience with the integration of the latest technology. [With the] Indian market being fixated on price and schedule, the mobile-first approach, with more service-centric features has revolutionised the customer experience on ground and SpiceJet is committed to avail the latest the industry has to offer, nurturing the travel experience of our end customers.”

Glory Nelson, senior vice-president, IT SpiceJet added, “Identifying the customers without them even entering the PNR [passenger name record] reference will be of great help to all frequent travellers and will be surely appreciated by our customers. Knocking off the long queues for the boarding pass will further improve operational efficiency along with improving our customer experience at the airport.”

The effective integration of technology into both airport and airline services can improve customer comfort and convenience, but the widespread adoption of NFC, which has been promised for some time, still seems a long way off. ■



# THE AIRCRAFT CABIN OF TOMORROW

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The Delta One winter menu was created by Maialino's executive chef Jason Pfeifer and available to passengers in the Delta One cabin on select routes from 1 December 2016 to 28 February 2017.

"We asked what we could do to overcome those issues," he continues. "It's easy to throw salt on food but there are negative effects to that as well. The answer is great spices and fresh ingredients that have a high flavour content and use spices that bring out those flavours to improve the taste despite the noise, pressure and low humidity."

As with anything in the air, it all mirrors trends on the ground.

"Passengers are much more sophisticated today when it comes to food," says Pelch. "This results from the increasing popularity of cooking shows, which have made us all foodies. Our expectations are a lot higher today and our goal is to exceed those expectations with bold flavours and unique and bold menus."

China Southern Airlines, New York sales director, James Cai agrees. China Southern recently launched an innovative food contest to engage passengers in New York.

Cornell assistant professor Robin Dando notes China Southern is partnering with Sennheiser, which produces high-quality, noise-cancelling headphones to mitigate noise impacts. "Research in my lab and others suggests that loud environments can alter how we perceive the taste of foods, resulting in a different profile than the chef intended," says Dando.

So China Southern is combating that with surround sound. "The partnership is designed to mitigate the impact of noise," says Sennheiser director of trade marketing Stephanie Reichert. "The headphones channel the sound into your ear in a distinct way, making you imagine you were totally engulfed by sound."

The shift to more care in the air stems from passengers demanding more than just on-time and safe performance. "Now, as you can see, more and more passengers are asking for a comfortable and special trip," Cai tells *Inflight*. "We need to better meet their needs and to do that we're engaging with passengers to tell us what they want."

More importantly, airlines are taking their cues from the restaurant industry. Partnering with the restaurants is nothing

# Plane food

**Kathryn B Creedy gets a tasty insight into how airlines are targeting foodies.**

**Airline** food has long been the butt of jokes, usually concluding that it is an oxymoron. But changes in the industry are forcing airlines to up their game and tackle two things that have long plagued passengers – the impression that airline food is little more than TV dinners served at 30,000 feet, and how tasteless it is. Indeed, food remains one of the key competitive ingredients in the front of the aircraft.

In-flight meal service has now been elevated to a fine art and people are taking notice. In fact, upgrades have even spawned an in-flight food blog – *Inflight Feed* – authored by Nik Loukas, a self-confessed airline foodie, who has been running the blog and website since 2012 to help passengers to get more out of their in-flight experience.

Wait. Airline foodie? You heard that right. Clearly something in the sky has really changed and it is best illustrated by the fact – AvGeek alert – that Loukas and filmmaker James Mellor of Rainbow Trout Films are making a 90-minute documentary on the

subject: *The Inflight Food Trip – It's Not Just Plane Food!*

To quote Mellor and Loukas: "Climb on board to take an in-depth look at airline food today and decide if it's still just plane food!"

What's the matter with airline food?

The problem with airline food is simple biology. Your sense of taste declines by around 30% at high altitudes. So, naturally, food does not taste the way it does on the ground.

"Aircraft are drier than the Sahara at altitude," says gategroup regional executive chef for the US, Kevin Levett. "Pressure also affects senses including smell and taste."

United senior manager, product strategy and implementation, Jeff Pelch agrees. "It is not only the low humidity and pressure, but the sound," he says. "When we look at airlines across the globe, this is something we are all trying to overcome. We've worked with local chefs in our kitchens across the globe and concluded menus have to be easy to source from that region, with foods that incorporate great flavours."

Delta's new meal programme will feature a variety of options for customers depending on the time of day of their flight.

new. I still have the Pan Am menus from a family trip to Paris when I was a teen that extolled catering by Maxim's of Paris.

### AHEAD OF THE CURVE

But watching restaurant trends, and even being ahead of restaurant trends is one of the most important keys to improving food on board. United is partnering with the National Restaurant Association to determine future trends.

While many airlines team with celebrity chefs, United is the only North American airline with its own catering kitchens. In fact, it has 160 kitchens worldwide.

"Having our own kitchens is important," says Pelch. "It enables us to do a lot of our own menu development, although we also work with catering companies such as *gategourmet*. Our chefs have deep experience in both the restaurant and airline worlds, leverage how flavours react and tailor their efforts to the unique demands of airline catering. They know they have to make it easy to board, plate and present to passengers. They also have to maintain high quality and consistency. Having our own kitchens ensures that the product is consistent, which is one of the biggest aspects of executing on a good passenger experience. We have to ensure that if two passengers are sitting next to each other and ordering the same thing, they receive the same meal in quality, taste and presentation. The key is fresh ingredients that bring out the natural flavours of the food itself."

Interestingly, it was United that prompted this story in the first place because, in its roll-out of the *Polaris* product, it indicated it was researching how to overcome what happens to senses at altitude. Turns out, it is not alone. Filmmaker Mellor noted Lufthansa tests its meals in a hyperbaric chamber. The fact is airlines in the past have relied largely on salt and pepper to flavour the food. All that has changed thanks to food science.

The *Polaris Galley* resulted from a partnership with The Trotter Project and was four years in the making. Essentially, it teamed United chefs with premier chefs from



around the world and developed a star-studded menu of 240 new entrées, 96 appetisers and 48 salads. It achieved direct customer feedback from customers who were served the new dishes in five-star restaurants.

"The new menus themselves were developed over two and a half years with multiple trips to China, Europe, Japan and Australia," Pelch explains. "We worked closely with our sales teams and customers in various markets. We let them talk to the chefs. We have received great feedback and there's a lot more to come. We continue to innovate. We have to avoid menu fatigue and try to rotate the menus frequently and add new elements so our customers will continue to look for something new; something with bold new flavours."

Menus are also seasonal, with the main courses being changed every quarter. The overriding goal is to create menus influenced by the region from which an aircraft is operating as well as sourcing fresh ingredients locally in a farm-to-tray-table concept. The menu is then complemented by wine curated exclusively by United's Master Sommelier.

United's effort also affords the ability to be ahead of the power curve when it comes to culinary trends.

Pelch explains, "We took a deep dive into the international foodscape and asked how we can design our menus to meet passenger expectations. We held 28 menu workshops in 16 cities and five continents, adding new flavours and seasonal ingredients that are sourced fresh from the local region."

Pelch notes it takes six to eight months to design a brand-new menu. "If we were to

design with today's trends, they may not be trendy in eight months so we have to work ahead," he continues. "We have to identify up-and-coming trends and then serve them at the peak of their popularity. Our goal is to serve restaurant-quality food, not airline food. We must gauge what the customer wants. It has to look appealing because you eat with your eyes before you take the first bite. Then, when you do take the first bite, you have to come away saying 'that was a great meal', not 'a great airline meal'."

*Polaris* includes a dessert cart with the company's signature ice cream sundaes, petit dessert options and chocolate truffles. On daytime flights longer than eight hours and on all flights longer than 12 hours, hot mid-flight snacks such as lobster macaroni and cheese will be available, as part of United's desire to include American comfort food with a twist of elegance on international flights.

### BEYOND SALT AND PEPPER

Perhaps the most important factors in new airline meals are flavouring and how food is reheated in flight. Levett explains airline ovens are hotter at altitude and have less moisture, resulting in dry food. To counteract this, *gategourmet* is using different cooking methods and making new food choices.

"Passengers and airlines alike are demanding fresh food," *gategroup's* Levett tells *Inflight*. "A lot of airlines used to provide frozen meals but no more. We are looking at trendy items. We are asking what is in market-leading restaurants. And we are



In 2015, United and The Trotter Project joined together to boost travellers' in-flight dining experience.

changing the way we cook to add value to the meal. For instance, we are doing sous-vide cooking.”

Sous-vide food is sealed in a vacuum-sealed plastic pouch then placed in a water bath or in a temperature-controlled steam environment for longer cooking times, resulting in more flavourful, moist and healthy dishes.

Airlines are also changing their meat selections away from the traditional steak and potato to more complex dishes. “We are offering braised beef, for instance,” says Levett. “We use meat cuts that are more flavourful and that don’t require as much seasoning. They are also less susceptible to airline catering and reheating.”

Pelch concurred with the shift away from steak, potatoes and broccoli. “If passengers drew a picture of what they wanted it would be something more adventurous, such as braised short rib with creamy polenta, fava and mushrooms; things with elevated flavour and a great story behind it. I think the real story is fresh flavours with really great ingredients that bring out the natural flavours. For instance, at our kitchens in Tokyo, we source fresh produce from a single farm, which delivers daily. Our crews can then talk about how this one farm supplies United every day. It’s a great farm-to-tray-table story.”

Similarly, Loukas notes Korean Airlines has an organic farm in Korea that supplies the meat and vegetables to first and business class.

Airlines are also shifting away from salt and pepper, to higher flavour content including umami, garlic, mushrooms, tomatoes, seaweed, anchovies and parmesan, according to Levett.

“We have to understand how food tastes in the air when we are preparing food on the ground,” Levett explains. “It is also about much more than taste. It is about the ambiance and the service, just as it is in a restaurant. The service affects the taste and experience of the food. If you have good service you enjoy your meal more. The plating has to be perfect because it is the first impression, which can bias the senses as to whether the meal tastes good or not.”

That is definitely part of United’s philosophy. United’s guide is something Chef Trotter said: “One of the most beautiful things that I can do for you – or that any one of us can do for another – is to serve each other. It’s one of the most human things. You do that from the heart. You do that because you want to connect with somebody. ‘Service, not servitude’ is something that should never be lost.”

#### FOOD FIGHT

In-flight service has always been seen as part of an airline’s competitive edge – the way it sets itself apart from its competitors. Since the Great Recession, industry consolidation, and the advent of competition from premium carriers from the Middle East and Asia, US airlines have invested billions in the passenger experience even as they short-changed economy class by adding fees for everything under the sun.

Loukas definitely sees good food as a competitive edge. “If you look at some of the world’s great airlines one of their key selling points is the in-flight service or food,” he says. “Price always wins out for consumers generally, and I don’t think people would fly a particular airline just because Nobu created the meals, although I

definitely would. However, I’m a big believer that airline food is like in-flight entertainment, all the various sections, taking off the wrappers, experiencing the meal, tasting are all forms of in-flight entertainment that help the time pass.”

In fact, the goal of the *The Inflight Food Trip – It’s Not Just Plane Food!* is to highlight that food and the entire story behind it is a driving point in competition.

And that is what fascinates Loukas and Mellor, who cover the industry from the passenger perspective, and brings a new view through Loukas’s food expertise. “For me, the film is all about discovering how airlines express their own identity by the foods they serve,” he says. “Each one has their defining dish and the way they serve it, which is quite unique to them. This is the way they say ‘we are SAS, China Southern, Swiss’. That’s an interesting story about how much effort goes into airline food – the logistics, how they source their food, how they prepare and serve it and the innovative things they do to engage with customers and bring new menus to the table.”

#### UPPING THE ANTE

Delta launched its passenger experience programme after the recession, investing US\$2 billion in cabins and airport infrastructure along with renewed emphasis on running an on-time airline. Efforts included quality meal service and comfort in business and first.

While American is pretty much there with Delta, United is playing catch-up with Polaris, which is a great start that will require continuing innovation, as Pelch acknowledges.

A recent ‘innovation’ by Delta illustrates just how competitive the consolidated US airline industry remains. The Atlanta-based airline is upping the ante once again with its 1 March roll-out of complimentary meals in economy class, after tests showed customers perceived a marked improvement in the in-flight experience.

“We are all about making our Main Cabin experience the best it can be for our customers, and offering free, high-quality

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meals is a big part of that experience,” says Allison Ausband, Delta’s senior vice-president – in-flight service. “When we tested this concept, our customers loved it and appreciated it so we are implementing it in our most strategic markets. We will be the only US carrier to offer complimentary fresh meals from nose to tail on select coast-to-coast routes.”

The meals will be served on its longest domestic flights, including transcontinental routes between Boston, JFK and Los Angeles, San Francisco, Portland and Seattle, targeting JetBlue, Alaska, American and Spirit.

The enhancement is part of Delta’s ongoing multi-million-dollar investment in the on-board customer experience that

includes upgraded Main Cabin snacks, enhanced blankets, refreshed Flight Fuel, its food purchase programme, as well as in-flight entertainment. Main Cabin customers on long-haul international flights are also treated to complimentary beer, wine and spirits, and sleep kits.

Delta, too, is focusing on innovative, seasonal and locally sourced food and beverages. Delta’s new meal programme features a variety of options for customers depending on the time of day of their flight. In the morning, customers will have the option to choose between a Honey Maple Breakfast Sandwich, Luvo Breakfast Medley or a fruit and cheese plate. During the day, they select from a Mesquite-Smoked Turkey Combo, Luvo Mediterranean Whole Grain

Veggie Wrap, or a fruit and cheese plate. For overnight flights, they are offered a breakfast bar during the pre-arrival beverage service.

In addition to the Main Cabin meal service, customers seated in Delta Comfort+ enjoy a pre-arrival snack basket, which will be included on all 12 routes, and complimentary beer, wine and spirits. Additionally, a mid-service Greek frozen yogurt bar will be offered in Delta Comfort+ on flights between JFK and LAX or SFO.

All this activity on the food front is just part of the continuing expansion and retraction of airline passenger services. In 2009, when fees began to take off, I predicted airlines would start rebundling their in-flight options, so it is no surprise that they are upping the ante with one another. ■

## China Southern creates NY food competition

Everyone knows the ‘Big Three’ US airlines – Delta, American and United – dominate the airline scene in New York. So, what is a relative newcomer supposed to do to engage some of the most demanding airline passengers out there?

The answer, according to China Southern, which fields two flights daily from New York to its hub at Guangzhou, was to stage a food fight. Well, it was actually a food competition, but food fight illustrates how airlines are focusing on creature comforts to compete for passengers.

“China Southern Airlines started this campaign to directly engage with travellers and learn more about local flavours,” explains Kevin Hou, general manager at China Southern Airlines New York.

Indeed, it was a way to raise its visibility in a tough market, according to China Southern’s New York sales director James Cai. “We hoped to promote our brand awareness both online and in the local New York area,” he tells *Inflight*. “We want to hear passenger opinions on in-flight food service, which is an important part of

a passenger’s travel. We’ve done a lot to make sure we provide the best quality of food to our customers, yet we still want to make sure we understand their need better.”

The winning entry during the event was a lasagne dish submitted by Lia Comandatore. The winning online entry was special steamed salmon submitted by Isabella Benjamin. Chefs also made a Swine and Wine pork stew submitted by Gina von Esmarch. While the dishes aren’t on the menu yet, the airline is working with chefs in China on how best to leverage the new recipes.

A member of the SkyTeam Alliance, China Southern Airlines sponsored #ChinaSouthernFoodies, a social media contest to find the next in-flight food sensation. Targeted at everyone from professionals to home cooks, foodies and flyers across the world, the airline wanted their recipes via Facebook, Instagram and Twitter to help the airline find the next in-flight dishes and snacks. How about a lavender and pistachio brioche doughnut or steamed special salmon? What about easy-to-make shortbread cookies or spring/veggie rolls?

Three entries were ultimately chosen to

compete in a final taste-testing event at BREAD, housed in New York City’s Nolitan Hotel on 26 January. BREAD is itself a winner of one of New York’s most coveted restaurant awards – *Time Out’s* Most-Loved Restaurant Award 2016 – and is planning on opening a restaurant in China.

China Southern also partnered with Airline Foodie Nik Loukas and Filmmaker James Mellor, who partnered to create *The Inflight Food Trip* documentary. Attendees are to be featured in the documentary and the winner won a round-trip ticket to Guangzhou.

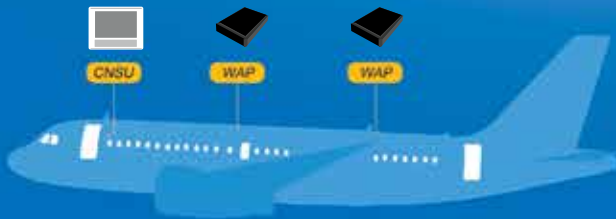
“This is something that has never been done before,” says Loukas of China Southern’s innovative passenger engagement programme. “By inviting the general public, China Southern Airlines will substantially upgrade the transparency surrounding airline food, where all decisions are typically made behind closed doors.”

BREAD chefs converted the winning entries into airline-friendly options and, highlighting the airline’s partnership with Sennheiser, participants tested the food while wearing the Sennheiser headphones designed to surround them with sound.



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## ADS-B out

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In 2020, the FAA and EASA will mandate that all aircraft flying need to be equipped with an upgraded version of ADS-B out (DO-260B). As currently only a limited number of aircraft are flying with compliant hardware, a large retrofit program needs to be started, where 40k aircraft need to be modified.

The modification for ADS-B out may take considerable effort. Therefore most probably the heavy maintenance schedules will drive the window of opportunity to modify each aircraft.

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FTS's wearable technology offers improvements to both crew and passengers.

**In FTS, Alexander Preston finds a company that's making a big entrance in the in-flight entertainment and connectivity market.**

A series of recent high-profile announcements belie the relative youthfulness of China-based FTS.

With regional offices in China, Singapore and the US, FTS is a relatively new player in the in-flight entertainment and connectivity (IFEC) market.

"FTS is not your average IFEC vendor," says Darrel Chua, general manager of FTS in Singapore. "We are partners to the airlines. We are confident that our business models will help airlines maximise revenue generation potential and these strategies will revolutionise the IFEC industry."

The company designs and manufactures its own aircraft hardware, software, mobile apps and cloud back end. During APEX 2016 in Singapore, FTS showcased one such mobile app.

The smartwatch app allows flight attendants to receive and manage passenger requests, such as extra blankets, without compromising their other duties.

FTS Cabin Wireless Solution is completely designed and manufactured in house. The system features a high-performance 2-MCU embedded file server. The General Network Server (GNS) supports Hot-plug SSD drives, USB 3.0 ports for maintenance and content



# Forged by experience

updates and weighs only 3.5 kg. The GNS supports Gigabit Ethernet and Discrete I/Os as well as ARINC429 and ARINC717 databus.

Also featured are two wireless access points that support the latest 802.11ac standard and a 3G/4G cellular modem that takes up to four SIM cards. The Cabin Wireless Access Points provides multi-Gigabit Ethernet and discrete interfaces. With FTS's proprietary technology, a single CWAP can supply 180 passengers concurrently streaming audio and video on demand (AVOD).

Passengers can connect to the on-board wireless network through their own mobile devices and enjoy streaming HD-quality

video and audio entertainment, play single or multiplayer games, read the latest news, view 2D or 3D flight progress maps and indulge in shopping.

In late October, the company announced the successful completion of the installation and certification test flight of the system on board a China Southern Airlines B737-800 aircraft.

"This is indeed a very exciting day for the FTS team and our customer," said FTS president and CEO Duan Shiping. "We kicked off this program just five months ago and it's amazing that we are able to complete installation, test flight and stay on schedule for CAAC [Civil Aviation Administration of China] MDA

## Canada's First Air is the first North American customer for FTS.



[Modification Design Approval] certification. We have great expectations for our next-generation in-flight wireless system and believe the new opportunities that it offers will be appealing to the airlines.”

“We were able to accomplish this feat in record time thanks to our tireless project teams and close collaboration with the customer,” added Shiping. “Unlike other platforms in the market, FTS Cabin Wireless Solution is designed from the ground up to optimise generation of airline ancillary revenue. The successful test flight and certification is a huge confidence booster to airlines and this opens up a world of opportunities to tap on new sources of ancillary revenue.”

The statement was followed immediately by the news that Canada's First Air is to install the system on its fleet of B737s in the first quarter of 2017, for both charter and commercial flights.

According to Shiping, “We are working closely with the airline and FAA to apply for STC [Supplemental Type Certification] approval. With the expected issue of STC in early 2017, that will start opening up new opportunities worldwide and establish ourselves as a respectable global player.”

### SUPPORT TOOLS

In a sign its products and services are gaining traction with the airlines, and following its breakthrough in North America, FTS announced its Cabin Wireless Solution had been selected by another undisclosed airline customer from Southeast Asia. The system will be

installed on the airline's mixed fleet of A319 and A320.

Supporting its efforts to deliver a world-class next-generation IFEC system and connectivity service with an affordable price point, FTS has received a financial injection.

FeiTian United System Technologies, the parent company of FTS, finished a series B funding round in China that is in the region of tens of millions of US dollars. The February 2016 financing round was led by Civil Aviation Investment Fund, the official government investment fund under Civil Aviation Administration of China, and China Aviation Industrial Fund, a leading investment fund for aviation industry sectors.

### TEAM PLAY

To enable its customers to identify and maximise the ancillary revenue generation as well as providing analytics on passengers' viewing patterns and habits, FTS has assembled a team fully backed by years of

avionics and telecommunications research.

Rich Salter has been appointed as chief technology officer while Jack Sunabe has joined as director of programme management. The additions further boost FTS's product development capabilities and strengthen its programme delivery to FTS's inaugural customer in North America.

“We are indeed most fortunate to have both Rich and Jack join FTS at the right time when we are rapidly expanding,” said Shiping. “Rich and Jack each bring a wealth of knowledge and experience across the different aerospace fields, including avionics hardware, software, testing, certification, programme management and quality. Their presence will help propel our global R&D and programme management teams to new heights, ultimately delivering world-class in-flight innovations to airline customers.”

The duo join Ben Fuller, who is spearheading FTS's marketing and business development efforts in the Americas and the Caribbean. “It's great to be back in the IFE industry again. I believe we are well positioned to make a big impact in the IFEC landscape and introduce some positive disruptions over the next few years,” said Fuller.

Fuller added, “We have a great opportunity to differentiate ourselves from the competition with our flexible business model, innovative products, impeccable service and rapid speed to market. My goal is to hit the ground running and continue the positive momentum at FTS.” ■

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**With FTS's proprietary technology, a single Cabin Wireless Access Point can supply 180 passengers with streaming AVOD simultaneously.**





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Hamburg will again play host to the cabin interiors, in-flight entertainment and passenger comfort industries.



# Finding order in Messe

As Aircraft Interiors Expo touches down in Hamburg, the *Inflight* team looks at some of the expected highlights.

**It's** that time of the year when the in-flight entertainment and connectivity (IFEC) industry descends upon Hamburg, Germany for the annual Aircraft Interiors Expo (AIX, 4-6 April).

"This year AIX welcomes 55 new exhibiting companies, including Adient, Bombardier and airtango. They will join more than 500 companies at the event including longstanding exhibitors, such as Airbus, B/E Aerospace, Boeing, Inmarsat, Panasonic Avionics and Zodiac and newer entrants such

as Acro, and Mirus Aircraft Seating," says Polly Magraw, event director for AIX.

Magraw adds, "Aircraft Interiors Expo is a unique opportunity for your business to exhibit your product innovations in front of more than 1,000 key airline buyers. The event will provide the opportunity for business networking as well as hearing and discussing the latest issues and trends within the industry."

As passengers, but particularly millennials, demand an at-home connectivity experience

in the air, airlines are under increasing pressure to invest to meet the evolving needs of passengers.

This is reflected in the continued growth of the IFEC Zone, which is now firmly established as one of the world's largest events dedicated to content and service providers. There are 18 new showcasing companies, including LiteAir Aviation Products, Otonomy Aviation and Philotech, alongside 100 existing exhibitors in the Zone.

Some 20,000 visitors are expected to register to attend Passenger Experience Week, which also includes the World Travel Catering and Onboard Services Expo, co-located at the Hamburg Messe.

The week begins with the eagerly anticipated Passenger Experience Conference (PEC) on 3 April. The event is dedicated to the future of the passenger experience industry and incorporates a broad choice of presentations and panel



**An expanded IFEC zone bears testimony to the growth of content and service technologies.**

discussions on the key themes of generating revenue, the connected journey, and comfort and wellbeing. Leading speakers on these topics come from inside and outside the passenger experience industry, including Dick Powell, the chairman of design agency Seymourpowell; Paul Edwards, head of industrial design at Airbus; and Blake Emery, direction differentiation strategy at Boeing Commercial Airplanes.

New to the PEC this year is the Airline Breakfast Forum. This addition presents an opportunity for airline attendees to network, debate informally with their peers about issues relevant to improving the passenger experience in their businesses and to share best practice insights. Attendees at the Airline Breakfast Forum will also be invited to a keynote by Jeff James, vice-president and general manager of the Disney Institute.

Another addition is CabinSpace LIVE, a theatre-style series of seminars where visitors can “learn and be inspired on a variety of pressing issues within the IFEC, interiors and MRO sector”.

#### **IN THE ZONE**

One familiar name returning to the IFEC Zone is Lufthansa Systems. Visitors to its booth will be able to see new features on its in-flight entertainment (IFE) solution, BoardConnect Portable. According to the company, the user experience stands at the heart of new developments. This includes a new user interface, which is even more intuitive to use, and an architecture that will become even

more flexible, making it “the best platform for the connected aircraft”. A fully modular approach will enable use cases for cabin, cockpit and crew, in addition to IFE.

Unwilling to share more details, Lufthansa Systems has teased with news of an extension to its existing partner network. The company is set to announce new partnerships, which will provide additional services and functionalities. During the show the company will give an update on current roll-out projects, which include the first airlines within the Lufthansa Group, for connectivity services and announce new customers for both BoardConnect and BoardConnect Portable.

“As IFE’s presence at the Aircraft Interiors Expo is rapidly expanding, it’s more important than ever that we are there to showcase our brand and services to leading airlines all over the world,” says content services provider Global One Media. “Our booth for 2017 is our largest ever for this reason.”

Encouraging visitors to check out their latest creative content concepts, along with exciting new developments, the company adds, “As AIX sets the agenda for our industry and the future of the aircraft interiors, it’s a great chance for us to meet our core customers and discuss the latest developments and future capabilities in in-flight entertainment.”

It is these future capabilities that Axinom is keen to showcase. “In the future, we will continue providing the core foundation of digital platform products to connect services,

assets, and people with proven industry-specific architectures and technologies and create an open platform that is extensible and adaptable to customer needs. Therefore, our platform approach keeps a constant consideration of innovative solutions in order to meet customer’s requirements in any industry, and builds a foundation that that can be further developed in the future,” says Sara Pepic, marketing manager.

“Our mission is to reinvent the way people consume media and services at home, at work and while travelling. As for 2017, there is no doubt that the content management in the cloud will be one of the most dominant topics. While the business decision for a cloud or on-premises solution is still a tough one to make, we already simplified this choice by making our Axinom Content Management System (CMS) support deployments both in the cloud and on premises.

“Furthermore, the ability to provide a studio-grade DRM protection in offline environments and cover different usage scenarios on board is one of the core requirements for modern IFE systems and this requirement will be further emphasised in the future.

“Our Axinom Digital Rights Management (DRM) service is the first multi-DRM product that can operate in a disconnected fashion, enabling premium video on board of more than a hundred aircraft in the world today. And with Axinom Content Delivery System (CDS), we will continue bringing new and future-proof aspects of synchronisation to different industries using standardised communication protocols and mediums.”

According to Phil Brace, IFEC and airborne power solutions at DDC Electronics, “The Aircraft Interiors Expo at Hamburg is considered to be one of the key industry trade shows for the cabin electronics and interior vendors and airlines. We can expect to see all of the IFE, connectivity, seat, monument and materials suppliers exhibit at this show in early April.”

He adds, “For DDC Electronics, we expect to see continued interest in our airborne



power solutions from the OEMs [original equipment manufacturers] that we have supported for more than 23 years”.

The Pascall product line has shipped in excess of 165,000 power supplies in line replaceable units and embedded forms to its core focus markets of IFE, connectivity, personal electronic devices (PEDs), power and seat actuation.

“In an industry that faces ever-increasing competition, DDC’s power solutions continue to offer high efficiency and industry-leading reliability in multiple form factors.

“We can expect to observe ongoing trends at the Expo in the areas of seatback IFE, wireless BYOD [bring your own device] IFE, high-bandwidth connectivity and PED power provision. In addition, next-generation seat designs will be exhibited,

all of which are focused on improving the passenger experience.

“As always, Expo visitors can expect to receive a warm welcome at the DDC booth in Hall 2, where a range of power and cabin system solutions will be on show,” Brace asserts.

Having been acquired by ViaSat in November 2016, Arconics will have a strong presence at AIX 2017. Along with colleagues from its parent company, it will display a full suite of connected apps for aviation, from high-capacity satellite connectivity for W-IFE to the AeroDocs safety and compliance document management system for airlines.

**VIRTUAL EXPERIENCES**

When a passenger enters an aircraft, they don’t only expect the latest movies and TV

series to be available, bridging a long flight time. Passengers, especially those travelling on business, want to be well connected and able to be productive, ideally not noticing any difference to working in the well-equipped office premises of their company.

The challenge facing airlines, and therefore aircraft manufacturers and all their suppliers, is making all this possible and offering their customers maximum comfort. Especially in the business-, first-class and VIP aircraft sectors, a customised and well-equipped flying conference room is needed.

In order to provide such an individual cabin, it takes more than a good interior designer. Such projects are usually highly complex, time consuming and very expensive. The sooner the OEM can present the cabin to his customer, the airline, the



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quicker he can implement all requirements and individual adaptations to start production.

Dassault Systèmes' Passenger Experience allows designers, engineers, and customers to virtually experience the aircraft's interior even before the first physical prototype is built. The 360-degree view lets them explore all cabin features under any lighting condition or in any environment to assess and validate shape, function, reflection materials, colour, trim, and comfort.

What differentiates Passenger Experience is that it fully automates the cabin design and layout process using unique knowledge, based on 3D applications that capture and apply companies' expert know-how. It incorporates a company's own design and manufacturing rules and Intellectual Property (IP), as well as industry regulations to make

sure the finished product will meet all safety and certification guidelines. By automating these various functions, companies are able to reduce the time it takes to engineer custom configurations that create whatever environment customers want to achieve.

At AIX, Dassault is offering visitors the opportunity to try Passenger Experience and explore how it feels to be inside their own cabin.

Another company taking innovation a step further is AIM Altitude. In the run-up to Hamburg, the company has given a sneak peek on what visitors can expect to see on its stand, which it says "will provide a metaphor for what the company does best: taking complex design visions from concept through to certified reality, while maintaining the design integrity and brand identity."

Ross Burns, group lead industrial designer at AIM Altitude's Cabin Interiors division explains, "The Virtual Experience Studio will be a creative area where customers and visitors can customise an aircraft scene to their own taste. This 'white space' virtual-reality model uses state-of-the-art technology to bring to life the interior space. Visitors to the stand will experience physical feedback blended with digital customisation of an array of units. Trim and finish, as well as 'feature' possibilities, will be enabled for visitors to see in real time how different products could look within the cabin architecture."

Based around a 'development project', the stand will consist of two areas that illustrate AIM's design, engineering and manufacturing techniques and capabilities. The first is a creative element – a Door 2

*Let your ideas take off.*



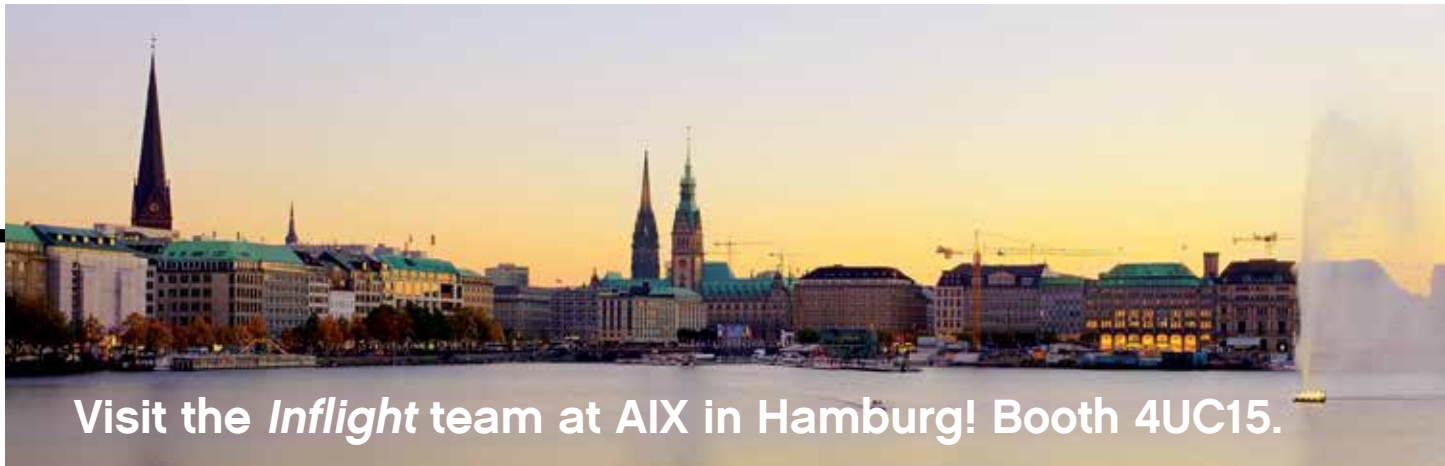
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## Visit the *Inflight* team at AIX in Hamburg! Booth 4UC15.

entrance concept. Being the main entrance to the plane for most airlines, Door 2 is the first impression that the passenger is likely to receive. This makes it particularly important for this area to create a brand image and differentiation from other airlines. It is also the space in which many airlines choose to include a bar, lounge, or display monument.

The second is a practical product that has potential for commercialisation. According to the company, this physical product is an exciting proposition too, with numerous new features, some of which AIM Altitude describes as 'revolutionary'. These developments to the product have, says Burns, come about from customer interaction, where AIM Altitude has designed and engineered features to meet specific customer demands.

The exact details, however, will remain under wraps until the show itself.

Bucher Leichtbau expects 2017 to be an exciting and positive year as it intends to introduce a range of new products. At this year's AIX, Bucher will be showcasing several new and improved products as well as a virtual cabin walk-through.

At their booth visitors can experience one of these products first hand – a complete aft galley, which is part of Bucher's new galley system for the Airbus A330neo. This galley, known for its lightweight and reliable design, has been optimised for additional storage space.

Also part of the exhibit will be the newly designed entry area complex, which will include a galley featuring the new and innovative SkyDrinx beverage dispenser. Part of this exhibit will also be a space-saving combination between a self-service counter and a business-class front row monument.

For aircraft seating applications, a variety of in-flight-entertainment and tray table

deployment systems with 'improved reliability, simplicity and feel' will also be presented.

"The market is very buoyant and we see growth for 2017, both in the global aircraft seating market and within our business. Exciting times ahead!" says Alan McInnes, head of sales at Acro Aircraft Seating. "The overall economy-class seating marketing is expected to grow year on year between now and 2032 (Airbus/Boeing data) with 39,620 new aircraft built by 2035, 78% of which will be single aisle.

The company will be exhibiting its new Series 6 economy-class seat, the Series 7 premium-economy-class seat and the Series 3 ST.

"The breakthrough in the evolution of the Series 6 seat, has been to simplify the structure in order to maximise living space for the passenger and to replace the traditional seatback with a composite that is both as beautiful as it is efficient. The simpler configuration and customisation offers increased passenger comfort, a more

sophisticated appearance, unequalled legroom, 13% lighter weight than the current-generation seat, 50% reduction in parts, greater durability and lower costs of operation."

Having successfully supplied seats for line-fit since 2015, the company signed a contract with Airbus during January for Acro products to be included in their BFE (Buyer Furnished Equipment) Catalogue. "This agreement with Airbus is the latest milestone achievement that reflects how hard we've worked to grow Acro by investing in our staff, product innovation and supporting infrastructure.

"Appearing in the Airbus Catalogue extends our reach and accessibility to scheduled flag carriers, enabling our growth and pursuing our vision of perfect comfort for passengers," McInnes says.

Elsewhere, LIFT by Encore and Rebel.Aero have indicated they will be making some highly anticipated product announcements. We await further details. ■

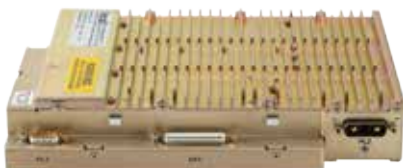


Dassault's Virtual Passenger Experience offers visitors the opportunity to explore cabin concepts.



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Neutral Digital's infotainment app, Fleet Explorer, provides up-to-date fleet information.

# A crystal salute

**Ariana Khushal casts her eye over the entries in this year's Crystal Cabin Award.**

**The** aircraft interiors industry's version of the 'Oscars', the Crystal Cabin Award (CCA), returns for its 11th anniversary and is once again setting milestones. As usual, the presentation ceremony will be held during Aircraft Interiors Expo in Hamburg, Germany. As Lukas Kirchner, marketing and press for CCA, declares, "We are very happy to see that the Crystal Cabin Award has set another record in shortlist entries for the fourth year in a row, with now 85 contestants from 21 countries. This also marks a new record in international participation."

The prizes are awarded across eight categories: Cabin Concepts; Cabin Systems; Electronic Systems; Greener Cabin, Health,

Safety and Environment; Material and Components; Passenger Comfort Hardware; University; and Visionary Concepts.

In-flight entertainment (IFE), in particular, is receiving more and more attention in the cabin industry. This includes innovations for passenger screens but also, and most importantly, in terms of on-board connectivity.

## PERSONAL TOUCHPOINTS

According to Ana Torres, marketing and communication at Immfly, her company's entry is unique in the European market. The Immfly system delivers quality, content-rich, connectivity-ready platforms designed with

clear marketing and revenue optimisation objectives. "Thanks to the user data, we provide airlines with the formula for on-board monetisation, and propose them several different sources of cash flow through on-board sales, entertainment content packs, platform sponsorship and performance marketing."

The system is based on the bring-your-own-device (BYOD) concept, allowing an airline to serve all kinds of entertainment, including TV shows, sports, news, comedy and e-books, to a passenger's smartphone, laptop or tablet using an in-cabin Wi-Fi network. Most of the content is provided free of charge.

"According to the airline's preferences, we can bring the passenger experience beyond the aircraft, offering airlines a 360-degree touchpoint with the passengers – before, during and after the flight," explains Torres.



Immfly has submitted its BYOD IFE solution.

Immfly is operative on Iberia Express's full fleet (21 aircraft), and recently launched on board Volotea's Airbus A319 fleet and XL Airways' A330 aircraft.

With the increasing use of personal electronic devices (PEDs) on board aircraft, more and more airlines are wanting to have a visible presence on these platforms as an extension of their brand.

One such response comes from Air Caraïbes, the regional aircraft of the French Caribbean, which, with its partner, Display Interactive, has nominated its IFEC ecosystem, iZivision. In short, the system is a "unique combination of seat-back IFE, cabin Wi-Fi, ground applications and broadband connectivity service, running on multiple technical configurations, integrated with the airline's IT systems and updated in real time."

As Thierry Carmes, strategy and development director of Display Interactive, highlights, "This is the first time, in my IFE experience, that an airline rolls out a comprehensive in-flight ecosystem where all IFE, connectivity, and IT software components are interfaced and mutualised, in order to maximise passengers' experience as well as tangible and intangible returns for the company."

For Carmes, iZivision "demonstrates that IFEC is no longer an insulated part of the travel value chain, and that the value generated can be harvested independently from technical architecture and hardware investments.

"This ecosystem addresses the key challenges of any air transportation operator: how to differentiate my product and services, how to save on Capex and Opex, and how to generate new revenues and create additional value."

#### AT HOME IN FLIGHT

As various surveys keep telling us, connectivity is tremendously important for travellers; so much so, in fact, that it is now set to become a fixed component of the passenger experience. And airlines are set to benefit too, if German tech company airtango has anything to do with it.

The company says it "focuses on turning free internet access, on the ground and in the air, into a source of revenue. Its integrated, user-centred solution, Living Networks, offers passengers live content tailored to their individual needs: live TV and entertainment, destination-related information, and customised services."

The technologies developed by airtango make it possible to achieve an almost 'at-home experience' on board an aircraft. Earnings from on-board shopping, affiliate marketing and personalised and target-oriented advertising exceed the costs of connectivity and increase the airline's ancillary revenues.

Living Networks attempts to solve two fundamental challenges of cabin connectivity: the limited willingness of

passengers to cover the costs by paying user fees, and the limited availability of bandwidth. The essential difference, the company claims, between airtango and other providers of in-flight connectivity is that the focus is not on a technical solution that enables 'bandwidth for payment'. Instead, Living Networks is an integrated, passenger-centred solution.

Steffen Knödler, chief executive officer of airtango, adds: "Having started just a year ago, we are honoured to be among the finalists for this prestigious award. It is a tremendous opportunity to present our innovative solution to a worldwide audience of experts. It definitely raises our profile in the market and will help to make our participation in the Aircraft Interiors Expo in Hamburg a success."

Helping deliver this 'at home' experience, while also bringing tangible benefits to airlines is the Airtime portal from Global Eagle (formerly known as Global Eagle Entertainment).

According to Josh Marks, executive vice-president, aviation connectivity at Global Eagle, "Airlines are faced with the challenge of rivalling the at-home experience. The Airview reporting dashboard is a suite of data-rich back-office tools that generate detailed analytics and reports, including actionable data to improve and evolve the airline's product offering."

"Global Eagle's combined content, distribution and technology platforms provide airlines and millions of passengers with the industry's most complete offering of in-flight content, e-commerce and information services gate-to-gate. These offerings are delivered via the most advanced technology solution in the industry and are accessible through Global Eagle's Airtime Portal. As the industry continues to mature, airlines are faced with the challenge of rivalling the at-home experience. With Global Eagle's Airtime Portal, airlines can give their passengers access to everything they have at home, on their preferred device, while building airline brand loyalty," he concludes.

**IFPL's Nexus Integrated Seat Arm addresses the dual problems of aesthetics and functionality surrounding in-seat power.**

Improved digital experience on board an aircraft requires airlines to keep IFE content, crew and passenger services continuously up to date. To keep the innovation pace high, airlines look for solutions to improve the partially manual, costly, and time-intensive process.

And it is here that Axinom steps in, as Sara Pepic, marketing manager of Axinom, states. "Our product Axinom CDS is the robust solution that magically manages all aspects, including utilising different pipes (LAN, WiFi, 3G, LTE, satellite networks), managing interruptions, prioritising important data, and controlling data transfer cost. Axinom CDS, together with Axinom CMS and Axinom DRM, make the core foundation of digital platforms in different vertical markets."

The system (CMS) supports deployments both in the sky and within ground-based premises, empowering crew members to automatically pull the latest content and service packages for the upcoming flight using the Sync App on their mobile devices while staying in a hotel or at the airport. During the flight the Sync App automatically connects to the on-board server to synchronise and distribute the content and service packages.

In the future, Pepic says that "the Axinom digital rights management (DRM) service is the first multi-DRM product that can operate in a discounted fashion enabling premium video on board of more than a hundred aircraft in the world today. With Axinom (CDS), we will continue bringing new and future-proof aspects of synchronisation to different industries using standardised communication protocols and mediums."

#### SMART THINKING

As smartphones become ever more pervasive, passengers are presented with the issue of keeping their devices safe. B/E Aerospace thinks it has the answer.

The company has introduced a very simple but smart device that comes from a snack box, and which will hold your phone. As part of a flight's food services, healthy snack bars can be packaged inside a reusable



and recyclable package. This package can be converted into a smartphone caddy that can be held by an airline seat's tray table latch.

As August Wong from B/E Aerospace's advanced design group reveals, "While the bulk of our work is a very high-level brief, we are often travellers in main cabin ourselves. It helps ground a lot of our perspective and solutions as we feel the same issues as others. However, we've the distinct advantage of being able to propose ideas that will be adopted back into the field."

It's one thing keeping a phone safe and cosy; it's quite another keeping it charged for the duration of a flight, especially on long-haul routes. With the Nexus Integrated Seat Arm, IFPL believes it has the solution, with "a ground-breaking concept that addresses the issues faced by the IFE industry regarding seat integration, whilst delivering an enhanced passenger experience".

According to the company, the product seamlessly blends passenger connectivity, power supply unit (PSU) and audio functions into the arm of the seat, meeting the passenger expectation of integrated, in-seat charging and connectivity for PEDs.

"The demands on airlines to deliver an ergonomic and aesthetically pleasing product for passengers are delivered, whilst counter-balancing the requirements for smaller and more compact seats.

"The Integrated Seat Arm is a stylish, new at-seat power, audio and data connectivity concept," IFPL claims.

Another company with in-seat power on its mind (or at its fingertips) is Astronics PGA Avionics.

Its 'Philea' concept has been designed to replace two products instead of one. Emilie Honneur, marketing communication manager, notes, "Dedicated to the premium economy seat, our product includes an innovative solution of embedded USB charging ports dedicated to the passenger seating behind to allow use of his/her personal electronic device independently. It also includes head capacitive control. The directional light beam allows direct light for passengers to illuminate their own personal space.

"The result is a perfect area of illumination for any passenger environment. This intuitive light can be easily mounted into the headrest of the seat. Moreover, the modern design is enhanced by a beautiful and discreet mood lighting, which perfectly suits the seat and cabin environment," she adds.

#### SAFETY FIRST

"We see more and more entries focusing on sustainability as well as safety, which are cleverly conceptualised and certainly here to stay. The Diehl Smart Wireless solution, helping the crew to oversee the cabin better, I think stands out," says Crystal Cabin Award's Kirchner.

The Smart Wireless Seat Monitoring System gathers essential data on each passenger's seat status, such as whether it is occupied, the position of trays, backrest and



Lufthansa Technik's niceview allows passengers to track their flight on their own PED.

so on. Legally, seatbelts must be fastened, backrests must be in the upright position, and trays must be folded away to protect passengers in emergency situations, such as when flying through turbulence. However, passengers are not always compliant and, currently, crew members have to visually verify the seat status of each passenger.

This system frees crew from this process, automatically determining the status and sending the information to the flight attendant panel (FAP) or a tablet while the crew is securely seated. This can be supplemented with further information, such as window shade positioning, to give a full overview of the cabin status. It also monitors seat pockets, alerting passengers if something has been left behind. The system additionally checks for the presence of life vests. As the system uses wireless communication, it can be easily installed in new and existing aeroplanes.

TU Delft's Myseat concept has been designed to help make the traveller feel better during the boarding process and reduce crucial boarding times.

A user-centred design, Myseat uses Bluetooth beacons throughout both the terminal and aircraft to guide a passenger directly and efficiently to their seat, straight from check-in.

The final beacon is the passenger's seat itself. As the passenger gets closer, a spotlight above their seat will start to light up. Getting closer means a more intense spot light. When at the seat, the passenger is able to put small luggage in the compartment under the seat pan and close it. Once seated, the spot light will turn off and a welcome message will appear on the IFE screen.

Elsewhere, Lufthansa Technik has introduced an interactive system that lets passengers track their own flight live on their tablet or smartphone. "Until now, this level of directly experiencing one's own flight was only available in VIP aircraft," explains Andreas Pfister, lead project manager for the Original Equipment Innovation division at Lufthansa Technik. "Now passengers can take the fascination of flying into their own hands." The 3D moving map uses real satellite imagery, which allows passengers to select from a variety of customisable options, such as information on altitude, speed and travel time.

With passenger numbers increasing, and fleets evolving rapidly to accommodate, keeping conventional printed fleet information up to date is not only outdated but also expensive and unkind on the environment, says Neutral Digital, who claims its IFE infotainment app, Fleet Explorer, removes these complexities and allows airlines to digitally and instantly update their fleet information.

Developed using Unity3D, the world's most popular game engine, Fleet Explorer uses the enhanced processing power of Panasonic's X series to showcase an airline's fleet in 3D – with high-fidelity textures and delightful interactivity. The benefit to the airline is an increased awareness of the fleet including current and future orders.

As CCA's Kirchner concludes, "2016 was already a year of milestone concepts, and looking at the shortlist of this year, we have the feeling that the key question in IFEC is currently more evolving around smart implementation and integration rather than the visible 'wow' effect of what you can do." ■

TU Delft hopes to make the journey to the seat more simple and less stressful via beacon technology.

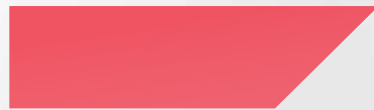




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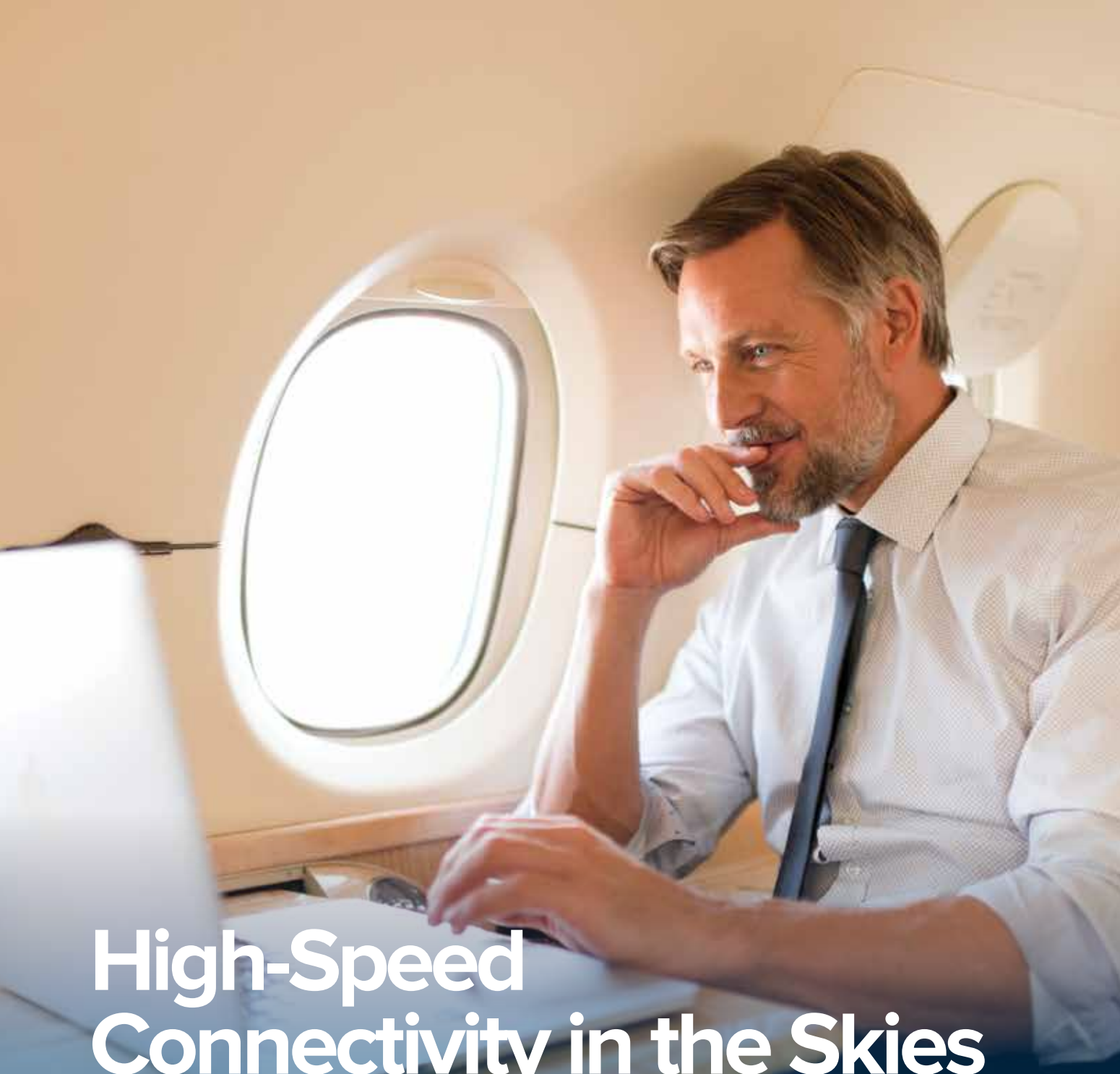
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# Hacked off

**Has the development of the connected aircraft and prevalence of PEDs left the IFE system an open gateway for hackers? Alexander Preston reports.**

“Any system that gets the attention of the hacking/research community will eventually be found vulnerable. There is literally an infinite number of ways to compromise any system. Organisations need to constantly monitor and test their systems in order to keep up with security issues. Moreover, organisations should assume compromise will happen and plan accordingly,” advocates Mike Ahmadi, global director – critical systems security at Synopsys, a software and security solutions provider.

Just before Christmas last year, IOActive researcher Ruben Santamarta published claims that he had found several vulnerabilities in Panasonic Avionics in-flight entertainment (IFE) systems and warned that such security holes could, under certain circumstances, be used to control in-flight displays, PA systems and lighting, access passenger credit card data as well as the wider aircraft network, including the aircraft control domain.

His were the latest in a series of such high-profile headlines, the most notorious being Chris Roberts, security researcher and founder of enterprise security assessment and consulting firm One World Labs. In a series of 2015 tweets and subsequent interviews with the FBI, Roberts admitted to ‘hacking’ into the communication system of a United Airlines flight he was on.

Despite finding a degree of succour in the mainstream press and other outlets, Roberts has subsequently been widely lambasted and discredited for his actions. In a written response, Boeing stated, “Media sources recently reported that a 737 passenger claimed that he used the aeroplane’s in-flight entertainment system to access certain flight control systems and alter the aeroplane’s flight. While we do not detail specific cyber-defence measures for security reasons, we believe, based on the aeroplane’s design, that this reported intrusion simply could not have occurred.”

However, there still persists a culture of ‘alternative facts’ around cybersecurity and the aviation industry, and threats do remain.

As Deloitte notes in its research paper, *Please Fasten Your Seat Belts: Managing digital risk to support aviation innovation*, “Traditional threats remain, but as the aviation industry reaps the rewards of technology innovation, the industry must also respond to an emerging and ever-evolving array of cyber risks. The consequences are no longer limited to data privacy breaches and compliance penalties. In the worst cases, cyber risks can threaten passenger safety and ultimately the viability of the organisation itself.”

A response has come at collegiate level. In December 2014, five major international aviation organisations – the International Civil Aviation Organization (ICAO), Airports Council International (ACI), the Civil Air Navigation Services Organisation (CANSO), the International Air Transport Association (IATA) and the International Coordinating Council of Aerospace Industry Associations (ICCAIA) – agreed on a common roadmap to align their respective actions on cyber threats.



The cybersecurity agreement formalises their common front against the hackers, 'hacktivists', cyber criminals and terrorists now focused on malicious intent ranging from the theft of information and general disruption to potential loss of life.

"Our common goal in developing this agreement is to work more effectively together to establish and promote a robust cybersecurity culture and strategy for the benefit of all actors in our industry," commented ICAO secretary general, Raymond Benjamin.

To better co-ordinate their actions and responses, the cyber agreement signatories will now be more proactive in sharing critical information such as threat identification, risk assessments and cybersecurity best practices. They will also be encouraging more substantial co-ordination at the state level between their respective government and industry stakeholders on all cybersecurity strategies, policies, and plans.

"As technologies rapidly evolve and become more readily accessible to all, cyber threats cannot be ignored," Benjamin stressed. "This is an important new area of aviation security concern and our global community will ensure that it is met with a strong level of commitment and response."

It may seem counter-intuitive, but this community also involves hackers themselves, and more and more companies are beginning to appreciate the value of bug bounty programmes.

Bug bounty programmes are an emerging category of crowd sourcing. Organisations

offer rewards to security researchers, who receive recognition and compensation for finding and reporting bugs, exploits and vulnerabilities in the organisations' websites and applications.

In December 2015, United Airlines became the first airline to launch such a programme. "We believe that this program will further bolster our security and allow us to continue to provide excellent service," the airline said in a statement.

#### BUG HUNTS

The programme covers the discovery of potential security bugs that affect United's websites, apps and/or online portals.

Then, at the beginning of February 2016, fellow Star Alliance member Lufthansa Group became one of the first aviation companies in Europe to face the challenges of a bug bounty program.

"Our websites are an attractive target for cyber criminals. Data theft and trafficking have become a lucrative business. We want our customers to feel comfortable trusting us with their sensitive data, and the security of our customers has always been our top priority. We already have very high standards to protect customer information and want to improve them even more with this bug bounty program. The topic of data security has a very high priority for the entire Lufthansa Group," says Andreas Dürkop, vice-president, IT security, of the Lufthansa Group. "The best possible protection for sensitive customer information is also a fundamental part of the corporate identity of Miles & More."

United was once of the first airlines to offer a bug bounty programme. It does not cover IFE systems.

The Group invited hackers and research centres to take part in the preliminary stage of the programme, hosted on the vulnerability co-ordination and bug bounty platform, HackerOne, which, once live, will encourage participants to hunt down vulnerabilities on [www.worldshop.eu](http://www.worldshop.eu) according to a predefined set of rules. Depending on the gravity of the reported vulnerability, a reward will be paid out in the form of Miles & More miles.

After a successful launch of the limited bug bounty program, every HackerOne user will be able to participate. The bug bounty program will later be expanded to include other Lufthansa Group websites.

As with United's bounty programme, despite recent concerns about the possibility of in-flight hacking of aircraft, Lufthansa's programme excludes bugs within on-board Wi-Fi, entertainment systems or avionics.

Even Gogo, a provider of in-flight internet and entertainment services, has focused its recently launched bug bounty programme on the security of the credit card transaction page.

The goal of the programme, which is hosted via Bugcrowd's crowd-sourced community, is to identify vulnerabilities in Gogo's ground-based public website and airborne systems, ensuring that Gogo's customers and employees are using a secure platform that's free of security vulnerabilities. For testing the airborne systems, researchers will only be able to access these systems while flying on a Gogo-equipped aircraft.

Gogo is reportedly offering between US\$100 and \$1,500 per bug.

But should more attention be paid to the IFE system as a weak link in the ecosystem?

In a strongly worded rebuttal to Santamarta, Panasonic said: "IOActive has chosen to make highly misleading and inflammatory statements suggesting that hackers could 'theoretically' gain access to flight controls by hacking into Panasonic's IFE systems. Panasonic strenuously disagrees with any suggestion by IOActive that such an attack is possible, and calls



# Wireless



## Bluebox Wow

Portable wireless streaming – lightweight, scalable, battery-powered, no mandatory STC.

## Bluebox Ai

Standalone portable IFE – optimised & approved for delivering pre-loaded EWC on iPads.

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## Bluebox wIFE

Fitted wireless streaming – 1,000's of hours of IFE content to passenger devices.

## Bluebox Hybrid

Connected portable IFE – provides secure EWC in a wireless cabin, minimises wireless network traffic.



# Portable



Looking for an IFE solution that is fast and cost effective to deploy?

**Portable IFE solutions** – Bluebox Ai and Bluebox Hybrid – provide airlines all the benefits of IFE on the latest off-the-shelf technology. Approved for pre-loaded early window content, they also deliver a range of other video, audio, reading and gaming content to passengers. Bluebox Hybrid connects to additional content and services available on wireless streaming systems.

**Wireless IFE systems** – Bluebox wIFE and Bluebox Wow – offer fitted and portable wireless options for streaming IFE content to both passenger and airline-owned devices.

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**Lufthansa Group recently launched a bug bounty for flaws on its shopping platform.**

with, or exceeds, all requirements, and are routinely and regularly tested by third-party professional security firms, as well as by participants in its independent bug bounty program, in which Panasonic provides unfettered access to its products to allow for in-depth security testing and analysis.

Panasonic also fully supports aircraft manufacturers and aviation regulatory agencies to ensure its IFE systems are designed to comply with all aircraft manufacturer and regulatory security requirements, and routinely reviews its designs with such groups.

upon IOActive to clarify that its research does not support any such inference.

“IOActive has presented no evidence that its examination of Panasonic’s systems would support any such suggestion, and its statement that its ‘research revealed it would also theoretically be possible that such a vulnerability could present an entry point to the wider network, including the aircraft controls domain’ will only serve to falsely alarm the flying public.”

### RED FLAGS

According to Stephen Gates, chief research intelligence analyst at NSFOCUS, a provider of enterprise-level network security solutions and services, Santamarta’s actions show that the “physical separation between in-flight entertainment systems and aircraft control systems could never be more important. As airlines continue to add new customer-based entertainment and information technologies, airlines need to ensure that an impenetrable barrier is in place protecting aircraft control systems. This research demonstrates that hackers could cause all sorts of issues that could impact a customer’s ‘experience’ while flying, but have yet to prove they could impact flight control systems. Let’s all hope that remains the case, long term.”

Such points were addressed by Panasonic’s statement. “It is important to note that, during the course of this unauthorised, in-service testing, the safety, security and comfort of passengers of the

aircraft were never in danger or compromised due to the system segregation and robust security design of our in-flight entertainment and communications (IFEC) product, and of all commercial aircraft as well. His exploit itself was limited to a single seat and information gathering; control override of the IFEC seat and system did not occur.”

Gates continues: “It’s not too far of a stretch to suggest that flight entertainment systems could even be hacked from the ground, via the internet access on the plane. If remote access was gained while the plane was on the ground, or by way of a hacker planting a backdoor via an infected device while in flight, hackers could cause all kinds of disruption that would not directly impact them – since they’re not even on the plane. Now that’s a scary thought...”

Alex Cruz-Farmer, vice-president at NSFOCUS adds, “Previous hacks and vulnerabilities have always been on the ground, but we’re now in the realms of something extremely scary – hacks in mid-air with no escape. The active threats will be growing, and with thousands of planes in the air, the remediation of this is going to be extremely complicated and time consuming. This will be a huge flag to all manufacturers to review their underlying platforms, and whether their integrated infrastructure has the necessary security around it to protect us, the passengers.”

For its part, Panasonic says its IFE products have a robust security design that complies

### SAFE AND SOUND

But Andrey Nikishin, head of future technologies projects at Kaspersky Lab, believes there is more the aviation industry can do. “I think there is a problem with cyber security in the aviation industry. Recent research conducted by IOActive proves this by revealing the reality connecting to the safety-critical avionics system of the plane via the in-flight entertainment system. This risk is another consequence of the current trend to connect anything and everything to the internet – in itself, connectivity is not a bad thing at all but that connectivity can only be a positive trend if the cyber security features are well designed and implemented.

“In my experience, I have seen a dangerous preconception among engineers who work in safety-critical industries such as aviation: they believe that safety and security are the same thing. In reality, this is completely the wrong approach; if a device is ‘safe’ it means it’s working properly and has normal functionality, protecting it against unintentional actions, but that doesn’t mean it’s automatically cyber-secure. Security protects against the intentional actions of a person who wants to misuse the device. A device is secure until new issues or vulnerabilities are discovered, meaning security needs to be maintained constantly. So, in the case of the in-flight system: is it safe? Yes. Is it secure? It was, until the problem was discovered, at which point it is no longer secure.” ■

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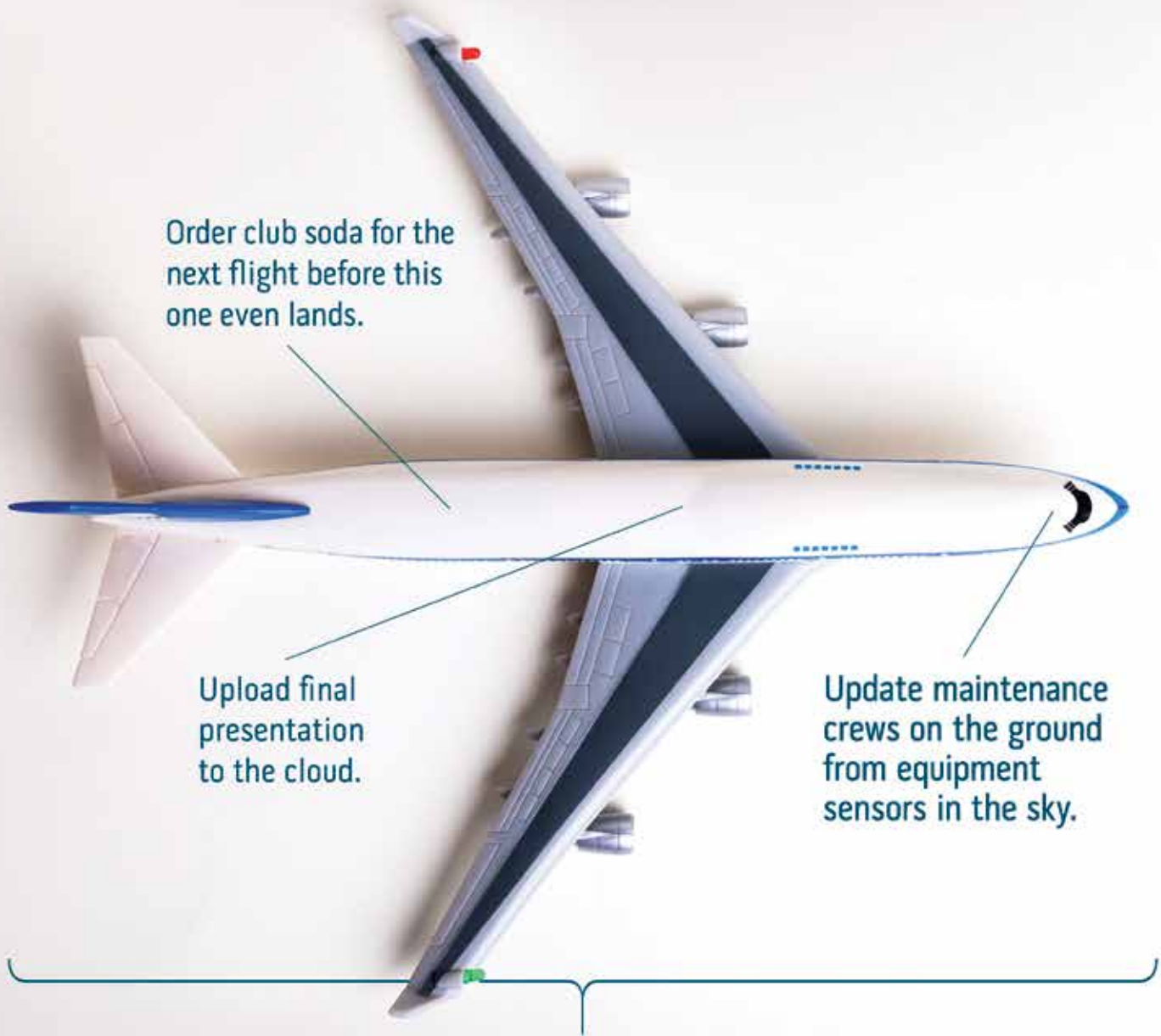
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# Time to deliver

**Joshua Flood of Valour Consultancy looks into the future of in-flight connectivity in Europe.**

In recent weeks, Valour Consultancy has been in discussion with a plethora of vendors about how in-flight entertainment and content markets are developing.

One of the potential key disruptors is the increasing installed base of Wi-Fi connectivity on passenger aircraft, quality of connectivity and the potential of video-on-demand offerings.

Conversations quickly turn to service operator offerings and their coverage in North America.

In the past, although satellite-based connectivity is now being widely adopted by European carriers, the conversation about service operator expansion and future airline adoption would become staccato and tended to splutter, before eventually mellowing to a slow, ponderous plod.

Nonetheless, with the advent of the strategic partnership between Inmarsat and Deutsche Telekom, and their European Aviation Network (EAN), things could change very quickly.

As such, Valour Consultancy aims to provide some clarification and foresight on this matter, as we do with most in-flight entertainment and connectivity (IFEC) and cabin technology related subjects.

## EUROPEAN AVIATION NETWORK

The EAN is a hybrid offering consisting of an S-band satellite, which will provide multi-beam, pan-European coverage, and a network of ATG cell towers.

The satellite is modified to offer mobile satellite services to commercial and business



**Inmarsat's European Aviation Network (EAN) combines an S-band satellite with a complementary LTE ground network being provided by Deutsche Telekom.**

airlines flying over the European routes, utilising Inmarsat's 30 MHz (2 x 15 MHz) S-band spectrum allocation in all current 28 European Union member states.

One of the unique aspects of the new network is the combination with a Long-Term Evolution (LTE) based ground network, which is a first in Europe for aviation purposes.

It is anticipated that 300 LTE sites will be built across Europe by Deutsche Telekom and Nokia.

Commercial operation is planned for mid-2017, with full European coverage expected by the end of 2017.

The LTE sites will have a range of more than 80 km, assumed not combined – eight times the ten-kilometre range of traditional LTE sites – and will be able to transmit data to the operating altitude of passenger planes.

Once the aircraft has reached 10,000 feet, Deutsche Telekom's ground network will be combined with the satellite connectivity.

Cabin systems will balance the use of the satellite and ground connectivity, which Inmarsat contends will not affect the service delivered on board.

In November 2016, Inmarsat announced that the International Airlines Group (IAG) had confirmed plans to install Inmarsat's EAN high-speed connectivity services on up to 341 of its narrow-body aircraft.

The first aircraft would be a British Airways Airbus A321 this summer.

Of the 341 short-haul aircraft, 132 can be attributed to British Airways, 124 to Vueling, 45 to Iberia and 39 to Aer Lingus. Lufthansa, which is rolling out Inmarsat's Global Xpress (GX) solution, has also committed to trial the EAN later this year.



**Air France-KLM has signed up to Gogo's 2Ku service.**

## OTHER AIRLINES

When talking about other airlines that may, potentially, install the service, we need to deliberate on the 'why', 'when' and 'how much' questions.

Certainly, airlines want to replicate the experience passengers have been accustomed to on the ground when hurtling through the air at 500 miles per hour, 35,000 feet above the ground.

Aside from a generally more satisfied passenger, the benefits of such high-speed connectivity include the potential to generate larger ancillary revenues, gain a greater level of understanding of their customer base, thus creating a more intuitive personalisation of passengers' likes and dislikes. This, in turn, may generate even further revenue opportunities.

Air-to-ground (ATG) technology is considered to be far more cost effective, easier to install and much smaller and compact than satellite equipment. To amplify this cause, bandwidth is also cheaper (although satellite capacity costs are falling quickly), and there are also latency advantages for ATG systems.

Valour Consultancy's belief is that low-cost carriers (LCCs) will grasp this opportunity with both hands.

One of the biggest LCCs in Europe, Ryanair, has previously stated a dislike for satellite-based connectivity solutions, one of the major reasons being the bulky radomes required for Ku- and Ka-band systems.

Some of the main issues are the weight of the antenna, air drag and consequential increase in fuel consumption – a big issue in past years, and potentially a big issue once again if oil prices increase. Another is the

high upfront costs associated with purchasing and installing such systems.

To put this into perspective, a Ku-band connectivity system might cost somewhere between US\$300,000 and \$500,000 to buy, install and certify, with the antenna accounting for a huge chunk of this sum.

The footprint of ATG systems are much smaller and more compact with blade antennas, four of which are generally required, estimated to cost somewhere in the region of \$2,400 each.

Due to its hybrid nature, aircraft connecting to the EAN will require both ATG antennas, and an S-band antenna – a factor that will increase installation costs compared to an ATG-only solution like Gogo's. However, it would still be more cost effective than a Ku- or Ka-band-based connectivity system.

## WHO AND WHEN?

Whenever performing the role of a maven and staring into one's crystal ball, it's important to map out the playing field.

Jotting down some quick calculations of the total available market on the back of a proverbial cigarette package, reminiscent of a famous scene in the cult football film *Mike Bassett England Manager*, where Ron Benson and Tony Hedges are called into the England squad for a crucial qualifier, Valour Consultancy estimates a total available market of more than 3,000 aircraft for the EAN as things stand.

Three hundred and forty-one of these are already assigned to the IAG group and there is the potential for a sizeable number of Lufthansa Group aircraft to also one day be fitted. But what of other major carriers in the region?

In Scandinavia, SAS and Finnair can be removed from the equation, having signed deals with ViaSat to fit Ka-band connectivity on their respective short-haul fleets.

Elsewhere, Air France-KLM has committed to deploying Gogo 2Ku on its long-haul aircraft, although a Global Eagle and Orange trial of Ku-band connectivity on a couple of A320s has now come to an end and could pave the way for a sizeable chunk of aircraft to join the network. Likewise, Alitalia's collection of 78 A320 family aircraft may also be up for grabs once the carrier completes roll-out of Panasonic IFC on its larger planes.

Other notable candidates could include TAP Portugal, LOT Polish Airlines and Aegean Airlines, as well as the previously mentioned notoriously cost-conscious LCCs. Between them, Ryanair, easyJet, Wizz Air, and Pegasus Airlines operate some 769 aircraft that are seemingly well suited to the EAN and all have ambitious fleet expansion plans in place.

Scrying through the haze, I foresee a major announcement from one of these airlines before the end of 2017. One with a logo resembling a Guinness looks a good bet. Could a touch of orange appear on the horizon by the end of 2020?

It should be noted that we're working under the assumption that twin-aisles will not adopt the EAN, unless of course airlines are also interested in GX. Inmarsat has talked about the possibility of airlines being able to switch between GX and the EAN, should they wish to do so.

All things considered, a reasonable assumption could see an installed base of at least 2,000 aircraft being realised in the not-too-distant future. Gogo has already demonstrated how ATG connectivity can be deployed rapidly, and the conditions exist for a healthy number of target aircraft in this region to be fitted out with similar equipment in a comparable timeframe. One thing's for sure, in-flight connectivity is no longer a conversation that centres on the North American market. Things are hotting up all over the globe and Europe is set to take centre stage. ■

# Let's talk about the future TODAY

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Aeronexus's B767-300ER has recently concluded a five-week Asia Pacific tour with the rock band Guns N' Roses.

# A better way to fly

**As Aeronexus celebrates the first anniversary of its Boeing VIP 767-300ER, Alexander Preston finds it really is a rock-and-roll lifestyle.**

**Founded** by former aircraft engineers Gavin Harrison and Sven Petersen in 2001, Aeronexus's original remit was to manage a Presidential Boeing 727 on behalf of a Head of State. This was a turnkey solution and included flight operations, maintenance and accounting, all of which were performed in house. In fact, holding Airline Transport Pilot Licences, Harrison and Petersen have flown for a wide range of airlines over the decades and today they continue to occasionally fly as captains, supported by a dedicated operations team.

In January 2010, the South Africa-based company expanded its operations to include two B767-200ER aircraft, one in an all-economy 220-seat configuration and one in a configuration of 100 lie-flat seats.

In 2012, the Boeing 727 was taken out of service and the all-economy Boeing 767 sold while the 100 seat VIP Boeing 767-200ER was relocated to London Stanstead Airport, UK to meet the growing demand in the European long-haul VIP market.

The VIP Boeing 767-200ER was replaced by a VIP Boeing 767-300ER by late 2015,

offering more space and comfort as well as an increased 6,500 nm range, enabling a London to Rio nonstop flight.

Based at the 24/7 Diamond Hangar at London Stansted since its arrival into service, the B67-300ER is perfectly located to serve the needs of Aeronexus' customers. Some 60% of the company's flying originates from the London area, with around 20% operating out of Manchester and Liverpool, and the remaining 20% from elsewhere in Europe.

Each charter is seen as a bespoke event. "We work closely with each client to ensure that their private jet charter is tailored to their exacting requirements. Our aircraft becomes yours for the duration of the charter and the only limit is your imagination," the company says.

In a first-of-its-kind project, Starling Aerospace transformed the B767-300ER from a passenger configuration to a corporate VIP layout, in just six weeks.

The aircraft was completely stripped, refurbished and refitted with 96 lie-flat Sicma Zodiac seats in a six-abreast layout.

Upholstered with cream leather, each seat now offers a 73-inch seat pitch and in-seat power for clients' laptops, phones and tablets.

During this project an AdonisOne XR + in-flight entertainment system was installed, enabling passengers to watch a selection of



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The aircraft was fully refurbished in early 2016 and fitted with 96 all-leather first-class lie-flat seats.

more than 90 movies, listen to music, read magazines and follow their flight on the live route map – all using their personal electronic devices. AdonisOne avoids the need for pre-installed apps or software, as the content is delivered using an in-cabin server and Wi-Fi router. The system offers the ability to stream up-to-date content and a real-time moving map. Up to 20 users can access the content on the AdonisOne via the unit's built-in Wi-Fi signal. Any smart device can connect to AdonisOne, which is controlled via an HTML 5 web user interface, and passengers can change destination information for the moving map using their devices. A lithium-ion battery provides up to eight hours of viewing time and 15 hours of standby time.

In response to customer requests a divan was also created, which converts to a comfortable bed in a discreet, divided area to the rear of the forward cabin. This area has its own private washroom facilities, allowing principal clients the utmost privacy to hold meetings, work or sleep.

"Client response to the Aeronexus offering has been extremely positive," explained Gareth Evans, head of sales and marketing. "These past 12 months, our B767-300ER has flown to numerous new destinations, including Buenos Aires, Auckland and Wellington. This year, some more exciting assignments are coming up, including charters to the Far East and the US for Premiership football teams, plus a 23-day tour of South America, Cuba and the Falkland Islands on behalf of Prestige Holidays.

"We attribute this success to our attention to detail and proven experience in the wide-

body market, having incorporated our first B767 model in 2010."

Such detail was evident in 2013, when the operator partnered with IFE Services (now part of Global Eagle), to provide PlayStation Portables (PSPs) for VIP passengers to enjoy.

Each device was preloaded with a selection of popular Hollywood movies, TV shows and best-selling games.

"We hope Aeronexus's VIP passengers enjoy using their PSPs to help them relax before their next football match or stage show," said Andy McEwan, CEO of IFE Services, at the time of the announcement. "The PSP is a lightweight, robust portable entertainment system, ideal for in-flight use."

### CELEBRITY CLIENTELE

The 767 has recently concluded a five-week Asia-Pacific tour with the rock band Guns N' Roses, with its exterior resplendent in a bespoke livery for the occasion. The tour itinerary has seen the B767-300ER visit Tokyo, Wellington, Auckland, Brisbane, Sydney, Melbourne, Adelaide, Perth, Singapore and Bangkok. The final date saw the aircraft arrive into Dubai World Central (at the Dubai South FBO) before returning to its home at London Stansted Airport on

2 March 2017. Aeronexus worked closely with charter broker Premier Aviation (UK) to ensure every sector and component of the trip went smoothly.

Clients that have enjoyed the Aeronexus B767-300ER's luxury offering over the past 12 months include Captain's Choice, which chartered the aircraft for two 23-day tours of South America (one from the UK and one from Sydney); and Liverpool Football Club, which undertook an 18-day tour of the US.

The on-board service is decided very much in conjunction with the charterer of the aircraft. Each of the operations has a flight manager on board, ensuring smooth travel throughout. He/she will direct the six-member cabin crew – serving first-class meals, whether breakfast, lunch, dinner or snack.

Furthermore, the flight manager acts as a liaison between the airline and charterer. All meals are served restaurant style, brought out course by course to the seat, with fine china and cutlery. Tray service can also be provided if preferred. In each location the flight manager will work with local catering companies to ensure a good choice of meals is made available. Naturally, special dietary requirements are catered for.

Meals can be accompanied by a selection of drinks choices, including – if requested – fine wines and champagne. Premium liqueurs, spirits and soft drinks are also available at any time, as is a selection of coffees and teas.

As the company says, "We make a bold statement. We say that 'Aeronexus is considered to be one of the most respected private jet charter airlines in the world' – put us to the test; we know you won't be disappointed." ■



A leather couch converts to a bed in a discreet, private screened-off area aft of the cabin.

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ALTO Aviation was recognised as Gulfstream Supplier of the Year for 2015.

# Aural delights

**Alexander Preston talks to ALTO Aviation as the company celebrates two decades of providing innovation in the cabin audio experience.**

**I**t began in Massachusetts in 1997, with the simple but ambitious aim of providing each customer with the most powerful listening experience available at 40,000 feet. Under the stewardship of founders Don Hamilton and Steve Scarlata, ALTO Aviation, which this year marks its 20th anniversary, has become synonymous with premium cabin audio and entertainment systems for business aviation.

Hamilton, ALTO's president, explains, "Prior to starting ALTO, Steve and I were both audio system engineers at Bose designing custom sound systems. After starting ALTO, Bose contracted us to provide engineering support and to manufacture audio systems for Gulfstream, which were designed while we were at Bose. Bose exited the business and ALTO worked with Gulfstream to provide a new audio amplifier, which has been standard equipment since 2001. We then expanded our product offering to complete audio systems and are now on OEM [original equipment manufacturer] models from Gulfstream, Falcon, Embraer, Textron, Sikorsky, and Honda."

In 2000, Bose endorsed ALTO Aviation as the preferred audio system supplier to the business aviation industry.

Currently, there are thousands of aircraft flying with ALTO products, ranging from small turboprops up to private 777s. "Our product line has expanded to full surround-sound systems, standalone IFE systems, PA systems, and our new Cadence Switch System (CSS), which can replace obsolete cabin management systems with minimal to no woodwork changes," says Hamilton.

The new CSS is designed to include modular discrete switch assemblies to control speaker and headphone audio. Additional modules are also attached within the same custom bezel housing for cabin lighting control and video source selection. An AUX audio input and USB charging port are also included in the switch panel configuration.

All ALTO Aviation systems are designed, engineered and manufactured in the US and distributed worldwide, as Hamilton elucidates. "Over the past couple of years, we have been investing heavily in both engineering and infrastructure. Our engineering staff has grown to allow us to support a broader product line and expand our research in new areas. Our Massachusetts (Sterling) and Florida (Jupiter) facilities have grown to 45,000 ft<sup>2</sup>

and we now have machining and sheet metal fabrication in house. We pride ourselves on listening to our customers and these investments are to directly support new products that they have asked for. In the past few years it seemed that products for the cabin were trying to do everything possible for all customers, making the system extremely flexible, but also very complicated. The trend we are seeing now is that customers seem to want products that are simple, easy to install, and are very reliable."

The internal investment mirrors the company's ongoing commitment to quality. According to Scarlata, vice-president of engineering/research and development: "When we originally started producing audio equipment for aviation the industry requirements were far less strict. It was not unusual to find car stereo or home audio equipment being installed in the cabin. As the years progressed testing and qualification requirements have constantly tightened. ALTO has always managed to stay comfortably ahead of our most demanding customer's requirements. Last year [May 2016] we received AS9100 certification so we are comfortable that we can easily comply with anything the industry requires."

ALTO Aviation's Quality System was already compliant to AS9100, and FAA approved. Adding AS9100 Rev. C



certification strengthens its competitive position and standardises quality processes across the company. The AS9100 Rev. C certification, issued by SAE International, is the highest of global standards for quality assurance in the aircraft, space and defence industries and AS9100 Rev. C is the most current standard. The standard provides manufacturing suppliers with a comprehensive quality system for providing safe and reliable products.

Delivering the highest level of sound performance at 40,000 feet, that is the equal of a home experience, is a science in itself. Conventional home type surround decoder systems are not optimal for the aircraft cabin. They are designed for a large living room where the seats are centred amongst the speakers, which can't be done in the aircraft.

Implementation of conventional type surround decoding in the cabin results in severe compromises for most of the passengers. Using proprietary decoding techniques, ALTO has created the ALTO nVELOP Digital Surround System to provide true surround sound for all passengers.

Every ALTO audio system is custom designed and acoustically contoured specifically for each cabin installation. "Prior to aircraft delivery, an audio engineer visits the aircraft and customises the sound profile to maximise the performance of the system. Elements of the cabin can impact the sound, including seating, furnishings, leather, carpet, grill material, etc. The tuning process compensates for these constraints to ensure

the most powerful listening experience for the VIP and every passenger in the cabin," says Scarlata.

The altitude doesn't directly affect the sound quality since the speed of sound remains unchanged in spite of the reduced cabin pressure. However, says Scarlata, background noise is the main issue. "ALTO has recordings of various aircraft cabin noise at various locations. In our engineering office we have a simulated cabin where we play the noise recordings at accurate levels to study the resulting impact on sound quality. This data is taken into consideration when we tune each system to ensure it sounds great under all conditions."

#### INTERNAL INVESTMENTS

The company's state-of-the-art research and development facility in Florida houses a testing lab, further supporting in-house DO-160 testing and TSO certification testing. An aircraft cabin mock-up is in place for use in advanced acoustic research. The facility also houses an electrical RF screen room to be used for EMC evaluation and certification testing on new product designs.

The lab has developed sophisticated proprietary design software, as well as custom-designed speakers and electronics, specifically created to optimise each audio system. ALTO's innovative design approach involves the complete acoustic mapping of the aircraft cabin, careful selection of system components, and guidance in optimal cabin installation.

ALTO Aviation is offered as standard equipment across a number of aircraft platforms, including Gulfstream, Embraer, Cessna and Sikorsky.

The proprietary surround decoding process takes into account off-centre monitors and seating, including frontal sound imaging with rear surround for forward- and aft-facing seats.

This processor has been designed exclusively with the challenges of the aircraft cabin in mind. In addition to providing the theatre feel for video, the decoding used by ALTO can enhance music recordings with no switching needed.

#### GULFSTREAM ACCOLADE

ALTO's relationship with Gulfstream continues to strengthen. ALTO sound systems are standard equipment in Gulfstream G650, G450/550 Elite Series, and G280 aircraft.

In June 2016, Gulfstream Aerospace recognised the company with a prestigious Gulfstream Supplier of the Year award for 2015. The Supplier of the Year award is given for outstanding support to Gulfstream's growing operations. Gulfstream issues these awards bi-annually to recognise suppliers who have achieved superior performance. Award selection is based on the Gulfstream Supplier Report Card measurement criteria, which tracks overall value, delivery, quality, customer service and compliance for select Gulfstream suppliers

As Hamilton notes, "Receiving this award from Gulfstream is a great honour and I'm extremely proud of our entire ALTO team, which makes great efforts to go above and beyond to support our customers and provide the best products possible. This is extra special for us since it was Gulfstream that gave us our start in the industry. Even though we were just a tiny company back then, they gave us the opportunity to design a new innovative product for them. They worked with us to get our quality system in place and showed us what it takes to support customers in this industry. We work very closely with both Gulfstream OEM and Service to provide aircraft with amazing audio quality and our new CSS to support older aircraft with obsolete cabin management systems." ■

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Ameco's ACJ319 VIP interior was inspired by the traditional Chinese ink-and-wash landscape paintings of the Song dynasty.



**Alexander Preston looks at some of the submissions representing business aviation at this year's Crystal Cabin Award.**

**While** its commercial aviation cousins may get all the plaudits, innovation has not been idle in the business aviation community. This year's Crystal Cabin Award submissions range from complete cabin systems to innovative individual components and materials.

First up is the Sky Blue Boeing Business Jet (BBJ) 787, the result of a collaboration between Paris-based yacht and aircraft design specialists Pierrejean Design Studio and US-based Kestrel Aviation Management.

Unveiled in Geneva, Switzerland, at the 2016 European Business Aviation Convention and Exhibition, Kestrel Aviation Management has had total turnkey

# Innovation by design

responsibility for this first true BBJ 787 from original concept, purchase, design, and modification through to delivery to the end user. The aircraft was sold by Kestrel Aviation Management in summer 2016 to an undisclosed buyer. This 2,400-square-foot, 40-seat (with 28 flat sleeping facilities available) corporate aircraft has an almost 9,800 nautical mile range and the ability to fly over 17 hours, non-stop between almost all major cities on earth.

The master suite has a California king-size bed with a floor-to-ceiling headboard, a hidden 42-inch TV monitor, and a separate bathroom with an oversized shower. The aircraft also has a large dressing room, a refreshment centre with fridge freezer and an open-plan lounge configured for 16 people and is designed for meetings and entertaining guests. It also has tablet-controlled technology throughout, with Wi-Fi hotspots and broadband data transfer capabilities.

## business aviation



The main lounge of Kestrel Aviation's BBJ787.

The aircraft was the first built in full compliance with the BBJ 787 specification. According to Stephen Vella, CEO of Kestrel Aviation Management, "As we did not have an end user identified, we were obliged to become a curator of a client's needs and wants on an ultra-long-haul corporate aircraft. Our primary aim was to minimise the physical toll that a passenger would suffer on an aircraft that is capable of 17-hour flights. To achieve this, we needed to push the frontiers of luxury, bespoke aircraft cabin design. The challenge was ensuring that these concepts were compatible with the unique structural characteristics of the carbon-fibre 787."

Given the ultra-long-range capability of the BBJ 787, the design concept needed to convey a feeling of zen, an oasis of peace, with soft earth tones, uncluttered flowing lines with the absence of sharp edges, good control of natural and artificial mood lighting. "To the touch, we wanted a design that felt organic with surfaces that invited emotional as well as physical connection. Noise and vibration were addressed with extensive soundproofing," says Vella. The cabin design was optimised for long-haul flying and comprises zones that reflect the requirements of government, corporate and high-net-worth principals, such as privacy with discreet guest and staff segregation.

As Vella notes, "No-one has project-managed a high-end VVIP BBJ 787 modification prior to this. This pioneering project has the benefit of Kestrel's prior technical experience on airliner 787s since 2004 and the modification of several large VVIP/head of state aircraft resulting in an exceptional cabin that was on time, largely on budget and below the weight target on a

carbon-fibre, all electrical wide-body aircraft."

Elsewhere, the creation of Ameco Beijing's VIP and Business Jet Services centre, the ACJ319 VIP Interior Design 'Ink-and-Wash Landscape' will be built and completed by 2017 as a full-size, in-house mock-up, functioning as a design and craftsmanship showcase.

This aircraft cabin features a master bedroom with a bathroom and shower, a VIP lounge with a five-seat divan and a club two-seating, followed by a large guest area with eight individual mini-suites and a guest bathroom. The interior was designed for ten passengers, in compliance with general principles of airworthiness, durability, ease of maintenance, and ergonomics.

The design team has aimed to create a unique, modern Chinese-style cabin, inspired by the traditional Chinese ink-and-wash landscape paintings of the Song dynasty. As Li Ping, senior aircraft interior designer notes, "The ACJ319 cabin is just like a continuous scroll painting, filled with

poetic and pictorial splendour," with images of scenery scattered throughout the cabin. "The style, colours and textures feature an unprecedented elegance."

### DESIGNER LUXURY

In another inventive cabin design, the Mercedes-Benz Style VIP Aircraft Cabin developed by Lufthansa Technik claims to offer a new dimension of private air travel by featuring an innovative design, combined with the latest communication and interior technology throughout the aircraft.

Conceived by Mercedes-Benz and Lufthansa Technik, the VIP Aircraft Cabin is a totally new cabin design. The design philosophy of 'sensual purity' creates pure, sensual forms and surfaces that showcase high-end technology while radiating emotional appeal.

In the front it features a welcoming entrance, a galley for live cooking and a VIP lavatory. In the aft part of the cabin an entertainment zone has been combined with the en suite private area including a free-standing shower with transparent side walls. The luxurious king-size bed is highlighted by the concave and upholstered head wall. The unique helix structure – a dynamic spiral layout – is the central design theme extending throughout the aircraft from the entrance all the way to the bedroom. This creates new, independent spatial zones

Mercedes-Benz Style VIP Aircraft Cabin. A blend of high-end technology and fine detailing.

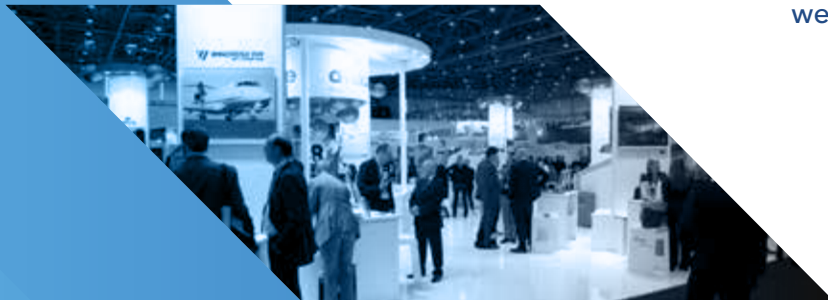


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# Inflight

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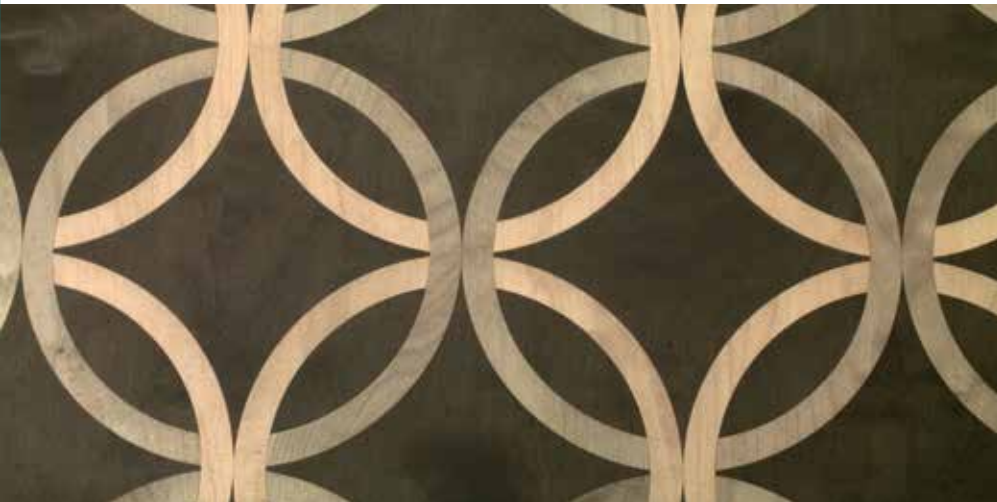
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**Air-Craftglass's Natural Collection offers designers a range of finishing touches and designs.**

parts with 3D geometries, in order to eliminate cold spots.

LITEHEAT relies on Villinger's unique heating technology, which utilises customised semi-conductive polymers that are applied on cabin surfaces as an ultra-thin heater layer (less than 0.2 mm thickness and less than 150 g/m<sup>2</sup> added weight). This layer emits heat when electrical power is applied with various suitable voltages.

Matching the exact shape and 3D geometry of the interior part, the applied heater layer creates a homogeneous heater surface which, depending on customer requirements, emits either infrared radiation heat or contact heat, and may be covered with several kinds of finishing materials.

While generating a much more comfortable environment in the cabin, LITEHEAT is also characterised by a lower power consumption and numerous other advantages compared to conventional engine bleed air systems.

The winners of the Crystal Cabin Awards 2017 will be formally announced on the evening of 4 April at a gala dinner in the Hotel Atlantic Kempinski in Hamburg. ■

without the typical arrangement of lining and wall elements. The aircraft is designed for 16 VIP passengers.

Both companies have been working on the design of this innovative, luxurious and integrated cabin concept since the announcement of the co-operation at EBACE in Geneva, Switzerland in May 2015. Led by Lufthansa Technik's engineering team, the designers have updated the initial design concept to fully match the requirements of airworthiness and certification.

#### CABIN CONTROL

On the materials front, F/LIST heated stone flooring is the first fully certifiable real stone flooring with integrated heating for aircraft cabins. It combines the comfort of underfloor heating with all the advantages of stone flooring – durable, easy to clean and the sophisticated appearance of 11 different available stone types – in a space- and weight-saving product for aircraft cabins. Fast heat-up time, an ingenious fastening system that guarantees easy installation and maintenance, and the additional services offered by F/LIST make this product a true innovation in the business and private aviation industry.

A newcomer, aviation glass specialist Air-Craftglass, has developed the 'Natural Collection' – a new technology for laminating lightweight and ultra-thin glass.

The technology enables cabinet makers and installers to create a bespoke aircraft interior from a palette of approximately 500 different real wood veneers. As an extra option, the company can laser cut the veneers to produce a variety of patterns.

Due to the patent-pending laminating technology, Air-Craftglass is able to

laminating ultra-thin real wood, with a thickness of just 0.2 mm, on one or two sides with ultra-thin, chemically tempered and scratch resistant glass.

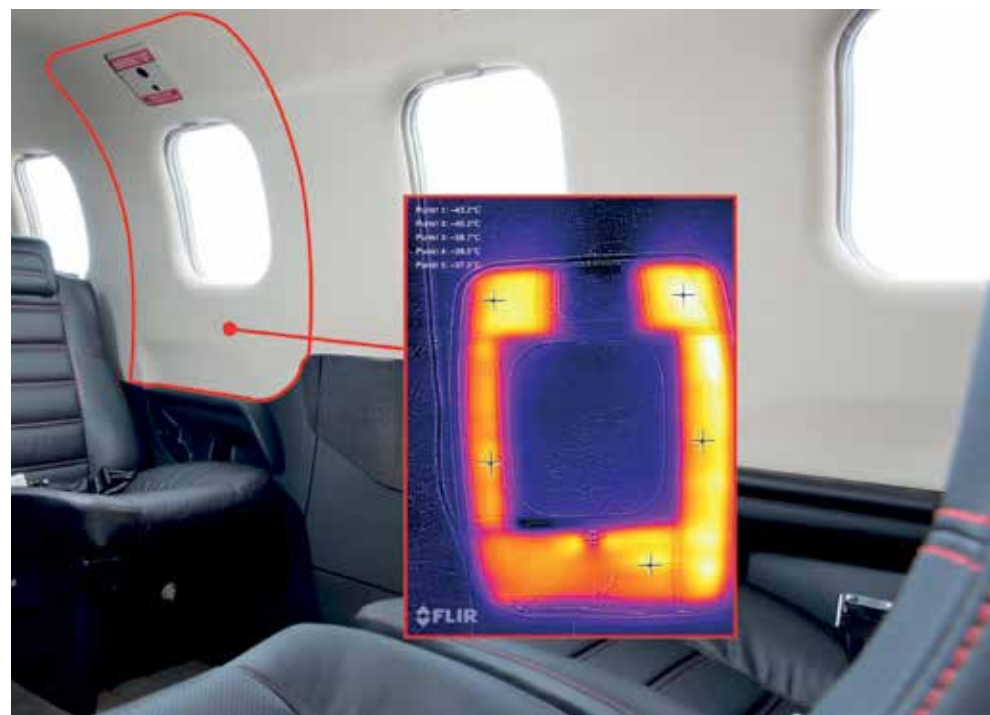
The final result is a high-end glossy or matte finish and an absolutely flat surface, which is scratch resistant, easy to clean and UV resistant. The panels are custom made and ready to install.

This not only helps furniture makers save cost, but also reduces the cost of ownership due to their reduced weight, supply chain costs and durability.

Finally, we have the LITEHEAT cabin heating systems from Villinger.

LITEHEAT offers a unique, lightweight, energy-efficient cabin heating technology, which may be adapted to many surfaces in the cabin, such as walls, ceilings, floors and

**Villinger's LITEHEAT provides a more controlled heating environment on board business jets.**



# THE LAST WORD

## Bhoopathi Rapolu navigates his way towards a 'connected aircraft'.

In the increasingly competitive market, savvy customers are continuously looking for a better passenger experience and lower costs from the multitude of airlines. As a result, this pressure is passed down the supply chain to manufacturers, with airlines looking to make cost savings to balance their books. Tier one suppliers are therefore constantly having to innovate and reduce their operational costs.

To combat these demands, tier one suppliers are turning to the digital economy for answers. While new technologies continue to positively impact isolated areas and operations, linking these through digital transformation is the next frontier, leading the industry closer to the possibility of the 'connected aircraft'.

### CONNECTED SUPPLY CHAIN

Traditionally, innovative manufacturing techniques have been geared towards improving isolated processes, such as enhancing component design.

We can see this in practice when looking at the Boeing 787 Dreamliner, which has about 2.3 million parts that are manufactured on five continents, across 12 countries, in 135 partner locations. Changes in the manufacturing of a single element could have knock-on effects throughout the supply chain, so collaboration and real-time visibility across the entire network is paramount to ensuring smooth production. With the innovative connectivity solutions available today, suppliers can predict future supply chain failures, identify where in the chain this is likely to happen, and implement appropriate preventative measures.

This represents a major cultural shift for an industry where airlines, OEMs and suppliers each hold sensitive information and intellectual property. But, as tier one suppliers continue to see the value of connection, they are pushing for their supply chains to widely adopt associated technologies, such as cloud and big data analytics. When executed effectively, this connectivity can have a dramatic impact. For example, Boeing's development of the airframe for the 787 (and 777) used collaborative virtual design to slash time to market by more than 50%. By connecting the supply chain through digital transformation, manufacturers can achieve both cost and time benefits, with more transparency at every point of the network.

### REVOLUTIONISING THE AFTERMARKET

Another area where digital transformation can have a sizeable impact is MRO and the aftermarket. Digital solutions are at the centre of this, with the modern aircraft producing upwards of half a terabyte of data per flight.

Sifting through this information to uncover useful, actionable intelligence is crucial, as data-driven decision making, when applied to traditional maintenance procedures, drives efficiencies, improving and even preventing costly operations as a result.

A practical example is seen in predicting maintenance requirements. Using data transmitted from sensors throughout the aircraft systems and subsystems, in line with pre-programmed safety parameters, maintenance crews can foresee the



Bhoopathi Rapolu is head of analytics for Europe, the Middle East and Africa at Cyient, where he is responsible for business development, technology solutions and customer engagement.

requirements of an asset before an incident occurs. As this technology develops we'll soon have the ability to stream this information in real time, while the plane is in flight, so teams on the ground will have sight on immediate maintenance requirements, and can be ready with the appropriate solution before the plane has even landed for inspection.

While the application of this technology holds huge potential for the MRO industry, when this is scaled up through connected technologies the benefits are further amplified, looking not just at the individual component on a single plane, but applying this intelligence at a fleet level. By combining sensor data with maintenance records and operational records, field event reports, and other information collated from MROs, airlines, general industry benchmarks, field representatives, and systems, aerospace companies can continuously optimise fleet maintenance procedures and reduce the time that any part is out of action.

By developing this 'digital tapestry' of connections throughout the supply chain, with insight across concept design, manufacturing, operations and aftermarket care, tier one suppliers can help their supply chains work better for them. The 'connected aircraft' of tomorrow will be an assembly of digital innovations, fully integrated through intelligent manufacturing and MRO supply chain networks; delivered faster and more efficiently than ever before. ■

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