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Cover: Rosen Aviation's Maverick cabin concept is a finalist in the International Yacht & Aviation Design Awards 2021. See OLED feature – A coming of age? – on page 44. Image courtesy of KiPcreating.

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Alexander Preston Editor

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Private prospers

Recent remarks by Alexandre de Juniac, Director-General and CEO of IATA, paint a gloomy picture of the financial health of the world's airlines.

The organisation is predicting that airlines will not turn cash-positive until 2022, burning through an additional US\$75–95 billion this year.

If this prospect is indeed the darkness, as de Juniac says, the dawn may be with business aviation.

While commercial airlines have lost around 55% of their flight volume due to the pandemic, entry-level jet operator GlobeAir saw its new accounts base grow by 89% during 2020 and has already registered a 17% increase in inquiries during January this year.

“This trend may be due to the growth of converters and downgraders. The first being frequent flyers who have switched to private jet services (converters); the latter being private jet travellers who now prefer entry-level jet services (downgraders),” says GlobeAir’s VP of Marketing & Sales, Jonathan Berdoz.

Private air charter specialist Air Partner expects private travel to continue to grow in popularity as the preferred method for transport, whether individually on private jets or groups on private commercial airliners. It is already fielding enquiries from wealthy clients about private jets to luxury destinations, including the Caribbean (including Barbados, Cuba, and St Lucia), The Seychelles, Iceland and Italy.

Air Partner also believes senior business executives and the C-Suite will continue to travel as high-level face-to-face meetings remain critical – and when they do, companies will choose to protect their safety by flying them privately. The operator also predicts that for businesses moving large groups around the world, the use of charter planes will be more prevalent.

Of course, all this is predicated on travel restrictions being lifted. In the meantime, as our issue shows, the industry is preparing for the return of all passengers.



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Partnership to design the next-generation aircraft seats

Italian seating manufacturer Geven is set to overhaul its catalogue of seating products, with the introduction of a new family of seats.

In collaboration with UK design agency PriestmanGoode, the seats – Economy, Premium Economy, Premium Economy + and Business Class seats – are

scheduled to be unveiled at Aircraft Interiors Expo in Hamburg, 31 August - 2 September 2021.

According to the partners, the project aims to provide Geven

with a distinct design language driven by the key attributes of being functional, timeless, clean and sculptural.

The new seats will provide Geven with a versatile offer that will enhance the passenger experience, are easily configurable for different aircraft platforms and allow for airline customisation.

Daniel MacInnes, Design Director at PriestmanGoode, said: "We're delighted to be working with Geven on this project. It's very much a collaborative partnership, with our team of designers working closely with Geven's engineers to develop this next generation of seats.

"The designs we're working on build upon the brand's strong history, as well as Italy's outstanding heritage of exquisite craftsmanship and timeless design," MacInnes added.



Art of darkness: All will be revealed by Geven and PriestmanGoode at AIX Hamburg in August.

Qatar Airways upgrades its 787-8 IFE experience

Qatar Airways has upgraded its current fleet of Boeing 787-8 Dreamliners with the Thales AVANT in-flight entertainment (IFE) system.

The retrofit installation was conducted without disrupting the utilisation of the fleet and minimising downtime.

Thales developed an upgrade programme to adapt the existing legacy system to incorporate new AVANT screens and servers into the existing seats and aircraft infrastructure.

The turnkey approach includes delivery of full seat modification,

hardware and all required certifications, as well as the ability to leverage media integration commonality across the Qatar Airways' fleet equipped with AVANT.

Business-class passengers will be able to enjoy new 17-inch Full High Definition touchscreens, with the main cabin featuring 12-inch seatback displays.

Qatar Airways will also benefit from high-capacity servers capable of storing over a terabyte of media content, including the latest HD movies, TV show episodes and music collections.

Catering guidelines offer a route through pandemic

New guidance that leads and supports the airline and airline catering industries worldwide as they continue to respond to the COVID-19 pandemic has been announced by The International Flight Services Association (IFSA) and the Airline Catering Association (ACA).

The ACA/IFSA COVID-19 Guideline introduces several guiding principles which provide direction on managing the COVID-19 pandemic and to support safe business operations including at airports, airlines, in kitchens, and on

aircraft. The document highlights and gives guidance on the ways in which individual locations and situations can best be re-engineered to meet the updated health safety standards. This document, which supersedes the previous guidelines released shortly after the start of the pandemic, serves to guide mitigation based on risk assessment for catering kitchens and airline in-flight services globally.

IFSA and ACA have made the guidelines available online and free of charge.

PC-24 now comes with 10-seat commuter interior



Pilatus PC-24: Looking forward with new 10-passenger commuter configuration.

✎ Pilatus is now offering a commuter configuration of its PC-24 for up to 10 passengers. Each seat is installed with a quick-release mechanism allowing

easy cabin reconfiguration for all transportation requirements.

The cabin features a private lavatory which can be serviced from the exterior and whose

lavatory seat is not used as a passenger seat.

Seat pitch in the commuter configuration varies from 34 inches (86 cm) to 40 inches

(102 cm). Each seat features a side storage compartment and cup holder and four 115-volt power outlets to enhance in-flight productivity. The PC-24's entirely flat floor also adds to comfort on long trips.

A customer in the western US has taken delivery of the first PC-24 with this configuration.

Ignaz Gretener, VP General Aviation of Pilatus, commented: "We expect this configuration will prove very popular with both public and private operators requiring a cost-effective solution for frequent transportation of passengers as an alternative to sending them on the airlines."

IFC report reflects impact of COVID-19

✎ A new aviation industry report highlights the full impact of the COVID-19 pandemic, including the cancellation of retrofit projects and delayed deliveries of new aircraft, on the number of aircraft installed with in-flight connectivity (IFC).

Over the next two years, "The Future of In-Flight Connectivity – 2020 Edition," from HMG Aerospace's exclusive market intelligence partner, Valour Consultancy, predicts a doubling from 9,026 at the end of 2020 to approximately 18,500 in 2029.

"The pandemic has caused airlines to defer new widebody deliveries, postpone IFC retrofit programmes and to retire older aircraft in favour of smaller, more agile and fuel-efficient planes. Despite this, low-level activity is still expected, with 70% of net new IFC installations between now and 2022 to take place on narrowbody jets," explains the report's author,

Daniel Welch. The majority of these IFC systems will be line-fit.

The study looks beyond COVID-19 and provides detailed commentary on factors that will help to create a more sustainable IFC business model as the industry begins to recover, as well as exploring the "captive portal".

According to Welch: "In the past, passengers flying with an airline that has multiple IFC services in use across its fleet have typically been exposed to the nuances of these deals, paying different rates based on the hardware/service onboard, be it from Gogo, Inmarsat, Panasonic or Viasat. Having a harmonised experience reduces friction during the login process, but also drives ancillary opportunities. Deploying an engaging portal is an achievable short-term win for carriers that already have IFC or wireless IFE that will continue to drive long-term growth."

Lightspeed LEO network unveiled

✎ Thales Alenia Space has been selected to manufacture Telesat's global LEO constellation, Lightspeed, initially comprised of a fleet of 298 next-generation satellites integrated with an advanced ground network.

Lightspeed has been optimised to serve the fast-growing broadband connectivity requirements of many users, including aviation.

Thales Alenia Space and its affiliate Telespazio have made a Lightspeed capacity commitment in connection with the agreement. Operating under Telesat's global Ka-band priority spectrum rights, the first Lightspeed satellites are

expected to be launched in approximately two years, with customer beta testing beginning shortly after that and commercial services commencing in the second half of 2023.

Dan Goldberg, President and CEO of Telesat, said: "The name Lightspeed underscores the essential speed advantages inherent to Telesat's LEO design. Lightspeed is the most technologically capable satellite communications network in history and exploits the latest advances in space-based data processing, laser communications, digital antenna technology and machine learning."



Lightspeed: Ka-band launch in two years.

JetBlue refreshes Mint experience

Mint Studio: Plenty of room up front.



Low-fare airline JetBlue and its official design partner Acumen Design Associates have unveiled its A321neo business class cabin featuring the new Mint Suite and Mint Studio.

The first complete redesign of Mint will take flight on JetBlue's London flights this summer, and a smaller 16-seat layout will debut on a limited number of flights between New York and Los Angeles later this year.

Inspired by the popularity of the four private suites in its current Mint configuration, JetBlue's transatlantic Mint offers more privacy with 24 individual suites, with an inward-facing herringbone layout offering direct aisle access and sliding privacy doors.

Mint Suite features charging points, two headphone sockets, a dedicated phone/tablet holder, as well as a wireless charging zone. Acumen redesigned the suites to

incorporate multiple large and easy-to-clean flat surfaces, to enable customers to eat, work and relax whilst simultaneously staying connected to their world.

Stowage options include a compartment for personal items, shoe and handbag storage, and nightstand with a bottle holder. Acumen and JetBlue also developed customisable mood lighting that can be brightened or dimmed and adjusted between "awake" and "relax" colour schemes. Each Mint suite includes a tilting 17-inch Thales AVANT seatback screen IFE monitor which can be used gate-to-gate.

The inner walls of each Mint Suite feature a distinct, contemporary pattern inspired by JetBlue's brand language, while the suite doors incorporate a bold, pressure-formed Mint pattern.

Each aircraft will have two Mint Studios in the first row, providing room to work or relax. They feature

a 22-inch tilting Thales AVANT seatback screen, an extra side table for added productivity, and a guest seat that can accommodate an additional Mint customer during flight at cruising altitude. When the seat transitions into bed-mode, the sofa seat can also drop – extending the bed surface and giving the customer the largest lie-flat bed of any US carrier.

Bespoke styling and features for JetBlue include unique mattress comfort technology from Tuft & Needle incorporated into the seat cushions supplied by Sabeti Wain, plus personal and additional stowage facilities including a laptop drawer.

Other features include integrated wireless charging and customised lighting including a Polystone feature light and custom-colour reading light from Beadlight, plus customised thermoplastics (from Kydex) with unique Mint graphics.

Ansar helicopters come with IFC as option



Kazan's Ansar: Equipped with Mku30 IFC system on request.

The Ansar helicopter, a light multipurpose twin-engine helicopter produced by Russia's Kazan Helicopters, capable of carrying up to seven passengers, has received approval from the

Federal Air Transport Agency (Rosaviatsiya) for the installation of the Mku30 satellite communication system.

The Ku-band satellite communication system,

manufactured by MOST Satellite Systems, provides up to 2 Mbit/s internet access at the Yamal satellite coverage area, allowing passengers to host onboard video conferences and stream high-

quality video in real time. Data transfer to passengers' mobile devices is provided using a Wi-Fi access point.

The first Ansar helicopter equipped with the new Mku30 satellite communication system was presented at the Paris Air Show in 2019.

"The satellite communication system will be installed in the Ansar helicopter at the request of the customer. It will be most relevant for passenger and VIP modifications of the helicopter. The ability to use the internet during flights is another step towards improving the comfort level of Ansar helicopters," said Managing Director of Kazan Helicopters, Alexey Belykh.

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Kenya Airways converts Boeing 787s for cargo



Cargo ready: Kenya Airways' 787 cabin.

Boeing 787. The repurposing began in December 2020 and was completed a month later.

The repurposed cabin has been certified to carry up to 16 tonnes of cargo, potentially enabling the aircraft to reach its maximum payload while in cargo operation of 46 tonnes.

In 2020, Kenya Airways used some of its nine Boeing 787 aircraft for cargo transportation, but aircraft seats remained, limiting the space for an increased freight capacity.

Avianor supervised Kenya Airways' modifications on the full cabin repurposing, which has received airworthiness approval from the Kenya Civil Aviation Authority (KCCA) and Federal Aviation Administration (FAA). Cargo flights are expected to begin soon.

✈ Kenya Airways has repurposed the aircraft cabins of two of its Boeing 787 aircraft for cargo transportation.

Working with Avianor, the project is the first-ever cargo repurpose of this type to be performed on the

Russian IFC market gets a boost

✈ Viasat, Russian satellite operator Gazprom Space Systems (GSS) and Russian telecom operator TMC LLC (TMC) have entered into a Memorandum of Understanding (MOU) to advance in-flight connectivity (IFC) in Russian airspace.

This cooperation is expected to offer Viasat's global airline customers roaming connectivity when flying over Russia; providing IFC services on domestic flights within Russia, and enabling Russian and international

airlines access to roam onto the Viasat global satellite network when outside of Russian airspace.

The MOU establishes an initial roaming agreement between current Viasat and GSS satellites, with Viasat operating in Russia leveraging TMC's telecom licence. The partnership commenced with Viasat procuring access to Ku-band capacity on the GSS satellite, Yamal-401, while creating a path for Viasat and GSS to leverage capabilities on future satellite constellations.

Air Peace pioneers E2 use in West Africa



Staggering: Air Peace's new E2 First Class cabin.

✈ Air Peace has taken delivery of its first E195-E2 aircraft, with a further 12 aircraft on order.

The delivery makes a double first for Air Peace, Nigeria and West Africa's largest airline; Air Peace becomes the launch customer in Africa for the E2, and the global launch customer for Embraer's premium staggered-seating design, developed in partnership with UK design firm PriestmanGoode, which won the 2015 Crystal Cabin Award for Industrial Design and Visionary Concepts.

The aircraft is configured in a comfortable dual-class arrangement with 124 seats.

In First Class, the new staggered individual seat option provides 50 inches or more of legroom without compromising total seat count. This configuration introduces a higher standard of comfort and space on a single-aisle jet traditionally found only on much larger airplanes.

In Economy Class, the E2 retains the advantages of two seats on each side of the aisle for greater passenger comfort and faster boarding and deplaning. The 18.3-inch-wide slim-type seats – among the widest in the industry – provide more legroom for passengers.

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XTS satellite goes live

The APSTAR-6D satellite, the first extreme high throughput satellite (XTS) from Panasonic, has entered service over the Asia-Pacific region.

According to Panasonic, APSTAR-6D is an integral part of its third-generation communications (Gen-3) network of high speed, high bandwidth Ku-band satellites.

The company is set to complete an upgrade of the 2,544 aircraft installed with its connectivity service to its Gen-3 network within the next month. Over 1,000 new commercial aircraft will be installed with its connectivity services and linked to the Gen-3 network from the outset.

APSTAR-6D will provide airlines with multiple gigahertz of new Ku-band capacity over China and high-density routes around East Asia using narrow XTS spot beams.

ESA: the endgame

Though installations may have stalled, interest in broadband connectivity hasn't waned during the COVID pandemic, prompting many to see the future in electronically steered antennas. So, will ESAs replace conventional satcom antennas, asks an inquisitive Henry Canaday.

The pandemic has provided a pause in the race to connect aircraft to the internet. However, technologies are improving during the lull all the same. Low-Earth Orbit (LEO) and Medium-Earth Orbit (MEO) satellites are going up alongside ever-bigger geostationary orbit (GEO) equipment. And the electronically steered antennas (ESAs) that are supposed to be best suited to LEOs and GEOs are coming along as well.

But there are questions and challenges surrounding the new antennas. Will the new ESAs be ready for prime time in the next couple of years?

According to CCO Steve Newell, NXT Communications expects to deploy its flat-panel, phased-array AeroMax ESAs in 2022. AeroMax's core technology is fragmented apertures designed on a computer with genetic algorithms. "That gives it higher efficiency than anyone else's," Newell argues. Achieving "upwards of 90% efficiency" means less power use and less heat to dissipate.

NXT Communications is looking for partners and talking to connectivity providers such as Panasonic and Global Eagle. It will also talk with airlines and satellite operators that are integrating downstream to provide broadband to airlines. The company is testing

its AeroMax ESAs with Eutelsat but will sell it to any provider.

"ESAs are not for every use case," Newell acknowledges. "They are very good for aviation and LEOs." The ability of ESAs to operate with LEO constellations maximises gains in size, performance and the cost of aircraft connectivity. Newell envisions AeroMax with GEOs initially but becoming more attractive as LEOs become plentiful.

With LEOs, an AeroMax measuring 25 cm x 50 cm could get more than 100 megabits per second. Newell contrasts that with a GEO-based antenna costing more than US\$350,000 and delivering less than 10 Mbps. "Half the cost, 10 times the bandwidth, lower latency and less recurring costs."

The flat-panel AeroMax would rise 2-4 inches on the top of a regional or business jet, versus up to 16 inches for the radome on mechanically steered antennas. AeroMax would use ARINC 791 or 792 installations for larger aircraft, removing



Wi-Fi booster: Delta Air Lines has selected Viasat's next-generation Ka-band satellite technology for more than 300 of its narrowbody aircraft. The Atlanta-based international carrier expects to introduce the new service to passengers by the summer of 2021.

mechanicals and replacing them with flat panels. NXT is moving towards curved models to conform to fuselage curvature.

The NXT antenna is being developed for Ku-band now, as all LEOs are Ku-band, but a Ka-band version will follow.

HIGH-PERFORMANCE Q-EPA

Michael Stobinski, Chief Commercial Officer of QEST, expects the first prototypes of his Q-EPA phased-array ESA to be available at the end of 2021. Q-EPA antennas are modularly designed. "They can be adapted to any customer size requirements," Stobinski notes "We are working on small aircraft, business jet versions as well as commercial aircraft."

Depending on aircraft and performance requirements, dimensions are between 40 cm by 40 cm and 60 cm by 120 cm. Q-EPAs' entire antenna systems will weigh 20-80 lbs. QEST is developing antennas for both Ku- and Ka-bands.

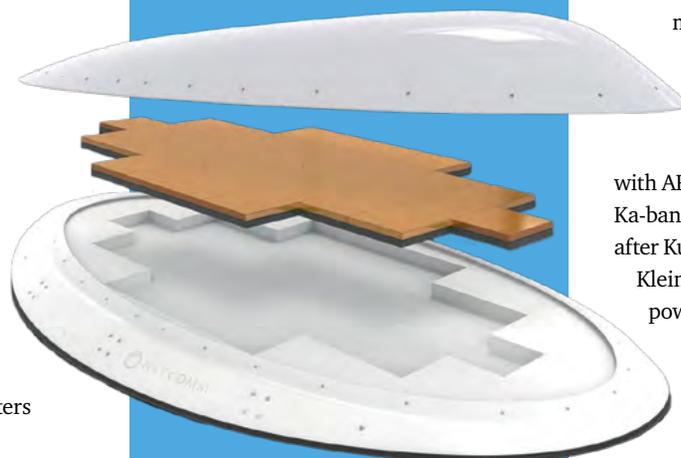
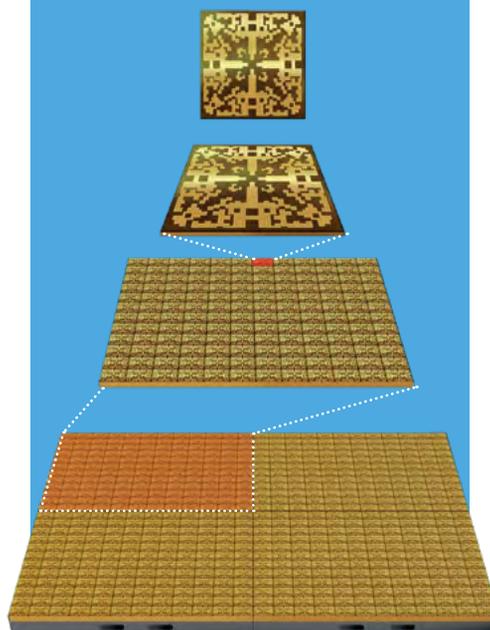
Stobinski predicts the high performance of Q-EPAs will enable them to work with LEOs, MEOs and GEOs. "Multi-beam operation is also supported. So multi-satellite links, for example, simultaneous hybrid links with LEOs and GEOs, are feasible."

QEST's offer addresses all connectivity providers. "The range of applications covers small business jets up to long-range commercial aircraft," Stobinski says. "Even applications on helicopters are feasible."

Q-EPA was developed using a proprietary ESA technology especially suited for aeronautical applications. The QEST executive says this leads to very high antenna performance, low weight, low-power consumption, very high reliability and environmental as well as regulatory compliance "at a very attractive price".

"We do not believe that low-cost, very-low-performance ESAs are of any use in aeronautical applications, given space limitations on aircraft and stringent environmental and regulatory requirements," Stobinski stresses. "The antenna performance of QEST's Q-EPA has been verified by extensive measurements on functional demonstrators." He says he has not yet seen comparable performance measurements

Performance gains: NXT Communications' AeroMax antenna optimises a highly integrated silicon-based chipset and sub-array design.



The AeroMax antenna features no moving parts, is electronically steerable, and delivers significantly enhanced performance in both Ku and Ka frequency bands.

from potential competitors, and that performance claims do not seem to be substantiated by hard data.

MULTI-BEAM JETTALK IN TRIALS

Israel's SatixFy has been working on an aircraft version of its Electronically Steerable Multi-beam Antenna Array (ESMA) JetTalk ESA in a joint venture with Singapore Technologies Engineering for several years, explains Aero Product Manager Gidi Klein.

JetTalk uses true-time delay to create shifting frequencies more precisely than phased arrays, Klein says. This enables digital beamforming without limit, and the antennas can support up to 32 beams steered simultaneously. "The advantages are scale, bandwidth and multi-beams." JetTalk can switch beams in less than 10 microseconds.

The partners are building their first JetTalk for commercial aircraft. "The chips are ready, we are progressing, we are in trials now, and we expect to have it integrated by the end of 2021," Klein says. Satixfy foresees installations in 2022.

The company has been in contact with almost all satcom providers to ensure workable net services. JetTalk's software-defined radio modem is embedded in the antenna, distinguishing the device from technologies with 4-5 components.

"We have a flat unit with a modem, all in a single component, just plug-in power," Klein stresses. The software-defined

modem enables multiple waveforms and make-before-break connections with different LEOs or MEOs.

The first JetTalk will be for Ku-band and will be compatible with ARINC installation. Klein expects Ka-band devices to evolve about 12 months after Ku-band.

Klein says JetTalk only needs maximum power of 2.2 kW in extreme cases such as very high latitude communication with GEOs. He estimates average power consumption as 1 kW.

Satixfy promises that JetTalk's costs will be competitive with current mechanically steered antennas. Installation will be simple, overnight in some cases, versus up to five days for existing antennas.

JetTalk itself will be less than an inch thick, and with radome and cooling device should be 8-14 cm thick. Klein stresses that digital beamforming has already been proved in a commercial aircraft. True-time delay enables multiple beams, higher bandwidths and flexible array sizes, and JetTalk needs no in-cabin components.

Another much-discussed ESA maker, Phasor, has gone through a financial reorganisation and has been purchased by Korea's Hanwha Systems, which declined to comment on the technology's future status.

“

Airlines are reluctant to change antennas due to cost and downtime. Intelsat's goal is developing technology that stays on aircraft for 10 years. 'Change for the sake of change will not happen.

Dave Bijur, SVP of Commercial Aviation, Intelsat

”

How realistic are all these ESA hopes and prospects? “There is a common misperception that ESAs are superior technology and just around the corner,” argues Bill Milroy, Chief Technology Officer at ThinKom. He says aeronautical ESAs still face many challenges, especially when compared with his company's VICTS (Variable Inclination Continuous Transverse Stub) antennas.

Challenges include documented reliability, with VICTS antennas achieving 100,000 hours of mean time between failures, double ESA claims. VICTS also provides up to 400 Mbps down and 100 Mbps up, double or much more than double an ESA of comparable size, according to Milroy. Further, ESAs are typically power-hungry, requiring thermal management, versus VICTS's cool operation. Flat ESAs can perform poorly with GEOs at high latitudes, while VICTS supports connectivity above 70N. Milroy also says

VICTS has instantaneous bandwidth ranging from 500 MHz to 2 GHz, much broader than comparable ESAs. And the ThinKom CTO says VICTS can switch from satellite to satellite in under 800 milliseconds and has proven its ability to operate with every LEO and MEO network available.

And VICTS is a veteran, not a prospect. Ku3030 VICTS antennas have been installed on more than 1,550 commercial aircraft flown by 16 major airlines, with more than 98% end-to-end connection availability. ThinKom is now ramping up production of Ka-band versions for hundreds of systems in 2021. Its Ka2517 Thinair antenna has been selected for Inmarsat's GX and GX+ service, been certified for Boeing 737-700s and expects certification on the Airbus A320 family, more 737 types and 787s and 777s.

VICTS antennas are not ESAs but are still slim and light, generally 2-4 inches in total

thickness and with an aerodynamic weight several hundred pounds less than competing gimbaled mechanical antennas.

What do connectivity providers say?

The big recent connectivity win was Delta Air Lines' January 2021 decision to go with Viasat for its Airbus A321neos, Boeing 737-900ERs and select 757-200 aircraft.

Don Buchman, Viasat VP for Commercial Aviation, says the main reason was Delta's plans to eventually offer free Wi-Fi, for which Viasat's extreme-throughput GEO satellites provided the only practical capacity.

Viasat has been offering a conventional mechanically steered antenna, but Buchman says his company will consider ESAs as LEO and MEO constellations go up. “For LEOs, phased arrays have very good properties, but there are also lots of hard problems. You have to make it small, easy to install, with a light profile, economic and using limited power. If they can solve these, then that's great.” Buchman estimates the solutions to all problems are still “a couple of years away”.

ENCOURAGING DEVELOPMENTS

Dave Bijur is SVP of Commercial Aviation for Intelsat, which acquired Gogo's airline business. He says Intelsat will stick with ThinKom's 2Ku VICTS antennas for larger and overwater aircraft. “It offers high reliability, as a result of fewer moving parts, exceptional throughput, and attractive aeronautical properties – its low profile reduces drag and fuel consumption.” Intelsat has been operating VICTS antennas since 2016.

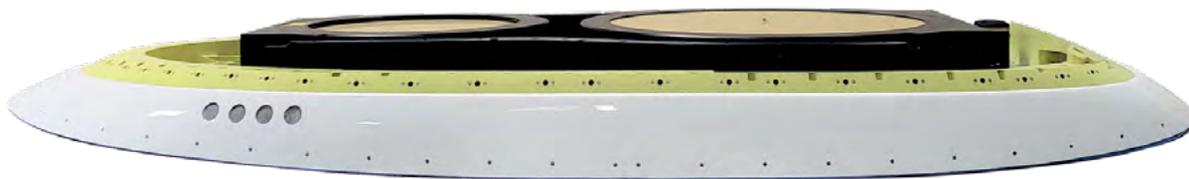
And Intelsat continues to be the leader in air-to-ground technology, powering 1,200 regional aircraft across the US and Canada. The company expects to upgrade many of these aircraft to a new 5G system that relies on a new beamforming antenna in coming years.

Bijur acknowledges that ESAs hold great promise. “We are seeing very encouraging developments, but they need to be commercially viable and offer compelling differentiation from 2Ku.” Meantime, he is confident that VICTS is compatible with LEOs. And he notes that airlines are reluctant to change antennas due to cost and downtime. Intelsat's goal is developing technology that stays on aircraft for 10 years. “Change for the sake of change will not happen.”

Inmarsat has been using Honeywell's JetWave antennas for its GX Aviation and Jet

On the crest of the Wave: Inmarsat has been using Honeywell's JetWave antennas for its GX Aviation and Jet ConneX Ka-band services. JetWave is 9 inches high on the fuselage and weighs 83 lbs.





Match me if you can: ThinkKom is ramping up production of its proven Ka-band Thinair antenna – the Ka2517.

ConneX Ka-band services. JetWave is 9 inches high on the fuselage and weighs 83 lbs.

SVP Inflight Business Niels Steenstrup says “we have also recently been working with ThinKom and GDC Technics to develop a next-generation terminal that is lightweight, low drag, and boasts one of the highest reliability rates on the market. Following a range of technology assessments and test flights last year, the powerful new antenna has demonstrated its ability to consistently deliver the highest levels of connectivity onboard aircraft, even over the world’s busiest airspaces.” These are the new Ka2517s.

When available, ESAs should complement the GX network perfectly. Steenstrup

“ There is a common misperception that ESAs are superior technology and just around the corner. ”

Bill Milroy, Chief Technology Officer, ThinkKom

acknowledges ESA weakness with GEOs at higher latitudes but notes that Inmarsat’s new Arctic satellites, GX10A and 10B, scheduled to launch in 2022, should eliminate that drawback.

Gogo’s current focus is on business aviation, which has weathered the pandemic better than airlines. According to spokesman Dave Melin, it uses ThinKom 2Ku antennas for VVIP aircraft and two different antennas, 3G and 4G devices, for air-to-ground connectivity on lesser jets. He says Gogo will evaluate ESAs as they become available for VVIP jets. Gogo’s ATG antennas are much smaller and lighter than satellite antennas, cost less, mount on the aircraft’s belly, and fit a much broader range of aircraft. ■

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Satellite storytellers

Founded as Europe's first private satellite operator in March 1985, SES has grown to help redefine the delivery of high-quality connectivity across multiple sectors. Alexander Preston speaks with Elias Zaccack, EVP, Global Sales, SES Networks, to find out more.

With a population of just over 600,000, Luxembourg is a relatively unknown country in the heart of Europe. Despite being smaller than the US state of

Rhode Island and easily driven across in a matter of hours, it's from this small country that SES achieves "the extraordinary in space to deliver amazing experiences everywhere on Earth".

Inflight: SES has recently celebrated its 35th birthday. The company began as a provider of broadcaster services – when was the move into aviation and in-flight connectivity made and why?

Elias Zaccack: SES was indeed initially a leader in the European broadcast video market but began expanding into new geographies and new markets, including aerospace, starting in 1999. You may recall that SES was a partner with Connexion by

Boeing (CBB) in the early 2000s and has launched satellites specifically designed to support the unique nature of aero IFC traffic. We started gaining real traction in the aero market about eight years ago when the trend towards ubiquitous mobile broadband unleashed new and massive demand for satellite-based in-flight connectivity solutions. Today, aero is an important growth driver, consistently delivering double-digit growth for SES Networks.

Inflight: In September 2019, SES Networks teamed up with Collins Aerospace to launch LuxStream. Why develop this for business aviation? What sets it apart from other business aviation-specific connectivity services?



Manufactured by Thales Alenia Space, SES-17 is SES's first Ka-band high throughput satellite. Image: Thales Aerospace

Elias Zaccack: Global reach and capacity are obvious key criteria that private aviation firms look for in a connectivity solution, and LuxStream offers both, ensuring that Collins' customers have the bandwidth they need wherever they fly. However, speed and resilience are also critically important, and those characteristics are what sets LuxStream apart. Our next-generation high-throughput satellites provide the discerning business aviation passenger with a superior in-air experience similar to what they receive at home or in the office. SES delivers this exceptional service via a dedicated business aviation network that allows travellers to access their cloud-based applications and stream ultra HD videos in the air. These satellites are powered by a ground system

optimised for mobility segments, ensuring seamless connectivity for fast-moving aircraft. Passengers are guaranteed a consistent, disruption-free experience, regardless of the flight route.

The partnership between SES and Collins is also a key differentiator. Our wholesale business relationship enables a tremendous amount of flexibility around pricing and packaging – Collins can create customised retail packages and offer a la carte pricing – which means we can respond quickly and proactively to customers, ensuring they have the connectivity they need when it's needed.

Inflight: LuxStream was launched with Vista Global as its first customer. How has the network performed since its introduction? What feedback have you had from Vista Global and passengers in general?

Elias Zaccack: The highest praise Vista Global has given us is its commitment to expand the relationship – it currently has eight aircraft fitted and flying with LuxStream and plans to install another 45 aircraft this year. It has recently conducted a demo flight where 10 devices, including laptops, phones and tablets, were all connected and either streaming video or doing video calls without disruption, which is a solid validation of LuxStream's performance and the experience it delivers to both passengers and crew.

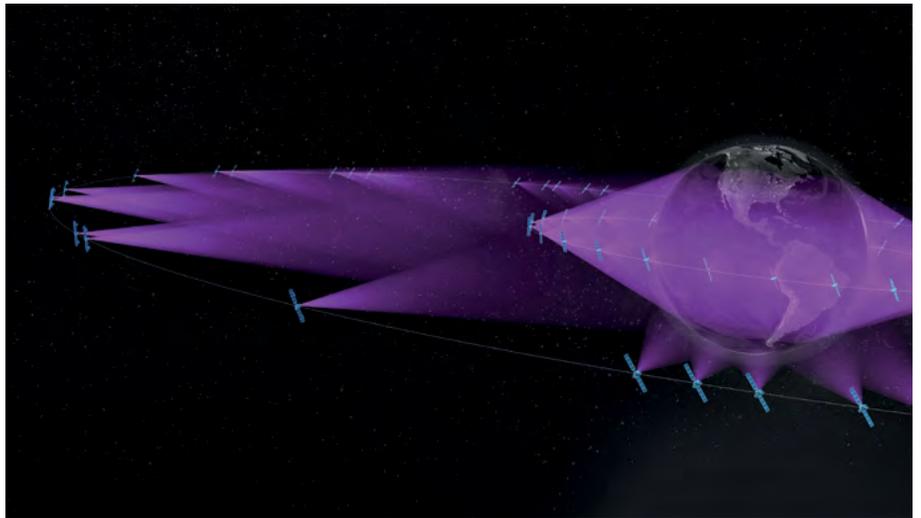
Inflight: SES's LuxStream service currently offers the fastest internet speeds in the business aviation segment. How do you do it? What added features/functionality can we expect in the future from LuxStream?

Elias Zaccack: The design of the LuxStream network was based on demand in the business aviation market – 70% of business aviation flight time is within North America. We are able to meet that demand with our new and powerful SES-15 satellite, which delivers coverage over that entire market, from the east coast to Hawaii. Globally, we rely on a mix of our HTS fleet and wide-beam satellites to provide a consistent and user-friendly experience. Our business aviation network is flexible enough to adapt to market



“ Our next-generation high-throughput satellites provide the discerning business aviation passenger with a superior in-air experience similar to what they receive at home or in the office.

Elias Zaccack, EVP, Global Sales,
SES Networks,



Above: O3b-mPOWER: Bandwidth can be allocated dynamically among aircraft, allowing more efficient use of capacity by only delivering what is needed.
 Left: The launch of the SES-15 satellite: SES's first hybrid satellite delivers a mix of wide-beam coverage and high throughput (HTS) capacity across North America.

demands and traffic requirements. Going forward, we plan to continue investing in new assets, new capabilities and new services. With the now proven coverage and resilience, we expect to expand our service offerings from the cabin to the cockpit.

Inflight: What impact has the current pandemic had on operations? How have you managed to maintain relationships with customers and suppliers?

Elias Zaccack: If anything, COVID-19 has underscored the importance of connectivity. In our business lives, we rely on communication tools – such as Zoom – in place of face-to-face meetings. In our

personal lives, we use social media and video chatting apps to stay in touch with our loved ones and depend on video streaming and online gaming to keep us entertained. The pandemic means we are collaborating more closely than ever with our customers and partners to ensure that end users can stay connected, even at 35,000 feet in the air. Interestingly, COVID-19 has driven those people that can afford it to shift their flying patterns from commercial to private aircraft. This has driven up demand for business aviation connectivity.

Inflight: What's the future for business aviation connectivity – is there still a demand for business travel at this time? Will the pandemic change the connectivity business model, i.e. cost structure, services offered, future satellite roadmap?

Elias Zaccack: While the entire aviation market was hit hard last spring, we've seen the business aviation segment start to bounce back as more and more passengers who can afford to do so opt to fly private for health reasons. We anticipate that a significant number of them will continue to do so even post-pandemic because they've become accustomed to the convenience and the amenities of private aviation. This will translate into continued growth for LuxStream, particularly given trends that we have seen towards higher average usage per

aircraft. As more passengers consume more bandwidth on private jets, the flexibility and scalability of LuxStream will become even more critical to delivering an exceptional business aviation experience.

Inflight: What can the industry and SES Networks customers look forward to from the company in the coming months and years?

Elias Zaccack: SES is taking a leadership role in the aviation market – both commercial and private – to meet the industry's rapidly growing connectivity requirements. We are actively participating in the Seamless Air Alliance, a non-profit association developing standards-based technologies for end-to-end airline passenger connectivity. We are paving the way for "smart planes" by delivering cloud-optimised connectivity to our customers via partnerships with the major cloud operators. We are launching ground-breaking new satellites later this year, including our next-generation Medium Earth Orbit (MEO) constellation, O3b mPOWER, and our high-throughput SES-17 satellite – assets that will deliver extraordinary throughput and flexibility to passengers on the move. And we are very much looking forward to continuing to work with our partner Collins to ensure that its customers can capitalise on all these initiatives and have their requirements met, even as their bandwidth demands inevitably ramp up. ■



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A good place to be: MIME is headquartered in one of Scotland's life sciences hubs at Inverness Campus. Photo: Gillian Frampton /HIE



Vital signs

When they occur, in-flight medical emergencies are stressful and often complex situations for cabin crew to manage. Alexander Preston speaks to Anne Roberts, CEO of MIME Technologies, to discuss a new innovation to help the industry with onboard medical handling.



Aviation focus: Anne Roberts of MIME Technologies.

Thoughts of the Scottish Highlands may conjure up images of picturesque countryside and whisky production, but away from the lochs, castles and distilleries, the region is establishing itself firmly in the life sciences and technology sectors.

Inverness, the 'capital' of the Highlands, has become a driving force in the region's wider life sciences cluster. One local company, in particular, is blazing a trail in in-flight medical emergency response.

Headquartered at the purpose-built life sciences building, Solasta House, on Inverness Campus, Managing Information in Medical Emergencies (MIME Technologies) has been far from silent, attracting both funding and plaudits for its technology.

During the course of 2020, MIME secured support from Highlands & Islands Enterprise, in addition to £248,000 in funding from the Early Stage Growth Challenge Fund, delivered by Scottish Enterprise on behalf of the Scottish Government, and before that the company raised its first investment from Scottish angel syndicate Equity Gap.

Its attractiveness to investors was rewarded with a Top 10 ranking in the Scotland Tech 50 for 2020, (a combined public and expert judging panel vote) in October, while the year began with Scottish Business Insider identifying MIME as one of 10 Scottish digital and science start-ups to watch in the year ahead.

This apparent 'overnight' success masks hard work and dedication.

MIME was originally a research project at the Centre for Rural Health (CRH), University of Aberdeen, as part of its Dot.Rural programme, which looked at new ways to enhance rural life and services through technology.

Led by Dr Alasdair Mort, (MIME founder and COO), the original study's scope was to investigate ways to underpin reconfigured remote emergency response services, by examining how technology could support the responders. During this time, the first prototype for responders was developed and refined.

With the technology validated, MIME Technologies successfully spun out of the University of Aberdeen. Anne Roberts, also a co-founder, was appointed as CEO in October 2019. Roberts says, "Our aim has always been to help people that are away from professional medical care, away from a hospital or those who may be in an extreme environment. We quickly identified aviation as our first repeatable and scalable market."

“

Our aim has always been to help people that are away from professional medical care, away from a hospital or those who may be in an extreme environment.

”

The MIME team is diverse, bringing together computer scientists, clinicians and med-tech expertise. “We’ve got a high-energy, resilient, and very passionate team,” says Roberts, with varied specialist backgrounds including technology, physiology, medicine and business.

Roberts herself has a background in remote health, specialising in the application of new technologies for pre-hospital care settings. Dr Mort, also a co-inventor, has a medical device PhD and was previously an Enterprise Fellow at the Royal Society of Edinburgh. He’s also worked in aircrew protection for QinetiQ, formerly the UK MOD’s Defence Evaluation Research Agency, where he conducted altitude protection research. Dr Tim Stevenson is MIME’s Aviation Medicine Adviser and was previously Head of Health Services for Virgin Atlantic and medical advisor to easyJet. “We have a real mix of skill that’s relevant to the technology that we produce, including aviation medicine,” adds Roberts.

INTRODUCING AIBER

After in-depth product development and end-user testing, MIME’s dedicated team launched its new solution, Aiber, in March 2020, specifically designed to support cabin crew.

“We spent many months working with the industry to fine-tune the product for aviation,” says Roberts, adding that although MIME initially looked at all aspects of multimodal healthcare, commercial and business aviation has been the company’s focus.

Aiber is lightweight (1.5 kg) and just larger than A4 in size and enables real-time data sharing of both minor incidents and major medical events in-flight through Bluetooth connectivity.

Aiber includes an iPad, with pre-loaded Aiber software, designed explicitly for non-medical professionals such as cabin crew. An in-built chat function allows the cabin crew to communicate directly with their ground-based medical support providers of choice, and the clinicians can equally review and recommend. “So, it’s an end-to-end product,” states Roberts.

The Aiber clinician dashboard allows aviation ground-based doctors to log in and view the incident in real time, as Aiber collects vital signs from the unwell passenger via equipment including an accurate and durable pulse Oximeter, 12-lead Bluetooth ECG recorder (designed for non-professional use), with disposable patch technology. This data is shared over secure cloud technology with clinicians, allowing not only better informed in-flight decisions, but, when necessary good diversion decisions.

As Aiber is a product developed for remote environments where sometimes there is no connectivity, it can still guide crew and record all vital data for accurate incident

Aiber enables real-time data sharing of both minor incidents and major medical events in-flight through internet connectivity.

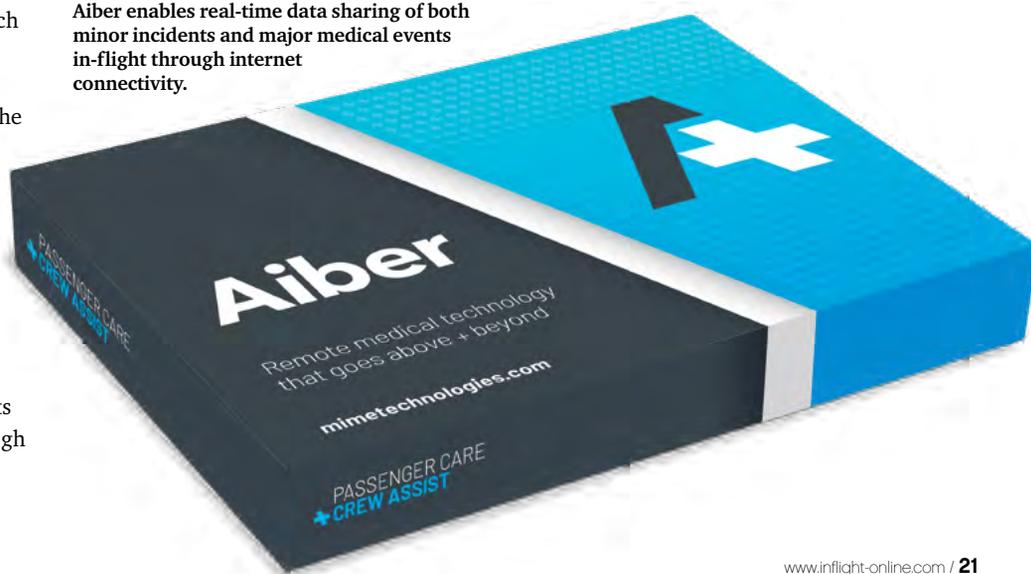
reporting, sharing data as soon as connectivity becomes available.

Roberts regards the low-bandwidth chat function as a key feature of Aiber. The crew don’t need to leave the passenger’s side to get help. But Aiber is also enhancing what already can be found on the market. For example, Aiber’s chat functionality is not impacted by noise and the vibration of the aircraft, which may distort the quality and clarity of existing voice communication technology. A valuable feature is the in-flight first aid guidance. During any medical event, Aiber can guide the crew with first aid steps, aligned with their training. “Although all crew do receive annual training, it may be some time since they undertook CPR, for example, and in the heat of the moment, they may not remember how many chest compressions to perform. Aiber will help them: it will prompt them and remind them, on the scene, of how to do things step-by-step, the right way,” Roberts explains.

ONE-TOUCH SIMPLICITY

As 2020 came to a close, MIME CE marked the Aiber software, paving the way for launch into international markets. The CE mark confirms that Aiber conforms to European Communities Council Medical Device Regulation 2017/745 and is now registered with the UK Competent Authority. This is a significant advancement for MIME Technologies as it allows the company to enter UK and European markets.

With more passengers and crew set to benefit from the solution, how easy is it to use? “Super easy,” says Roberts. “Aiber has a unique element to it – one-touch technology,



“Aiber’s in-built chat function allows the cabin crew to communicate directly with their ground-based medical support providers.”

which simply means the crew just needs to touch singular buttons. There’s little typing or scrolling.

“One of the key pieces of intellectual property of Aiber is that we automate incident reports for the airline. We take the numbers and the data from the incident to create a readable English language report that can be used for handover reports for paramedics or for an airline audit (and insurance reporting) or for post-incident training. This all comes from a simple one-touch front-end user app that the crew have to use.”

PROTECTING PRIVACY

Such simplicity hasn’t compromised data privacy. All the data shared is purely incident-specific, as Roberts is at pains to reassure. “We take confidentiality very seriously. We work within GDPR guidelines. The clinician dashboard is hosted on a secure Microsoft Azure platform. Crucially, we only record data that is required for the incident, we don’t necessarily have to record passenger identifiable information; we just need to know the health status of that particular casualty. We are strict with data quality and privacy.”

If 2020 ended on a high for MIME, the new year has begun in a similar fashion. The company joined the ATI Boeing Accelerator Programme as part of its second cohort of intakes. The ATI Boeing Accelerator is a three-month-long

programme intended to support innovation and the growth of young companies in the UK’s aerospace ecosystem. The accelerator was created in partnership with the Aerospace Technology Institute and Boeing. GKN Aerospace is the programme’s corporate sponsor, and Rolls-Royce recently joined as a programme partner. According to MIME, the alliance with the accelerator, coupled with the commercial and business support it brings, will deepen its networks and continue to raise its profile in the aviation industry.

“The professional input of the strategists and technical experts of these industry-leading companies will enhance our position in the aviation market,” says Roberts.

“We have to constantly consider that we’re ensuring that we have the most up-to-date

solution for the airline industry,” asserts Roberts. “When we started out, the Aiber product could only support the end-user, the cabin crew. We just had a front-end solution, but nowhere for that data to go, no end-to-end solution. As we’ve developed, we’ve made and brought new value because we don’t just support the crew, we support the airline, those that are making in-flight diversion decisions. So really, we’ve enhanced those features over time and will continue to do so. For example, in the year ahead, we will focus on sustainability, ensuring that it is at the heart of our product and our organisation. Sustainable solutions are key to the aviation market. We will also focus on communicable disease. Although the world is watching the COVID-19 pandemic right now, let’s not forget that various infectious diseases remain active across the globe. Communicable disease functionality helps to ensure that we’re continually relevant in the aviation market.”

Roberts concludes: “It has never been more important for the aviation industry to provide clear guidance and reassurance that every effort is being made to prioritise the health of passengers and employees. As the industry begins to recover following COVID-19, commercial airlines and private jets can use our technology to do just that.” ■



Aiber’s simple ‘one-touch’ technology helps cabin crew to manage a medical emergency.



FLY AGAIN TOGETHER

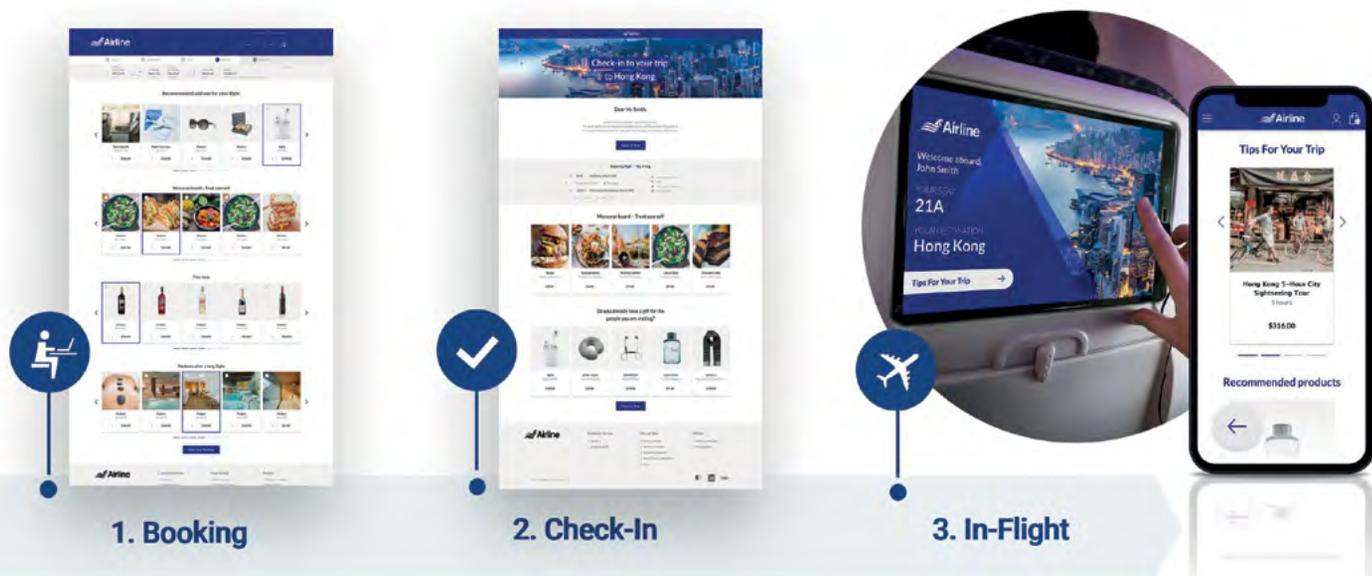


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Omnichannel Commerce suites, like those available from AOE, allow airlines to create personalised experiences seamlessly integrated into the customer journey.



The time is now

Considering the current climate for aviation, now may not seem the right time to introduce new technology to airlines. But for AOE's Kian Gould, it makes perfect sense. Alexander Preston hears why.

“We actually kind of stumbled into travel retail by accident six years back,” admits Kian Gould, CEO and Founder of AOE.

Gould founded AOE 21 years ago as a web development company before branching out into e-commerce in 2008, which since 2010, has been its primary focus.

But it was securing an RFP (request for proposal) from Frankfurt Airport that brought the company into the aviation market. “They weren’t looking for a travel retail expert per se,” explains Gould, “but they wanted to build a big e-commerce platform that combined all of the retail, food and beverage services, parking, business intelligence, CRM etc. It was a *big IT project.*”

Winning the project made the company realise there was a lot of potential in helping airports digitalise their non-aeronautical revenues. More and more airports have begun thinking they have to become more consumer-

focused organisations. Since Frankfurt became the first digital omnichannel airport in the world, Heathrow and Auckland have followed suit, taking advantage of AOE’s OM³ Suite (now part of Omnevo).

Frankfurt Airport’s success encouraged airlines to approach AOE, says Gould, having recognised that in-flight retail was dying, the cart business was outdated, and passengers were becoming disenfranchised. They also understood they couldn’t carry the relevant stock and had too much waste. All in all, “the dilemma of the classic model,” observes Gould.

They wanted to become real omnichannel retailers, says Gould. “When we saw what airlines could actually achieve because they have access to the data which the airport doesn’t, then we got hooked.” Gould admits AOE realised it had to focus its solutions a lot more on airlines. “Because airlines have customer data, they have loyalty points that need to be burned. They have multiple touchpoints with the passenger throughout the whole year. And they are perfectly suited to become real retailers. And very few airlines have used that at all.”

Gould highlights Lufthansa WorldShop as a rare example that capitalised on this early on, with most others very slow to adopt. Then, there’s Singapore Airlines, which in 2018

became AOE’s first airline customer through its redesigned and remodelled KrisShop.

“Together with them, we built something that is now years ahead of what any other airline is doing in retailing,” says Gould. The model includes a range of new features such as pre-ordering goods up to an hour before flight departure, mixed-cart transactions for in-flight and home delivery, IFE and onboard integration and Ctrip (the largest online travel agency in China) integration.

OMNEVO GOES END-TO-END

Gould feels that e-commerce could also overhaul the traditional catering model, which often relies on “outdated” legacy technology and underrepresents possibilities such as pre-order or upsell ability into the customer experience. This is usually caused by a disconnect between commerce technology and catering management solutions.

But this gap has been bridged, Gould believes. First, through AOE’s 2020 acquisition and integration of SHIFTEO, an onboard sales and supply chain specialist. The agreement included SHIFTEO’s in-flight ePOS, supply chain management and back office for catering management solutions. And, latterly, through the creation of the merged solutions into Omnevo, which uses the synergies of both companies. Omnevo is a

Omnevo for airlines: a fully integrated solution



fully modular digital solution suite designed to provide end-to-end, vendor-agnostic digital retailing and catering management. It uniquely addresses everything from front-end customer experience such as personalisation, choice and fulfilment to complex operational challenges, including logistics, warehousing, crew, ePOS and most importantly end-to-end analytics and forecasting.

“It’s pretty unique to be able to do this end-to-end,” says Gould, “but I think many airlines haven’t fully understood it yet because of the models they are used to.”

In just six months, airlines have been forced to bring forward their adoption of digital technology by some five years, but

“They are perfectly suited to become real retailers. And very few airlines have used that at all.
Kian Gould, CEO and Founder of AOE”

there is still reticence and scepticism over perceived vapourware that exists a lot in the market. It is a challenge for companies like AOE, but one its client list proves otherwise.

Other factors are also holding back airlines from pursuing omnichannel retail. One is long-term contracts and their inherent inflexibility. “Another aspect,” opines Gould “is that to some, it’s scary because it involves too many departments that used to be able to work in silos but now have to work together in the new scenarios.

“Our job right now is to help them see that we can reduce the complexity of doing it significantly.” Start small, says Gould and then scale it. An airline could, for example, transform its onboard programme into a predominantly pre-order programme. This allows the airline to bring onboard those products that have been sold and not products that are simply going to be flown around the world or thrown away. “You start somewhere that’s relatively small, but you start collecting data, you start generating cash, and then you can grow it.”

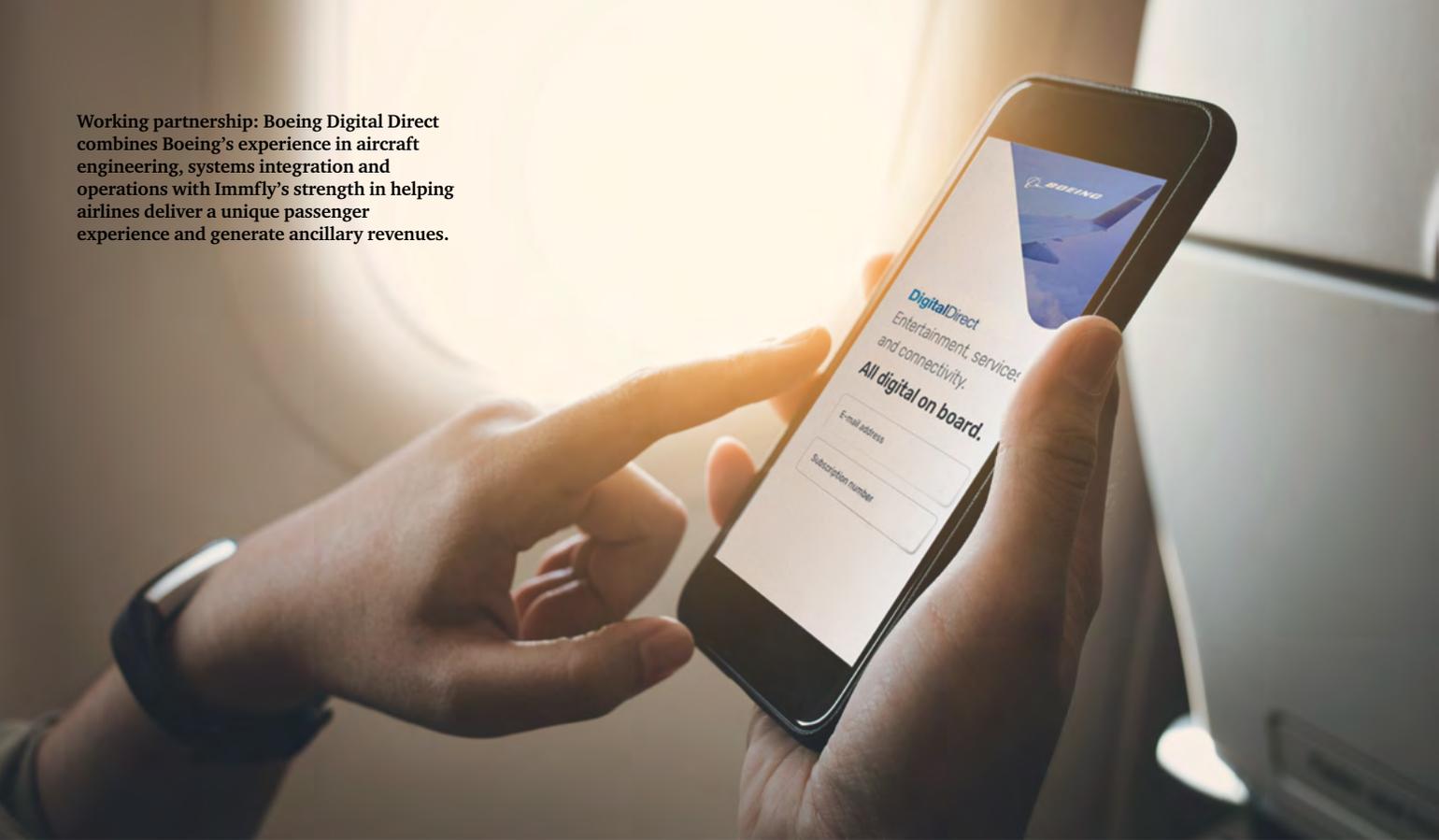
Michael Raasch, CEO of Omnevo, agrees. Explaining that the name Omnevo is derived from a synergy of the words ‘omnichannel’ and ‘evolution’, Raasch says that for airlines considering a move into omnichannel retailing and adopting a solution, “My advice would be

to test it and evolve from there, rather than using formal evaluations without ever using the tech.”

He advises against going through an RFP or RFI (request for information), which tends to advertise the intention of the process rather than its actual execution. Instead, he encourages an airline to start with a minimum viable product: “Test it on board, test it quickly, get it off as quick as possible, and test if these solutions are really offering a product or are just vapourware.”

Gould adds: “My advice would be it depends on how radical you want to be as an airline. I think the real advice would be to merge several departments together, which could be the customer experience department, catering, in-flight, product, retail, digital, e-commerce experience, because this all belongs together. It doesn’t belong separate. But of course, that’s not an easy thing to do in a flagship carrier. It’s much easier to do, and they’re doing it already in a low-cost carrier. That would be my strongest advice: you need to reduce silos to reduce complexity because, frankly, you can’t use our end-to-end solution if you don’t have end-to-end thinking. You can use parts of it, for sure, and it will still have an impact. But you cannot use it end-to-end if the departments are too scattered and can’t align on a vision.” ■

Working partnership: Boeing Digital Direct combines Boeing's experience in aircraft engineering, systems integration and operations with Immfly's strength in helping airlines deliver a unique passenger experience and generate ancillary revenues.



If you can't beat them, join them!

Emma Kelly charts the airframers' move into the wireless space and what it really means for the in-flight experience.

Airframe manufacturers Airbus and Boeing are playing an active role in the booming wireless IFE (W-IFE) sector, with both launching their own solutions and partnerships. Their moves come as W-IFE is set to play an increasingly dominant role in a post-COVID-19 world as airlines seek to improve the passenger experience and increase passenger engagement and revenue-generating opportunities.

Boeing's response to the W-IFE evolution came in late 2019 with its Horizon X innovation and venture organisation

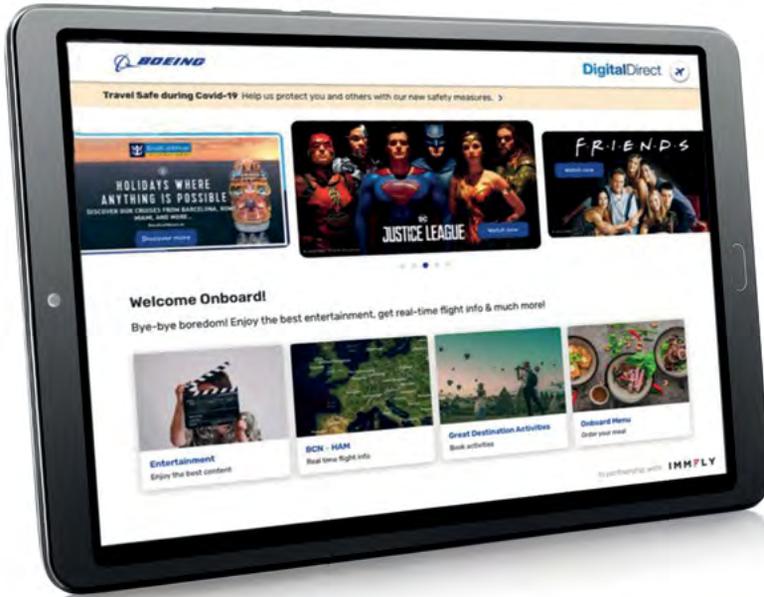
investing in Spanish in-flight digital services and IFE company Immfly. Immfly's W-IFE digital solution was already flying on 300+ aircraft with numerous carriers worldwide, mostly low-cost carriers and regional operators, providing passengers with IFE content, flight information, advertising and onboard retail sales.

The result of the partnership is W-IFE-and-digital-services platform Boeing Digital Direct which combines Boeing's experience in aircraft engineering, systems integration and operations with Immfly's strength in helping airlines deliver a unique passenger experience and generate ancillary revenues, says Laura Ross, Senior Program Manager, Digital Solutions, Boeing.

Of course, this is not the first time Boeing has directly entered the IFE space, with its Connexion By Boeing in-flight broadband

communications service announced in 2000, delayed by the events of 9-11 and subsequent industry downturn and eventually launching on Lufthansa in 2004. Despite flying with 11 carriers by the time of its demise, Connexion by Boeing was shut down in 2006 after it became clear Boeing would not make a return on its extensive investment, with the market not materialising as expected.

The IFEC market has developed and matured exponentially since then, with W-IFE taking off in the last few years. W-IFE is a far safer bet for the airframe manufacturer, with its potential passenger engagement and revenue-generating opportunities of particular appeal. "Boeing had long been exploring opportunities to expand our existing portfolio of solutions to address potential gaps we identified related to passenger experience and to help airlines



Portal to profit: Boeing's W-IFE solution has been built for ancillary revenue generation.

generate additional revenue in the cabin," explains Ross. "Our growth into this space reflects a belief that digital solutions in the cabin are a key ingredient for our airline customers and the COVID-19 pandemic has only accelerated that evolution," Ross adds.

Boeing Digital Direct is a web-based portal that can be accessed wirelessly on passenger mobile devices, with content stored in a server and distributed via wireless access points throughout the cabin. The system can be installed in an overhead bin and powered by the aircraft or integrated into an existing wireless network.

THE COVID CONNECTION

In terms of content, Boeing offers a "robust portfolio and can tailor content line-ups based on airline and passenger profiles", says Ross. "On the digital experience side, we work with airlines to offer services they are seeking to drive efficiency, from crew-passenger interaction to loyalty and catering systems integration," adds Ross. The capabilities of the system are coming to the fore in the COVID environment. "The impact of COVID related to passenger experience is very much at the top of our mind," says Ross, with the system supporting in-seat ordering, branded health/wellness channels and digitalisation of seat pocket materials to reduce touchpoints and physical contact.

"All of these capabilities are integrated with our powerful ancillary revenue engine," explains Ross.

According to Boeing, it is the revenue-generating capabilities of the system that distinguishes it from other W-IFE solutions. "Digital Direct is unique in its ability to truly deliver on ancillary revenue generation," says Ross. "While all wireless IFE suppliers can stream movies to passenger devices, our solution is built upon an agile digital architecture with autonomous system management, enabling the digital creativity and media sales strength of Immfly to deliver positive financial results for airlines," adds Ross. The system is connectivity agnostic, with connectivity providing the potential for further ancillary revenue opportunities.

Further developments in system capabilities and revenue generation are planned. "We constantly watch what is happening on the ground as much as what is happening in the air to ensure we're ready for new ideas and technologies. In addition, we routinely review potential content and e-commerce providers as that is a fast-evolving space," says Ross, pointing to its recent partnership with travel retail products, services and technology provider Tourvest Retail Services as an example of its expanding services.

“Our growth into this space reflects a belief that digital solutions in the cabin are a key ingredient for our airline customers and the COVID-19 pandemic has only accelerated that evolution.”

Laura Ross, Senior Program Manager, Digital Solutions, Boeing

While Immfly's solution initially appealed primarily to LCCs and regional operators, Boeing anticipates its reach to widen. "The industry is constantly evolving, so this offering has to evolve with it. Carriers are thinking creatively, and digital solutions in the cabin are crucial for LCCs and traditional full-service carriers alike. We don't view Digital Direct as better for one segment than another – the needs and interests are different, and we rely on our flexibility to meet those needs with an understanding of unique individual requirements," says Ross. Discussions are underway with "several airlines now". The solution is available as a retrofit option on all commercial and regional aircraft – Boeing and non-Boeing aircraft – with the manufacturer currently studying future line-fit solutions.

AIRBUS'S OSP USP – FLEXIBILITY

Airbus's W-IFE communications architecture, the Open Software Platform (OSP), is a line-fit solution for A320 family and A330 family aircraft that has recently entered service with launch customer, UK charter airline Titan Airways. Titan is one of five launch customers, including airlines and lessors for line-fit and retrofit of single-aisle and widebody aircraft.

OSP is part of the Airbus Connected Experience onboard Internet of Things (IoT)

ecosystem to deliver a new personalised passenger experience and an open ecosystem approach for airlines. Airbus envisages a connected cabin future whereby passengers will be able to order food and beverages from their seat and receive customised IFE content, for example.

OSP comprises embedded servers, routers, Wi-Fi access points and the software platform itself. One of the major benefits of OSP is the flexibility it provides, with operators able to choose from a growing portfolio of W-IFE partners who provide the software and content, says Airbus. To date, Airbus has confirmed Bluebox Aviation Systems, Inflight Dublin, Collins Aviation and Display Interactive, “with more to come”. Bluebox is the software and content provider in the Titan programme.

Under the OSP-hosted W-IFE model, the software and in-flight apps selected by the airline are pre-loaded onto the platform, with airlines able to customise their onboard offering without any hardware or certification impact, says Airbus. This is “an important benefit to simplify the process of aircraft transitions from one operator or lessor to another”, it says. Another benefit is that the W-IFE hardware does not encroach into the passengers’ overhead bins or other personal space, it adds.

The manufacturer and its partners are expanding the platform’s scope with IoT-

“With an OEM W-IFE platform now available, that puts us in an enviable position of having a range of options to support airlines with new and old aircraft.”

Catherine Brown, Head of Marketing, Bluebox

based value-added services as part of the Airbus Connected Experience.

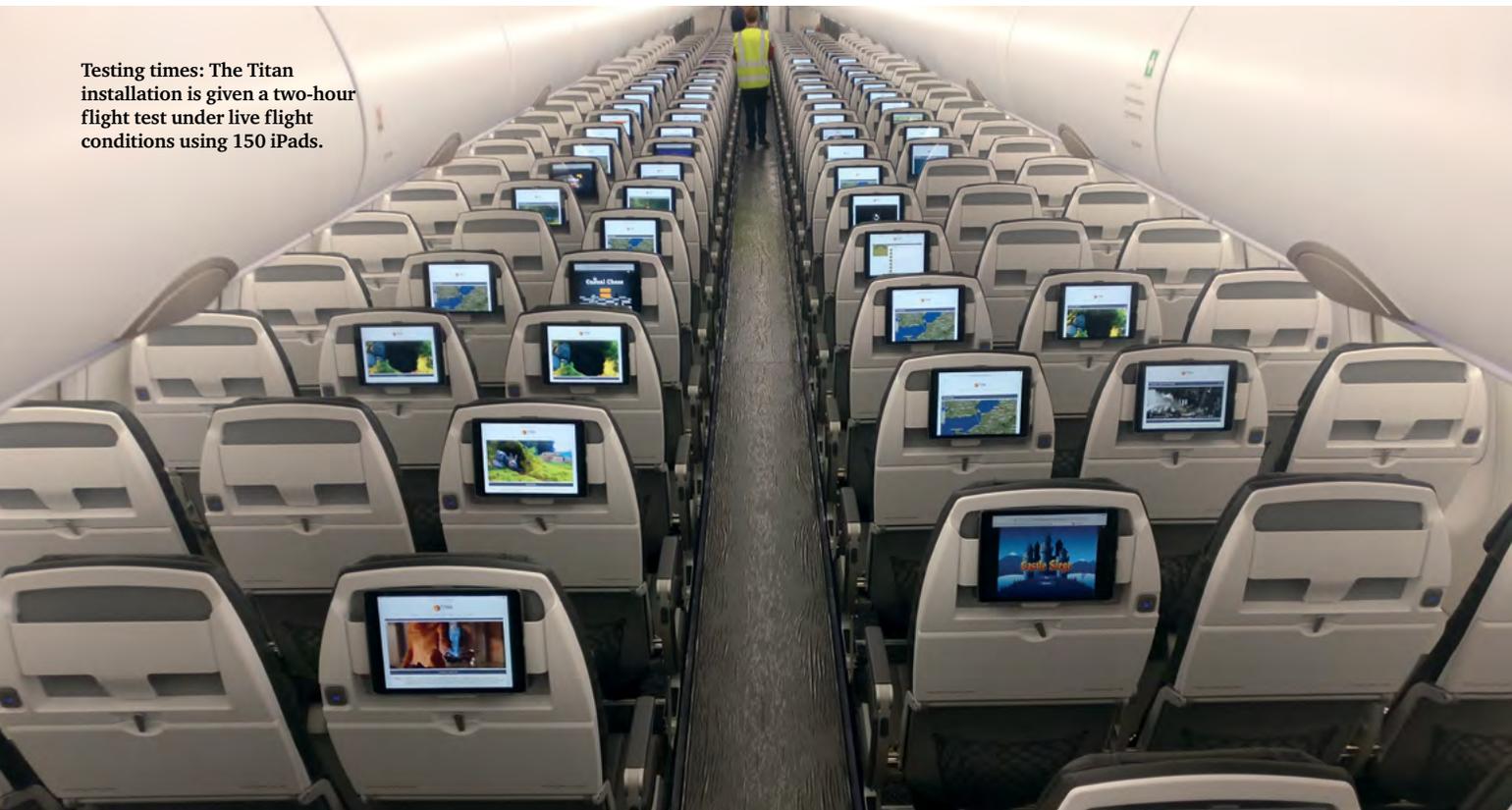
The OSP was launched on a Titan A321LR late last year following extensive preparation work by Bluebox. This work started in 2019 with core integration work and a series of system tests to ensure Bluebox’s wireless base software suite passed Airbus quality standards, says Catherine Brown, Bluebox Head of Marketing. “This aspect ran very smoothly,” says Brown. Bluebox established an OSP Lab, with dedicated facilities, equipment and staff

to ensure the implementation’s smooth running. The OSP Lab, based in Scotland, features the Aircraft Communication Manager – a media server hosting the Airbus Airline Network Architecture (ALNA)/OSP software platform, a test harness for simulation of aircraft systems interfacing with the media server, a 4G cellular gatelink capability and a wireless access point. The Lab was used to test interfaces and content sets and the system software package before shipping to Titan for installation.

The initial programme was by no means straightforward, however. “There was lots of technical complexity in the Titan programme, but we were able to get quite far along with the general OSP integration before feeling the full effects of lockdown, and the travel restrictions kicked in,” says Brown, with remote tests conducted once travel restrictions took effect.

As the Titan installation was a line-fit one, final integration was completed after the transfer of title to the aircraft customer. Final system testing took place in late October 2020 at London Stansted Airport, including several ground-based tests and a two-hour flight test under live flight conditions. “Some 150 iPads were set up on the aircraft to test functionality, performance and reporting – including content streaming, moving map, third-party application integration and connectivity,” says Brown.

Testing times: The Titan installation is given a two-hour flight test under live flight conditions using 150 iPads.



Titan's first customer for the aircraft is Seattle-based luxury tour operator TCS World Travel which, in addition to IFE, requested additional functionality to support its tour programme, including comprehensive destination-driven modules which interface with real-time flight route information and allowing TCS to manage bespoke content for the modules via Bluebox's content management system.

In addition to Titan, Bluebox has a second, unidentified customer – “a large low-cost airline in Asia-Pacific” – for new aircraft provisioned with OSP and featuring the Bluebox Wow solution. “This project was put on hold due to the airline's challenges dealing with COVID-19 in their region. Discussions have ramped up again as the airline starts to see some light in their regional conditions, but it's too early to say when the OSP part of that project will re-start,” adds Brown.

Bluebox has welcomed Airbus's move in this space, as has its airline customers, viewing it as “an important milestone in the proliferation of infrastructure to support digitalisation in the cabin”. Brown explains: “For new aircraft it simplifies the whole decision and reduces costs, making the economics of W-IFE more attractive to airlines and, with an uptick in demand, we expect to capture a share of that.”

Airbus's OSP very much fits in with Bluebox's product line and roadmap, with the UK company being a software company which diversified into hardware with its Bluebox Wow W-IFE solution to meet a market demand. “The portability of our software on that platform was always part of our solution set and product roadmap, whether deployed as our own fitted solution on third-party hardware or on something like OSP. We saw the opportunity to provide uniformity in the software and features available to passengers across a range of hardware platforms,” says Brown.

THE EVOLUTION OF IFE

“With an OEM W-IFE platform now available, that puts us in an enviable position of having a range of options to support airlines with new and old aircraft, as well as mixed fleets with different aircraft types – delivering a consistent passenger experience for all customers regardless of



Titan Airways' project team: Andrew Taggart, Airbus A320 TRI, EFB Manager, Project Manager and Performance Engineer (left) and Mark Holt, Titan Airways Account Director (right).

the aircraft. That's an incredibly powerful proposition,” explains Brown.

The OEM move into the wireless space indicates the growing importance of digitisation of the in-flight experience, Brown suggests. “Though it may seem this is just a major shift in the hardware landscape for W-IFE, it signals an elevation and expanded opportunity for the digital – software-based – evolution of IFE,” says Brown. By shifting the focus to software rather than hardware, Brown says it will allow far greater creativity

and opportunities for passenger engagement and ancillary revenues. “Just as we start to see signs of recovery from the global pandemic, we're seeing a confluence of the simplification of W-IFE hardware selection with the development and provision of retail and other revenue-generating services driving further adoption of W-IFE technology. But is it really IFE as in-flight entertainment anymore?” questions Brown, adding that amidst the gloom of the pandemic, Bluebox's discussions exploring what the IFE of tomorrow will be like is “truly exciting”.

According to Boeing's Ross, the changing landscape is also likely to see further collaboration and industry partnerships. All this is a far cry from the late 1990s and early 2000s when problem-plagued early interactive IFE systems caused tension between airframe manufacturers and IFE system suppliers, as well as airlines and their passengers. Collaboration has been key to this improvement. “Certainly, the landscape and technologies at play have changed drastically since that time,” says Ross. She adds: “Between rising passenger expectations, technology improvements and IoT evolution, we do feel strategic alliances are a high priority. Airlines expect collaboration to improve the travel experience and while there's more work to be done, we'd say the industry has been collaborating better than ever.” ■

“ We saw the opportunity to provide uniformity in the software and features available to passengers across a range of hardware platforms.

Catherine Brown, Head of Marketing, Bluebox

Travelling light: Relax / Evening mode (main image), Morning (inset). Soleil's Dynamic Daylight Simulation reproduces the full range of natural, cooler light temperatures associated with mornings and the warmer light temperatures associated with evenings. (Photo: Bombardier Aviation)



Circa Diem



Jet lag, as most of us will have experienced, can take a real toll on the body after a long-haul trip. However, for business travellers fortunate to fly long-distance aboard a Bombardier Global 7500, jet lag may just be a miserable thing of the past thanks to the innovative, new Soleil lighting system. Tim Guest reports.

For the occasional long-distance traveller, contending with jet lag once in a blue moon is tolerable. 'Drink lots of fluids, don't drink alcohol during your flight, set your clock to local time and don't go to sleep until it's bedtime at your destination...' Yes, lots of advice to follow and the body will cope pretty well if you don't do it too often. But with more and more people travelling to all corners of the globe, entering different time zones, grabbing naps when they can, eating at strange times, and generally throwing their

bodies' natural rhythms out of kilter, jet lag can become a serious health problem that's now associated with frequent flying. Wouldn't it be great if there were a technological way of countering this problem? Well, there is, but first, more on jet lag.

JET LAG IN FOCUS

Jet lag disrupts circadian rhythms – aka our 'body clock' – and occurs anytime a traveller crosses two or more time zones, according to experts at the Mayo Clinic. Crossing multiple

time zones puts our circadian rhythms out of sync with the time in your new location. If, for example, a person leaves New York on a flight at 4 pm on Tuesday and arrives in Paris at 7 am Wednesday, their internal clock still thinks it is 1 am. That means they are ready for bed just as Paris is waking. And because it takes a few days for the body to adjust, their sleep-wake cycle, along with most other body functions, such as hunger and bowel habits, remains out of step with other Parisiennes.

However, one of the key influences on our internal clock is sunlight because it influences the regulation of melatonin, a hormone that helps synchronise cells throughout the body. Certain cells in the tissue of the retina at the back of the eye transmit light signals to an area of the brain called the hypothalamus. At night, when that light signal is low, the hypothalamus tells the pineal gland, a small

organ situated in the brain, to release melatonin; during daylight hours, the opposite occurs, and the pineal gland releases very little melatonin. By exposing oneself to daylight in the new time zone, as long as the timing of light is done correctly, travellers may be able to ease their adjustment to a new time zone and minimise the effects of jet lag (factors not lost on the team at Bombardier which has developed the Soleil Lighting System, more of which shortly).

With all its various factors taken into account, advice from the Mayo Clinic is that it's best to arrive early at a long-haul destination if there's an important meeting or other events that require a traveller to be on top form. Indeed, arriving a few days early to give the body a chance to adjust, not to mention getting plenty of rest before a trip is ideal. Starting out sleep-deprived makes jet lag worse. A traveller might also try gradually adjusting their schedule before leaving. If travelling east, try going to bed one hour earlier each night for a few days before departure. If flying west, go to bed one hour later for several nights and eat meals closer to the time they will be served at a particular destination, (it's harder to fly east, when time is lost, than west, when time is gained).

And when it comes to light, the Mayo Clinic's advice is that it is important to regulate bright light exposure to help adjust to a new location faster. In general, exposure to light in the evening helps adjust to a later than usual time zone (travelling westward). In contrast, exposure to morning light can help adapt to an earlier time zone faster (travelling eastward). The one exception is if someone flies across more than eight time zones from their origin. This is a problem because the body might mistake early morning light for evening dusk, or vice versa. If this is the case, and you have travelled to the east through eight time zones, it's recommended by the Mayo Clinic experts to wear sunglasses and avoid bright light in the morning, then take in as much sunlight as possible late afternoon for the first few days in a new location. If travel has been to the west by more than eight time zones, sunlight should be avoided a few hours before dark for the first few days to adjust. And no matter

Advanced flight: The Global 7500 (right) is the only aircraft to feature the Soleil lighting system. Suite controllers bring home-like automation to the cabin (below). The aircraft's master bedroom suite (below right). Photo: Bombardier Aviation



how tired, travellers need to stay on their new schedule; watches/phones should be set to the new time before leaving and once at a final destination, don't sleep until local nighttime, and take meals at local mealtimes, too.

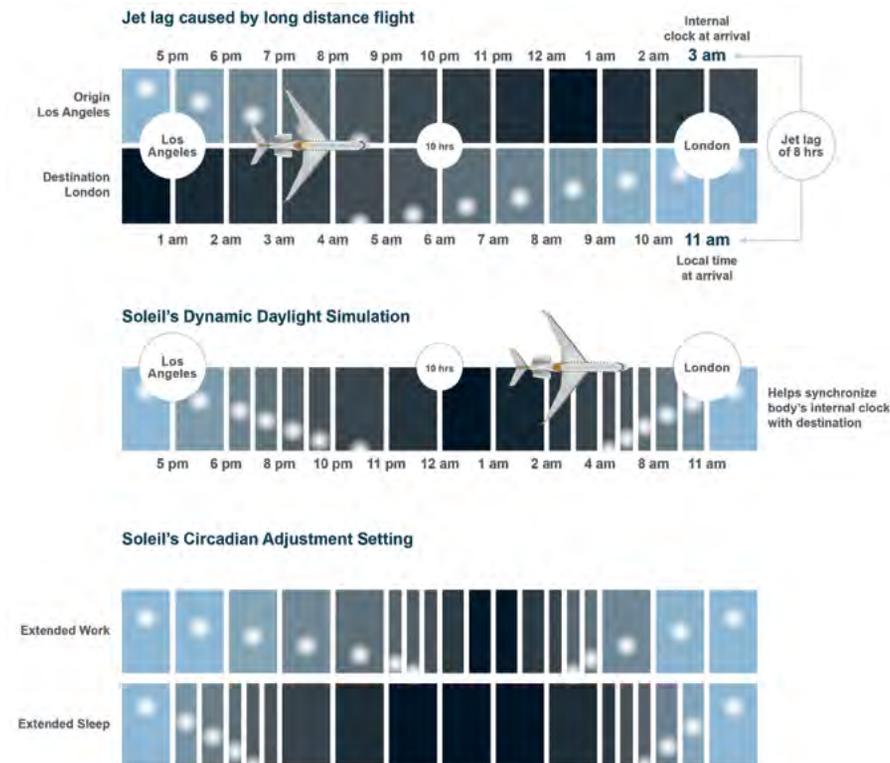
CLEVER THINKING SHINES THROUGH

While the above offers lots of great advice for the avoidance of jet lag, it can all be a little confusing for the weary traveller and a challenge to remember. For the team at Bombardier Aviation, however, the effects of light on our circadian rhythms are so well understood it decided it could come up with a lighting solution for its new long-range aircraft, the award-winning Global 7500, to counter jet lag based on those rhythms – and so, the ground-breaking Soleil lighting system was born.

Inflight spoke with members of the Bombardier Aviation team to find out more and according to Laurence Casia, Bombardier Aviation's Manager, Industrial Design, key reasons for developing the Soleil lighting system for the Global 7500 included its long range. "Since it can fly especially long distances, it was important for us to develop

an advanced lighting system that can help synchronise a traveller's circadian rhythm to the time at their destination to help combat jet lag. As part of our overall approach to passenger wellness, integrating the innovative Soleil lighting system was a natural opportunity to take the cabin experience to new heights. With four true living spaces, a separate kitchen and crew rest area, as well as the smoothest ride thanks to our Smooth Flex Wing, the Global 7500 business jet is the largest and longest-range purpose-built business jet in the world. So, complementing the aircraft's leading-edge wing design, the Soleil lighting system redefines comfort, technology and wellness in business aviation." According to Casia, the lighting system is integrated into every Global 7500 aircraft as standard and is a self-developed part of its cabin management system.

On the technical side and to explain how the system works, Bombardier's Bruce Malek, Technical Lead, Industrial Design Specialist,



Light time: The Soleil lighting system is aviation's first circadian rhythm-based cabin lighting technology fully integrated with the Flight Management System. (Image: Bombardier Aviation)

says that Soleil's Dynamic Daylight Simulation reproduces the full range of natural, cooler light temperatures associated with mornings and the warmer light temperatures associated with evenings. He says the changing light temperatures over the course of the day are known to stimulate the production and suppression of melatonin – the body's natural sleep hormone, (as mentioned above). However, Malek adds that the Soleil system goes some clever stages further. "The system has also been designed to adjust for the seasonality effect of daylight, altering the sunrise, mid-day, dusk and sunset lighting, as well as the colour and intensity throughout the journey."

ABOUT TIME

He adds that the synchronisation process between a passenger's circadian rhythm and the lighting environment can be felt in as little as 15 minutes and increases effectiveness with time, making it ideal for long-distance flights. "Soleil's Dynamic Daylight Simulation mode is calibrated automatically thanks to its integration with the avionics suite in the Bombardier Vision flight deck. The algorithm uses departure and arrival information from the Flight

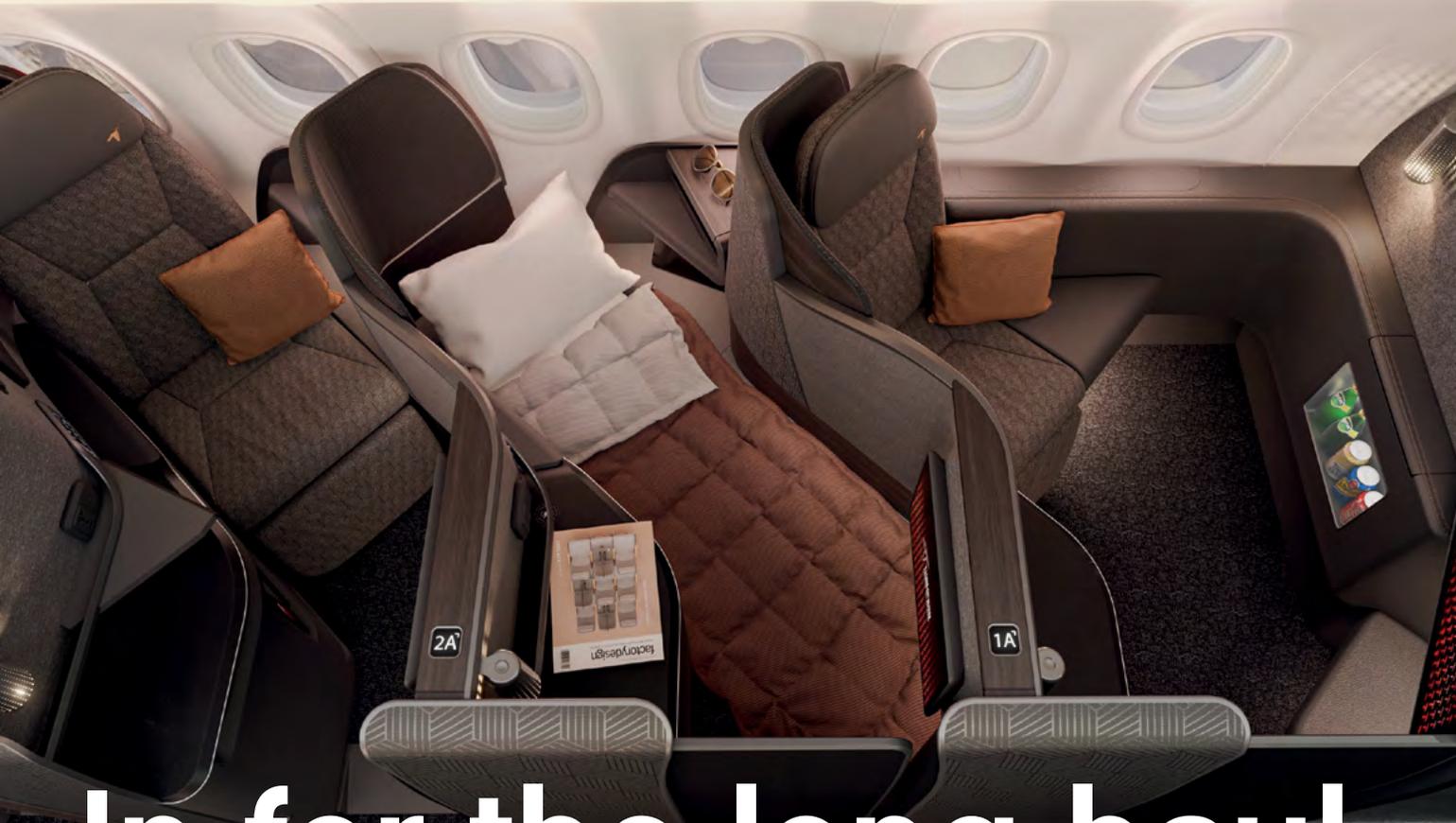
Management System (FMS), or via manual inputs by the cabin crew."

Malek turns to the science to explain the benefits of the new lighting for passengers hoping to avoid the ravages of jet lag. He says that the effects of lighting have been scientifically proven in studies on circadian rhythm, to deliver numerous psychological and physiological benefits, including alleviating jet lag; improving alertness; increasing productivity; stimulating social interaction; reducing stress and anxiety; aiding relaxation; promoting sleep. He adds: "More precisely, the 'Boarding' pre-set leverages lighting to accentuate the length and height of the cabin, helping travellers transition more comfortably to the cabin environment when coming from the wide-open space of the hangar, or outdoors. The system also intelligently adjusts the lighting colour and intensity for the time of day." Malek reveals that the "Taxi, Take-off & Landing" (TT&L) pre-set adjusts the interior lighting to make the cabin appear wider, improving relaxation by enhancing the cabin's already spacious interior. The 'De-planing' (or Walk Out) pre-set turns all the cabin lights on, increasing the intensity in specific areas to assist passengers in locating their belongings before disembarkation.

“Bombardier Aviation leads the way in passenger lighting, as no other system can be customised to a passenger's profile or adjusted on demand for either extended sleep, or work.”

As to whether the new lighting system will be installed on other aircraft and whether it's a system only for the business sector, or with potential take-up by commercial carriers for long-haul flights, Casia, says that at this time, the Soleil lighting system is only available on the Global 7500. "It's unique to Bombardier, revolutionary for travellers and the Global 7500 business jet, which is the only aircraft in the world equipped with it. It's the most advanced cabin lighting in the industry, and what makes it so unique is its integration with the FMS and its proprietary algorithm that allows the lighting to dynamically adjust during the flight, based on the departure and arrival time and location.

"Bombardier Aviation leads the way in passenger lighting, as no other system can be customised to a passenger's profile or adjusted on demand for either extended sleep, or work. The Soleil lighting system is also the only 'Dynamic Daylight Simulation' allowing for up to five different lighting zones in the aircraft, including one for the crew occupants. Special care and attention were paid to ensure that the cabin crew benefits from optimal lighting conditions, with the ability to run their own preferred daylight simulation in order to safely carry out their work," Casia concludes. ■



In for the long haul

Michael Doran looks at the new design approach for bringing widebody comforts to single-aisle aircraft.

When Airbus launched the A321XLR at the 2019 Paris Air Show a pandemic was something you read about in a history book, yet within nine months one had grounded most of the world's airline fleet.

Filling a widebody seems unlikely for some time, so long-range narrowbody aircraft may be the solution for building traffic on long but thin international routes. The comforts of premium cabins on A350s and 787s have set the benchmark, so how will airlines entice premium passengers into a narrowbody cabin for 10 hours and who is leading the way in squaring that circle?

Airbus sees its A321LR and XLR as game changers in long-haul travel. Antonio Da Costa, the airframer's VP of Single-Aisle Marketing, tells Inflight that while the aircraft will open a world of new routes, it



VantageSolo gives full lie-flat bed and direct-aisle access in a narrowbody cabin. Photo: Factorydesign

will still have all the trappings and comfort of a long-haul aircraft.

"This aircraft has the widest cross-section of any single-aisle aircraft, offering a seat comfort the same as any of the Airbus widebodies with the same features as on a long-haul aircraft," he explains. "We're installing our new Airspace cabin on the XLR, so it will

have the same look, feel and design as our widebody aircraft.

"When an airline or seat design company develops a new seat, we do some technical meetings with them to make sure the aircraft constraints are well explained and launch into an iterative process with them to make sure everything goes to plan," he says.

“These seat design projects can take up to two years or more to develop, and if you don’t get it right, it can be a big issue, even delaying the delivery.”

Airbus has paired widebody aircraft such as the A330 and A350 for airlines to mix and match as they launch and develop new routes. Today, the same concept is being used at TAP Air Portugal with the A321LR and the A330.

“Pre-COVID, TAP was operating routes using the 321LR on the lower traffic days and the 330 on the high traffic days, so you could be flying in on a 321LR and flying out on a 330,” Da Costa illustrates. “I would say the A321 is a unique aircraft because in one package you can do short- and long-haul with the LR and soon even more with the XLR.

“It’s able to do routes that are currently not feasible to be done with a single-aisle aircraft

and yet are too thin to be viable with a widebody aircraft like Delhi–Manchester or Sydney–Tokyo,” he says. “Many airlines like TAP, SAS and Aer Lingus are offering three classes, and American Airlines have four classes, so this is something that is becoming more common in the marketplace.”

ALL BY MYSELF

The Solo seat concept started with UK creative design agency Factorydesign, who have extensive experience in creating aircraft interiors, including Etihad’s The Residence, Virgin Atlantic’s Upper Class Loft and the Air Living Room for China Eastern.

The Solo seat’s genesis was sparked by analysis Factorydesign did in 2014, which Director Peter Tennent says showed the emergence of long-range narrowbody aircraft

would create demand from airlines for a fully-featured business-class seat.

“Business class had reached a point in widebody where any self-respecting airline was pursuing the ideal offer of direct access and a lie-flat bed. So we began to look at how that could be achieved on a single-aisle aircraft,” Tennent tells Inflight. “We worked from the feet up to find the balance between the seemingly conflicting criteria of a lie-flat bed, direct-aisle access and a commercially viable cabin density.”

An inward-facing herringbone pattern was chosen as it created greater passenger separation between the cross-aisle seats, kept the head away from the aisle and gave a window view, configured with an under-window console and stowage. Factorydesign has a close relationship with seat-maker Thompson Aero Seating, which also saw the market potential. The two developed the seat – the VantageSolo – and optimised the offer to include a standard seat version, one with a screen and another with a door option.

Producing mock-ups is an integral part of designing seats, and as the process progresses, the mock-ups become more detailed, although Tennent says each type of mock-up serves an invaluable purpose at each stage.

“Of most value are full-size card and foam models to assess space and configuration of features, moving on to more structural high-density model board and timber mock-ups, perhaps with some moving parts,” he explains. “The final mock-ups are better described as pre-production prototypes, built using the correct aviation materials and processes.”



ACCESS is a totally new concept giving direct aisle access for the window passenger. Photo: Factorydesign



SOLVING AN AGE-OLD PROBLEM

With VantageSolo now in production and soon to enter service, Factorydesign is developing an entirely new concept for long-haul narrowbody flying called ACCESS, where the premium is the freedom to move around without stepping over your neighbour.

“A full business-class seat is space-hungry and may not be appropriate for every airline or every route so we considered what might result if we prioritised aisle access over a full-length bed,” he reveals. “While it may look similar to a 2-2 premium narrowbody seat the off-set allows the window passenger to get to the aisle without stepping over their neighbour by moving behind the seat next to them.

“ACCESS is a Lazy-Z recliner, an advantage over a conventional 2-2, and has a fixed back eliminating the scourge in premium economy of the seat in front reclining into your space. It is not competing with lie-flat beds but is complementary and bridges the gap between business class and 3-3 economy, creating an enhanced premium economy or even a four-class aircraft.

“The pandemic has yet to reveal its true impact on cabin interiors but one regular topic of discussion, particularly for business class, is cabin size and passenger density,” concludes Tennent. “It’s our view that compact, premium products that keep accountants happy and the passenger happy will be winners over the next few years.”

JETBLUE GOES SOLO

When Factorydesign first approached Thompson Aero Seating, part of AVIC Cabin Systems, with the Solo concept “we liked the look of it, so we started talking to potential customers about it,” recalls Andy Morris, Thompson VP Commercial. “We already had a good product in the Vantage seat, but the Solo is the next step up with full direct aisle access.

“Where we were a few years ago was quite a different place to where we are today. Then it was more about capacity and larger aircraft, but that has changed,” Morris explains. “As soon as the XLR was announced, there were a number of airlines committing to it, and that gave us a degree of confidence that we were heading in the right direction with this product.”

With Solo being such a new concept, Thompson took the prudent step of working with both major OEMs to ensure incorporating it into the aircraft would not throw up any surprises or disrupt the final assembly process.

“Thompson has a good reputation for innovation but having a seat such as this on a single-aisle has never been done before, so you have to work alongside the customer and the OEM, in this case, Airbus,” he says.

Thompson started working with JetBlue on the Solo project in 2016 and Morris says, because it was a completely new concept, marketing took a back seat, despite strong interest in the concept.

“We took a decision at the very start of the JetBlue programme not to take on a second or third customer too quickly until we had got over the hump in terms of certification of the



JetBlue is launching the Mint premium cabin of Solo seats on routes to London in 2021. Photo: JetBlue



JetBlue programme,” he says. “We’ve purposely held back in terms of pushing it, but now it’s certified and out there we are seeing a lot of interest and activity in the single-aisle market.”

REFRESHED MINT

Also debuting with JetBlue is the Mint Studio, an enlarged space located in the first row of seats. It features a guest seat that translates into bed mode for added sleeping room, an extra side table, a 22-inch tilting screen and suite doors. This concept of using the monument wall was something that Thompson first used with China Eastern for its 787s and A350s and utilises space previously used for cabin storage and a footwell.

“We took a different view and saw if we didn’t give that space above the footwell to the

aircraft we could give it back to the customer and open it up within the same footprint for a potential upsell,” Morris says. “And that’s certainly what we did on China Eastern.”

In February, JetBlue unveiled its revamped Mint premium cabin of 24 private suites in the herringbone layout, each with a sliding door and featuring the Solo seat and including two Mint Studio cabins.

The launch is planned for the northern summer on transatlantic flights to London, and a 16-seat layout will also debut on a limited number of New York–Los Angeles flights in 2021.

“We put our heart into this redesign of Mint and were inspired by our original vision of offering customers an exceptional experience at a lower fare – which is what JetBlue is all about,” says CEO Joanna Geraghty. ■



Work-wear for the 2020s: Keyvan Aviation's stylish and comfortable clothing made with fabric with antimicrobial properties.

By design

When thinking of sustainable practices, cabin crew uniforms may not be near the top of an airline's checklist. But they could and should, as Alexander Preston discovers.

Sustainability has long been premised as standing on the three legs of the stool: environmental, social and economic sustainability.

In March 2020, Finnair presented its climate strategy and put sustainability at the heart of everything the airline does. Like other carriers, this includes investing in new aircraft, committing to greater use of sustainable aviation fuel and cutting back on plastic and waste.

Writing on Finnair's *Blue Wings* blog, Anne Larilahti, Finnair VP of Sustainability, cites that "life in the middle of a pandemic and the slow recovery from it has highlighted the need for the balanced sustainability approach."

She adds that the airline will learn from this and "hopefully come out with an increased understanding and willingness to move from black and white one-cause advocacy to cooperation and a joint quest for systemic, sustainable solutions."

Cabin crew uniforms are often an overlooked part of these sustainable solutions. They can help an airline meet its contribution to Goal 12, Responsible Consumption and Production of the 17 Sustainable Development Goals by the United Nations.

PROUD TO BE GREEN

Unveiling its cabin crew uniforms in early February, Jasmine Dhillon, Director of Cabin Services at Green Africa Airways, declared that for the airline, "green is not just a colour. It's a concept representing growth, vibrancy and sustainability."

From an initial list of 17 invited designers, Green Africa Airways selected Lagos fashion school, Zaris Fashion & Style Academy and Orange Culture to create its crew uniforms. These are a key element of the Nigerian start-up airline's visual identity and the latest step towards its full brand launch.

Natural fibres are used for comfort and breathability. The resulting 'gCrew' uniform is both functional and durable, and according to Dhillon, "proudly African, proudly Nigerian".

Whilst the final product may be sustainable in nature, are airlines considering uniforms as part of their environmental responsibilities and requesting sustainable uniforms for their cabin crew as part of their design brief?

SUSTAINABLE UNIFORMS

Keyvan Aviation has worked with a number of airlines, some of whom, says Chairman and CEO Mehmet Keyvan, "are very serious about sustainable uniforms, but some of them still prefer traditional uniforms for procurement. We think, as part of their environmental responsibility, they should provide sustainable uniforms to their ground and aircrew. Through this, they will have the happiest crew members, lower costs as well as lower waste."

With an increasing number of airlines valuing sustainable options for cabin crew uniforms, what does sustainability mean to suppliers? How are their designers incorporating it into their approach to uniform design?

"Sustainability is the most important agenda for the industry players around the world," says Keyvan, adding that for his company, sustainability means caring for the environment, people, and cost. "When our design team is working to prepare a new design idea, they care about materials, comfortable design and manage the cost."

FUTURE FOCUS

"Sustainability is a central part of SKYPRO's mission," says Jorge Pinto, CEO. "It is what drives our decisions."

“The clothing industry is the second most polluting industry, and the reduction of its carbon footprint will include a novel way of designing uniforms.”

Jorge Pinto, CEO, SKYPRO

During the past 17 years, SKYPRO has worked with more than 70 airlines worldwide, including Qatar Airways, flydubai, Austrian Airlines, TAP, Groundforce and Ethiopian Airlines.

“All companies have their own staff uniforms, and it is our responsibility to help make the transition from the linear model of uniform business to a circular model,” continues Pinto. “The clothing industry is the second most polluting industry, and the reduction of its carbon footprint will include a novel way of designing uniforms.”

“ECO-DESIGN uniforms are a part of the SKYPRO Ecologic System that considers protecting the environment from the concept through the product’s entire life cycle. We started ISO 14001 certification during the pandemic, and our company is proposing circular concepts in new projects.

“The adoption of this paradigm shift during the pandemic is difficult because the first priority is for economic and financial recovery. But it is also necessary to prepare for the future now.”

EVER-EVOLVING TEXTILES

Denmark-based Olinio believes that sustainability is a complex topic. “Environmental sustainability is no exception, as it has to do with everything from subcontractors and production facilities to logistics and recycling.”

Located in Odense and with vast experience in the industry, Olinio has made its proximity to its main subcontractors and manufacturers in Europe a cornerstone of its business.

For 35 years, Olinio has specialised in delivering airline uniforms for cabin and flight deck crews, ground staff and other airline employees. The company currently serves more than 30 aviation clients, including Air Italy, Icelandair, Jazeera

Airways, Qatar Airways, Qatar Aviation Services, SAS, Star Air and Jet Time.

Olinio says that looking into alternative fibres and fabrics is essential in developing its sustainable uniform products. “With a rapidly evolving technology, the development of different fabric alternatives moves fast – and we wish to do the same.”

The company says it closely follows the development in alternative textiles and can already supply customers with garments made from recycled polyester (rPET) and organic cotton for a sustainable uniform solution. The recycled or organic fibres substitute the virgin polyester or cotton for an environmentally friendly alternative in textiles.

Olinio already offers bamboo-fabric uniforms ready-to-wear and as part of its standard stock programme. It says bamboo possesses inherent attributes suited for uniforms. It is incredibly soft and comfortable to wear; it is highly breathable

and odour-free as the fabric absorbs and evaporates perspiration; is temperature regulating, keeping the wearer warm in colder climates and vice versa, and is protective against UV rays.

According to Keyvan Aviation’s plan, a sustainable uniform should be made from natural fabric and be comfortable for the end-user, easy to maintain, and keep them safe and away from virus and bacteria. “To answer this demand, our design team and textile engineers offer natural fabrics or closest options to our customers,” says Keyvan. He explains that the design is made after reviewing customer needs, operation area, temperature, humidity, and customer culture. “While we respect the culture and the corporate colours, we work closely to make it comfortable for the end-user and to be easily maintained during the lifecycle of the product. Our technical and operational advice to our customers will help them increase the lifecycle of the uniforms and decrease their operating costs.”

The company uses fabrics that can be included with lots of different combinations of cotton and wool, sometimes together with a small portion of polyester and elastane, but it ultimately depends on customer needs and the area of operation.

For SKYPRO, it all starts from the product design where the product is ensured to be fully sustainable or have sustainable tendencies. “The second stage is the material

On the runway: For Nigeria’s Green Africa Airways, the comfort of the crew while wearing their environmentally friendly uniforms is paramount because “happy crew means happy customers”.



selection,” explains Pinto. “We use easy-to-recycle materials that use less energy, less chemicals, and less water. Using materials of excellent quality and durability is the fundamental principle. For instance, using the fabric that is produced using treated water and solar energy. Most of our current suppliers already have their production units prepared and certified to meet strict environmental goals.”

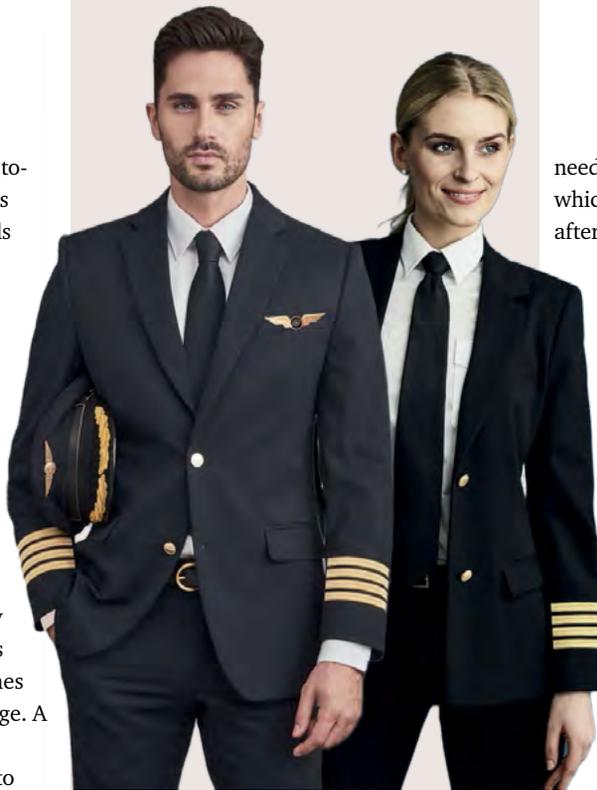
Pinto declares there are enormous challenges for companies that typically use a lot of fibre mixtures in the composition of their uniforms, which makes the recycling process very difficult. “A 100% pure wool suit that is recyclable is not possible for most airlines as cost optimisation is always a challenge. A durable composition with a mixture of synthetic fibres is also not yet possible to recycle. Having a 100% recycled uniform still remains impossible. But we are capable of conceiving a circular process from an ECO-DESIGN uniform. And above all, SKYPRO has a catalogue of raw materials already tested that allows the reduction of companies’ footprint left by uniforms.”

Pinto says that constant innovation will move the industry closer to having fully sustainable uniforms.

“Our SKYPRO Ecologic collection is all finished and ready for the aviation industry. Over the past two years, we have been testing products that prove to be an optimal choice. We produce organic cotton shirts mixed with recycled polyester washed at 60°C, fabrics produced with clean energy and reused water and a dyeing process with less chemical intensity and less water. Our shoes are crafted from materials made from vegetable skins and cactus, and their soles are made from recycled plastic. Our corporate website in April will have an entire collection of sustainable materials available.”

The principal supplier of SKYPRO fabrics is GRS-certified (Global Recycle Standard) and is currently on its way to complete all OEKO-TEX Certification steps. OEKO-TEX consists of 18 independent institutes in Europe and Japan, which together continuously develops test methods for the textile and leather industry.

“There is so much that can be done for sustainability,” says Pinto. “For instance, we can transform old uniforms into new fibres to



Crew chic: Denmark’s Olino says that looking into alternative fibres and fabrics is essential in developing its sustainable uniform products.

“Environmental sustainability is no exception, as it has to do with everything from subcontractors and production facilities to logistics and recycling.”

Olino

make onboard blankets. We can also create gifts for customers made from recycled uniforms.” The company currently recycles uniforms on a small scale but plans on expanding this process by the end of this year.

Like SKYPRO, whose uniform management system (UMS) for mySkypro is integrated with RFID technology to manage the uniform pieces’ durability, Keyvan also offers its airline customers a UMS to help reduce their carbon footprint and costs significantly. However, it says “for recycling service we

need to work more closely with the airlines which we think can be a possible negotiation after this crisis is solved.”

For its part, Olino takes an active role in different projects concerned with the circular economy and recycling. It is a member of a pilot project overseen by the Odense Waste Management Company responsible for the recycling stations in Odense. It donates obsolete uniforms and uniform garments for educational purposes to gain insights into how its customers can prolong the garments’ active life.

There is a consensus among suppliers that most passengers will not choose an airline that does not respect its effects on the environment in the near future.

“Airline uniforms have a high impact, and it is mandatory to create substitution strategies without severe effects on costs,” says Pinto. “We are working very hard to be the most competent uniform management company in the world by leading in sustainability and innovation,” he adds.

“SKYPRO will handle the entire uniform management system from eco-design and raw materials selection to supply chain management. That’s how we will create a complete uniform management system for our clients. It is not only sustainable materials but also sustainable processes.

“We can do it by taking care of all the sustainability aspects and by using the latest technology, mySkypro. By operating in this way, we can guarantee a huge cost reduction, sustainability, circular process and comfort for employees,” says Pinto.

Mehmet Keyvan proffers this advice to airlines. “Use designers and textile engineers who know aviation and are familiar with the daily routine and duty of ground and flight crew. While the designer should think about the culture and incorporate each airline operator’s colours, they should also consider the comfort of the final product, its easy maintenance, and the material’s durability. Using recyclable materials will give them power for the future.”

As Olino acknowledges, “Working with corporate responsibility is an endless process. We can always do better. We know that, and we strive to improve every single day.” ■

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Value for money: new or used?

In our last issue, we established what motivates someone to buy a private jet, so the next stage is to dive deeper into the overall process, from initial discussions to delivery. Again, adding his expertise to our series is Camber Aviation Management CEO, Tom Chatfield.

Whether the plane in question is a Boeing Business Jet (BBJ), an Airbus Corporate Jet (ACJ), a Gulfstream G700 or a Bombardier Global, Tom Chatfield, CEO of Camber Aviation Management, says the ownership path starts by meeting with the client to understand their needs, what they want to do with the aircraft and ‘what motivated you actually to say you want to have an airplane?’.

“So we talk about range, what airports they want to fly to, the number of passengers they are taking and how often the plane will be used. Out of that conversation, a definition of what their requirements are begins to crystallise,” Chatfield tells Inflight. “Once we have that my next real question is what is the timeline and from that, we can recommend

some basic aircraft types and move onto the budget.

“Once we’ve got those four things; needs, type, timeline and budget, we put together a consultancy proposal for the completion or refurbishment management and the budget and timeline will drive whether it’s a new or pre-owned aircraft,” says Chatfield. “We define what has to be done to go from the client’s vision today to putting the aircraft into service, and we put an agreement together around that.”

For the consultancy agreement, Camber puts together a ‘rough order of magnitude’ of the hours they expect to work on the project and then provides regular updates on how those hours are being spent as the project progresses. This keeps the client abreast of

changes and how these impact the project and the time Camber spends on it, avoiding any unpleasant surprises.

“For us, it’s that honesty and transparency to say you might want the airplane in four months, but it’s going to take six, and it’s not going to be a million dollars, it’s going to be two million, but we explain the reasons why. We’re building trust by explaining our proven process and letting them ask questions until they feel comfortable with every aspect of the project.”

Having agreed to work together, the collaboration continues to what Chatfield calls the ‘fun stuff’, teasing out the nitty-gritty of what will be in the cabin, such as seating and sleeping arrangements, bathrooms, connectivity, entertainment and what’s needed in the galley.

“Some people have catering from fine restaurants and heat it up, others want a chef to cook for them, have special dietary requirements or just prefer simple things, so how the galley is fitted out depends on what they want,” he explains. “If you have 19



Shop window: The BBJ MAX 7 has a flight range of 7,000 nautical miles and 82 sq.m of cabin space.

Photo: Boeing



Buying a pre-owned aircraft offers a number of advantages, and when someone decides to sell an airplane, they usually want to get rid of it, so availability is generally very quick.

Tom Chatfield, CEO, Camber Aviation Management



people onboard for a 12-hour flight you're going to have two meals and a snack, and that's a lot of china, so we may put a high-speed aviation-approved dishwasher onboard to save space."

A key determinant of which jet is selected is when the client wants delivery because that could be more than two years for a new Airbus or Boeing private jet or a matter of weeks for a pre-owned business jet, depending on how willing they are to compromise on the fit-out.

From those discussions, a picture will emerge of the aircraft that can meet the requirements. The choice between new or used generally hinges on the budget and the timeline. Using a BBJ 737 as an example, if you go with a new aircraft there is a blank canvas to work with, but it comes with a hefty price tag, an expensive completion and a rather long wait.

"You would be buying the airplane for around US\$70 million, and you're going to

put another \$30 million into the cabin, and between you buying it and picking it up it's going to be two to possibly even three years," Chatfield says.

The other option is to look for an existing BBJ with a good pedigree and a reasonably close fit to the client's wish-list for around \$15 million with another \$10 million for the cabin refurbishment, system upgrades and a new livery with a much quicker delivery time.

"If you were to put in new satellite phones, galley, IFE, carpet, new veneers and upholstery and apply a new livery you're going to walk up to that plane and what's going to tell you it's not brand new?" he asks. "And a 20-year-old BBJ may only have 8,000 hours on it, that's three years of airline work, and it's been kept in a hangar and well cared for."

"Buying a pre-owned aircraft offers a number of advantages, and when someone decides to sell an airplane, they usually want to get rid of it, so availability is generally very quick. Also, it gives you the ability to look at

airplanes and see something you like but may want to change a few things, so we've already got the bones to work with."

If the client's needs are better suited to a business jet, such as Global or Gulfstream, the situation with a new aircraft is somewhat different. The cabin choices are fashioned around what the OEM offers, rather than the blank canvas of the larger private jet. In that case, the client will pick from a range of options, colours, furnishings, galleys etc., on offer from the OEM, and Camber will be their advisor in the process.

YOU BUY IT, WE COMPLETE IT

Refurbishing a pre-owned business jet brings greater opportunities for customising it to meet specific needs. The process more closely resembles what happens with a BBJ or ACJ project.

Having settled on the type and made a choice between new or pre-owned, the next step is to find and purchase the aircraft, and on this point, Chatfield has a very definitive position as to the role of completion managers in the purchase.

"We're not going to buy or sell an aircraft at all, and I think that's important, because as soon as you do that you're in a conflict," he says. "Brokers make money on percentages, but we work for our client on an hourly or project rate.

"What we are happy to do is to take a look at what's out there and say here are three airplanes with different brokers. We'll do a technical survey, physically inspect each plane, go through the documentation to see how it has been maintained and establish the condition of each aircraft."

Luxury on the menu: This sumptuously appointed ACJ320neo, operated by Acropolis Aviation, boasts a full-spec galley where cabin crew can create freshly prepared meals in flight. Photo: Airbus





Sleep like a prince: Airbus says the ACJ220 can deliver the quietest flights over intercontinental range, so you can lie back in London and wake up in Los Angeles or Tokyo. Photo: Airbus

From that, Camber reports back on any issues and how much it will cost to rectify them and then make a recommendation as to which aircraft represents the best fit and value for money to the client. Once the selection is made, Chatfield advises that a more thorough and objective pre-purchase inspection is done of the chosen aircraft at a Completion Centre, costing around \$50,000.

“It normally takes around three or four days where they will open the panels and go through the whole airplane taking a very good look at it and finding anything that needs to be attended to and advise us how much it will cost to fix,” he explains. “On a used plane we also do an acceptance flight, so we go through a flight profile and make sure the aircraft is working the way it’s supposed to.”

Armed with all that information, Camber then advise their client to consult with their legal and financial team to negotiate a purchase contract with the broker. “And we will sit in the background advising on technical aspects and what things will cost, but we don’t negotiate the purchase, that’s simply not our deal.”

A vital step is to prepare a detailed specification of every aspect of the cabin and the works required, which Chatfield estimates will be around 150 pages for a BBJ/ACJ or well over 200 pages for a 787 private aircraft, prompting clients to ask ‘why do we need so much detail?’.

“The specification is incredibly important, so my answer is if you don’t have the detail how do you know what you are going to get,” he says. “When we’ve written the specification, we go through the whole thing

with the client, and they sign off on it. They may not read the entire thing, but we do a presentation to make sure we have captured exactly what they want.”

AVOIDING ‘JUST IN CASE’ COSTS

The specification document defines the relationship with the completion centre, and Camber will seek proposals from centres based on their capabilities, slot availability and fit to the available budget. The Camber technical experts will liaise with the centres to ensure everyone understands the specification and can quote precisely without adding on any contingency costs ‘just in case’.

“Our specification forward always says ‘this is the way it is, and any alterations will be a change order affecting cost and possibly schedule, so quote exactly to this,’” adds Chatfield. “This means there won’t be an excessive margin on top from not knowing and it gets rid of stress, that’s why completion centres love a detailed specification.

“It also prevents the client from constantly making changes and the completion centre saying no, so everybody knows what is required and what is going to be delivered to the client. I can’t overemphasise the value of a really good specification.”

If a new ‘green’ BBJ has been purchased, then Camber will represent the client at the OEM and do a full technical inspection of the aircraft, including ground and flight testing before formally accepting the aircraft.

“Once it’s accepted, the aircraft is flown to ALOFT AeroArchitects to get the auxiliary fuel tanks put in together with the unique BBJ features not normally installed in an airliner. We will go there and inspect all of that, make sure it is good and the paperwork is correct,” explains Chatfield. “And then when it goes to the completion centre we are also onsite for that.”

For a pre-owned aircraft, all of the pre-purchase and testing has already been completed, and the documentation has been reviewed, so the aircraft is ready for acceptance and transfer to the completion centre for whatever refurbishment work has been agreed to. Camber represent the client throughout that process and has experts on the ground to liaise and oversee the entire project.

The aircraft is now at the completion centre, which knows everything required from the detailed specification. In the case of a BBJ, the year-long process can commence.

In the next issue of Inflight, our focus shifts to the cabin design process and how the dreams, hopes and expectations of the customer take shape to produce the stunning and functional interior they are searching for. ■

See the world in style: Inside the spacious interior of a BBJ 787, designed for the Chinese charter market and operated by Deer Jet. It has 28 seats, a bedroom suite and a full-sized bathroom with a shower.



A coming of age?

In recent months several developments have boosted the appeal and capabilities of OLED technology for aviation. Alexander Preston finds out how business aviation passengers are set to benefit from a new cabin experience.



The Maverick Project represents a collaboration between Rosen Aviation and its partners KiPcreating (Miami, Florida, USA) and SkyStyle (Argentina).
Image: KiPcreating

Project Maverick has been recognised for its use of the latest in sensor and display technologies to create an enhanced cabin experience. Image: KiPcreating

“The flexibility of dynamic form factors is a specific characteristic that enhances traditional applications, as well as opening entirely new solutions in an aircraft cabin.”

Verena Bintaro, Head of Marketing and Public Relations, AERQ



According to Verena Bintaro, Head of Marketing and Public Relations at AERQ, “OLED technology is the future of display technology in the cabin.”

With OLED technology already successfully applied to consumer electronics, she says AERQ strongly believes that aviation will be the next chapter for OLED technology.

OLED stands for Organic Light Emitting Diode. “In a traditional Liquid Crystal Display, the liquid crystals do not produce their own light, so an LED backlight is placed behind the red, green and blue liquid crystals, as well as polarising and reflective layers,” explains Justin Watson, Customer Success Manager at Rosen Aviation, a leading US-based provider of aircraft cabin systems and touchscreen displays.

Providing a more detailed background, he continues: “As the name would suggest, OLED pixels produce colour and their own light output, eliminating the need for an LED backlight and additional layers. The technology itself is relatively mature, but manufacturers have spent considerable time and resources optimising yields and manufacturing techniques. Many display manufacturers are phasing out LCD production in favour of OLED production, although it’s unlikely that LCDs will be entirely replaced as a display solution.”

The architecture of an OLED has a few substantial benefits, Watson believes, such as the fact they are incredibly thin and lightweight, resulting from its low number of parts. Additionally, because OLEDs lack an

LED backlight, the contrast ratios are significantly better than an LCD. “Colours are far more vibrant and lifelike, and black levels are nearly perfect,” he says. “For example, Rosen’s 32-inch OLED display, weighing in at 7.25 lbs, has a stated contrast ratio of 1,000,000:1, but in reality, OLEDs offer nearly infinite contrast ratios. A typical LCD measures in around 1,000:1.”

As Watson points out, “OLEDs are not limited to a flat form-factor, either, as the pixel matrix can be applied to a flexible film that can be shaped and curved, or even rolled. OLEDs, on average, consume less power than an LCD, but power consumption varies greatly based on the content being displayed, as pixels only illuminate when needed. Lastly, due to the simple construction



The Maverick Project is very much the vision for the cabin of the future and showcases the imaginative and creative talents of all involved. Image: KiPcreating



where space and weight reign king. Whether it be commercial, business or VIP, reduced space and weight are massively valuable, increasing efficiency or making room for additional components or features. “The flexibility of dynamic form factors is a specific characteristic that enhances traditional applications, as well as opening entirely new solutions in an aircraft cabin. A curved OLED can easily be integrated as a virtual window; a concept Rosen showcased in its Maverick Project demonstration video.”

A finalist in the “Cabin Design – Concept” category for the 2021 International Yacht and Aviation Awards hosted by design et al, The Maverick Project is very much the vision for the future cabin, says Watson, adding that OLEDs are an integral piece of that new vision. “Because they have so many benefits and are so dynamic, it allowed our design & engineering team, along with our Maverick partners, KiPcreating and SkyStyle, to let their imaginations run wild.”

The results include skylights and virtual windows, where a thin, flexible panel can be applied over or in place of a glass window and tied to external cameras to produce a larger, clearer image of the outside world. This image can then be integrated with moving map information to create an augmented reality experience, says Watson

of an OLED, transparent displays are a possibility. LG already produces a 55-inch transparent OLED display, with a 40% transparency level.”

AERQ itself is a joint venture between LG Electronics and Lufthansa Technik. Leveraging both partners’ expertise, AERQ’s Cabin Digital Signage portfolio is based on OLED technology to create a unique cabin experience. This includes the Welcome Board, positioned to greet passengers onboard the aircraft and enhance the airline’s brand while providing passengers with relevant information. The Ceiling Panel

concept features flexible OLED technology and is AERQ’s concept for a class-divider using transparent OLED displays.

“In general, we are working on different concepts and ideas utilising the ‘configurability’ of OLED technology within the aircraft cabin,” says Bintaro. “All of these use cases could also be of interest for business and VIP aircraft as they have even more individual needs. However, AERQ and our Cabin Digital Signage solutions primarily focus on commercial aviation.”

Rosen’s Watson picks up the point. “OLEDs are ideal for aircraft cabins, an environment

highlighting that Rosen has already provided virtual windows, in partnership with WASP, for Emirates first-class centre-aisle suites found on more than 10 of its Boeing 777s.

Self-proclaimed 'creators of flight couture', Swiss-based YASAVA designs for improving the in-flight experience in ultra-long range corporate aircraft.

The company has used OLED technology to introduce new features into its ZEN interior, which improves upon the ASTRAL Design, as a spokesperson explains.

"Our interior with the OLEDs is an integral part of our ZEN interior, the first CO₂ neutral solution in aviation for cabin design. The OLEDs are retractable, i.e. they do not replace the cabin windows. In future aircraft designs, however, one must consider whether cabin windows are still necessary, as they contribute significantly to structural weight and fuel consumption."

DIVIDER CONQUERED

Another concept found within The Maverick Project is that of divider walls. Comprised of transparent OLEDs, these high-tech versions of a traditional monument allow information to be displayed on both sides of the display, creating more versatility in how the dividing wall can be utilised. "It also serves to create a more open environment when switched to transparent mode, producing the illusion of added space without having to break out the saw and sledgehammer," opines Watson.

Other elements include embedded displays, vastly improved personal displays, and smart cabinetry fixtures such as the wine glass cabinet and a full-length lavatory mirror.

"The thing that really makes Maverick so exciting is how close to reality it actually is," states Watson. "Although the design and integration of technology are quite the departure from any existing cabin, most everything found in Maverick could be accomplished today, and anything that isn't quite possible is only a couple years down the road pending certain technology maturity. We've shown the complete Maverick Project video to virtually all of our customers, but the part that really moves the needle is when we roll out a working proof-of-concept that shows the technology in action. The concept video juxtaposed to working demos paints the picture for customers and takes the guesswork out of the equation."



Developed by one of its parent companies, AERQ's OLED screens offer transparent class divider (top), and ceiling panel (below).

As Bintaro says, "Flying is a highly personal experience, and specifically on a business/VIP aircraft. It evolves around comfort and a unique high-end experience. OLED technology can give the cabin exactly that."

Watson agrees, adding that "it's easy to get so focused on the benefits found with OLEDs related to their architecture and efficiency that you forget how incredible the viewing experience is. The image quality is so sharp and so clear, and the colours are so rich that high-quality content almost appears 3D."

He provides the following anecdote as an illustration. "The first year Rosen brought OLEDs to the NBAA tradeshow, we set up a 65-inch 4K OLED on one wall and an 82-inch 8K QLED on the backside wall. Passers-by were drawn in by the massive 8K QLED display, which is undoubtedly impressive. But their expectations were shattered when they turned the corner and observed the 65-inch

4K OLED – the picture quality is that good, even at a lower resolution!"

On top of the fact that OLEDs produce lifelike imagery, another positive is how they perform in ambient light. Although OLEDs are not as bright as LCDs, the incredibly high contrast ratios typically make viewing easier and clearer in an ambient light environment. That means the executive VIP does not have to close all the shades throughout the cabin to view content with an OLED.

However, YASAVA is more circumspect in its attitude. "To be clear, OLED is display technology, that is available today in the form of a thin and flexible film. We are essentially replacing wood veneers and other exotic materials and developing innovative techniques of applying OLEDs to various types of surfaces, and making them scratch and water resistant on surfaces exposed to touch. While we are showing the future of



YASAVA's Zen cabin features customised large OLED displays, which can be controlled by a client for a truly personal view. Image: YASAVA

what will be achievable, we are currently limited with the available sizes of OLEDs by the current OEMs.”

There are those who may say that such rhetoric is presented through rose-tinted glasses, a point-of-view addressed by Watson.

“As with anything technology related, there is usually a series of trade-offs when comparing one technology to another. That’s certainly the case with OLEDs, although we’re quite certain that the benefits outweigh the challenges.

“The biggest drawback with OLEDs is burn-in,” concedes Watson, explaining that “displaying static imagery on OLEDs causes the pixels to decrease in brightness, creating a shadowy dead spot in the shape of whatever imagery was being displayed. This is something you might be familiar with on earlier plasma and LCD displays. Fortunately, there are a few different mitigation techniques to overcome this challenge, such as pixel shifting or creating menu/logos that aren’t fixed and allow the pixels to be used more evenly. There’s also pixel refreshing that can regenerate pixels, thereby eliminating any burn-in effect, but does slightly reduce panel life.”

In terms of maintenance, Watson says this should not be any different for typical mounting solutions, but embedded and integrated displays could prove a bit challenging, depending on the final architecture. “Seeing as these are still in development, we will have to wait and see what that final application looks like,” he says.

CERTIFICATION CHALLENGES

Testing and certification of traditional display architectures will be similar to LCD-type monitors, but with the emergence of new form factors, such as flexibility and transparency, it’s clear there will be new challenges in the certification process. “It’s really up to our engineers and designers to learn OLED technology inside and out to find creative ways to pass certification without sacrificing their many benefits,” says Watson before teasing that “without giving away too much information, Rosen has some unique solutions coming in the next 12 months”.

Bintaro says that AERQ works closely together with partners and its parent companies for the continuous evolution of its technology. “One of our two parent companies, Lufthansa Technik, is specialised

in certification and installation in the cabin. We profit from this expertise with regards to our work with OLED technology in the cabin,” she adds.

Both AERQ and Rosen Aviation are also profiting from their respective partnerships with Japan’s JOLED, which uses a unique ink-jet printing process to produce panels that increase manufacturing efficiency.

In September last year, JOLED announced a partnership with Rosen to develop and integrate medium-sized OLED displays into aircraft interiors. Of the collaboration, Naoto Hikichi, Executive Officer, Head of Business Division I at JOLED, proclaimed: “As we manufacture medium-sized high-resolution OLED displays, we think the cabin display is a very interesting and adapted application for us. Rosen and JOLED will investigate and develop a completely awesome and first-in-class display, which will fit every kind of new well-being scenarios the passengers will live, feel, see and enjoy in the future aircraft.”

Watson adds: “Rosen identified OLEDs as having value in an aircraft cabin a few years ago, but our only access to OLED technology was re-packaging off-the-shelf consumer products. While we could provide our customers with new, improved OLED displays, the initial product would not be aviation-specific and thus not specifically designed for the aircraft environment. Certifying consumer model displays usually never produces the ideal product.

“Partnering with JOLED changed everything and allowed Rosen access to raw panels for aviation-specific designs. Whether that looks like traditionally mounted displays in a thin, light bezel, or a flexible OLED virtual skylight, it’s really up to the customer’s desired experience and not the limitations of a consumer TV. The average passenger likely doesn’t realise how much engineering goes into certifying technology on an airplane, and having raw components is hugely beneficial.”

Two months later, JOLED announced its collaboration with AERQ.

Sang Soo Lee, Managing Director at AERQ, said of its collaboration, “we are completing our OLED line up by adding mid-sized displays from JOLED on top of our existing portfolios that are 55-inch and 65-inch from LG Electronics. This will enable us to stay confident that we can take the digital transformation of aircraft one step further.” ■

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THE LAST WORD

Alexander van Deudekom, CEO and founder of Get-e, looks at how digital communications can be the difference between customer satisfaction and a lost relationship.

With a return to travel

potentially in sight for 2021, now is the time for airlines to be preparing their operations to support the wave of eager travellers going on their long-awaited holidays, business trips, or to visit family and friends.

With so much at stake for airlines following such a tough year, every little helps to re-engage and retain happy customers. Sometimes, it can be the smallest thing that can result in customers feeling appreciated, and in recent years, we have seen that communication is a key element of this.

Flight disruption is one example of this in action.

As we learnt from previous flight disruptions – for example, the crew strikes of recent years or the Icelandic ash cloud of 2010 when more than 95,000 flights were grounded across Europe – the main complaint from affected passengers was the lack of communication or information from their airline as to what was happening and what actions were being taken.

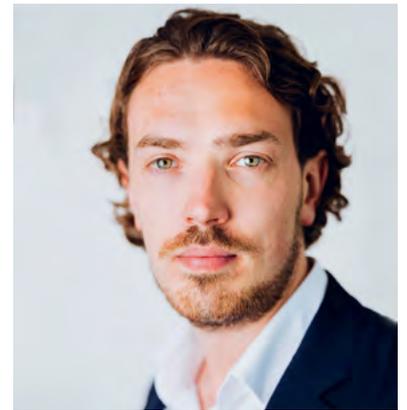
This is where technology comes in. In many cases, something as simple as sending push notifications or text messages to your customers' phone to update them on what the current situation is and what will happen next can be the difference between anger and understanding in the event of travel disruption.

Take flight diversions, for instance. These are likely to occur during 2021 and beyond as border closures may still occur at short notice, meaning aircraft will need to land at neighbouring airports. Being able to update passengers in-flight about the situation and the alternative transport arrangements being

“ Sometimes, it can be the smallest thing that can result in customers feeling appreciated, and in recent years, we have seen that communication is a key element of this. ”

made, and then sending push notifications to their phones informing them of where they need to be and at what time to continue their onward journey, makes all the difference. Technology is the key to enabling this to happen, and using digital solutions across the value chain means that in the time between finding out about the diversion and the plane landing, alternative transport can be sourced, booked and en-route to the airport, without hours of administration time being spent and repeated information requests from passengers going unanswered.

If no information is communicated to passengers, they can be left feeling frustrated and not cared for. In some cases, these frustrations can also find themselves on social media, further damaging an airline's reputation.



Alexander van Deudekom has held the role of CEO of Get-e, the ground transportation, hotel and accommodation (HOTAC) and disruption management provider, since he founded the company in 2014. He has a BAsc in Aeronautical Engineering from the Amsterdam University of Applied Sciences.

DIGITAL REVOLUTION IN AVIATION

Digital solutions are by no means new to aviation. Still, the industry's recent downtime has led to a surge in organisations developing new technologies designed to support carriers as they gear up for activity later this year or in 2022. Improving digital communications is one area in which airlines can improve efficiency within their operations and mitigate against any damage to their reputation, caused by events outside of their control.

In addition to getting information across in a timely and efficient manner to passengers, remembering the importance of communication builds trust and your reputation. Airlines have a lot of information about their customers at their fingertips. They can use this to demonstrate that they understand and care about the journey and experience that the passenger has with them.

Particularly while airlines are in recovery mode over the coming month or years, retaining customers will be a critical part of any business plan to ensure an airline's ongoing success and survival. In the instance highlighted, digital communications can be the difference between customer satisfaction and a lost relationship. As a lifelong advocate of the power of technology, I am keen to see how digitalisation will improve the passenger experience and how the airline industry's adoption of more digital solutions over the coming months will impact operations. ■

Years ago, the greatest obstacle to understanding was getting hold of all the relevant information, making it difficult to connect the dots.

a *b* *c*

Today, we are faced with the opposite problem:
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