

Aircraft

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CABIN

Perfecting the passenger experience

Management

TOUCHY SUBJECT

**Every surface in an
aircraft has to have a
chemical coating**
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talks customer experience

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New standards in design
to satisfy demand

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Plant-based menus becoming
ever more popular

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Sustainable lightweight construction with a long tradition





Cover design: Phil Couzens

EDITORIAL TEAM

EDITOR

Greg Whitaker
greg.whitaker@realresponsemedia.com

EDITORIAL DIRECTOR

Lee Hayhurst
lee.hayhurst@realresponsemedia.com

ART DIRECTOR

Phil Couzens

CONTRIBUTORS

Alex Preston
Bernie Baldwin
Stephanie Taylor

SUB-EDITOR

Heather Ford

COMMERCIAL DIRECTOR

Toby Walton
toby.walton@realresponsemedia.com

CEO

Chris Pitchford
chris.pitchford@realresponsemedia.com

For subscriptions & enquiries:

Barnaby Moore
barnaby.moore@realresponsemedia.com

All enquiries
+44 (0) 20 8444 2554

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Management

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CABIN PRESSURE

Not long ago, I attended the launch of a new airline in a crowded function room of a London hotel.

The new venture is to be called Global Airlines, and it's possible you might have heard of it as it has often been in mainstream news as well as the trade press, mainly due to its founder, a young upstart named James Asquith, is far more interesting to write about than the consortiums of private finance groups that tend to be the usual way to get expensive projects moving.

However, if I was hoping to get more detail on what the inside of Global's fleet of A380s will look like, I was disappointed. Asquith simply said that everything would need to be 'slam dunked' before they'd reveal what the cabin would look like, or even confirm what the class layout would be. Originally a five-class layout was teased, with one section being kitted out with video game consoles and with screens suspended in front of the passengers via a hoop from the headrest. This was later dropped, but what the rest of the aircraft will look like remains a mystery, at least for now.

Asquith has no reason to take lectures from the likes of me, but he'll be aware that the transatlantic route is littered with the remains of airlines that couldn't make a success of it. They will need to offer



▲ When will we see the cabin of the A380?

passengers a real point of difference to make a success of this heavily trafficked line. Deals with the Likes of Laurent Perrier are great, but we want to see what the new era of flying he has spoken about will look like.

What we do know is that a ticket on Global Airlines will be a glamorous ride whatever the class.

Greg Whitaker

Greg Whitaker

EDITOR

greg.whitaker@realresponsemedia.com

P.S. I'm new around here, and I'd love to get to know you better. Please don't be shy in dropping me a note about what you'd like to see more (or less) of in the magazine. You can get me at: greg.whitaker@realresponsemedia.com

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BUSINESS BRIEFING



SUSTAINABILITY

AVOLON PARTNERS WITH SOISA TO TURN SCRAP INTO CRAFT PRODUCTS

Aviation finance company Avolon has partnered with Soisa Aircraft Interiors on a project to turn scrap material from old aircraft into craft products. Waste materials, including more than 800kg of leather, are donated to members of the Tarahumara tribe in Chihuahua, Mexico, who make them into traditional artisan products like wallets, bags, aprons and tablecloths.

Interior furnishings of aircraft being decommissioned or refitted, such as seat covers and curtains, often end up in landfill. Through the 'Waste to Wonder' project, they are instead helping to provide an income stream for the families

of tribe members who have participated in the project.

The project is supported by a Mexican government body known as Fodarch that has provided training and is facilitating the sale of the finished products in a shop popular with visitors to Chihuahua, the largest state in Mexico.

As part of its sustainability policy, Avolon recently joined a coalition of partners in a pledge to use only tear down facilities accredited by the Aircraft Fleet Recycling Association (AFRA).

Enda Swan, head of technical, Avolon, commented: "The Waste to Wonder project provides an excellent example of

how, through creativity and collaboration, better use can be made of materials in the aviation supply chain that were previously regarded as scrap."

Jacobo Mesta, Chief Executive, Soisa Aircraft Interiors, commented: "Working closely with members of the Tarahumara tribe in Chihuahua, we have been honored to establish this project with the support of Avolon and Fodarch. Working more sustainably is a key objective at Soisa and this project has provided a perfect opportunity to convert something previously regarded as waste into a craft product that can be sold to improve the livelihoods of local communities."



ACCESSIBILITY

United adds Braille to cabins

United Airlines has added Braille to aircraft interiors in order to help blind and partially sighted passengers.

The airline currently has equipped 'about a dozen' aircraft with Braille markings for individual rows and seat numbers as well as inside and outside the lavatories. United expects to outfit its entire mainline fleet with Braille by the end of 2026.

"Finding your seat on a plane or getting to the restroom is something most of us take for granted, but for millions of our

customers, it can be a challenge to do independently," said Linda Jojo, executive vice president, chief customer officer for United.

"By adding more tactile signage throughout our interiors, we're making the flying experience more inclusive and accessible, and that's good for everyone."

In addition to adding Braille, United is working with several disability advocacy groups to explore the use of other tactile navigational aids throughout the cabin such as raised letters, numbers and arrows.

IFE

Malaysia Airlines strikes IFE deal with Viasat

Flag carrier Malaysia Airlines has signed a deal with IFE provider Viasat to outfit the airline's new Boeing 737-8 fleet with its wireless in-flight entertainment (IFE) system. The airline also plans to introduce internet connectivity on the same aircraft.



The agreement encompasses factory installation of Viasat equipment on Malaysia Airlines' aircraft, with the first expected to be delivered later this month. The deal marks a change of strategy for the airline, which originally specified B737-8 aircraft with no IFE screens.

Don Buchman, VP and GM, Commercial Aviation at Viasat said: "The initial deliveries of these new aircraft equipped with the Viasat system is an exciting milestone for our partnership with Malaysia Airlines, and, more broadly, for in-flight connectivity in the Asia Pacific region."

Once introduced, high-speed internet connectivity on Malaysia Airlines' 737-8 aircraft will allow customers to stay connected throughout their journey. With anticipated flight routes across Malaysia and Southeast Asia for the new fleet, Malaysia Airlines will leverage Viasat's Ka-band satellite network in the region.

BRIEFS



'Aria' suites coming to Cathay Pacific

● Hong Kong-based Cathay Pacific has announced its business class seats which it plans to fit in to its refitted B777-300ER cabins from Q2 of 2024. So far, the airline has kept details about the new suites light. However, we know that the business class seats will be known as 'Aria' and will feature things that you might expect, such as a table with wireless charging and stowage compartments, as well as things that you might not, such as a sliding 'roof' over the cabin.

Airbus chosers Acro

● The latest Airbus buyer-furnished equipment catalogue features manufacturer Acro Aircraft Seating as a premium supplier. The accolade covers economy and premium economy seating and is based on performance in three areas: delivery, quality and technical.

Adhetec adds Perrone

● Adhesive supplier Adhetec has acquired interior fabric company Perrone for an undisclosed sum. The purchase will provide a more 'comprehensive and holistic approach to transportation interior solutions', according to a statement from the new owners.

Gogo no-go

● IFE provider Gogo Business Aviation has announced a delay in its 5G system launch, which it says is due to a third-party design error.

12

Aircraft initially fitted with Braille by United. The American carrier expects to equip the whole fleet by 2026

\$400

million

Air India is to spend a significant sum rebranding and refitting the fleet

29%

YoY increase in revenue at LSG Group ahead of its transition to independent ownership



INTERIORS

New Hawaiian suites for 787-9



Hawaiian Airlines is to introduce a new interior for its Boeing 787-9 Dreamliner to be known as the Leihōkū Suites.

Passengers onboard Hawaiian's 787 – entering service beginning early next year – will get to enjoy an interior apparently inspired by the craft that made early Polynesian voyages, albeit with better IFE.

“The combination of our evocative cabin design and unparalleled service will make our 787 the most relaxing and enjoyable choice for travel to and from Hawaii,” said Avi Mannis, chief marketing and communications officer

at Hawaiian Airlines. “We take pride in sharing our home with our guests, and the design and details of this product truly reflect what it means to be the flagship carrier of the Hawaiian Islands.”

The 34 Leihōkū (garland of stars) suites promise to envelop guests in a ‘tranquil, elegant space’ with fully lie-flat seating, an 18-inch in-flight entertainment screen, personal outlets, wireless charging and direct aisle access. Set in a 1-2-1 configuration with doors, the suites can offer privacy or a shared experience, with combined double seats allowing couples to fall asleep while gazing at a starlit ceiling. Nice!



FINANCE

LSG Group posts strong results as private equity beckons



Catering and on-board retail company LSG Group has reported strong half-year results, with a rise in revenue.

In the first half of 2023, the LSG Group reported a consolidated revenue of €1,107m, compared to €857m during the same period in 2022, which translates into a 29 per cent increase. This is thanks to continuing positive trends across all geographical regions of the company, particularly North America and Asia-Pacific.

The LSG Group's result turned positive in the first half of 2023. The adjusted EBIT (earning before interests and taxes) improved by €23m to €10m after a loss of minus €13m in the previous year. As a reflection of the overall business recovery, the number of FTEs as of the end of June was 20,918, a 21 per cent YoY increase.

“We are on track with our business performance and pleased with this positive result in the first half of the year, despite suffering a negative impact from currency developments,” said LSG Group CFO Holger Fleige.

Lufthansa divested LSG's European operations in late 2020 to Gategroup.



INTERIORS

Air India to refit fleet in 2024



Flag carrier Air India is to spend \$400m on refitting its B777 fleet.

Following the announcement made in August regarding the airline's new livery and logo, it has published a video of what the refurbished B777-300er interior will look like.

The aircraft will be divided into four sections, namely First, Business, Premium Economy and Economy. The interiors follow the current trends in aircraft cabin design and feature business class cabins with wireless charging and sliding doors.

The airline has not said which suppliers it will use, though Air India CEO Campbell Wilson told a reporter for the Insider website at the Paris Air Show that while the retrofit will smarten the aircraft up and put Air India 'squarely in the upper echelon', it won't have 'much of a bespoke feel' because of time restraints.

Work will start on the refits in Q2 2024 and is expected to take about 30 months to complete.

Even if the interiors might be a little generic, the refresh will undoubtedly be welcomed by passengers. Once a glamorous airline, Air India has become synonymous with dirty seats and broken facilities. It had lost domestic market share to various regional low-cost carriers such as SpiceJet, and long-haul flights to Middle East airlines such as Emirates and Saudi Arabian Airlines.

However, the airline was bought back from government ownership by Indian conglomerate the Tata Group in 2022. Since the acquisition, Tata has replaced the entire board of Air India and ordered a number of brand-new aircraft, including a number of A350s originally destined for Aeroflot which will fly with the interiors that they were specified with by the Russian carrier.



CABIN

BA boss hints at cabin improvements



Sean Doyle, CEO of British Airways, has hinted at plans to improve the airline's offering at both ends of the aircraft.

In an interview with the UK's *Sunday Times*, he said that he wanted to 'surprise and delight' passengers in economy, saying that the airline was looking at introducing complementary hot drinks on its 'longer short-haul' routes. Meanwhile, customers in economy and premium economy on long haul routes now get to enjoy a gratis ice cream between meals.

A possible problem for Doyle is that his predecessor, Alex Cruz, reconfigured the cabins, increasing seating at the expense of galley space, so the amount of complementary delight the airline is able to serve must surely be limited.

First and business class passengers will also see an upgrade to their surroundings, as Doyle mulls over whether to introduce modern amenities such as doors on the seats of the airline's fleet of 12 A380s. The newspaper article suggests that the super jumbos might undergo a complete re-fit with the first class section moving upstairs on the double-decker aircraft.

"We want to surprise and delight our passengers in economy"

APEX IFSA GLOBAL EXPO

19-21 September 2023

Long Beach Convention & Entertainment
Center, California, 90802

The APEX show or, to give it the full name, Airline Passenger Experience Association Global Expo event is almost on us and we thought you might like to have a run-down of what you can expect this year.

Open to decision makers, top bosses and industry professionals, the organisers say that the show will attract thousands of the movers and shakers from across the industry.

At the event, there will be several prestigious awards being presented.

When the expo show floor is open, visitors, including hundreds representing various airlines, will fill the room, looking to find what's new and likely to give them a competitive advantage in the cabin and on the ground.

AWARDS

The APEX Official Airline Ratings were created based on neutral, third-party passenger feedback and insights gathered through the event organiser's partnership with TripIt from Concur. Using a five-star scale, more than one million flights were rated by passengers across nearly 600 airlines from around the world.

Meanwhile, the APEX Passenger Choice Awards were created on the previously mentioned partnership. Passengers are given the opportunity to provide anonymous ratings in five subcategories: seat comfort, cabin service, food and beverage, entertainment and Wi-Fi.

Also at the event, the APEX/IFSA Awards honours the most innovative approaches to business in passenger experience from our member airlines and vendors.

SPEAKERS

Confirmed speakers at the event include the following:

Akbar Al Baker

Group CEO, Qatar Airways

Akbar Al Baker is the group CEO of Qatar Airways and the chairman of Qatar Tourism. Under Qatar Airways Group, Al Baker is also the CEO of Hamad International Airport, which opened in 2014. In May 2021, Al Baker was appointed as chairman of Oneworld.



3



2

**ONE MILLION
FLIGHTS WERE
RATED BY
PASSENGERS ON
600 AIRLINES**



1

EVENT PREVIEW: APEX SHOW

1. Thousands of visitors are likely to hit the show floor
2. The market has returned since the pandemic
3. Hundreds of meetings will take place at the event
4. There will be lots of interesting panel sessions
5. Attendees can expect to have plenty to see and do



5

VISITORS WILL BE LOOKING FOR WHAT'S NEW AND LIKELY TO GIVE A COMPETITIVE EDGE



4

Zhao Dong

Chairman, Xiamen Airlines

Zhao Dong has served as the chairman of Xiamen Airlines since February 2019. He has been working in the civil aviation industry for 33 years and has accumulated a breadth of experience in airline operations and management. He was appointed as Xiamen Airlines' CEO and president in December 2016.

Andre Viljoen

MD & CEO, Fiji Airways

Andre Viljoen, born in South Africa, has 33 years of seasoned airline experience and joined Fiji Airways as managing director and chief executive officer in October 2015. He holds an honours degree in commerce and is a chartered accountant.

Patrick Brannelly

VP Retail and IFE, Emirates

After a decade in London working in marketing communications, Patrick Brannelly joined Emirates in 1992 and has been responsible for shaping the at-seat customer experience.

He is in charge of inflight connectivity and retail operations among other things. Brannelly has served three terms as president of the Airline Passenger Experience Association.

Dina Ben Tal Ganancia

CEO, El Al

Dina Ben Tal Ganancia has been with El Al for 14 years and is the airline's first female CEO having been appointed in April 2022, replacing Avigal Soreq who had been in the post for just over a year. Ben Tal Ganancia brings a wide range of experience, including over a year as VP of commercial and industry affairs.

Estibaliz Asiain

SVP, Anuvu

Estibaliz Asiain has been in the inflight entertainment business since 1999, first with her family business Transvision, and then as part of IFE Services. She came to Global Eagle in 2013 and held many positions in her tenure, mainly in customer-facing sales and account management roles. Through 2018, Asiain managed GEE's Latin American region for media content, then picked up coverage for Europe and Africa. [@](#)

IS AIRLINE RETAILING AT A TIPPING POINT?

Aviation Business News will be media partner to this year's T2REngage conference in London in September where 500 airline, technology and travel retail delegates will discuss the emerging digital future of air travel ticketing, distribution and servicing



What airline ticket retail and servicing looks like in the future is crystalising, but is the sector at a tipping point in the adoption of new technology and what are the challenges and opportunities?

For two days in September, these questions will be at the heart of the conversation among airlines, technology developers and distribution partner delegates taking part in the 2023 T2REngage conference.

The history of digital transformation in aviation suggests the industry should not expect rapid change or revolution but, according to T2RL, momentum is growing and a tipping point may be here.

Bert Craven, president technology and deputy chief executive at T2RL, says: "The airline industry doesn't have big inflection points. These kinds of changes can take 10 years to happen – the industry doesn't pivot, it drifts. Certainly, interest is growing and the rate we're seeing that interest appear is accelerating.

"It is just this gradual attrition where more people talk about it. Technology vendors are now starting to openly talk about their strategy and are selling their next generation of solutions. There's a much clearer definition starting to emerge. Maybe a year ago the ideas about the future were slightly more nebulous but they're starting to crystallise."

Ian Luck, T2RL president of distribution, adds: "In the past 12 months or so we certainly have had much more interest from airlines wanting to understand Offer/Order. They need to think about what that means in terms of their next set of technology procurement decisions."

At the centre of this change is the shift away from the legacy Passenger Service System (PSS) approach towards what global industry aviation body IATA terms ONE Order.

This new XML standard promises to simplify the 'offer, order, settle, deliver' process in airline ticketing, consolidating three data record types (PNRs, e-tickets and EMDs) into just one.

The idea is to introduce modern e-commerce capabilities, making order

management simpler, more efficient and flexible while reducing costs and opening up new revenue opportunities.

A precursor to this has been New Distribution Capability (NDC), a data standard for the 'offer' part of the process which has seen slow, and at times painful, adoption over the last decade.

Craven explains: "One of the things we learned from NDC is there was a massive focus on who was ready to send NDC messages, and it was all very focused on the airline end of the business.





1. The event focus is on panels and roundtables
2. Travel sellers will visit the conference
3. The aim of the conference is to be 'like holding up a mirror'
4. Engage's format lends itself to controversy



"There was less focus on who was ready to consume them at the other end, on how many points of sale can actually receive an NDC offer, and is it going to look different on a shopping screen.

"When you think about orders and servicing of orders and all the different people in the value chain who might touch an order at some point, we have to start thinking end-to-end.

"WE MIGHT AGREE AS THE AIRLINE INDUSTRY, BUT WHAT DOES IT LOOK LIKE TO TRAVEL SELLERS?"

"We need to think about all the parties who might reasonably have reason to touch, service, use or fulfil an order and bring those people in so they understand the impact on them."

For this reason the T2RLEngage event this year will see greater participation from travel sellers, whether business Travel Management Companies (TMCs) or Online Travel Agencies (OTAs).

Luck continues: "T2RL's conferences have always been really strong on the technology side. What we are also trying to do this year is engage other parts of the chain.

"We are bringing some travel sellers to the conference this year to get those conversations going about what does 'offer, order, settle, deliver' mean to a big TMC or OTA. How does the whole industry need to work together to play their role to make this work across the value chain?"

Craven outlines how this vital need for inter-operability in the complex, global

airline sector can make the business case for investing in change hard to make, even if that change is inevitable. He says this is why it is important that the sector comes together at conferences like Engage to share best practice and shape the future.

"We are sort of holding up a mirror," he explains. "We might agree what we're doing as the airline industry, but what does it look like to travel sellers?"

"The secret of the Engage conference is the format. There's not a lot of slides, not a lot of keynotes and speeches. The focus is one panels and roundtables.

"That format lends itself to a bit of controversy. We can tackle really juicy topics and have people who might naturally be slightly combative in terms of their viewpoint.

"It enables us to get very quickly to the nub of issues. The conversations are very direct to that point. Everybody wants to get their say, so you get chunky digests on all of the key issues of the day."



T2RENGAGE 2023

Where and when will it happen?

18-20 September at the QEII Centre,
Westminster, London

Who attends?

The two-day conference will be attended by around 500 airline executives from around the world and representatives of technology developers, distribution partners and retailers.

What's it about?

The aviation sector is being transformed by technology and no more so than in the way airlines create and retail their products and service their clients.

This digital journey away from legacy and towards an Order/Offer future is just at the beginning and a long transition period lies ahead.

T2REngage will be bringing experts together from across the industry to share market intelligence, innovation and best practice.

New for 2023, the T2REngage conference will be split into two content streams which all registered delegates are welcome to attend. These are:

Airline Core Systems

Dedicated sessions for technology supplier delegates addressing the challenges in transitioning from legacy systems to new Offer/Order tech and how to plan for this multi-year transition.

Selling Channels Stream

Leading industry speakers representing travel sellers, airlines and associated tech providers will tackle the complexities of structuring Offer/Order transition for corporate and leisure travel sellers and the associated technology requirements.

Confirmed Airline Speakers:

Jost Daft, *program manager for the order transformation, Lufthansa Group*
Rob Gurney, *chief executive, Oneworld*
Melissa Skluzacek, *director – trading & revenue management, easyJet*

Tiina Vesterinen, *vice president commerce and CX solutions, Finnair*

Glenn Hollister, *vice president sales strategy and effectiveness, United Airlines*

George Bryan, *senior director, distribution, Hawaiian Airlines*

Neil Guerin, *managing director, airline retailing, American Airlines*

Stefan Auerbach, *vice president revenue marketing and pricing, Eurowings*

Yasin Demir, *head of distribution and payments, Virgin Atlantic*

Tamur Gourdarzi Pour, *chief commercial officer, Swiss International Airlines*

Register Now

Airline delegates can register to attend T2REngage 2023 for free at bit.ly/44UnBaf

Podcast

The latest T2RLTalks Podcast *Transformation Series Part Four: The Impact of Offer, Order, Settle, Deliver for Travel Sellers* featuring Flight Centre global manager for travel distribution Nicola Ping is out now.

About T2RL

Founded in 2005, T2RL works with airlines on their IT procurement in areas like PSS, revenue management, loyalty and merchandising. More than 60 airlines use its ProcureIT process to save time and resources when assessing their technology needs. The tool includes over 6,000 capability requirements, supporting airlines in evaluating, selecting and contracting for their requirements based on their commercial needs. 

Cabin Air Quality Monitored on every flight

Teledyne ACES® environment monitoring system is a complete and autonomous solution to efficiently monitor and measure the air quality in the cabin and flight deck. The system provides comprehensive environmental data so aircraft operators can continuously verify the air quality in the airplane, identify potential emerging issues, and ultimately deliver the safe cabin environment that crew and passengers expect.





Peggy Shumway is vice president of customer experience for commercial aviation at Intelsat

INTELSAT

One app to rule them all

All the technology in the world is useless if the client can't use something. **Peggy Shumway** shares her views on the importance of developing the best customer experience possible for her firm's IFE solution



Visit: intelsat.com for more information

Since assuming the role of Vice President of Customer Experience for Commercial Aviation four years ago, Intelsat's Peggy Shumway has leveraged her Master Black Belt in Digital Six Sigma and her electrical engineering and computer science degrees from MIT to improve performance and quality using modern approaches and techniques.

Under her guidance, the Intelsat team has adopted agile software development processes and regimented quality control measures to offer airlines new functionality, improved system performance, and new services layered on top of the satellite communications network.

However, she is keen to stress that none of this matters to the users, who want a seamless product that 'just works', so the user experience is most important consideration in her work.

Aircraft Cabin Management: Congratulations on the successful launch of the new satellite. Can you tell us how this will benefit service users?

Peggy Shumway: The [Galaxy 37/ Horizons-4] satellite that went up recently was mostly a replacement for an existing satellite, but it does give commercial aviation some additional capacity over the Pacific. So, as we have more inflight connectivity demand in the Pacific, it will enable us to provide more capacity.

We're looking forward to implementing our 'multi-orbit' strategy, which enables us to provide a quality of user experience that we can measure. That extends

beyond just looking at whether you are connected to the right satellite, but we need to monitor the demand in an area and if the network has the right capacity. Ultimately, it's about: "Given the application that I'm running, what's the right network [GEO or LEO] to run it on?"

Recently, we've consolidated around the concept of customer experience. We're driving a series of initiatives to deliver reliable and consistent service with less variation and improved performance. For our software development team, the focus is to create the best app out there. We call it 'One application to rule them all'. That's consistent with customer experience, because CX is what you need to 'rule them all' and it's all driven off the same concept.

Can you tell us more about the onboard portal? Is the app something the airlines have been asking for?

The onboard portal is our platform that gives the airlines the capability of customising their [passengers' IFC] experience. With the onboard portal we take on the task of providing those services, supporting those services, and





“Those custom configurations are done by in-house developers. It’s relatively fast and easy, as we do it via a content management system”

making sure they stay up to date.

Our onboard portal consists of components that are very flexible. Airlines can select where components can go. They can create special themes. For example, we had one airline that wanted snowflakes for the month of December. If an airline has a specific livery on a particular aircraft, we can theme the portal on that aircraft to match the livery on the outside. It can also be set up for different themes on different routes.

Those custom configurations are done by in-house developers. It’s relatively fast and easy, as we do it via a content management system. In the next quarter

we’re looking at increasing our capacity to implement portal changes even more quickly.

We also support something we call portal manager for those airlines that want to create their own portal and their own user experience. In this case, the airline is responsible for the development.

What kind of capabilities can the airline put on the platform, and can it be updated?

The answer to your question is that it depends on the airline and what that airline wants. For example, some airlines that have been early adopters of free [for



passengers at the point of use] service have seen an increase in loyalty. They have seen the growth of their market share exceed the competition, which I believe is somewhat a result of offering ‘free’ internet. However, the approach will depend on the airline. Some will go free from the outset; others will get there in steps.

We have a variety of tools that allow airlines to get value out of the internet service. Some of them might not subsidise it, and the cost of access will be down to the passengers, but if the airline is interested in sponsored services, we have tools for them.

For example, we have airlines that are doing sponsorships with mobile network operators because that’s a natural extension. The mobile operators were able to do roaming on the ground, and now they are able to do roaming in the air.

Another way to offer sponsored services is through advertisements, along the lines of ‘Watch this video and you get free internet’. 🍷

1. Screenshot of the ‘app to rule them all’

2. Passenger demand for connectivity has gone up

3. Streaming should be seamless for the user



Straighten up

1 Airline seats are designed to not only minimise discomfort but promote passenger comfort. **Alex Preston** discovers how ergonomics and anthropometry are improving passenger posture

There is no such thing as perfect posture,” asserts Professor Matthew Reed, Head of the Biosciences Group of the University of Michigan Transportation Research Institute, where he conducts research in a variety of areas relating to anthropometry and biomechanics.

“Any posture, no matter how well supported, will become uncomfortable over time so it is very important to

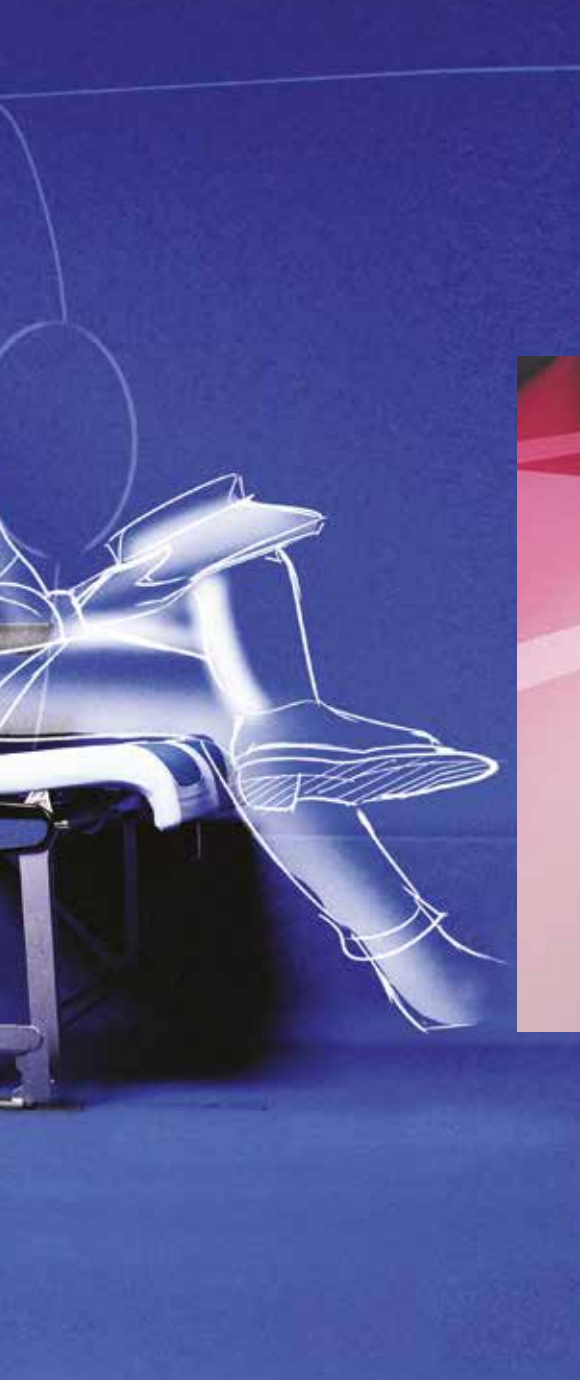
design seating to provide support in multiple postures,” he continues.

It’s known that people do not sit in one position but instead vary their postures, prompting Dr Peter Vink, Professor of Environmental Ergonomics at the Faculty of Industrial Design Engineering at TU Delft to observe that the most comfortable sitting position is the next one. Vink has recently published his latest book *Seat Comfort and Design* which includes

examples from Boeing and the future Flying V airplane.

Both Reed and Vink stress the importance of taking into account the very large variability among individuals in passengers’ body dimensions in their size, shape and posture preferences.

The Alba Seating Concept from a student group from the TU Delft Faculty of Industrial Designing Engineering is one such approach that takes into account this anthropometric variability.



2

1. Is there such a thing as 'perfect posture'?

2. The Mirus seat is ergonomically designed, despite being intended for high-density operations

A new archetype

Shortlisted for this year's Crystal Cabin Awards in the University Category, Alba is an ultra-light seating fixture inspired by the biological form of the human spine.

"By Embraer's invitation, we embarked on a mission to challenge the incremental approach to sustainability and rethink the entire seating experience," explains Floris Pester from Design Team Alba.

The resulting Alba Seating Concept is a "bold statement for comfort and sustainability in the aviation industry", envisioning the emergence of short-haul electric flying in the near future.

"Our approach breaks away from the conventional belief that more foam equals greater passenger comfort," says Pester. "Instead, we focused on achieving comfort while reducing the volume and number of materials, which led us to eliminate foam entirely from the design."

The design concept is backed by studies from Nijholt et al. (2016) and Hiemstra-van Mastrigt (2015), which specialised in position optimisation through contact area measurements and identified key factors enhancing comfort.

Pester says that the team tailored the side profile of the design based on the collective data from these studies, which corresponded to Dutch P95 (95th percentile) and P92 (92nd percentile) users respectively.

The seat frame is a unibody aluminium curve with specialised suspension fabric that fits the biggest number of users and allows for repositioning. "By aligning the data at the middle back (Y=300) and lumbar (Y=100) positions and employing technical fabric with elastic properties, we significantly increased the contact area, resulting in enhanced comfort," Pester explains.

"Our commitment to passenger comfort is at the heart of every seat we design," states Adam Challenor, Technical Director at Mirus Aircraft Seating. "From cushion height to armrest shore hardness, we carefully consider each element of our seats, maximising passenger comfort and living space at every opportunity,"

"OUR APPROACH BREAKS AWAY FROM THE CONVENTIONAL BELIEF THAT MORE FOAM EQUALS GREATER PASSENGER COMFORT"



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1

“THE BIOMECHANICAL REQUIREMENTS ARE THE SAME FOR THE PEOPLE SITTING IN ANY CLASS”

Challenor shares that each seat the company designs begins with a basic mock-up which is upgraded and modified at numerous points throughout the project to ensure every design decision adds ergonomic value. “Further to this, we run extensive comfort trials and pressure mapping activities on new and existing seats with a wide range of potential users to ensure an awareness of how our seats perform on longer journeys,” he says.

Support where it’s needed

“It’s true not only of airline seats but basically in all seating environments that if you have a backrest the lumbar support is the most important feature of the seat,” Reed proclaims. “Over long-term sitting, the best predictor of the overall comfort is the low-back comfort: if your back is not comfortable, you’re not comfortable.”

Mirus designs its seatbacks in an S-shape to support posture, with the curvature in the lower part of the seatback working to maximise space for the knees and legs.

200



United’s recently redesigned first-class seat is already in commercial service on its 737 fleet with installations on 200 domestic planes expected by 2026, including 737 NGs, A321neos and 737 MAXs

The second most important feature is to contour the cushion in the area under the buttocks says Reed, who was part of a team of experts, including United’s engineering and inflight teams and design firm PriestmanGoode, which recently redesigned United’s domestic first-class seat, its first since 2015.

In addition to winged headrests and tray tables that deploy from outer armrests to reduce passenger contact, the United First seat features a five-inch recline range, adjustable aisle arm rest that lowers completely and an ergonomist-designed

seat cushion that sits one-inch lower to accommodate a wider variety of heights.

The seat has already entered into commercial service on United’s 737 fleet with installations on 200 domestic planes expected by 2026, including 737 NGs, A321neos and 737 MAXs.

Passenger dimension changes

Reed draws attention to another point. “The people who are sitting in the airline seats are also sitting in car seats and office chairs. The same biomechanical principles, the same anthropometric information applies in all those environments,” he says, noting that the critical importance of lumbar support was first recognised in automotive seating leading to subsequent innovation.

“I’ll also point out that the biomechanical requirements are the same for the people sitting in first class and the people sitting in coach –

▲ Prototype mesh seats seen at the Crystal Cabin Awards



1

30%



Alba's fully netted design, combined with the removal of non-essential elements, has allowed the design team to increase the pitch by 30 per cent (17mm) compared to the Recaro SL3710 model

they have the same bodies," he adds, indicating that in these areas of the cabin you have more space, which means you have more opportunity to provide features such as a more accommodating headrest, or more lateral space.

Experience has demonstrated that there is a historical change in average height, arm length, weight and many other body dimensions of individuals. This type of human variation, occurring from generation to generation over time, is usually referred to as secular change. For NASA, the validity of the design requirements for the actual operational years of its long-term space modules depends on the accuracy of the secular trend estimation.

This is also true for aircraft seating, where Reed feels modern, accurate anthropometric data on body dimension, size and shape particularly, is not widely being used.

"KESTREL DRAWS ON A PRE-RECLINE ANGLE OF 23 DEGREES, OFFERING LEG ROOM CLOSE TO 30 INCHES"

Humans are getting taller, living longer and getting bigger. For many people their body mass index (BMI) has increased, which, notes Reed, means their hips are further forward in the seat. Consequently, the pitch period feels like it's shrinking because their knees are further forward than they would be if they were the same size but with a lower body mass.

Intersecting with this is lateral spacing, and the questions around how passenger behaviour accommodates this. For example, where are the elbows placed? What sort of arm support is there? And how can the seat pan be used to improve this sort of personal space?

It's an area Reed says is understudied, especially when applied to a seating row rather than just a single seat in isolation.

Challenor says that every element of a Mirus seat considers how to optimise passenger comfort. "Our seatbacks, for example, are designed in an S-shape to support posture, with the curvature in the lower part of the seatback working to maximise space for the knees and legs. In addition to this, we minimise the material used in the structure of the seatback to allow more living space for the customer."

He highlights Mirus' soon-to-be certified Kestrel seat as an example of this in practice. According to Challenor, Kestrel draws on a pre-recline angle of 23 degrees to not only enhance the comfort of the seat, but also to eliminate the spatial compromises inherent to reclining products, offering leg room closer to 30 inches, despite being pitched at 28 inches. This, he claims, ensures that passengers exceeding six feet in height can sit comfortably and achieve both knee and shin clearance, even though the seat weighs just 7kg fully dressed.

"In collaboration with pursers and studying user preferences, we learned



2

that passengers prioritise leg space and overall seat comfort over features like food tables," says Pester. "Therefore, we designed a minimalist seat that only incorporates elements directly in contact with the user, omitting non-essential components."

Alba's fully netted design, combined with the removal of non-essential elements, has allowed the design team to increase the pitch by 30 per cent (17mm) compared to the Recaro SL3710 model. "This, in turn, offers improved legroom – a crucial factor in short-haul comfort," says Pester.

As an avouching Reed sums up, "If there was a single posture, all seats would be the same. And they would all be designed around this posture. In fact, a good seat allows a wide range of postures with good support." 

- 1. Mirus' soon-to-be certified Kestrel seat
- 2. Passengers tend to prioritise legroom

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TOUCHY SUBJECT



Surfaces within an aircraft cabin have to take a variety of punishment. **Bernie Baldwin** reports on how special coatings and paints can maintain cleanliness and protect them from damage

Imagine the number of people who pass through an aircraft cabin during its lifetime. The surfaces there are touched by many hands, many times. They may even have food and beverages spilled on them. Or perhaps they get knocked by baggage or scuffed by footwear. To counter this, airlines ensure that the surfaces are protected with coatings and/or paints which must be hardwearing, hygienic and easy to clean.

Nowadays, many surfaces – though not all – are made from composite materials. These include sidewalls, monuments, bins and seat parts which – as noted – can get scuffed or have spillages on them. Suppliers of coatings and paints which provide protection develop these materials with all the necessary attributes in mind, in addition to ensuring that a coating works with the substrate material.

Grant Semanskee, account executive at Sherwin-Williams Aerospace, notes that there are several surfaces within an aircraft that aren't covered in paint. "Beyond the softer materials like tapestries, seat cushions and wall coverings, there are also items like bin exteriors, sidewalls and galley and lavatory sides that are covered with decorative laminate and are not painted," he notes.

"The parts that are typically covered with paint are ceiling panels, window shades and trims, bin interiors, overhead passenger service units (PSUs) underneath the bins plus flight deck trims, furnishings and instrument panels," he adds. "Also, many components of the seat assemblies are painted including plastic shrouding, literature pockets, tray tables and inflight entertainment enclosures."

The key interior coating materials offered from Sherwin-Williams Aerospace Coatings include Polane L and Jetflex Aircraft

Interior Finish. "These are two-component polyurethane coatings specifically formulated for the finishing and refinishing of plastic and metal components within the cabin and cockpit of aircraft. JetFlex also meets the durability performance requirements of Boeing BMS 10-83T, Type II, III and V," Semanskee explains. "The paint is solvent-based, making it easy to clean in high-touch areas and offers superior abrasion resistance in interior settings."

Importantly, Jetflex paint can be used on a wide variety of substrates, including metal, plastic and composite parts – typically, anything found in an aircraft's interior.

Another leading company in this field is Mankiewicz, whose executive managing director for aviation coatings, René Lang, points out that liquid coatings are an integral part in giving surfaces in aircraft interiors a high-class finish. "Mankiewicz Coatings has invented and implemented them for decades and continues developing them in close cooperation with airlines and OEMs to meet their requirements," he notes. "Regardless of the part geometry, from large, flat surfaces to components with more complex shapes, they can be applied with excellent adhesion and custom designs."

"Weight reduction is a crucial part when deciding on coatings in terms of optimised fuel consumption. Coating systems certainly offer attractive economic and sustainable potential here since, for example, scratch-resistant, lighter topcoats can replace 'heavier' technologies," Lang continues. "Mankiewicz supports airline customers in their sustainability efforts not only with a focus on light weight, but also on water-based technology and we offer the majority of the portfolio in such a variant without sacrificing the performance."

Mankiewicz interior coating systems are heat release, FST and specification compliant and can be easily cleaned thanks to their high

ILLUSTRATION PHIL COUZENS



1

“THE DEGREE OF AUTOMATION IN PAINTING IS LOW AND THE HUMAN FACTOR IS HIGH”

chemical resistance. “Especially since the Covid-19 pandemic, the use of sometimes aggressive disinfectants in the cabin is a particular challenge for surfaces, which our products master excellently,” claims Lang.

“Coatings used in the cabin must withstand the shortened cleaning intervals and increased disinfection and still not discolour or delaminate over time,” he adds. “Tests using several certified disinfectants in an extensive programme have proved that Mankiewicz FST interior coatings can withstand this increased load without any problems.

“Even over a long period, the technical or visual quality is not affected. Therefore, the durability and longevity of our cabin interior coatings can significantly extend the lifetime of sensitive spare parts which gives the airline planning security and a great product lifecycle,” Lang emphasises.

If damage does occur from an impact such as a heavy baggage bump, Mankiewicz has a practical answer on hand for airline customers. “With our coatings, an airline can perform a quick and effective repair without much effort. Less weight, downtime and less material used for the repair mean less cost and improved sustainability. It’s a win-win

situation for the airlines,” Lang declares. “The cabin crew themselves can repair minor damage between flights using a handy repair kit.”

As noted, the substrate material and its condition play a role in achieving an effective coating. “The final layer can only be as good as the substrate underneath it, and the condition of the substrate surface is the starting point for all further steps,” Lang confirms. “Depending on the surface quality of the part, the paint stack-up must compensate for any imperfections so that a uniformly aesthetic final finish can be achieved.

“If the substrate already has a good surface, process-optimised, time- and weight-saving one-layer systems are the eco-efficient solution. Even with just one layer, a wide variety of our products efficiently enable diverse effects and textures directly on the substrate,” he continues. “If, however, the substrate requires primer and filler work because of its unevenness or a difficult adhesion profile, Mankiewicz offers Alexit FST PrimeFill, which combines both products in one and thus offers noticeable time and weight savings.”

The use of fillers is what often enables exceptionally lightweight substrates such as rigid foams to be used in the cabin,

1. Seats are touched by thousands over their lifetime
2. Mankiewicz’s coating kit allows for swift repairs

as they help to upgrade the very uneven substrate surface into a smooth surface for subsequent painting.

It’s one thing to select the right coating or paint, but it is of little use unless they are applied correctly. Interestingly though, human skill plays a key role. “Aircraft are usually painted by hand with a spray gun. Especially in the field of refurbishment, the degree of automation in painting is low and the human factor is high,” Lang remarks. “This primary condition formulates a demand for simple processability of the systems, starting with clear and straightforward mixing ratios, through robust paint application, to good support of the painting teams on site in the paint shops.”

Semanskee concurs regarding the approved method of paint and coating delivery and points out that all Sherwin-Williams Aerospace Coatings solutions “are formulated for spray application using typical spray equipment to produce the highest quality finish”.

With so many surfaces being customer-facing, airlines can not only use coatings to protect them, but also to position elements of their brand in front of passengers. “Branding is important on the inside of the aircraft and airline customers look to incorporate it into every aspect of the interior,” Semanskee comments.

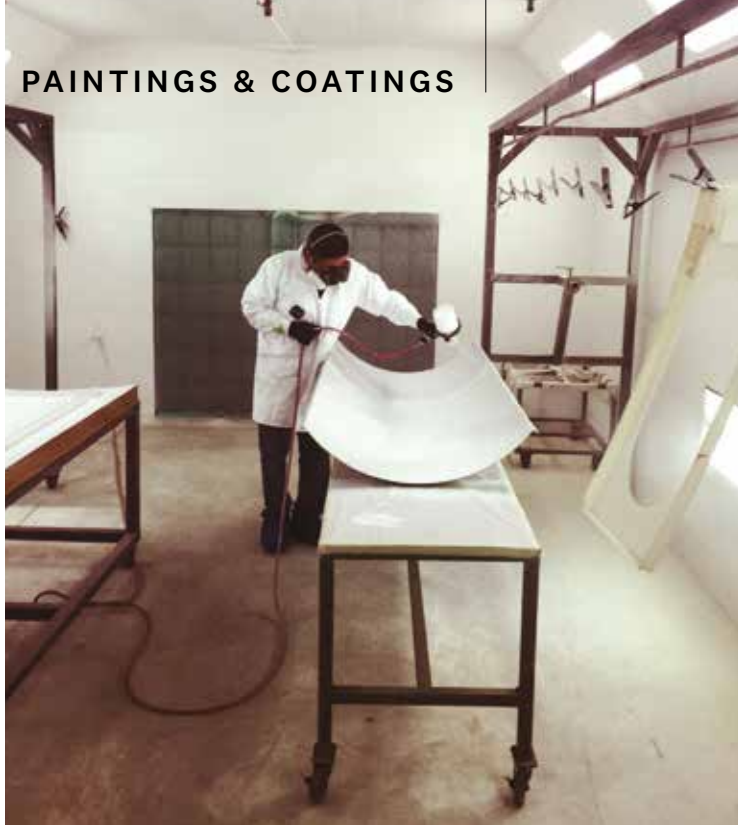


2

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2

1. All Sherwin-Williams coatings are formulated for spray application
2. Mankiewicz's René Lang
3. Spray guns are the usual choice for painting aircraft

"COATINGS IN THE AIRCRAFT INDUSTRY MEET THE MOST STRINGENT REGULATIONS"

"On new aircraft, there is typically a limited number of colours which meet the airline's brand standards. However, in the aftermarket, with Jetflex in particular, there is a much wider range of offerings, including the matching of customer-requested colour options," he adds.

René Lang agrees that brand awareness and corporate design are crucial factors in both the interior and exterior. "While the exterior naturally involves large-scale work on the fin or fuselage, in the interior, it is often tiny details and nuances that convey the airline's brand and colour image," he observes. "The range of possibilities here with coatings is pervasive. The surfaces can be tailored in many ways: colour, gloss, texture, tactile, metallics and other different effects to help tailor the cabin to the airline's look and offer finishes for the different demands."

Using mixing benches, even the smallest quantities of the required paint can be mixed directly on-site at the OEM or MRO without much additional logistical effort or ordering times, the executive MD reports.

As with so much in the airline industry, the products from these companies have to deliver all their desired attributes, but also comply with industry standards.

"Coatings used in the aviation industry are exposed to some of the most stringent rules and regulations in the coatings world, as nothing less than passenger safety must be ensured," Lang remarks.

Coatings are, of course, made from chemicals, the raw materials of which must be used in the paint recipe in such a way that the FST (fire, smoke, toxicity) requirements are met under all circumstances. "The individual effects, such as gloss or texture, result equally from ingredients that are added to the paint. So creating a coating that meets the highest safety and design aspects at the same time is a complex challenge," Lang explains further. "For both aspects, we have a broad pool of experience and are always moving forward with our customers to be able to meet future challenges safely."

That safety aspect has been demonstrated in recent years through the Covid pandemic and increased hygiene requirements. "Hygiene and onboard well-being include many factors that comprise a holistic system," Lang states. "The foundation can be Mankiewicz's so-called 'Care free coating' concept. Alexit FST PureGuard, available as a topcoat or clearcoat, meets all the requirements for cabin interior coatings, has been equipped

with antimicrobial active additives, and is Boeing and Airbus qualified."

According to the Mankiewicz executive, this long-term solution does not have to be constantly reapplied, as independent institutes attest to the paint system's effectiveness over many years. "Combined with the other interior products, this enables the hygiene-optimised coating of components," he elaborates.

At Sherwin-Williams, Semanskee says that, in operation, there aren't many challenges with OE-certified materials provided they are applied per the OEM specifications. Post-delivery aftermarket product changes, however, may require testing to show compliance in meeting FST requirements.

The variety available means that airlines have plenty of choice as seek tough, durable and hygienic coatings that, applied properly to a well-prepared substrate, can deliver hard savings and soft messaging. 



3




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PLENTIFUL **POWER**

Airlines are installing in-seat power to satiate even the most power-hungry passengers while minimising installation and maintenance requirements as well as, of course, weight in the cabin. *Stephanie Taylor* plugs in

This year's Aircraft Interiors Expo in Hamburg saw numerous companies showcasing 60 watt USB Type-C in-seat sockets, which are far more capable of charging power-hungry laptops and smartphones in comparison to older style USB Type-A chargers, which typically provide 10-15W of power.

The proliferation of these products is a strong indicator that 60W USB-C charging could soon become the new normal onboard, and there are multiple reasons for this development. Firstly, airlines continue to encourage power-intensive activities with the installation of in-flight connectivity and wireless in-flight entertainment (IFE) offerings and are realising that passengers need access to charging power to make the most of them.

For example, look at Southwest Airlines, which began offering free IFE in 2018. It's taken five years, but in May the carrier introduced USB charging ports onboard the first of its Boeing 737 MAX fleet. When it announced plans to roll out a combined 60W USB-C and 10.5W USB-A charging solution provided by Astronics across its MAX jets in May 2022, Tony Roach, Southwest's VP customer experience and customer relations, said, "The ability to keep your devices charged while you are connected inflight is a request that we've heard consistently in ongoing conversations with our customers."

A gradual transition

As evidenced by Southwest's decision, the move to USB-C in the air won't be ubiquitous, something that IFPL, which recently launched a USB-A and USB-C Combination Module capable of delivering up to 60W of in-seat charging power, factored into its latest product. Mark Reed, the company's director of business development, explains, "Although consumer products are moving towards predominantly using USB-C to charge, there are plenty of products which still require a USB-A port."

"Operators cannot afford to assume that passengers either all have the newest products which charge using USB-C, or own a cable adapter allowing them to charge legacy devices via USB-C. If airlines fail to offer charging facilities for both older devices and the newest devices, they will alienate and frustrate at least some of their passengers. Our product allows operators to offer both charging methods in one module, saving them the headache of trying to design two different units into their seating."

"An important thing to understand about our 60W system is that it offers up to 60W of power. A passenger's device will draw the power it needs – whether that's 7.5W, 10W or the full 60W – from what is available," Reed continues. "Regardless of whether the majority of passengers want to charge a phone or e-reader, it makes sense for an operator to offer the maximum power they can in order to cater for passengers who want to charge more power-hungry devices, as those with devices that require less power will still be able to utilise the in-seat power system."

de·risk

/dē'risk/

verb

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2

This need for flexibility has also been considered by Burrana, who at the time of writing confirmed its Rise Power system will soon be entering into service. The product is certified for linefit installation on Airbus A320 family jets, with the first to be installed and delivered with Rise Power out of the OEM's factory due in September. The company says Rise Power could be installed on 18 new jets by the end of 2023.

David Pook, Burrana's VP customer experience, comments, "Our solution supports both 15W and 60W power outlet options, so as passenger demand grows for 60W USB-C charging, airlines need only swap out the jacks to upgrade from 10-15W USB-A to a full 60W USB-C

"IT MAKES SENSE FOR OPERATORS TO OFFER THE MAXIMUM POWER THAT THEY CAN"

Power Delivery solution. This removes significant cost and weight and simplifies installation."

Pook notes that Burrana is committed to providing as much "juice" as possible for USB-A customers too, claiming it is "the only supplier to offer a high-power USB-A solution at 3A/15W, providing passengers with more power for their devices than any other 2A/10W supplier."

Florida-based Imagik International Corporation forecasts that the demand for USB Type-A will decrease over the next two to three years. "Our primary objective is to provide systems that can be easily upgraded without requiring the entire system to be replaced," asserts CEO Pablo Vadillo. As such, since the beginning of the year, the company has spoken with airlines and seat suppliers regarding its new Quatro product range, which caters to a wide range of use cases, from 110VAC to USB-A, USB-C and USB-C PD (60W). "As a result, we have made several minor design refinements in our newer systems, reflecting our commitment to delivering top-notch products," Moss added.

Switching things up

Making sure that older technology is still chargeable onboard hasn't stopped innovation across the industry. Startup player WeSky, founded by Vytis Petrusевичius in November 2021, has created Recharge, a 60W high-power USB charging solution (that can also incorporate 10.5W USB-A charging ports) due to be installed by a launch customer before the end of this year.

Petrusevicius began the company after years of experience working extensively on the integration design of flight critical avionics systems as well as in-seat power products for wide- and narrow-body aircraft. He explains, "Throughout my career, I embarked on a journey that started as a licensed EASA Part 66 B2 engineer and eventually led to becoming an EASA Form 4 holder where I served as the Head of Design in EASA Part 21J DOA."

1. There's demand for both USB-C as well as older USB-A ports
2. Passenger demand to charge multiple devices is growing



1

1. IFPL USB-A and USB-C sockets
2. Receptacles light up in the dark for ultimate visibility

\$20

MILLION

“Based on our current sales activities and request for proposals we are forecasting and already negotiating orders for over US\$20 million in revenue of Recharge in-seat power systems within the next 24 months”

Marius Barcas, WeSky's head of sales

He describes how Recharge was designed to streamline installation and slash aircraft downtime: “One of the key aspects of our optimised architecture is the reduction in the number of sidewall disconnect boxes required. By minimising the need for these disconnect boxes, we are able to significantly reduce the amount of wiring that needs to be routed behind the sidewalls. This strategic design decision has a direct and positive impact on both installation and maintenance times.”

“WE FIRMLY BELIEVE THAT THERE WILL BE VERY FEW AIRLINES THAT WON'T HAVE PLANS FOR ISP”



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Burrana has similarly changed up the traditional architecture of in-seat power systems to reduce weight and possible maintenance requirements. According to Pook, the 48VDC Smart Power Distribution Architecture that forms part of its Rise system “converts from aircraft power to 48 VDC at the head of each column to produce high-power USB outlets with significantly less infrastructure within the seat. This reduces the number of components required and the cable weight.”

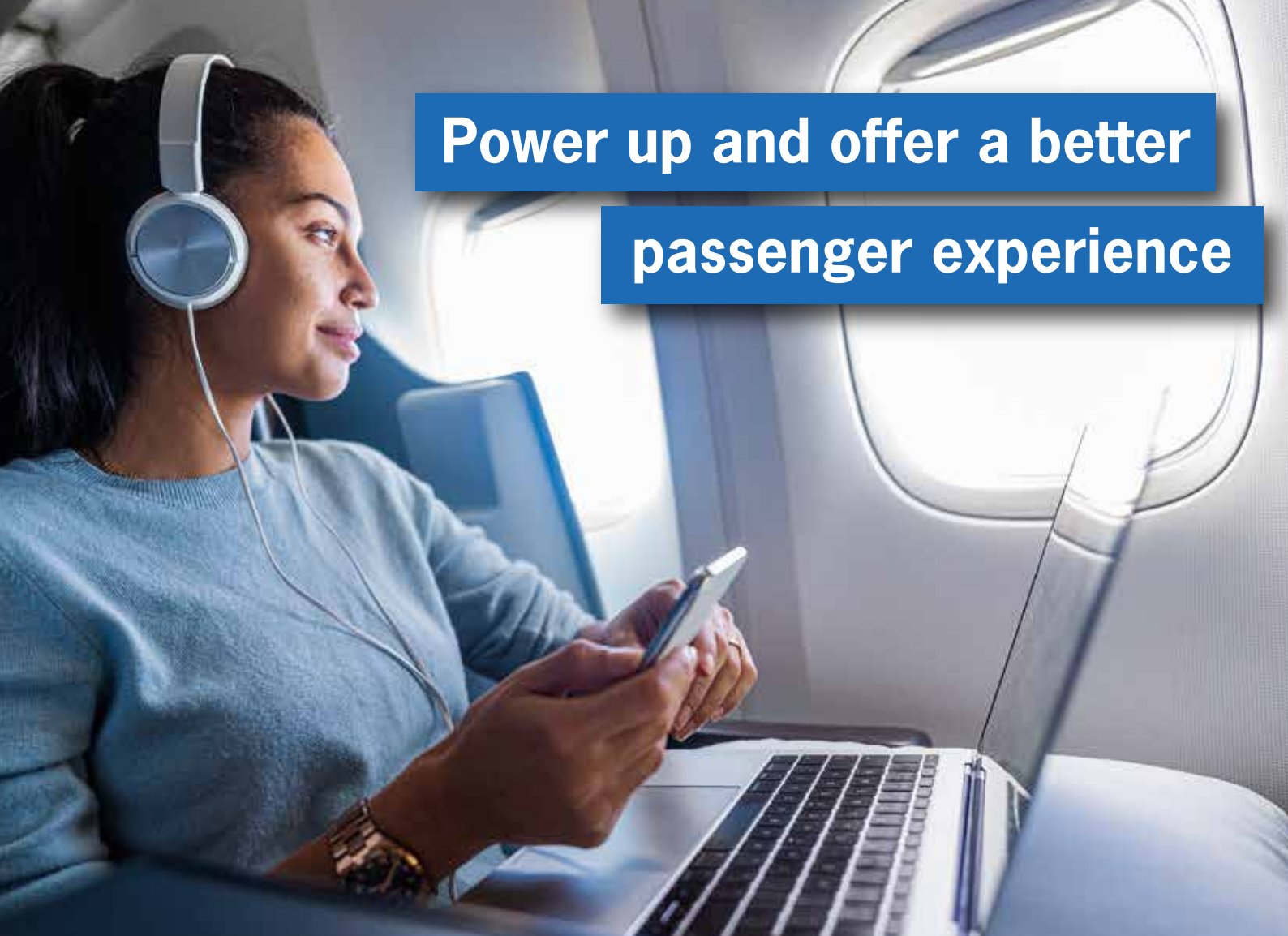
Moss says of Imagik's Quatro line, “We have prioritised lightweight USB outlets with minimal embedded electronics in the head. This approach involves controlling the USB head from the power supply

unit, resulting in reduced weight and cost for the USB outlets. Given that USB outlets are often the most frequently replaced component over the system's lifespan, this design methodology significantly lowers the total cost of ownership for our valued customers.”

Conclusion

The future is looking bright for ISP providers, who are bullish in their outlook. Reed says IFPL has had interest in its new solution “across the board: from large flag-carrier airlines to small business jets.” Pook reveals that Burrana is “working with various seat partners to pre-integrate in-seat power so airlines can procure seats with power already built in,” adding, “this may prove so compelling it will tighten the race to deliver USB-C across our industry.” At the time of its launch in November 2022, WeSky's head of sales Marius Barcas stated, “Based on our current sales activities and request for proposals we are forecasting and already negotiating orders for over US\$20 million in revenue of Recharge in-seat power systems within the next 24 months.”

Imagik is currently working on installation projects with numerous European carriers, so Moss' predictions are also optimistic. He claims, “The market is thriving. We firmly believe that there will be very few airlines, even in the low-cost carrier segment, that will not have plans to incorporate ISP into their cabins. In the foreseeable future, we expect that a significant majority of airlines will have either retrofit solutions already in place or include ISP installations in their fleet renewal plans within the next three to five years.” ©



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PLANT-FORWARD THINKING

Once the butt of jokes, airlines have worked hard to make food that today's passengers want to eat.

Greg Whitaker peels back the foil

If you asked someone 30 years ago what they enjoyed about flying, they might respond with something about the attentive service or the glamour of boarding the aircraft.

What they probably wouldn't say is anything about the quality of airline food. There was a time where passengers on any airline, in any class and regardless of flight duration would be dished out a tray of something stodgy with a side of baby carrots.

This was not only unappetising, but quite wasteful as some passengers didn't want to eat it, while others simply couldn't for dietary reasons.

Today, the situation is different. In a world where choice and brand names matter to consumers, airlines have been practically falling over to offer menu choices to cater for individual tastes and requirements, often packaged up with the name of a famous restaurant in the airline's base country.

Take Cathay Pacific for example. It has recently signed a licencing deal with a Hong-Kong based hotel eatery called Veda by Ovolo. The twist here is that Veda is a vegetarian restaurant, which gives the airline a new angle to talk about, as well as a tasty new dish to serve to customers.

Announcing the deal with Veda, Cathay Pacific general manager customer

experience and design Vivian Lo notes that "[the restaurant] shares our commitment to providing fantastic cuisine while also being more sustainable".

"For Cathay, the difference is in the detail. We know inflight dining is something that is extremely important to our customers, and we carefully work with partners to bring them memorable experiences by sourcing ingredients, designing menus and preparing dishes with great attention to detail," Lo adds.

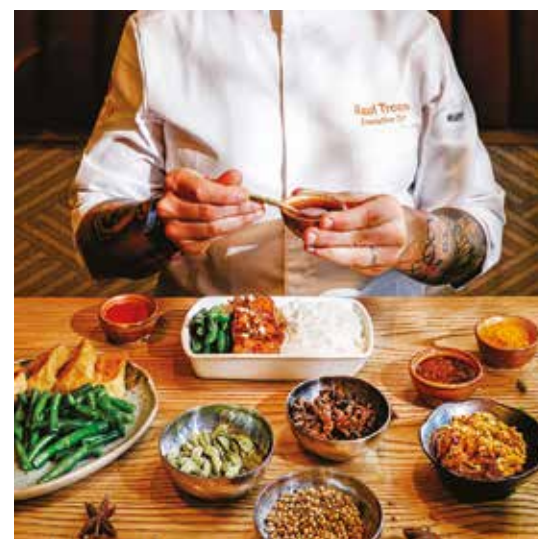
Credible goal

Sustainability is a credible goal, although it seems that the airline is aware that using terms such as 'vegetarian' or 'vegan' might be off-putting to some passengers. It is telling that the press release that trumpets the arrival of the new menu choices doesn't use those terms, preferring to describe the dishes as 'plant-forward' with marketing terms including 'ethical eating' and 'conscious cuisine' buried further down the copy flow.

Another airline to introduce new plant-based dishes with celebrity endorsement is Japan-based ANA. From September, some routes will be offering vegetarian curry, created under the supervision of Yusuke Nomura, the director of the Michelin-starred restaurant, Daigo, renowned for its vegetarian take on traditional Buddhist cuisine.

"At ANA, we are continuously looking for ways to elevate the in-flight experience for our customers," explains Tomoji Ishii, executive vice president, customer experience management and planning of ANA. "This new meal option reflects not only our dedication to providing exceptional in-flight dining but also our unwavering commitment to catering to the unique preferences and dietary requirements of our valued customers."

▼ Raul Tronco is the latest celebrity chef to lend his name to an airline





2



1

THE HUMIDITY LEVELS IN AN AIRCRAFT CABIN CAN BE DIFFICULT TO CONTROL

although it admits that, when buying worldwide, getting farmers and suppliers to modernise facilities incurs higher costs and takes time.

"We want to direct our focus to sustainability topics that are central to our business and where we can also make an impact at the same time," says Erdmann Rauer, CEO of the LSG Group. "In doing so, it is important to understand precisely how these topics are linked to our operations and our broader value chain. Our cage-free egg pledge is clearly a factor in this process. We expect our suppliers to have the same high standards our customers expect from us".

Pre-ordering

Another element of reducing food waste is the ability to pre-order, or even cancel food before flying. Passengers on ANA can select their preferred meal choice up to 24 hours in advance, which means it will be in stock and more likely to be consumed. Travellers who don't want to

eat on the plane can tick 'No thank you,' or a select an option to simply have a snack comprising a sandwich, salad and dessert instead.

Other airlines have also started providing meal pre-order services. Emirates started offering it from the end of July, stating that not only will doing so help reduce food wastage and help passengers get their preferred meal, but will also improve time management and add another layer of insight into meal consumption onboard.

4





3

AI for dinner

“Meal preordering will be added to the existing suite of AI-enabled customer preference tracking data and cabin crew reports, which facilitate menu planning and optimal food loading to deliver the premium ‘restaurant in the sky’ inflight dining experience,” a statement from Emirates reads.

Of course, making sure that customers have pre-ordered their plant-forward menu of choice won’t do the airline any good if they don’t like the way that it tastes. Any cook, and certainly the celebrity chefs that lend their names to premium airline food, knows that things taste different in a pressurised cabin at height and adjustments to the recipe need to be made.

“Food and drink really do taste different in the air compared to on the ground,” according to Charles Spence, professor of experimental psychology at Oxford University in a recent interview with BBC Future. “There are several reasons for this: lack of humidity, lower air pressure and the background noise.”

When an aeroplane reaches cruising altitude, the humidity in the cabin drops to about 20 per cent, drier than most deserts and one of the reasons why passengers all seem to get thirsty at the same time.

20%



When an aeroplane reaches cruising altitude, the humidity in the cabin drops to about 20 per cent, drier than most deserts and one of the reasons why passengers all seem to get thirsty at the same time

This combination of dryness and low pressure reduces the sensitivity of your taste buds to sweet and salty foods by around 30 per cent, according to a 2010 study commissioned Lufthansa. As an experiment, the researchers constructed a special lab that reduced air pressure simulating cruising at 35,000 feet as well as sucking moisture out of the air and recreating the engine noise. It even made seats vibrate in its attempts to mimic an in-flight meal experience.

The researchers found that sweet and salty tastes were affected (sour, bitter and spicy flavours were much less so). Also, it was discovered that, in the parched cabin environment, the sense of smell was affected, which is a major factor in the

way in which people perceive taste. Even the background thrum of the engines affected perception of the food, although interestingly it seemed to change the way in which texture was perceived.

The study, along with other similar research projects, offers essential knowledge for airlines to move their food from being the butt of jokes to something that people might want to eat.

It also gives vital information for the chefs tasked with creating the dishes. “Designing a meal to be enjoyed at 30,000 feet comes with its challenges. I have had to consider everything from how taste buds are affected at altitude to cooking techniques,” explains Raul Tronco, the executive chef from Veda that created the new menu for Cathay Pacific.

With top chefs, scientifically improved menus, accurate inventory control and higher quality and more responsibly-sourced ingredients, the future of food in the cabin will taste good. ©

1. Emirates’ pre-order app
 2. Business class on Emirates
 3. Veggie menus are better than ever
 4. Low-pressure testing lab
- (Credit: Fraunhofer IBP)



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ACCESS FOR ALL

Accessibility is an imperative, writes Nathalie Herbelles, security and facilitation director at ACI World

There are many reasons why we must enhance the accessibility of airports to persons with disabilities.

It is, first of all, a human imperative. Providing all individuals with full and effective access to society and with the freedom of movement are rights enshrined in the United Nations (UN) Convention on the Rights of Persons with Disabilities.

It is also a societal issue. According to the World Health Organisation, 15 per cent of the world's population has a disability. This number is increasing due to medical advances and growing life expectancies. Anyone of us can now expect to spend an average of eight years living with a disability. How many choose not to travel, or travel less, because it might be too difficult?

This means that it makes business sense for airports to invest in inclusion and accessibility. It makes sense to remove barriers to travel for disabled persons, but also barriers to their

15%

According to the World Health Organisation, 15% of the world's population has a disability

employment. In many parts of the world, the job market is currently one of high demand and low supply.

Airports are struggling to bring staff back to the workplace. In this environment, organisations should be active in providing the right conditions to attract a wide and diverse pool of talent.

The aviation industry suffered the worst crisis in its history with the pandemic. Survival and recovery were priorities for our airport members around the world, all the while ensuring the safety of travellers and staff.

In 2019 ACI's highest body, the World Annual General Assembly, adopted a milestone resolution which affirms the commitment of airports worldwide to continuously strive for excellence in customer service and experience including accessibility for passengers with disabilities.

Leading airports in accessibility

These are not just words: airports are taking some great, pro-active steps towards inclusion. Vancouver Airport gives people on the autism spectrum (along with their family members and caretakers) the opportunity to tour the airport and become acquainted with its procedures before their trip.

London Gatwick was one of the first airports to introduce a sensory room to create a relaxing environment for passengers with a wide range of disabilities and conditions. Hong Kong International Airport has a caring corner where people can pause and relax while waiting for assistance.



◀ Airports and airlines are improving facilities for people with limited mobility

“REGULATIONS CAN DO MORE HARM THAN GOOD WHEN THEY CREATE A MINDSET OF COMPLIANCE”

Many airports, from Heathrow Airport to Seattle-Tacoma International Airport, are part of the hidden disability sunflower lanyard programme, whereby the easily identified accessory alerts staff to provide support without the need to verbally declare the disability. More and more airports, such as Adelaide Airport, have accessible changing benches and facilities which allow non-ambulant persons to use toilets safely, comfortably, and with dignity.

At ACI, our accessibility strategy is working on three levels: first, by making sure the regulatory framework is sound; second, by helping our members share and adopt best practices; and third, by forming partnerships.

On the regulatory side, we work closely with ICAO, the UN organisation specialising in aviation, to enhance the global regulatory framework around accessibility. A set of common obligations for all governments are included in its facilitation annex. This annex includes a good set of compulsory standards with

some additional recommendations – but in this case, the aviation industry is asking for a more comprehensive and ambitious regulatory framework. This was agreed by ICAO last year and we look forward to contributing to further work in the next few months.

Regulations are important because they constitute a baseline, and they level the playing field. Persons with disabilities expect a certain level of service throughout their travel, and good regulation can provide more seamlessness across travel modes.

However, regulations also have the potential to discourage innovation when they are too prescriptive. They can do more harm than good when they create a mindset of compliance. This happens when operators and staff become focused on avoiding penalties instead of continuously improving.

Regulations should allow airports to go above and beyond and do things differently. This includes deploying autonomous wheelchairs, wayfinding

apps and beacons. Innovation and continuous improvement can happen when regulations are focused on the outcome, that is, on what needs to be achieved, instead of focusing on ‘how’ things need to be achieved.

On the second level, we are helping our members by establishing strong guidelines and best practices. The ACI handbook *Airports and Persons with Disabilities* looks at infrastructure elements, such as the provision of barrier-free access points, ramps and tactile paving, but it also considers operational components such as boarding processes for persons with mobility aids, personnel training and evacuation plans.

To sensitise airport staff directly, ACI’s online learning centre offers two online training programmes related to universal access and accessibility: a certificate in airport accessibility for specialist staff, and a disability sensitivity training course for frontline staff. More online courses that deal with providing accessible customer service to travellers with disabilities are also in the works.

There are many reasons why I believe that we must enhance the accessibility of air transport to all persons, particularly to persons with disabilities. But I have another, simple motive: travelling by air is a wonderful thing and I wish more people could experience it. There is nothing like watching the sun rise in a tall airport terminal, or watching it set from an aircraft window. We tend to take for granted the technological and human advancements that make flights possible every day. We should allow as many people as possible to experience and benefit from it. ©



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GET INTO THE SPACE RACE

Reza Rasoulian, vice president broadband satellite services at Hughes Network Systems, says airlines must consign slow bandwidth to history by exploiting the most advanced tech for home-like in-flight connectivity



“Airlines need to take advantage of all the satellite industry has to offer”



Reza Rasoulian is vice president broadband satellite services, Hughes Network Systems



To learn more about in-flight connectivity, visit hughes.com

If a passenger on a commercial aircraft didn't know it already, any attempt to access the internet using on-board Wi-Fi would quickly expose the limitations of in-flight connectivity.

Email is slow, and using a programme that depends on a back-and-forth exchange of data is nearly impossible, especially when other passengers are sharing the limited bandwidth.

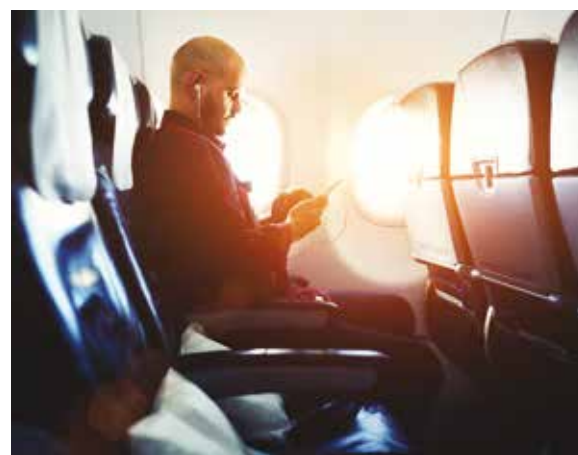
These networks in the sky rely on satellite connections to operate. For the last decade, global satellite operators have launched new, more powerful spacecraft to provide additional broadband to customers like the airlines.

To date, these have been satellites in the geosynchronous orbit more than 22,000 miles (36,000km) from Earth. However, they just can't keep up with bandwidth demand.

Now a new generation of satellites operating in low-earth orbit (LEO), between 600 and 1,000 miles (960km-1,600km) above the planet, is being hailed as a solution. And it doesn't require airlines to rip and replace existing GEO equipment.

With a LEO connection, a new kind of antenna, and the proper networking software, an airline can deploy a hybrid network that can connect to both LEO and GEO satellites, offering more bandwidth and reliable connections.

As airline executives with existing GEO-only solutions begin to look at hybrid options using LEO, they should consider four important considerations:



1

Does the provider offer committed information rates and service-level agreements, or simply best-effort service?

Does the antenna weight, size, form, and mounting meet the avionics industry standards used by airlines worldwide?

How easily and cost effectively can the new LEO equipment be integrated with existing GEO systems on aircraft currently in operation?

Does the system have a network-management tool that can automatically use connections from a LEO and a GEO satellite depending on which is the most efficient and the best fit for the situation?

If airlines are ever to make in-flight connectivity a steady revenue generator, carriers are going to have to provide a reliable service to passengers. Some LEO operators only offer a best-effort service.

Many satellite operators, particularly those that provide bandwidth to enterprise and government customers, are familiar with the requirements of committed information rates and service level agreements.

This same level of service should be demanded by airlines adding LEO satellites for hybrid connectivity.

It's also important to note that satellite capacity to aircraft needs to be managed to ensure an excellent user experience is maintained throughout the flight, gate to gate.

The most essential component of these hybrid networks is the electronically steerable antenna (ESA), a device considerably different than a GEO antenna now found on airplanes.

Satellites in GEO are at a fixed position relative to the Earth, so an antenna on the ground can be pointed at a GEO satellite and require little adjustment.

Even on a commercial jet traveling at 550 miles (885 km) an hour, tracking the satellite is not difficult since it is fixed in space.

On the other hand, a LEO satellite passes over a given spot on Earth in just a few minutes, requiring hundreds of satellites to provide continuous global coverage.

An antenna on the ground or on an airplane needs the ability to switch seamlessly from one passing satellite about to go over the horizon to the next one coming along to ensure stable in-flight connectivity – no small feat when the antenna is also flying through the air.

Hughes has developed an ESA for aeronautical applications with no moving parts and a small form factor using a fraction of the power of any other LEO aero antenna.

It can be installed in an existing radome of a commercial jet in just two to four days - half the time of a typical antenna installation - depending on the experience of the installers.



“The aviation industry needs to connect airplanes to satellites that are more technically advanced”

To integrate the connections to multiple satellites, Hughes has developed Fusion In-Flight that works with any GEO IFC solution using the OneWeb constellation of LEO satellites.

The software routes data over the optimal blend of transport paths based on quality of service (QoS) requirements.

The software recognises when user requirements for an active traffic flow change, and automatically optimises routing over GEO or LEO as needed to maintain performance.

The server works with existing GEO modems and onboard Wi-Fi access points at speeds up to 195 Mbps and 32 Mbps. The OneWeb constellation is just coming into service, and the HAS a global OneWeb aero distribution partner, Hughes expects to have Fusion In-Flight service available in late 2024 or early 2025, giving airlines time to plan for the service and installation of the ESAs on existing aircraft.

Hybrid solutions like Hughes Fusion In-Flight can offer a solution to delivering a low latency, reliable internet experience to airline passengers, offering an at

home-like Wi-Fi experience while maximising the value of existing GEO investment, equipment, and services.

Passengers benefit from reliable, responsive Wi-Fi with pole-to-pole coverage, so they can browse, use social media and access VPNs and cloud-based applications as they do on the ground.

Airlines benefit by addressing common customer complaints about existing Wi-Fi services, enabling them to attract travellers and increase passenger loyalty.

Research firm NSR predicts the number of satellite receivers on commercial and private aircraft will increase from 71,000 to over 145,000 by 2032, a growth rate of more than seven per cent a year.

The aviation industry needs to connect airplanes to satellites that are more technically advanced. Airlines need to take advantage of all the satellite industry has to offer. ☺

1. A lot of flights now offer Wi-Fi services

2. Satellite capacity to aircraft needs to be managed to ensure excellent user experience



Hunger for bandwidth

Allowing passengers to use the internet while in flight comes with two challenges, namely technical limitations and cost

It wasn't that long ago that it was forbidden to use any electronic device more powerful than a wristwatch in the aircraft cabin. Today's passengers of course want more. The trend that's sweeping the industry now is on-board internet access, of which an increasing number of airlines offer free at the point of use as an added value on the cost of a ticket.

This connectivity isn't just reserved for the nicer sections of the more upmarket carriers either. In August, Southwest announced that it was expanding its complementary Wi-Fi offering to passengers that bought Business Select fares. As most low-cost carriers base their business model to a greater or

lesser extent on Southwest, it can only be a matter of time before others introduce a similar offering.

But connecting a planeload of passengers to the internet and providing a consistent service is not easy from a technical point of view, nor is it free. However, there are ways of overcoming both issues.

Technical considerations

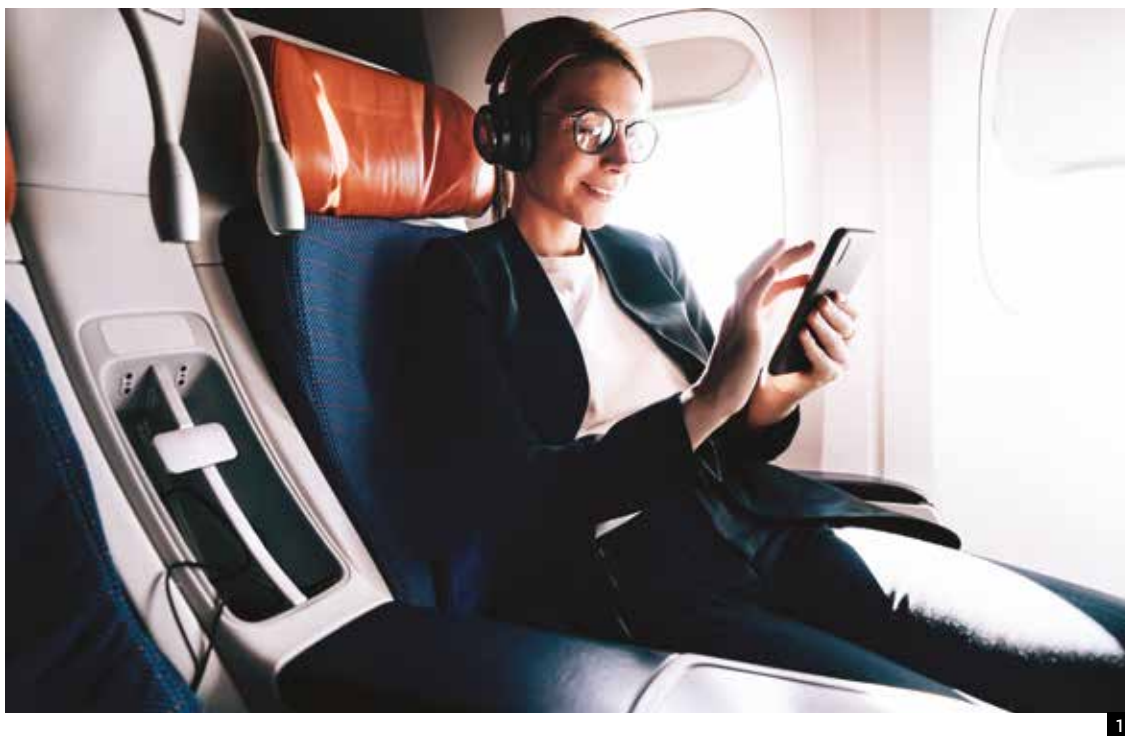
On the technical side, connectivity providers are increasing the bandwidth available by launching satellites, and replacing existing ones, with improved equipment that offers a greater capacity.

While the specs of the space hardware is not something that airlines need to concern themselves with especially,

choosing the correct equipment to fit inside an aircraft certainly is.

Electronically steerable array antennas (ESA) are increasing in popularity. One of the more recent designs on the market is from Gogo Business Aviation. The firm has launched an ESA designed in conjunction with Hughes Network Systems that will work with a low-earth orbit satellite network.

In this case, the hardware is small enough to fit on aircraft as small as a super light jet and will operate on the OneWeb network. To access the network, the new services require the firms to have an Avance line-replaceable unit. Customers that already have that LRU only need install the antenna.



1

“AIRLINES ARE LOOKING AT DOING SPONSORSHIPS WITH MOBILE NETWORK OPERATORS”

“We’ve designed the system to reduce costs by simplifying the installation,” said Sergio Aguirre, Gogo Business Aviation’s CEO. “We have long delivered affordable, high-quality connectivity and award-winning customer service to aircraft owners in North America, and now we want to bring those same benefits to all aircraft owners in the rest of the world.”

Meanwhile, Intelsat has introduced an ESA antenna with no moving parts that can operate low Earth orbit satellites and geostationary satellites. Announced in June 2022, the new antenna has been accumulating flight hours with Ball, Stellar Blu Solutions, Intelsat and OneWeb engineers validating antenna and network performance.

Earlier this year, Intelsat successfully demonstrated the new system to global airlines on the company’s Bombardier CRJ-700 regional jet outfitted with the new antenna and inflight Wi-Fi system. With peak inflight download speeds exceeding 275Mbps, airline customers were able to participate in live virtual meetings, stream media and stay connected without interruptions.

“An antenna without moving parts, that is much smaller than its predecessors,

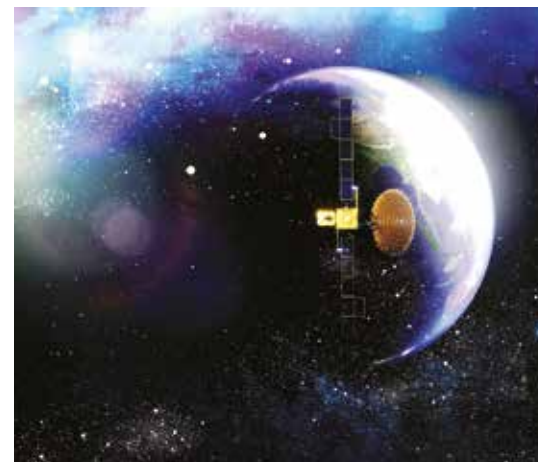
enables airlines to compete in the marketplace, delight their guests and have confidence that Intelsat’s multi-orbit antenna will provide the best performing inflight connectivity experience in the market,” said Jeff Sare, president of Intelsat Commercial Aviation. The firm has supplemental-type certificate programmes underway for a wide range of aircraft and expects to begin delivering and installing shipsets in early 2024.

Cost

As the technical abilities of high-performing equipment are proven, the question remains over how airlines might make providing such a service worth it.

“We have airlines that are looking at doing sponsorships with mobile network operators because that’s a natural brand extension” Peggy Shumway, Intelsat’s VP of customer experience told us. “The mobile operators were able to do roaming on the ground, and now they are able to do roaming in the air. We’ll be able to provide services as we have suite of tools for that”.

Shumway added that sponsorships through advertisements along the lines of ‘Watch this video and you get free internet,’ were also a possibility.



2

Of course, some airlines might want to simply swallow the cost altogether, while others might make the service available as a paid-for upgrade, or on some sort of pay-as-you-go basis. One thing is for certain though, in-flight connectivity is here to stay, and the hunger of passengers to use it is unlikely to ever be satiated. **C**

1. Passengers expect Wi-Fi at 30,000ft

2. Satellites have to handle demand



1

IN PERFECT HARMONY

IFE audio development is catching up with video, explains *Lee Clark*, VP of strategy at Rosen Aviation

While the evolution of hi-res displays has been widely celebrated, the progress of high-resolution audio is equally worthy of acknowledgment yet little “noise” is made celebrating these advances. Now, there’s a great deal of innovation in both audio and visual capabilities, thanks to new technologies.

High-resolution audio has undergone its own metamorphosis in the consumer space, offering an aural experience that now complements 4K+ HDR visuals. High-res audio captures the intricate nuances of movie sound effects and music, ultimately delivering a journey that matches our real world closer than ever. The aircraft cabin now represents a new market segment for enhanced

audio technologies to be adopted – an environment where photo-realistic displays have already gained significant adoption and yet audio currently lags.

Technology didn’t previously allow audio to be developed at the same pace as video displays. Furthermore, aerospace engineers have dedicated considerable resources into making engines quieter and cabins more soundproof. This meant that efforts to enhance the combined audio/visual experience were often relegated as a poor investment. Thankfully, that no longer holds true.

Instead, we are taking steps towards new product development focused on next-level audio experiences in the aircraft cabin. You might ask yourself what these new innovations entail, and how the listening experience could be improved so dramatically? The answer is multi-layered, with novel audio solutions that allow for



2

“NOW, THERE IS LOTS OF INNOVATION IN AUDIO, THANKS TO NEW TECHNOLOGIES”

spatiality and optimise the final output for the given environment.

While the promise of immersive audio is a step in the right direction, there are ‘audio holograms’ being developed that provide a true-to-life 3D listening experience going beyond a relatively simple surround sound configuration. Tone, timbre and timing are all presented in space and substance with real height, width and depth that accurately portrays the character and emotion intended.

This is in part achieved through software and signal processing, although the physical drive units play a significant role as well. It’s critical these physical elements are right as no amount of software tuning can correct ill-designed core components. At the end of the day, as with almost everything in life, the less processing and better the raw ingredients, the better the results.

Software enhancements and the use of AI also offer speech intelligibility, which make difficult-to-understand cabin communications easier for passengers to hear and comprehend. On top of all these great improvements and benefits, changes in hardware and software also have the potential to greatly reduce aircraft weight and increase efficiency, due in part to the reduction in size and number of “speakers” in their traditional sense.

The result will be an aircraft cabin where sound and vision can not only exist in harmony but, better still, actually complement each other to deliver a passenger experience like no other. 🎧

1. Discreet speakers will enable headphone-free listening
2. Seats will be designed around IFE
3. Rosen’s first-class cabin concept

active noise cancellation, dynamic signal processing, speech intelligibility, and ultra-precise soundstage renderings and even personal ‘sound bubbles’.

With a ‘sound bubble’, the passenger sits in a personalised space where only they can hear the movie or listen to music – all without the use of headphones. This, along with full cabin audio, can be paired with active noise cancellation to significantly reduce the noise ceiling and create a quieter journey. On the software side, front-end and back-end processes fine-tune the source signal to create true

3







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AUSTRALIA'S SAF PLAN

Producing biofuel in meaningful quantities requires a mixture of science and good management

There's a lot of talk about SAF right now, but very little of this chat is translating into fuel in tanks. However, this might be about to change if an initiative between Boeing Australia and Australia's national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), takes hold.

The possible plan is to turn all kinds of waste into jet fuel, especially that from agriculture, as well as animal fats and vegetable oils. This, coupled with conventional feedstock from plants, could be turned into a viable industry. We're not talking chicken feed either – some

grow fuel crops, the continent can soon become a major producer of SAF.

CSIRO Senior Manager and lead report author Max Temminghoff believes Australia is in a prime position to develop a domestic industry.

"By actively working to liberate feedstocks, the roadmap estimates that Australia is currently sitting on enough resources to produce almost 5 billion litres of SAF by 2025. This could supply nearly 60 per cent of jet fuel demand projected for that year," he said.

To convert these feedstocks into viable jet fuel, the report identifies the Alcohol-to-Jet process and the Fischer-Tropsch process – a method that

converts a mixture of carbon monoxide and hydrogen known as syngas into liquid hydrocarbons, currently conducted at CSIRO's Perth laboratory – as ideal technology options to get a domestic SAF industry underway.

With a mixture of political will, backing by big business with an interest in making its products more sustainable and scientific know-how, Australia could show the rest of the world how to get SAF usage out of single-digit percentages. Let's hope that it does. **C**

1. Animal fats could be turned into SAF under a new plan

2. Can SAF ever be produced in meaningful quantities?

Australia could show the world how to get SAF use out of single digit percentages

five billion litres could be produced by 2025 if there is enough commitment put into producing the biofuel.

The ideas have been put down on paper in a report entitled the 'Sustainable Aviation Fuel roadmap' which identifies where and how there are opportunities to create the fuel.

The science agency hopes that by applying a bit of lean management of resources often considered to be waste alongside careful planning of where to



5
BILLION

By actively working to liberate feedstocks, the roadmap estimates that Australia is currently sitting on enough resources to produce almost 5 billion litres of SAF by 2025

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