

Aircraft *interiors* INTERNATIONAL

MAY 2010

THE INTERNATIONAL REVIEW OF AIRCRAFT INTERIOR DESIGN AND COMPLETION



foreverfirst?

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homefront

I've seen the future of first class – unfortunately I can't share the images with you as the airline involved is understandably a little wary of publicising its plans at this early stage. The concept in question is inspired by modern domestic furniture trends – recognising the investment carriers make in their first- and business-class airport lounges, which are crammed full of swish 'Barcelona' style seating and the latest lighting from the likes of Tom Dixon or Philippe Starck. Why not offer something similar on the actual aircraft?

"Because the cabin is nothing like an airport lounge," I hear you say. Confronted by a barrage of certification, engineering and manufacturing constraints, let alone purely functional considerations, airlines and their design partners have traditionally struggled to create the same simple, sexy and seamless forms that populate the floors of Milan's famous furniture fair.

Premium airline seating also has to work much harder – providing a seat, bed, dining table, entertainment console and workspace rolled into one – whereas home or office furniture normally only has to look good while performing just one of these functions. And it doesn't have to survive being slung down a sled at a rate of knots or be as mindful of what it weighs.

Hence there have been very few attempts in the past to align airline seating with iconic pieces of domestic design – Swissair's 'Chair-in-the-Air', inspired by the classic lines of Charles Eames' famous lounge chair, being the one obvious exception. However, that now looks set to change, with the airline in question already deep in discussion with a design firm and an established aircraft seating supplier. The latter will have to be extremely considerate of how the seat will attach to the aircraft, ensuring it shrouds electrical and environmental connections to maintain a high-end 'designer' look. "If you know your attach points, you simply design your furniture to cover it," says an industry source. Unfortunately, in our look at the future of first class on page 46, Noam Perski, CEO of JamesList.com, a luxury goods website, suggests premium cabins should offer seats that can be "moved around to suit customer needs" – throwing up a whole set of new attachment challenges for manufacturers! In the meantime, perhaps the best example of simple, understated classic luxury is to be found in British Airways' new First cabin – see our report on page 36.

And for those in search of something a bit different in all classes, our look at Air New Zealand's new 777-300ERs on page 56 should provide plenty of inspiration. Of course, it also calls into question the 'catalogue' approach favoured by Airbus and Boeing for their next-generation aircraft (see page 76 for the latest on the A350). If the future is all about greater individual choice and more contemporary design values, airlines may resent having to pick their cabin offerings from a pre-arranged package of modules.

Anthony James, editor

IF THE FUTURE IS ALL ABOUT GREATER INDIVIDUAL CHOICE AND MORE CONTEMPORARY DESIGN VALUES, AIRLINES MAY RESENT HAVING TO PICK THEIR CABIN OFFERINGS FROM A PRE-ARRANGED PACKAGE OF MODULES

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Total Qualified Circulation:
12,362 (Average circulation
June-December 2009)

Annual Subscriptions (5 copies)

Worldwide Rate: £42/\$88

The views expressed in the articles and technical papers are those of the authors and are not endorsed by the publishers.

While every care has been taken during production, the publisher does not accept any liability for errors that may have occurred.

Periodicals postage paid at Dover, NJ, 07801.
US Mail Agent: Clevert Worldwide Mailers LLC,
7 Sherwood Ct, Randolph, NJ 07869
POSTMASTER: Send address changes to Aircraft
Interiors International, 19 Route 10 East, Bldg 2
Unit 24, Succasunna, NJ 07876
USPS Periodicals Registered Number: 019-144

ISSN 1463-8932 Aircraft Interiors International
May 2010. This publication is protected
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Printed by: Nuffield Press, 21 Nuffield Way,
Ashville Trading Estate, Abingdon,
Oxfordshire, OX14 1RL, UK

Cover image: karinefaoul@eyecandy.co.uk

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forever first? 046

Some airlines are stripping away their front cabins, while others continue to invest – ultimately the future of first class relies on a better understanding of customer needs on specific routes
GUY BIRD, AIRCRAFT INTERIORS INTERNATIONAL



features



036 less is more

British Airways' new First combines intelligent design with a proven heritage to create a truly authentic and liberating luxury experience
ANTHONY JAMES,
AIRCRAFT INTERIORS INTERNATIONAL



056 multiple choice

Operating the world's longest sectors has inspired Air New Zealand to develop an innovative 777-300ER cabin that breaks new ground in accommodation, entertainment and service
BERNARD FITZSIMONS,
AIRCRAFT INTERIORS INTERNATIONAL



066 safety zone

For passengers, aircraft seats are just a more or less comfortable place to spend the journey – but in regulatory terms, the main consideration is the protection they provide in the event of a crash
BERNARD FITZSIMONS,
AIRCRAFT INTERIORS INTERNATIONAL



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select few 076

Airbus has just published its catalogue of approved cabin equipment for the A350 – so who’s in and who’s out, and what are the options available?

BRENDAN GALLAGHER,
AIRCRAFT INTERIORS INTERNATIONAL



reverse gear 086

A new wave of IFE entrants are taking a fresh look at how entertainment is delivered on board by shifting storage and processing power from the head-end to the seat

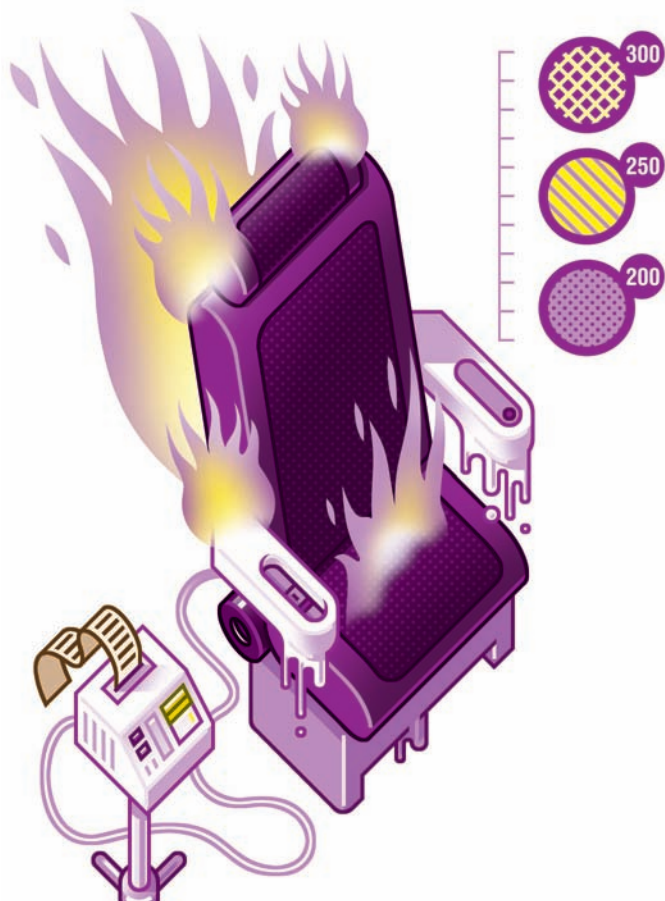
BRENDAN GALLAGHER,
AIRCRAFT INTERIORS INTERNATIONAL



fast mover 096

Oman Air is spending heavy on luxury interiors and the latest cabin technology – CEO Peter Hill explains the airline’s strategy

MARCELLE NETHERSOLE,
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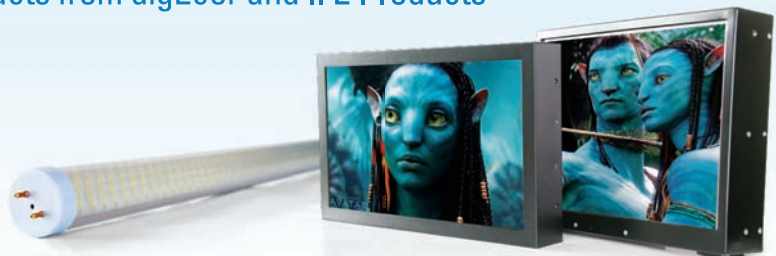


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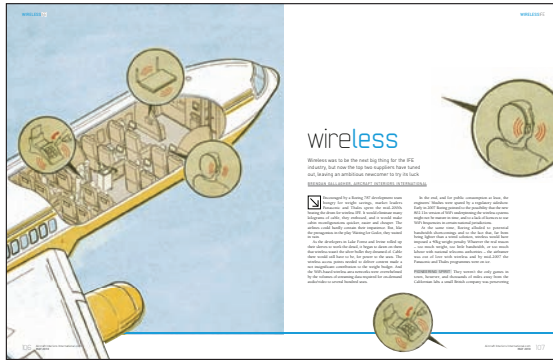
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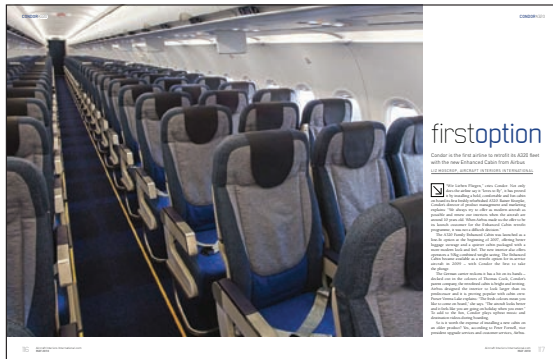
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106 wireless

Wireless was to be the next big thing for the IFE industry, but now the top two suppliers have faded and a new ambitious newcomer is trying its luck

BRENDAN GALLAGHER, AIRCRAFT INTERIORS INTERNATIONAL



116 first option

Condor is the first airline to retrofit its A320 fleet with the new Enhanced Cabin from Airbus

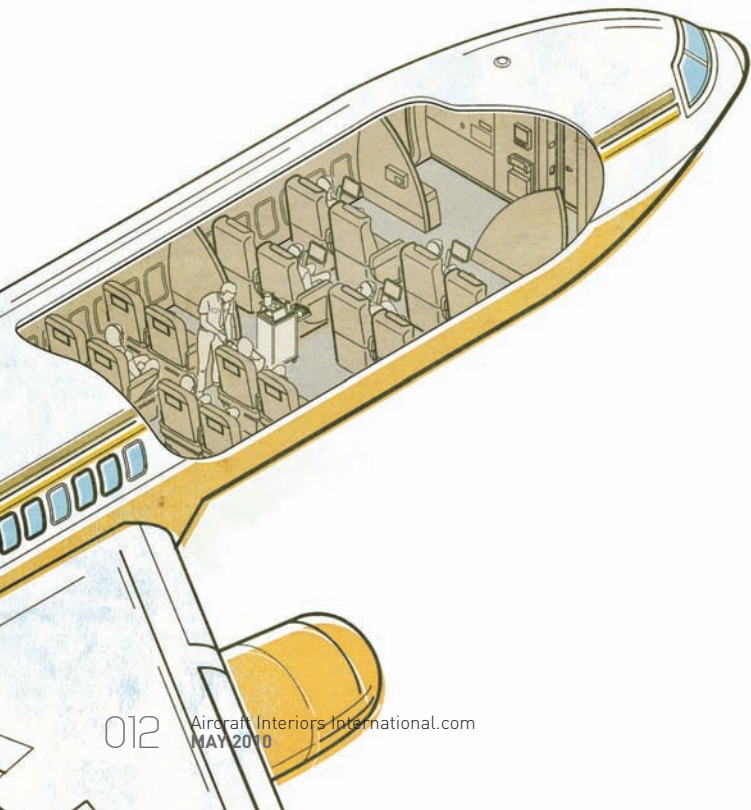
LIZ MOSCROP, AIRCRAFT INTERIORS INTERNATIONAL



124 ocean view

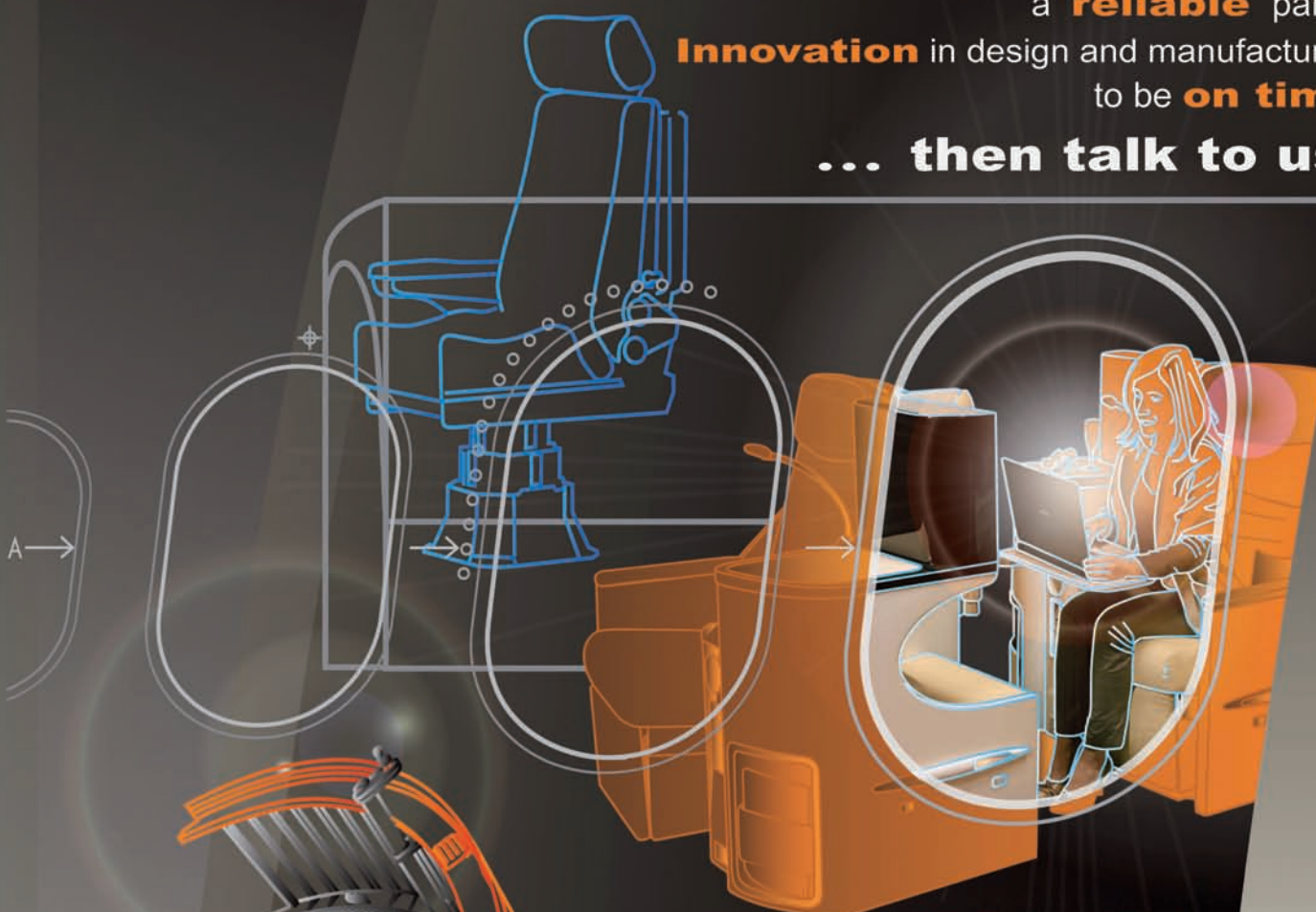
Philippine Airlines has introduced new interiors inspired by the carrier's home coastline on its latest 777-300ERs

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Qantas upgrades B747-400s but cuts first class

Qantas is investing A\$400 million (approximately £240 million/US\$370 million) to upgrade seats and IFE on nine B747-400 aircraft to match its A380s. It is also reconfiguring its A380 fleet – 12 A380s will continue to fly with a four-class configuration, including first class, but will be refitted to reduce seating in business class (pictured) and increase capacity in premium economy and economy. The remaining eight A380s (to be delivered from 2012) will feature a three-class configuration, with no first-class cabin.

The nine B747-400s will be fitted with Qantas's A380 standard seats and inflight product, including a fully flat Skybed sleeper seat in business class, and an economy-class seat designed by Marc Newson and manufactured by Recaro, as well as Panasonic IFE in all classes. First-class cabins will be removed, with business-class seats installed in their place to make a three-class configuration with 359 seats (58 in business, 36 in premium economy and 265 in economy) –

an increase of 52 seats overall. The exact configuration of the A380s is still to be confirmed, subject to discussions with Airbus and suppliers. The upgrade and reconfiguration programme will start at the end of 2011 and is due for completion by the end of 2013.

"Maintaining a First offering on flagship routes is essential for Qantas as a premium airline. It is vital that we align this offering with forecast demand, which is expected to be relatively slow compared to business, premium economy and economy," said Alan Joyce, chief executive officer at Qantas. "Our 14 A380 First suites will be offered on 12 aircraft and on daily services from Sydney and Melbourne to London via Singapore and Los Angeles.

"These changes will ensure we remain competitive in terms of aircraft configuration, product and service, and that we are better able to ensure capacity is more closely aligned with demand. They will also add the equivalent capacity of more than three B747-400s."

Webjet makes fleetwide order for SaftGlo floorpath marking system

STG Aerospace has received a fleet-wide order from Brazilian low-cost airline Webjet Linhas Aéreas for its photoluminescent (PL) floorpath marking system, SaftGlo. WebJet has ordered SaftGlo SuperSeal kits, in yellow, for all of its B737-300 aircraft. SaftGlo PL floorpath marking systems store and simultaneously emit light, giving emergency exit guidance for up to 16 hours in darkness.

Fokker Services introduces LED cabin lighting for B737

Fokker Services has developed LED cabin lighting for the B737 platform. The lighting is designed to last for 50,000 operating hours, and save money through weight and power savings and reduced replacement and material costs. The system uses the same 115V AC power connection as current TL lighting, so changes to the cabin lighting control are not needed. "We can develop this modification for virtually any commercial airliner," said Erik Goedhart, vice president of marketing and sales at Fokker Services.



B/E Aerospace's new Pinnacle seating platform has been selected by nine airlines and leasing companies. These launch awards are initially valued in excess of US\$250 million (approximately £163 million), and are for economy-class programmes on new B737, A320, and B787 aircraft. Deliveries are expected to begin during the latter part of 2010.

Pinnacle utilises advanced proprietary technologies designed to reduce cost of ownership, simplify maintenance and increase passenger living space. B/E Aerospace says the seat offers a 15% weight saving over the lightest seat on the market today, achieved through increased use of composites, an integrated light-weight comfort suspension system and a

Nine orders for B/E Aerospace's new seating platform

25% reduction in parts. Pinnacle is designed for both narrow- and wide-body aircraft, and can accommodate a variety of comfort features and options.

"In addition to the launch awards, a number of our customers have expressed an interest in our Pinnacle seating platform across all narrow and wide-body aircraft types for both their new-buy and existing fleets," said Amin J. Khoury, chairman and CEO of B/E Aerospace.

Spirit Airlines to print targeted adverts on onboard receipts

US low-cost carrier Spirit Airlines has agreed to deploy targeted advertising using GuestLogix's OnTouch Ads, powered by Jetera. Destination-based, targeted ads will be printed on the front of receipts, with pre-printed branding ads on the back, whenever a passenger makes a purchase on board. "We are very excited with the new ancillary revenue that can be generated," said Cenith Wheeler, senior manager onboard products at Spirit. "Since we already have the GuestLogix onboard retail technology deployed across our fleet, the opportunity to turn receipts into dynamic publishing space fits perfectly with our goals of growing non-ticket revenue at zero cost to our airline while adding customer value that will lead to a fulfilling travel experience." Every front ad can be designed to be measured for effectiveness. The programme will be rolled out initially on Spirit's most popular domestic US flights, starting with New York City this year, and then on flights into Las Vegas, Miami/Ft Lauderdale, Orlando, Chicago, Los Angeles, Atlanta and Washington DC. Expansion into the Caribbean and South America will be evaluated for 2011.

China Southern expands premium economy to all domestic routes

China Southern Airlines is expanding its premium-economy service to all domestic routes using B777-A, B737 (Next Generation), A319, A320, A321 and A330-200/300 series aircraft. The airline expects to have 7,000 premium-economy seats available on nearly 300 aircraft by July. The premium-economy cabin, which has been available on the airline's non-stop transpacific service between Guangzhou and Los Angeles for more than a decade, offers a seat pitch of 35-37in, compared to 31in in the airline's standard economy-class cabin.

Andrew Muirhead & Son completes factory expansion

Aircraft leather manufacturer Andrew Muirhead & Son has completed work on its new premises, which will be used alongside its existing factory in the east end of Glasgow, UK. The new 10,000ft² premises will be accessed through a service yard at the rear of the original factory. Founded over 160 years ago, the company has occupied its original site since 1870. The expansion will provide much-needed additional warehouse space, off-road loading bays and parking. The company is trying to minimise its carbon footprint by reducing 'hide miles' for its hides.

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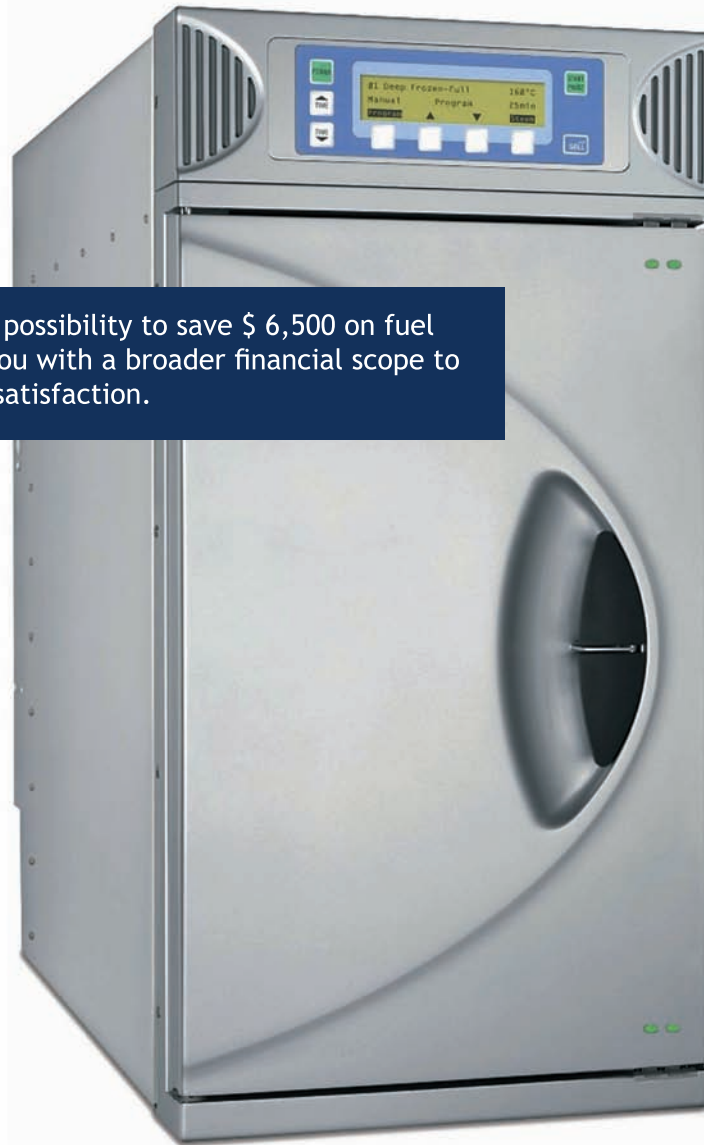
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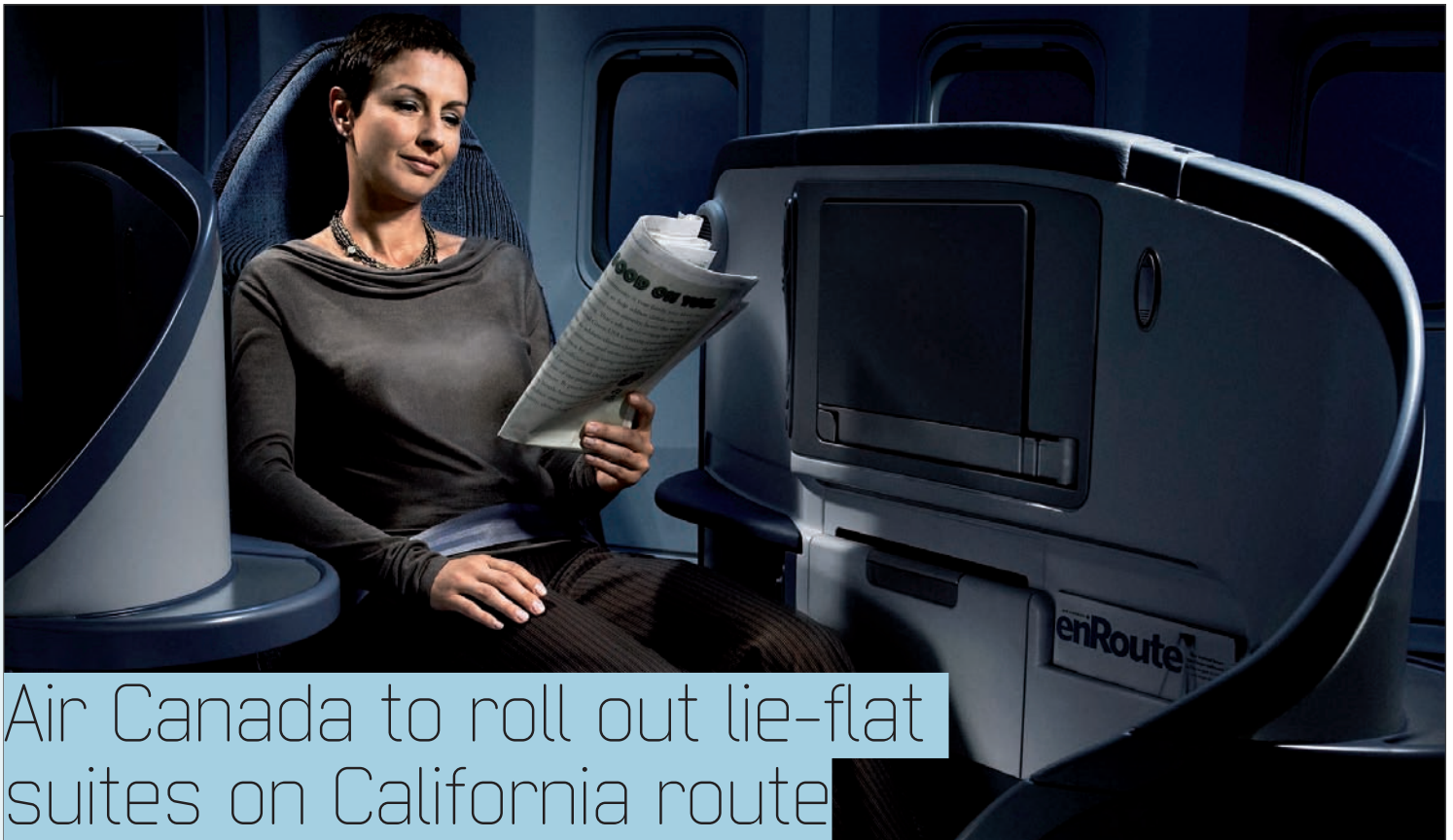
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Air Canada to roll out lie-flat suites on California route

From 1 June, Air Canada will increase its service to Los Angeles by introducing a B767-300ER aircraft with its international Executive First service, featuring lie-flat suites in business class. All seats will be equipped with seatback digital IFE systems with hundreds of hours of audio-visual entertainment, plus power plugs and USB ports at every seat.

The move is part of a major increase in capacity this summer between Toronto and California. The airline launched a new daily service between Toronto and Orange County on 8 April, using a 120-seat A319. The initiative also includes a new route to San Diego, and increased services to San Francisco, both launching in June and using A319s.

Bluetooth access point to deliver inflight mobile phone services

ASiQ has launched a Bluetooth access point for aircraft that, when combined with the company's SafeCell App, will enable passengers to access SMS, MMS, voice messaging and text email via their mobile phones. The company says one major advantage is that SafeCell eliminates GSM roaming charges, as it does not require a GSM Picocell connection to deliver its services. Bluetooth access points operate as a personal area network (PAN) and unlike WiFi do not have to connect to the internet to establish a link. ASiQ says the system can operate over even a narrow-band satellite link, and that Bluetooth can transmit at up to 3Mbps. With ASiQ's proprietary PAN design, two access points can cover a narrow-body aircraft such as a B737 or A320.

Regent Aerospace to open new interior refurbishment facility

MRO company Regent Aerospace is to open an aircraft interior refurbishment facility in Mobile, Alabama, adjacent to ST Aerospace Mobile. The first phase, due to be complete by 2012, will see 90 people employed at the site. The company will then buy, build or lease a much larger facility at Brookley and double its workforce. "One of the driving forces behind Regent's decision to make this investment in Mobile is its working relationship with ST Aerospace Mobile," said Mike Lilley, vice president and general manager at Regent. "Both Regent and ST Aerospace Mobile have mutual customers and the synergy resulting in both companies being in Mobile will benefit these customers considerably." Regent has eight facilities in the USA, and two international locations.

SriLankan enlists Skytrax in effort to revamp cabin experience

SriLankan Airlines is introducing a whole new experience on ground and in the air, and has started by asking airline rating organisation Skytrax to conduct a full audit of its customer experience. "I'm proud to say that refurbishment and reflighting are on the cards in the near future, thus reflecting our vision to achieve a five-star status, not in terms of size, but quality onboard service," said Manoj Gunawardena, CEO of SriLankan. As part of the changes, the airline's front-line staff from cabin to ground crew will sport a brand-new uniform. The airline also plans to offer more comfortable seats on board, with more leg space and flat bed seats in business class. Trimmings such as seat covers will also change to complete the new look. The airline has also designed a new menu featuring both international dishes and reinvented Sri Lankan cuisine. Offerings include preserved ginger and cardamom smoothie, suduru samba braised in aromatic mutton and spice stock with aubergine and plantain pahi, dark roasted chicken curry, and spicy seeni sambal. The airline is also introducing new wines and cocktails in both business and economy class – including coconut passion cocktail, a shot of fresh coconut arrack plunged into passion juice and shaken with coconut water.

Continental Airlines is now offering customers the option of purchasing premium seat assignments for unreserved economy-class seats that feature extra legroom. Continental's OnePass Elite frequent flyer members and their travelling companions will be able to continue to assign themselves extra-legroom seats in economy without charge.

The seats differ from others in the economy-class cabin only in terms of legroom, and were already on the aircraft – for example in exit rows. “Our customers want more choices,” said Jim Compton, Continental's executive vice president and chief marketing officer. “Seats with additional legroom are higher-value seats, and we want to offer them to customers who recognise that value.”

Depending on the type of aircraft and row, these seats provide customers with a minimum of 7in additional legroom. Customers can purchase the seats on the airline's website or during check-in, 24 hours prior to departure of the first flight in an itinerary. Pricing for the seats varies depending on a number of factors, including the length of the flight and market. Extra-legroom seats are offered on all Continental and Continental Express flights, but most Continental Connection flights are excluded.



Continental Airlines markets extra-legroom seats in economy

Heath Tecna awarded Qantas 747 upgrade programme

Heath Tecna will upgrade and reconfigure nine B747-400 cabin interiors for Qantas. Heath Tecna will produce reconfiguration kits, manage the delivery and installation of buyer furnished equipment from suppliers, and obtain an STC from the FAA for all aircraft modifications. Work is due to start in Q3 of 2011. Heath Tecna will provide approximately 32 units per aircraft for a total of 288 units for the overall programme. The contract includes retrofitting new passenger seats, galleys, lavatories, furniture, curtain assemblies, floor coverings and an IFE system. The interior architecture, general cabin lighting, emergency escape path lighting, floor tracks, plumbing and wiring will all be modified where necessary. The company will also design and supply cabin furnishings for the main and upper deck of each aircraft, including new closets, coat locker stowages, floor-mounted stowages, furniture or monument-mounted stowages, partitions and composite curtain headers.

American Eagle to add first-class to all CRJ-700 jets

American Eagle Airlines, the regional affiliate of American Airlines, is adding a first-class cabin to all of its CRJ-700 jets, which will be available from 2 July. “By July we will have our fleet of 25 CRJs converted by American Eagle mechanics to the new first-class and main-cabin design, and we will have taken delivery of the first two of our 22 new CRJs,” said Peter Bowler, president and CEO of American Eagle. The airline worked closely with engineers at Bombardier to design new custom leather seating for the premium cabin. The new seat will include four-way adjustable headrests, contoured back and seat cushions, and an articulated seat bottom. In addition, Eagle's 22 new aircraft will be delivered with a redesigned ultra-slim seat in the main cabin that will provide an additional inch of space compared to the existing CRJ-700 seats, and incorporate many features from the new first-class seat. The CRJ-700s will have 54 or 56 seats in the main cabin and nine in first class.

Panasonic wins Israil Airlines A320 IFE order

Panasonic has been selected to provide IFE systems on three A320 narrow-body aircraft owned by Tel Aviv-based Israil Airlines. The first aircraft is equipped with the Panasonic Digital Multiplexed Passenger Entertainment System (DMPES), an overhead audio and video IFE system for narrow-body aircraft. The system uses technology that incorporates Panasonic's X Series System, and also features a 10.4in touchscreen crew access panel. “We are very impressed with Panasonic's global support network, and having local support based in Tel Aviv was important in our decision to choose the Panasonic DMPES,” said Tamir Jacoby, service manager at Israil. “Also, the quality and innovation of the product is in line with the high expectations of our passengers, who want a rich and seamless ground-to-air IFE experience.” Established in 1996, Israil offers domestic flights and international flights between Israel and major destinations in the Mediterranean basin and Europe.

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Hawaiian Airlines has signed a four-year contract extension with handheld IFE provider digEcor. The airline's passengers have used the digEplayer 5500 since 2004. Starting in the next few months, they will be able to rent the digEplayer XLP.

The first phase of the agreement includes the replacement of around half of Hawaiian's current digEplayer 5500s, with the remaining stock being replaced in phase two. The digEplayer XLPs will initially be offered on longer, premium routes. The agreement also includes provisions to implement new revenue-generating programmes such as shopping and advertising. "Our close relationship with the studios allows us to pass content

Hawaiian Airlines revamps IFE with digEplayer XLP

cost-savings to Hawaiian and our other customers," said Jed Thompson, content administrator at digEcor.

"With the downturn in the marketplace, we have taken the opportunity to engineer new product offerings and build flexible content applications focused on our customers' financial and logistical needs," said Brad Heckel, president of digEcor.

US Airways takes to the sky with Gogo inflight internet

US Airways has launched Aircell's wireless Gogo internet service on five of its A321s. By 1 June, all 51 A321s in US Airways' fleet will be Gogo-equipped. A WiFi symbol on the aircraft's exterior at the boarding door will alert passengers that Gogo is available on their flight. The symbol will also appear next to the seat and row number, and seatback cards will provide access instructions. The service is available over the contiguous 48 US states and within 100 miles of its borders. Pricing varies by flight length and type of device used. Gogo was also recently chosen by Alaska Airlines for all its aircraft.

Etihad to introduce onboard health monitor system

Etihad Airways will install new technology on its long- and ultra-long-haul aircraft by the end of May that can monitor the condition of passengers who display signs of sickness. RDT's Tempus IC system allows cabin crew to gather vital information about a passenger's health. The data gathered covers a wide range of the passenger's vital signs, including blood pressure and an electrocardiogram. It also allows the crew to take photo imagery. That information is then transmitted to a medical team specialised in assisting in inflight medical contingencies. The airline is currently training its crew to use the system.

Gulf Air launches Falcon Gold

Gulf Air has launched Falcon Gold, a new premium cabin experience that it says will offer the best elements of its first-class cabin for the price of a business-class fare, with a choice of pricing options linked directly to the flexibility of the ticket. The airline's Sky Chef service, previously exclusive to first-class passengers, can be enjoyed throughout the new single premium cabin. Luxury pillows and blankets, as well as overnight amenity packs will also be rolled out. From the end of 2011, Gulf Air will introduce a new flat bed throughout Falcon Gold cabins on long-haul flights operating on routes over 4.5 hours. In the interim, customers on fully flexible Falcon Gold tickets will be priority pre-seated in fully flat sleeper seats at the front of the aircraft, when available. Passengers on less flexible fares will be allocated lounge bed style sleeper seats, available on A330-300 and A340-200 aircraft on long-haul routes including London, Frankfurt, Paris, Kuala Lumpur, Bangkok, and a number of regional routes on an ad-hoc basis. Gulf Air is also refurbishing the entire Falcon Gold cabin. Short-haul operations will feature improvements to seat comfort and onboard services for Falcon Gold customers.

European business jet operator NetJets Europe has rolled-out a new eco-friendly catering package and recycling initiative. The catering box is fashioned from sustainably sourced bamboo and features wooden cutlery and porcelain inserts – all of which are recyclable. Even the lids are biodegradable, and the porcelain inserts can be re-used.

Each box will now take about half of the space of the previous catering box and the package will be adapted to suit the storage requirements of the small and mid-sized jets in NetJets Europe's fleet. Recycling targets have been set and NetJets is working with its crew, local FBOs, anchor caterers and cleaning companies to ensure that equipment can be reused at the end of each flight to minimise its impact on the environment.

"NetJets Europe takes its environmental responsibilities seriously, and this new packaging is just one way in which the catering department can contribute," said Ricardo Paiva, senior catering manager at NetJets Europe. "We're encouraging our crew to work with our ground staff to achieve and exceed our recycling targets and minimise wastage."



NetJets Europe debuts eco-friendly catering package

I-Shade selected for 400NEXT

Nextant Aerospace has selected InspecTech Aero Service's I-Shade Cabin Light Management System (CLMS) for its 400NEXT Beechjet 400A. The I-Shade smart windows are integrated into Rockwell Collins' Venue cabin management system on the 400NEXT. They manage light, glare and heat by electronically adjusting the amount of light that enters the cabin through a solid-state filter embedded in each inner window pane. The windows can be turned opaque for total privacy, via the Venue seat switch module or from the cockpit. "In February, we conducted the first flight of a fully equipped Phase 1 400NEXT aircraft and the I-Shades' benefits were compelling," said James Miller, president of Nextant Aerospace.

AAC delivers BBJs and ACJ

Associated Air Center (AAC) has delivered its 17th and 18th BBJs, as well as its 13th ACJ. All three aircraft were delivered with options such as external cameras, moving map/flight information systems and high-end IFE. They were also equipped with high-speed data satellite communication systems capable of voice/fax/data transmissions and internet access. Other systems installed on the aircraft included additional potable water tanks, comprehensive cabin insulation systems and a centralised cabin humidifier system. The 17th BBJ aircraft and the ACJ were both for Eastern European clients, and were designed by Peder Eidsgaard. The 18th BBJ, to be based in India, has an interior designed by Alberto Pinto Design.

Stone flooring for the Global 5000

LIST components & furniture and RUAG Aerospace have fitted-out a Global 5000 with real stone flooring for Bombardier Aerospace. The stone flooring was fitted in the entry and galley area, as well as in the crew and passenger lavatory areas. "We've been able to make continuous improvements in stone flooring in terms of noise and low-temperature isolation, and by using a new attachment-to-floor system," said Helmut Wiesenberger, business development director at LIST. The attachment system is designed to make installation fast and easy, with a high level of accuracy. Granite is cut into 2.5mm slices and attached to a back-plate, which gives it high elasticity without losing the necessary floor-loading capacity.



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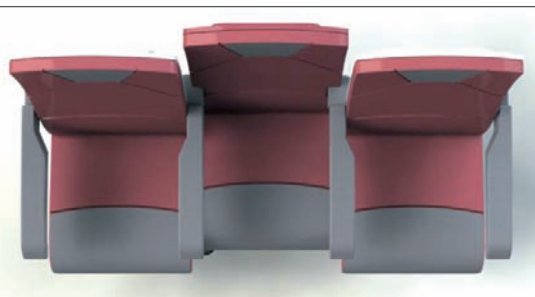
slidingchairs

BRIEF: Molon Labe Designs LLC, an interior design firm based in Colorado, USA, has developed a patent-pending design featuring a sliding airline passenger seat that increases the width of the aisle during passenger boarding and deplaning. "The aim of this project is to improve aircraft turnaround times by expediting passenger loading and unloading," says Molon Labe's Hank Scott. "We expect to display a full working model of the design at Aircraft Interiors Expo 2010."

DESCRIPTION: "Using a staggered configuration, we can 'slide' the aisle seat approximately two thirds of its width away from the aisle, effectively increasing aisle width from 19 to 43in during boarding and unloading (if both sides of the aisle are modified with the seat design)," continues Scott. "This permits passenger movement around slower moving aisle passengers. The idea came from a former airline CEO stating that the number one way to improve revenues would be to turn aircraft around faster, specifically by loading and unloading passengers faster." Scott also says the staggered seat layout nullifies the need to jockey for armrest space, while an intuitive single-action sliding/locking armrest action enables easy operation. A wider aisle would also enable more efficient and thorough cleaning, and the concept is being designed to ensure retrofitting without any aircraft modifications. Scott admits there is a slight weight penalty, but he expects this to be offset by improved turnaround times. "Our risk reduction study will address this main concern. Our Wide-Slider design would also permit the centre seat pan to be up to 6in wider, specifically designed to improve the comfort of larger passengers."



VERDICT: Molon Labe has teamed with a state university in Colorado to complete design risk reduction, construct a prototype, conduct cost-benefit studies and quantify turnaround time improvements. "Our basic stress analysis using Solidworks supports our belief that we can meet forward and vertical loadings," says Scott, who is also actively seeking an established seat manufacturing partner. "We plan to have the prototype and all of our basic testing completed by the end of this year, hopefully earlier," he says. Watch this space.

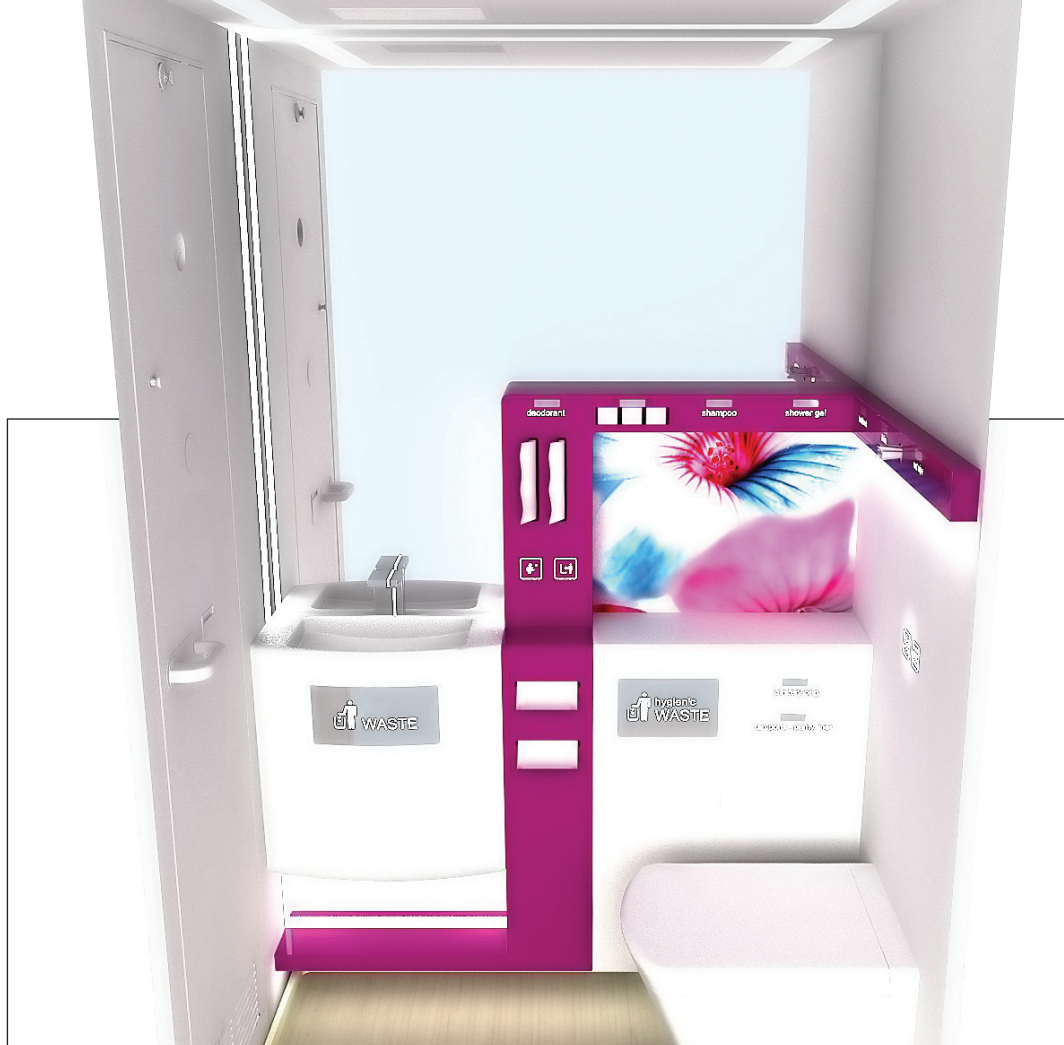


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ladiesonly

BRIEF: In all other public areas there are separate lavatories for men and women – so why are there no lavatories dedicated for female use on board aircraft? This simple question proved the starting point for the 'Lady-Lav' – Kerstin Strelow's diploma project at Germany's FH Wismar University of Applied Sciences, where Strelow is studying design.

DESCRIPTION: Special attention has been paid to the needs and wishes of female passengers. The design draws on the latest ergonomic research to ensure that use of the lavatory is more comfortable for women in terms of the distance and height of key features. A brightly coloured service column clearly separates the wash basin from the dressing table. The column incorporates all service elements, including paper towels, soap, tissues, lighting, etc. Wherever possible, the design employs 'non-touch' technology to ensure the highest standards of hygiene. There's also a new baby-changing table: "Normally, these are too small and not comfortable for changing a baby," says Strelow. The new table is considerably larger than existing units, and is made from a more flexible, 'soft-touch' material that Strelow says is more pleasant to use. The washstand itself can be adjusted to suit various passenger types: "The results from the ergonomics studies showed that being able to adapt the washstand height was absolutely necessary to achieve a comfort increase," says Strelow.



VERDICT: Stuck on a long-haul flight, a trip to the washroom at least offers some respite when travelling in economy – that is until you get there and are greeted by its grey surfaces and often wet floor, which makes you wish you'd put your shoes back on before venturing from your seat. And that's before you graze your knees on the door as you turn to lock yourself in. Clearly any improvement in lavatory design is welcome. Dasell already offers a urinal unit for use on Airbus aircraft – could the Lady Lav inspire a manufacturer to deliver a more female-friendly bathroom? I fear for the gents' facilities though if it did – with no ladies around to complain, things would only get worse...



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Peter Tennent of Factorydesign is a firm believer in the value of building physical mock-ups

Last week I had a 'virtual meeting'. Yes, I know, they used to be called video conferences, but now they are virtual meetings... and it was virtually useless. Once a project is up and running, or when you already know the person you need to confer with, I admit, there is value in picking up the phone or the digital camera and having a chat. But if you are trying to make an introduction or discuss a tricky matter, there is nothing quite the same as shaking someone's hand, getting around a table and pointing at stuff... with a real finger, not a digital one.

In much the same way, you cannot beat a mock-up when it comes to product development. Photo-real renderings and illustrations are now the expected minimum standard in the presentation of new concepts and the technology is getting better all the time. While it is not always feasible with some budgets to achieve Pixar levels of communication, it is still possible with a fairly modest investment to produce very real-looking virtual images of a future concept. Meanwhile, virtual reality programmes enable viewers to navigate their way through a digital world and experience spaces and products that don't exist, albeit with silly glasses on. But even the very best computer wizardry will be viewed on paper or on screen, and these are two-dimensional interfaces.

Our world is three-dimensional, and so are we. In fact if you add emotion, we are almost four-dimensional and you can't get that from a visualisation. Perhaps it is something to do with our stereo vision or the sense that alerts us to the existence of someone in the room before we see or hear them. Whatever the reason, we engage and interact with mock-ups in a completely different way than we do with a picture. And that interaction will be a more accurate experience of the eventual product.

Mock-ups come in all shapes and sizes – some to scale, some full-size – and are often made of cardboard or wood or even the sinisterly named 'chemical wood'. Different techniques are appropriate at different points in a design programme and address different issues, such as size, touch, form, space, function, comfort, ease of use, and so on. They can be held together with string, or built with the appearance of the final product, so much so that some will wonder why they do not actually 'work', while others will even include motors and moving parts.



PETER TENNENT

Peter is one of three partners at London-based Factorydesign, supported by an experienced and highly skilled team of designers, engineers and modelmakers. Peter has worked with a wide range of aviation clients, including British Airways, Etihad Airways, Jet2.com, Acro Aircraft Seating and Thompson Aero.

With project budgets being squeezed and with all this technology about, there must be a strong temptation to skimp on mock-ups. They are not always cheap and the more sophisticated variety cannot be made overnight, but as an aid to getting the most from a space or seat, or as a reassurance that your new lavatory is not fit only for dwarves or giants, they are priceless. So dig deep and three cheers for the mock-up. ☒



WE ENGAGE AND INTERACT
WITH MOCK-UPS IN A
COMPLETELY DIFFERENT
WAY THAN WE DO WITH
A PICTURE



01. Mock-up built by Factorydesign for Thompson Aero

01

factfile:air new zealand

AIRCRAFT TYPE	B747-400	B777-300ER	B777-200ER ***	B767-300ER	A320
No. of aircraft	7	5	8	5	12
Refurbishment	2005	For delivery from Nov 2010	From mid 2011	Late 2008/early 2009	Late 2008/early 2009
Total seats	379	338	304	223	152
Number of seats	46 (Business Premier)	44 (Enhanced Business Premier)	26 (Business Premier)	24	8
Configuration	1-1, 1-2-1	1-2-1	1-2-1	2-2-2	2-2
Seat pitch	N/A (not forward-facing)	N/A (not forward-facing)	N/A (not forward-facing)	50in (127cm)	42in (106.7cm)
Seat width	22in (55.9cm) *	22in (55.9cm) *	22in (55.9cm) *	18in (45.7cm)	18in (45.7cm)
Seat recline	180°	180°	180°	15in (38.1cm)	7in (17.8cm)
Bed length	79in (200.7cm)	79.5in (201.9cm)	79in (200.7cm)	N/A	N/A
Seat supplier	Contour	Contour	Contour	B/E Aerospace	Brice
IFE system	ETES	eX2	ETES	eFX	eFX
Business class	IFE supplier	Rockwell Collins	Panasonic	Rockwell Collins	Panasonic
Number of seats	39 (Pacific Premium Economy)	50 (Premium Economy Spaceseat)	36 (Pacific Premium Economy)	0	0
Configuration	3-2, 2-2	2-2-2	3-3-3	N/A	N/A
Seat pitch	38-40in (96.5-101.6cm)	N/A (not forward-facing)**	41in (104.1cm)	N/A	N/A
Seat width	18.5in (47cm)	20in (50.8cm)	17.8in (45.2cm)	N/A	N/A
Seat recline	9in (22.9cm)	9in (22.9cm)	9in (22.9cm)	N/A	N/A
Seat supplier	Contour	Contour	Recaro	N/A	N/A
IFE system	ETES	eX2	ETES	N/A	N/A
Premium economy class	IFE supplier	Rockwell Collins	Panasonic	Rockwell Collins	N/A
Number of seats	294 (Pacific Economy)	244 (184 Economy, and 60 seats creating 20 Economy Skycouch configurations)	242 (Pacific Economy)	199 (including 46 Space +)	144 (including 36 Space +)
Configuration	3-4-3, 3-3, 2-4-2	3-4-3	3-3-3	2-3-2	3-3
Seat pitch	32-34in (81.3-86.4cm)	33in (83.8cm)	31-33in (78.7-83.8cm)	31-35in (78.7-88.9cm), 35in (88.9cm) in Space +	30-35in (76.2-88.9cm), 35in (88.9cm) in Space +
Seat width	17in (43.2cm)	17.1in (43.4cm)	17in (43.2cm)	17.5in (44.5cm)	17.5in (44.5cm)
Seat recline	6in (15.2cm)	6in (15.2cm)	6in (15.2cm)	6in (15.2cm), 7in (17.8cm) in Space +	2in (5.1cm), 4in (10.2cm) in Space +
Seat supplier	Recaro	Recaro	Recaro	B/E Aerospace	Brice
IFE system	ETES	eX2	ETES	eFX	eFX
Economy class	IFE supplier	Rockwell Collins	Panasonic	Rockwell Collins	Panasonic
AIRCRAFT TYPE	B737-300 ****	ATR72	Q300	BEECH1900D	
NO. of aircraft	15	11	23	18	
Refurbishment	Replacement from Jan 2011	Entered service from 1999	Entered service from 2005	Entered service from 2001	
Total seats	133	68	50	19	
Number of seats	133 (including 67 Space + seats)	68	50	19	
Configuration	3-3	2-2	2-2	1-1	
Seat pitch	30-35in (76.2-88.9cm), 35in (88.9cm) in Space +	31in (78.7cm)	32in (81.3cm)	31in (78.7cm)	
Seat width	17.5in (44.5cm)	17in (43.2cm)	Info not available	17in (43.2cm)	
Seat recline	2in (5.1cm), 4in (10.2cm) in Space +	N/A	N/A	N/A	
Seat supplier	B/E Aerospace	Sicma	B/E Aerospace	B/E Aerospace	
IFE system	MPES	N/A	N/A	N/A	
Economy class	IFE supplier	Panasonic	N/A	N/A	

HEADQUARTERS: Auckland, New Zealand

PASSENGERS CARRIED IN 2008: 12.4 million

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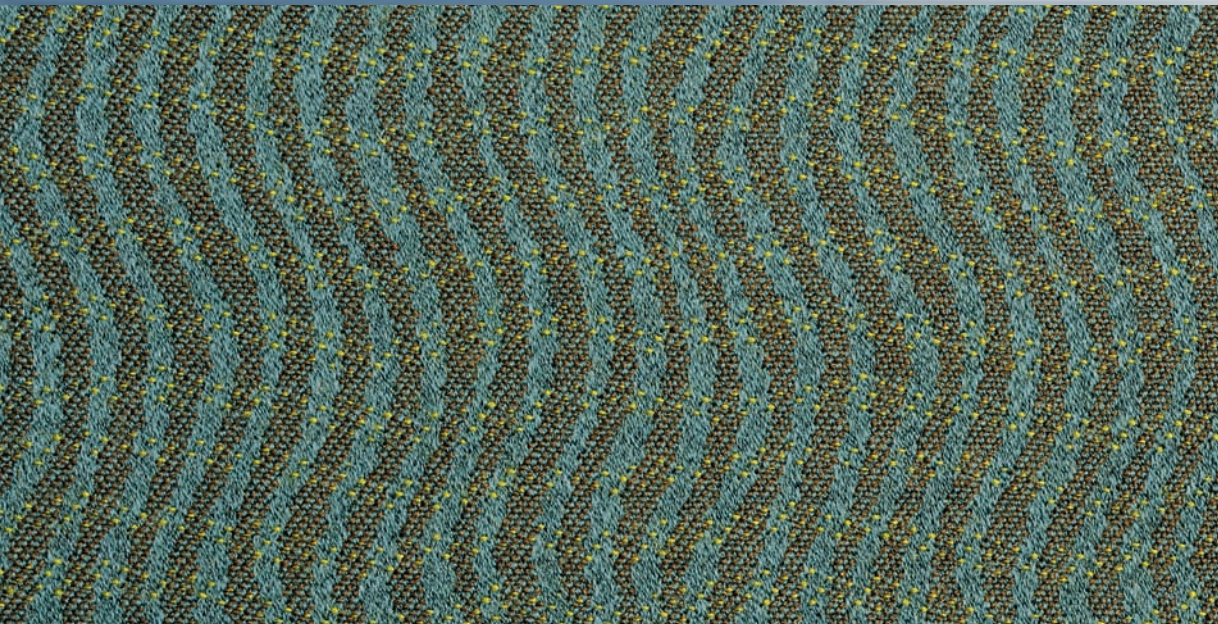
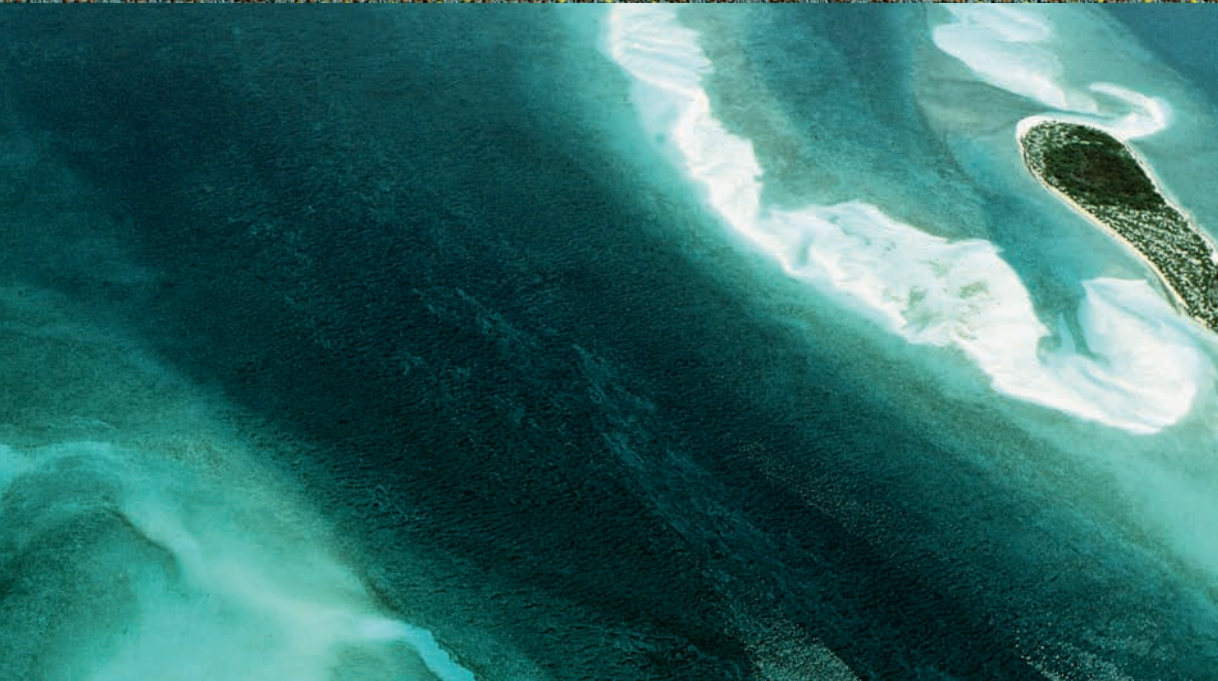
* 33in at shoulder

** Approximately 36in (91.4cm)

*** To be refurbished with Enhanced Business Premier, Premium Economy Spaceseat and Economy Class Skycouch, as on B777-300ERs

**** To be replaced from Jan 2011 with 14 A320s in an all-economy layout

***** ANZ also has eight B787s on order for delivery from 2014, details to be announced



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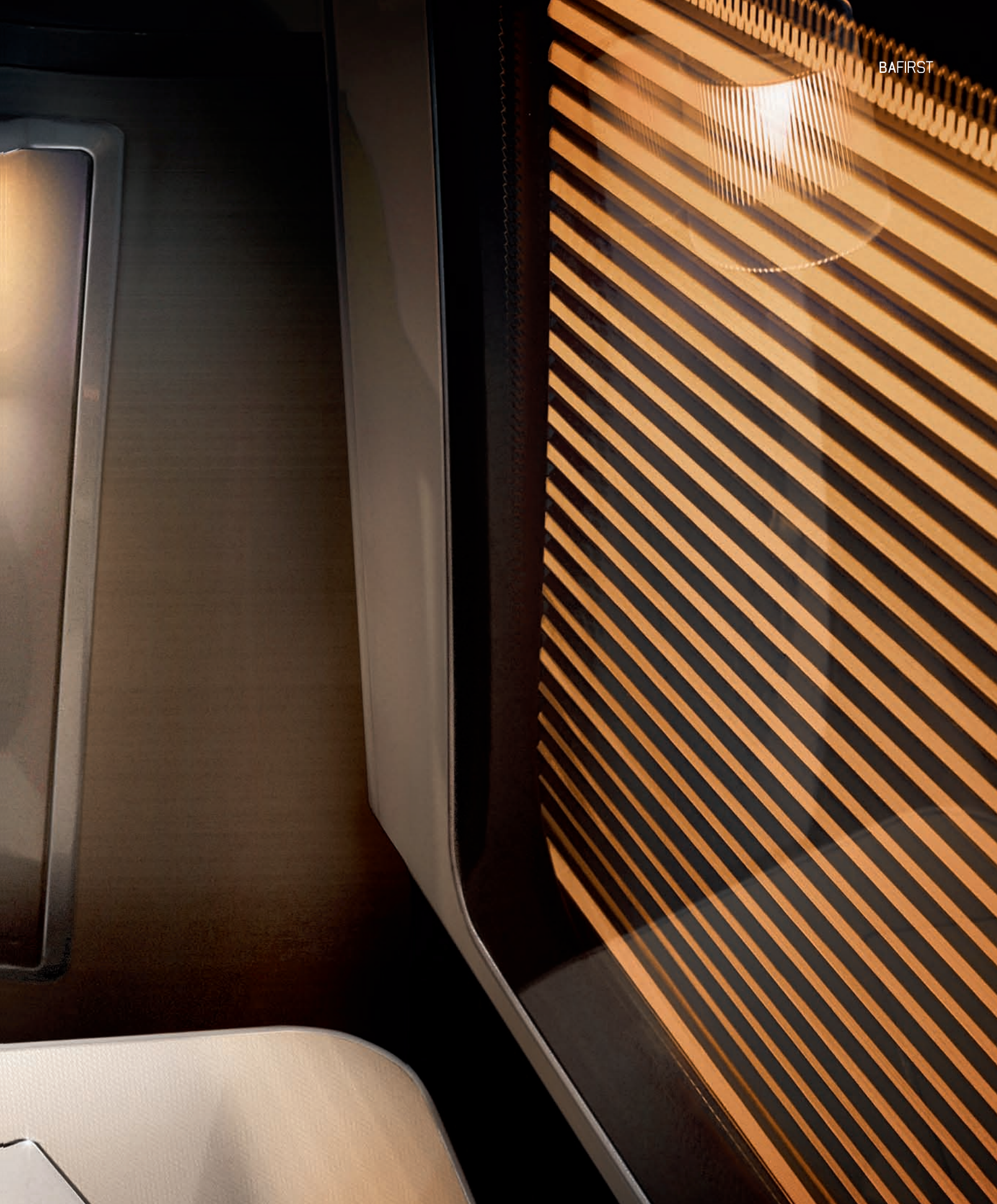
British Airways' new First combines intelligent design with a proven heritage to deliver an authentic and liberating luxury experience

ANTHONY JAMES, AIRCRAFT INTERIORS INTERNATIONAL



British Airways' new First cabin finally took to the skies on 10 February, on a Boeing 777 bound for Chicago. The airline has invested £100 million in its flagship brand, delving deep into its history to craft an elegant, understated and classic onboard environment that oozes style and timeless sophistication. The project sees the airline continue its successful relationship with design firm Tangerine, which has previously worked on both generations of its Club World cabin; and a new partner, London-based forpeople, which helped shape the overall creative vision.

At the heart of the new cabin is a redesigned suite from B/E Aerospace, featuring an enhanced bed with more width at the shoulders, a new 'intelligent' mattress, a personal wardrobe, a leather-bound writing desk that converts into a dining table, a 15in IFE monitor and an ottoman. An innovative seat control unit similar to those found in luxury cars enables passengers to move effortlessly into bed mode and activate pneumatic panels to support the head and lumbar positions. The airline has also developed new mood lighting and introduced personal electronic window blinds.





EMPHASIS HAS BEEN GIVEN IN THE DESIGN TO
CREATE SPACE FOR THE PASSENGER, AND TO MAKE
THAT SPACE WORK MORE INTUITIVELY





02

The airline will retrofit over 2,000 of the new suites on 73 of its long-haul aircraft (all those that currently offer First). Its B777 fleet will be reconfigured first, followed by its B747-400 fleet, with the programme expected to take two years. Each cabin takes approximately 10 days to install, with the work taking place alongside the aircraft's scheduled C check. All new B777-300ER aircraft joining the fleet from this year will be line-fitted with the new cabin.

SAME, BUT DIFFERENT Crucially, the LOPAs stay roughly the same, with no reduction in seat numbers: "Commercially, losing seats wasn't considered viable at the time," says Peter Cooke, British Airways' design manager. Hence its 777s will feature 12, 14 or 17 (depending on aircraft type) First seats in a 1-2-1 herringbone format, while its 747s feature 14 seats. "It quickly became clear that if you could keep the same number of seats but deliver a much better experience, then that was the way to go," adds Tangerine's Martin Darbyshire.

Despite certain similarities with the old product, Darbyshire says there are a number of key differences: "It occupies the same size of cabin, but it's not an identical footprint," he says. "We always look for the maximum commonality where we can, but we also look for the points of difference that really add value."

Hence the revamped cabin features a distinct choice between inboard and outboard seats: "We've made the centre seats, which were traditionally not the most popular, bigger – so they've become good propositions in themselves," explains Cooke. "You don't get a window, but you get more space."

The inboard seats use the same seat and shell as the outboard, but the space has been designed to offer a larger bed area and increased privacy from a separate wardrobe. In place of the freestanding credenza, from which the table is deployed on the outboard seat, the inboard seat also has

wonder wall

The First cabin's stylish sidewall panels are only possible as a result of a new transparent PPSU material, supplied by Evonik Degusta, Germany. "It's an acrylic that passes the necessary burn requirements required in aircraft," explains British Airways' design manager, Peter Cooke. "Acrylics are used in individual windows, but these are small enough (under 1m²) to pass certification, but we managed to find a material that we could use across much larger areas, where the testing is more stringent. It's been used in private jets before, but this is the first time it's been passed for commercial use." The material is delivered in batches, and each batch has to be tested – the airline is nervously awaiting the test results of its second batch!

a larger surface off to the side where the two centre seats join, but are then screened off by the 'hoop and blind' – the divider between centreline seats. The hoop holds a fabric-pleated blind that can be slid backward and forward to vary the level of privacy between two adjacent passengers. Its shape mimics that of the window frames in the wall panels, which also hold pleated blinds, with both demarking each passenger's personal space.

Outboard passengers may have slightly less volume to play with, but their perception of space is reinforced by the clever window frame and wall panel design, which clearly denotes the 'double' set of windows assigned to each seat. Personal electronic blinds that the passenger can raise or lower at whim further reinforce the idea of 'ownership'. "We wanted to create something that was the length of your seat that you can actually own and control," explains Cooke.

"This was never about a LOPA or a plan view – it was about creating ownership, which was the whole idea behind the windows," adds Richard Stevens of forpeople. "It was as much about defining personal space as it was about delivering an actual blind, which anyone can do."

SPACE EXPLORATION Another fundamental revision involved the removal of all superfluous structure to deliver more room where it is most needed: "Emphasis has been given in the detailed design to create space for the passenger, and to make that space work more intuitively," explains Darbyshire.

As a result, shell and wall panels have been thinned to the minimum, and typically complex mechanisms have been simplified wherever possible. A good example is the ottoman, which now simply pulls forward and lowers to the floor, offering comfortable foot support when seated in a reclined posture. It can then quickly and easily be pushed back with a foot into its stowed space.

01. Rachel Weisz makes herself comfortable in the new First
02. Outboard passengers benefit from their own personal blinds



03

03. The new seat converts into a bed that is 60% wider at the shoulder
04. Anya Hindmarch washbag designed exclusively for First

The armrests are generous in size where required, but sculpted away at the back of the seat. They also retract flat when in bed mode, providing vital extra width around the shoulders, helping ensure a better night's sleep. "We realised that just by dropping the arms you can achieve 33% more bed space," says BA's Cooke. "That helped us realise that we could lose a lot of the hard furniture that wasn't really being used and turn it into bed – that was a eureka moment. You look at the existing seat and then you strip it of all the stuff you don't need and suddenly you've got this space that's really useful."

ANGLE OF ATTACK Meanwhile, the seat geometry borrows heavily from the airline's innovative Club World seat, ensuring First passengers now sit low and in a reclined posture from the moment they board. A wide range of reclined positions is available, but the seat pan remains steeply angled throughout, regardless of the seat back angle, to reduce stomach muscle strain. "The Z-bed position is the centre zone across the range of reclined positions, and we believe it offers the lowest strain on all muscles, creating the greatest comfort," explains Darbyshire, who first introduced the idea on the second-generation Stretch seat of Club World.

"On push back in Club World you'll find people already dozing off because the seat has been optimised for comfort," observes Stevens. "You rarely see people adjusting it when the seat belt signs go off because the whole thing has been considered."

This idea of keeping things simple, avoiding unnecessary trinkets and reducing the workload on the passenger when interacting with their environment was key. Take the 15.4in IFE touchscreen – not the biggest, but carefully considered nonetheless: "We know some of our competitors are putting



ULTIMATELY, IF YOU NOTICE SOMETHING, IT'S IN THE WRONG PLACE, IF YOU DON'T NOTICE IT, IT'S DONE RIGHT



04

dream machine

A key feature of First sees the width of the bed increased by 60% at the shoulder. "To get a good night's sleep you turn over maybe 30 times in the night," explains tangerine's Martin Darbyshire. "If you're interrupted in doing that, you don't get the good quality sleep that leaves you feeling really rested. You don't need to offer that same width down by the feet – so long as you are able to turn the major motor part of your body without interruption, you should sleep well."

in 26in screens at the end of their beds, but we asked ourselves what was right for our customers and we did a lot of ergonomic work to find the best viewing angle and correct distance to deliver the best experience," says Cooke. "Ultimately, if you notice something, it's in the wrong place, if you don't notice it, it's done right."

Darbyshire is an equally keen exponent of the 'less is more' mantra: "Eliminate the risks of failure as a result of confusing the passenger with too much complexity – just make it work in a way that gives somebody a seamless experience that lets them get on with enjoying their meal, the work they need to do or the book they are going to read," he says.

"Our aim was to create one peerless product, with one perfect function for every touch point," adds forpeople's Stevens. "Many first-class and super-first-class products are complex, confusing, feature-loaded, heavy and prone to failure," he continues. "A truly first-class travel experience should be one in which uncompromising quality of product and service is delivered in the simplest yet most



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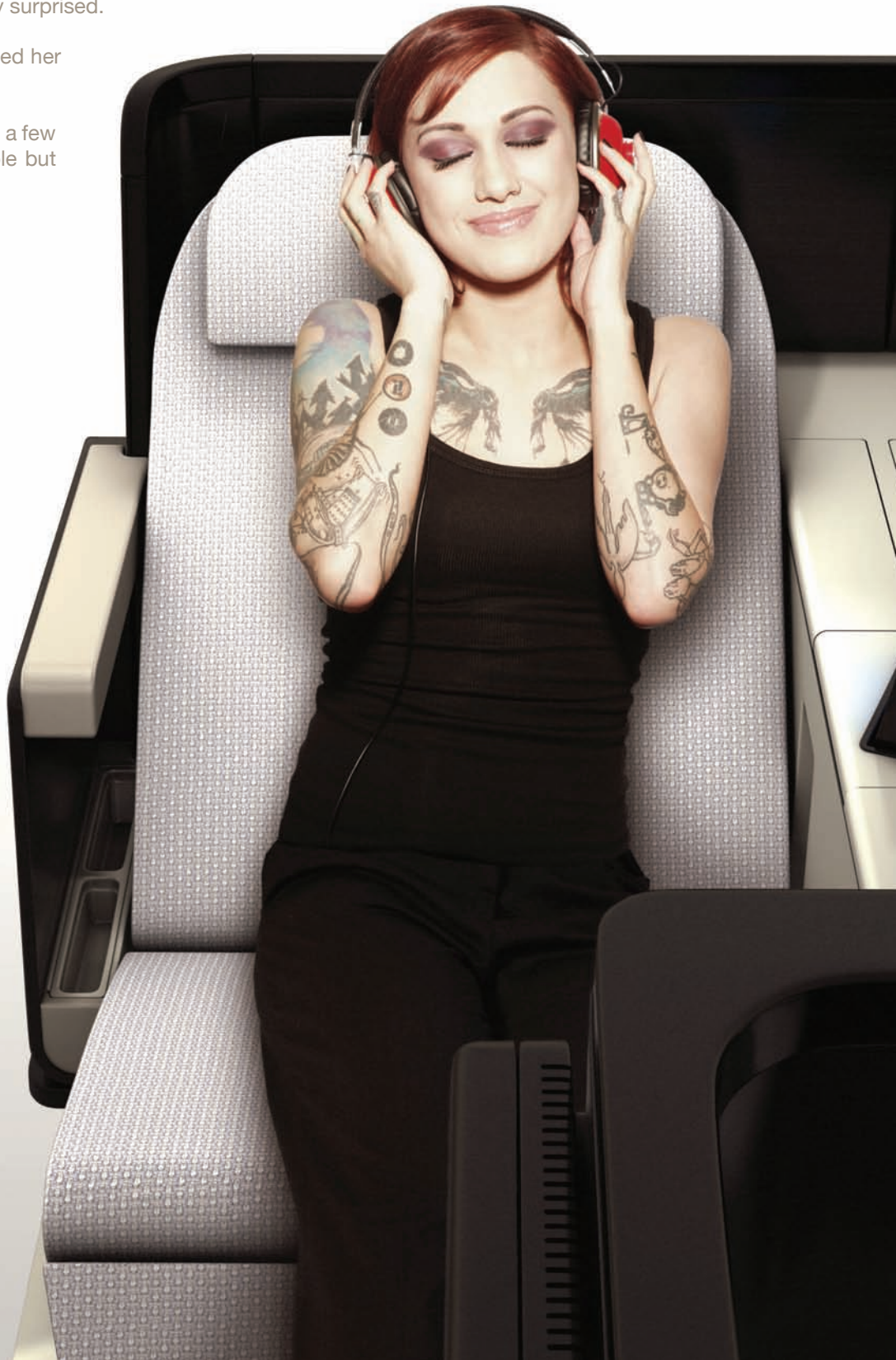
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05

ingenious way. We have therefore focused on removing unwanted features and reducing visual clutter. This will undoubtedly enhance the travel experience and improve the operational efficiency for the airline.”

Cooke agrees that some of the suites offered by its rivals miss the point: “If you go to sliding doors and a private suite, you can’t engage with passengers and you can’t create that theatre between crew and customer,” he says. “If you look at most premium products, they’ve taken a lot of their queues from private jets. Private jets are nice, but they don’t have any heritage or brand significance.”

PERMISSION GRANTED Staying true to the airline’s rich history was crucial, according to forpeople’s Stevens: “The original objective for the project was for new First to inherit the mantle of Concorde and create a new flagship experience for British Airways. We knew that First needed to reference its heritage and provenance in a thoughtful, sophisticated and contemporary way.”

To better understand how this might be achieved, forpeople researched a number of classic British brands, including Smythson, Alfred Dunhill, Asprey, Fortnum and Mason, Browns hotel, Jaguar and Rolls Royce.

“The key insight was that when an established brand assesses its heritage it provides the opportunity when doing something new to question whether you have the ‘permission and authority’ to do it, based on your brands heritage,” explains Stevens. “It doesn’t mean simply regurgitating things from the company archive but seeking inspiration to create product and service ‘stories’ that your competitors cannot.”

One such story sees Cyril Kenneth Bird’s ‘Care in the Air’ character return to the skies in the new First cabin. Bird, pen name Fougasse, was a British cartoonist best known for his editorship of *Punch* magazine – he was the only cartoonist ever to edit the title – and his iconic World War II propaganda

Key features

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posters, including the famous ‘Careless Talk Costs Lives’. “It just so happens that Fougasse also crafted the first luxury travel marque for Imperial Airways, which later became British Airways,” explains Stevens. “We have brought his character back to life to signal the brand’s continued commitment to the very best in inflight service.” Meanwhile the carrier’s coat of arms with the motto ‘to fly to serve’ adds a flourish to its Anya Hindmarch-designed washbags.

MORE THAN A SEAT All three men emphasize the importance of service to the new First, and how this influenced the overall cabin. “I think it’s important to establish that it wasn’t just the seat design that really occupied our minds, it was the experience,” says Cooke.



IT WASN’T JUST THE SEAT DESIGN THAT REALLY OCCUPIED OUR MINDS, IT WAS THE EXPERIENCE

05. British Airways’ classic ‘Care in the Air’ character, by Fougasse, adds an original touch of class to the dining service



06

07

06. Seat control unit inspired by luxury cars
07. Power socket and USB port are easy to find

Afternoon tea inspired by the Dorchester is one particular ritual unique to the airline, which has also introduced a cocktail hour on board. The team strove to enhance such service elements at every turn: “The aim was to create a cabin product that acts as a blank canvas for rolling service innovation; enhancing the journey experience by creating appropriate moments of ‘theatre’ throughout the flight,” explains Stevens.

LIGHTEN THE MOOD One enhancement sees the introduction of a new LED mood lighting system, developed with input from Pinniger & Partners, the lighting consultancy responsible for the airline’s award-winning Galleries Lounges at Heathrow Terminal 5. “We knew that the considered use of lighting would obviously play a huge part in adding to that sense of theatre on board but what we didn’t want to do was create an overt expression of LED mood lighting technology,” says Stevens.

“What we’ve tried to do is create the best type of ambient lighting for each individual stage of the flight,” adds Cooke. In particular, the airline strived to create low-level lighting similar to a tungsten bulb or candle light, which is very comfortable for dining and sleeping. “Those levels are hard to create using a conventional LED system, which has to mix red, green and blue light together,” explains Cooke. “But we have worked with our suppliers to create a new system capable of 2,700 Kelvin output. I think this is one of the key aspects of the experience on board. It’s mood lighting, not disco lighting.”

A deep blue cabin level lighting scenario is used as an accent to punctuate the journey through service routines on board, such as afternoon tea and boarding and

disembarking. This deep blue accent appears within the window fascias in each (outboard) suite and also in the bulkhead feature lights.

EVOLUTION, NOT REVOLUTION British Airways was the first airline to introduce a fully flat bed in first class in 1996. It then went on to pioneer fully flat beds in business class in 2000, which it later revamped in 2006. It began thinking about upgrading First, partly in response to fears that passengers might trade down to Club World, at the end of 2005 – so why the wait? “There were some delays early on in terms of deciding which direction to take,” responds Cooke. “Do we refresh our product or go for something completely new?”

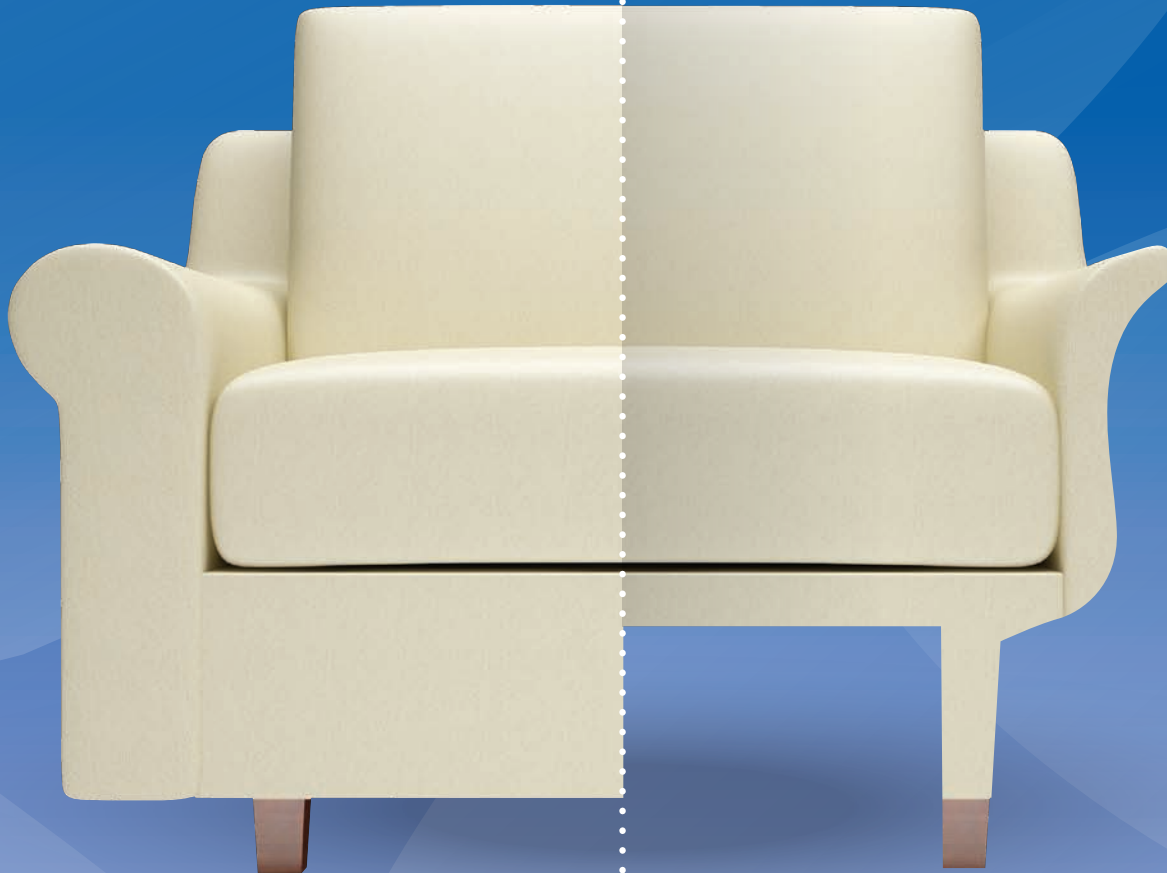
In the end, the airline opted for evolution rather than full-scale revolution: “Evolution seemed to make the most sense,” responds Darbyshire. “Some airlines may choose to hose down their passengers with space, but that wasn’t really an appropriate strategy in this case. Instead we focused on delivering the very best possible experience within a very tight set of constraints.”

Overall, British Airways seems to have got it right – it hasn’t lost any seats, putting it in a good position to capitalise as the economy picks up – currently its premium traffic (First and Club World) accounts for 13% of its passengers – but 45% of its revenue. “I think this is the most integrated piece of cabin design we have ever undertaken in the way that everything works together – the lighting, the sidewalls, the seat and the service,” concludes Cooke. ☒

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foreverfirst?

Some airlines are stripping away their front cabins, while others continue to invest – ultimately the future of first class relies on a better understanding of customer needs on specific routes

GUY BIRD, AIRCRAFT INTERIORS INTERNATIONAL

“I think we’re witnessing the demise of first class,” says world-renowned product designer and Qantas design director Marc Newson with a slightly hollow laugh. In light of Qantas’s recent decision to replace first-class seats with business equivalents on a considerable chunk of its existing fleet and cancel their installation in the remaining eight A380s due from 2012, he’s certainly got direct experience to back up his assertion.

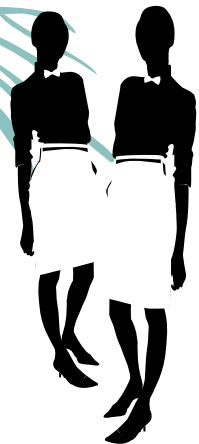
According to IATA, in early 2009 the rate of decline in ‘premium traffic’ (business and first class) exceeded 20% – twice the decrease of economy – while total passenger demand for the full year was down 3.5%. In May 2009, in the midst of the worst recession since the 1930s, first-class passengers in particular plummeted by more than a quarter year-on-year (-25.9%). It wasn’t much better for business class in the same month – down by 23.8% – but the difference has been the divergence within premium travel since.

Business class has slowly improved culminating in a +5.9% increase year-on-year in January 2010 but first class is still languishing at -3% for the same month

(albeit after a brief spike of +4.5% in December 2009 perhaps accounted for by private travel over the Christmas holiday period).

MIXED MESSAGES Noam Perski, CEO of JamesList.com – a website for luxury goods and services covering everything from yacht charter to supercar purchases – provides a useful high-end customer perspective: “If those people are flying with colleagues and leading a company asking its staff to make sacrifices, it’s hard to justify flying first. However I think this will only be a short-term rather than a long-term issue.”

Qantas isn’t so sure and while it isn’t ducking out of first class altogether its future path is cautious, as CEO Alan Joyce puts it: “Maintaining a first offering on flagship routes is essential for Qantas as a premium airline,” he says. “However, it is vital that we align this offering with forecast demand, which is expected to be relatively slow compared to business, premium economy and economy.”







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01. Qantas A380 first class
02. Kingfisher First



Less premium travel is particularly bad news for airlines' overall bottom line too, as Kevin Lau, an analyst at Hong Kong's Daiwa Institute of Research makes clear: "Sometimes, just filling the first- and business-class sections are enough to make a profitable flight. The yields are very high."

Part of the reason for dwindling first-class sales may be the vast improvement in many business-class offerings, as Newson points out: "The standard has ramped up to such a degree the differences have become blurred. Business class is infinitely better than the first class of 10-15 years ago."

Indeed, some experts think things could get even more confusing with new product offerings that sit between these two traditional classes like those that already exist between economy and business.

Priestmangoode – the design agency behind Swiss Air's first-class cabin among others – has already developed a 'business-first' cabin for Kingfisher, branded 'Kingfisher First'. Founding director Nigel Goode explains: "The specification is much greater than standard business, with more control of the seat, more comfort, better control of your environment, and a large table that's very robust. It's not quite first class where you'd only expect four seats across. It's a halfway house."

“BUSINESS CLASS IS INFINITELY BETTER THAN THE FIRST CLASS OF 10-15 YEARS AGO”





AS WE MOVE FORWARD AIR TRAVEL WILL BE MORE ABOUT CUSTOMERS PAYING A PREMIUM FOR A COLLECTION OF EXPERIENCES



Richard Stevens, creative director of forpeople – the design firm called in to help British Airways with its new First experience, as well as working for luxury brands Alfred Dunhill and leather designer Bill Amberg – also believes such ‘hybrid’ classes between first and business will become more prevalent. But this will only reinforce the need to truly define first class above them all, as he suggests: “Business-class propositions have improved – on the ground and in the air – so it has become increasingly difficult to justify and differentiate first class. It has to come down to the quality of all aspects of the journey experience, not just on board. As we move forward air travel will be more about customers paying a premium for a collection of experiences they need and desire at any particular time rather than simply for class segregation.”

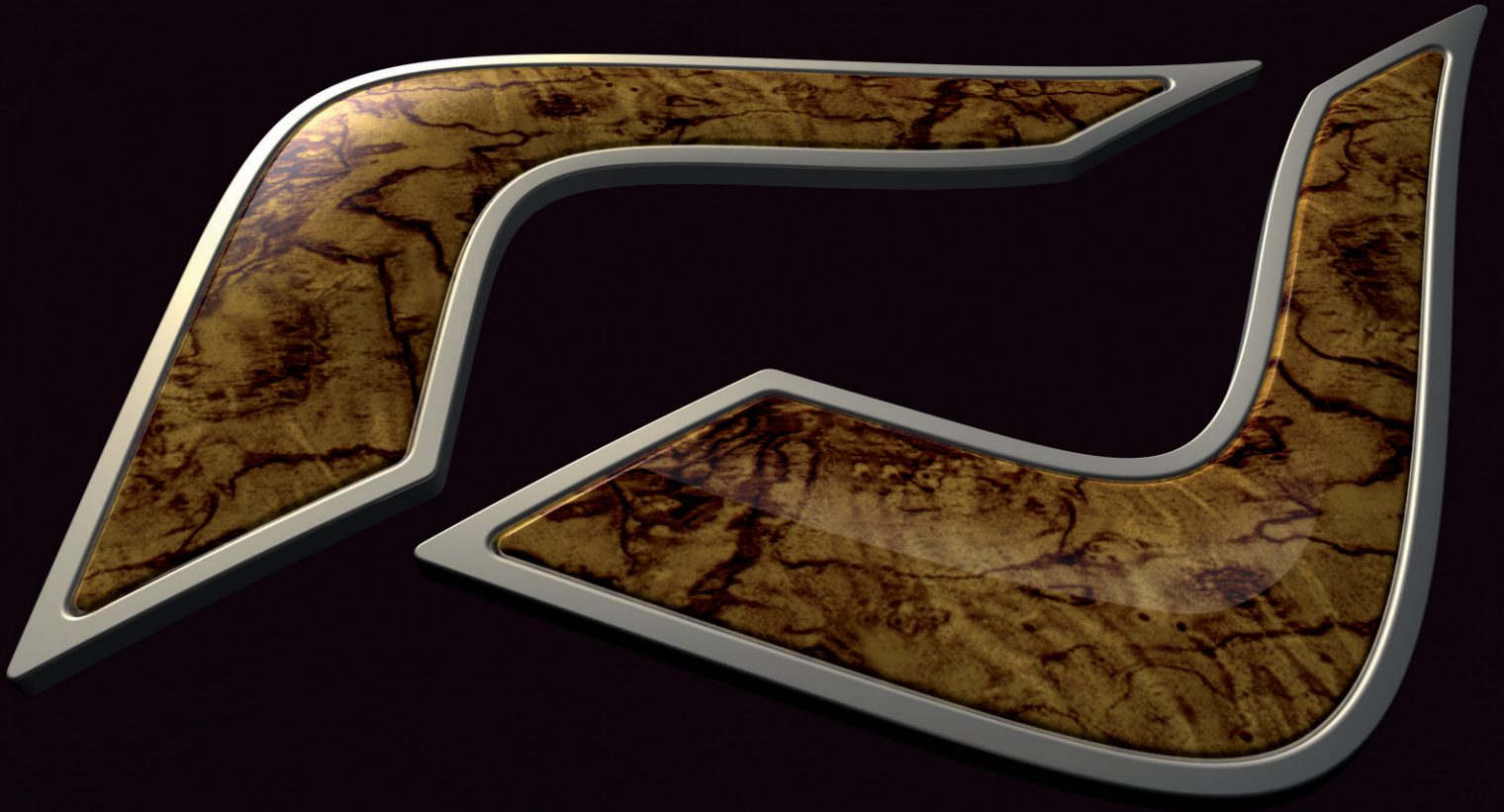
REDEFINING FIRST So how can carriers re-attract passengers to first class and what role can design play? Stevens makes an obvious but all too often overlooked point – understand your customer: “Customers in this sector are looking for so much more now from their journey experiences, more so than in any other cabin,

simply because of the frequency of their journeys. They are not interested in gimmicks but demand quality and consistency. First-class customers are used to the highest standards of product, service and quality in all aspects of their everyday lives. These are people of stature and influence who have high expectations, always.”

All fair enough comment but how to deliver this? Stevens continues: “Passion and rigour in every detail of the design process is key. First impressions of a radical new cabin environment are great but a lack of thought, attention to detail and substance quickly becomes apparent, more than ever in a first-class environment.”

One tangible example he cites concerns positive customer feedback to British Airways’ new seats and their configuration to allow flyers to relax and doze off more easily even with the seat upright. Stevens says this detail clinched the loyalty of one particular customer, as he recounts: “The customer mentioned that while this is not something that is immediately apparent (or easily marketable) it is the reason that he had previously chosen Club World over the competition because he felt reassured by the level British Airways will go in order to get things

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STYLE CAN ATTRACT PEOPLE
TO YOU BUT SUBSTANCE
IS WHAT MAKES THEM
STAY



right for their customers. Style can attract people to you but substance is what makes them stay.”

For Nigel Goode a first-class package is down to quality: “You don’t see many plastic or vacuum-formed panels in first,” he stresses. “With low production it’s hard to amortise the costs and you can end up with standard latches and switches but on the Swiss First cabin there is a lot of customisation. We spent a lot of time on special buttons, fit and finish, making sure the seat controller fits nicely in the hand and that the graphic user interface is easy to follow.”

FEEL THE DIFFERENCE First-class cabin design needs to go beyond how easy things are to use and create an appropriate ambience as well – although its definition may vary according to customer and region, as Goode continues: “Perhaps first class is also about being more understated although while for Swiss Air ‘less is more’, for some of the Middle Eastern carriers ‘more is still more’.”

Either way, as JamesList’s Perski posits, first-class cabins, especially those working long-haul routes, fundamentally need to “create a sense of calm”, he says. “You’re moving out of a relatively chaotic environment, even in the case of a first-class lounge, so there needs to be a sense of space as you know you’re going to be there for some time.”

In terms of inspiration Perski says upmarket hotels are already having an influence – given their often good use of calm-creating space while from a manufacturing perspective forpeople’s Stevens believes the aviation industry can learn design lessons from the car industry: “From a purely design perspective the value of the airline industry seeking inspiration from sectors like automotive is in my view, the only way forward. The typical argument from a cabin product supplier is always about economies of scale (particularly with the relatively low volumes of product in first class) but the key thing to take inspiration from is the simple processes that have been established to deliver consistent levels of quality. Particularly in trim and

brand alliances

Brand alliances – where more than one brand collaborates for hopefully collective gain – often sound like great ideas on paper. But the promising constituent parts rarely make for a truly satisfying whole: “An airline that tries to align itself with another brand may get a short term PR ‘win’, but I think it does dilute the brand,” says Priestmangoode’s Nigel Goode. “It’s a bit of a trend – the classic one is Philippe Starck. You’ve got to be careful.”

Richard Stevens at Forpeople is also cautious: “One of the most intriguing dilemmas facing airlines when designing new cabin product and service propositions is whether to endorse that programme by working with a named designer that offers the opportunity for greater exposure and recognition. That designer applying their own creative style and direction to the project runs the risk of the airline losing control of a holistic vision versus the use of design experts (internal or external) who understand the industry, how to push innovation and take a more responsible and holistic view.”

Even among the ‘believers’ – unsurprisingly including Marc Newson at Qantas – there are caveats: “I think they can be of huge value. I’ve used cutlery by Alessi and some furniture in lounges, but overall I think my involvement with Qantas might be more useful than sewing on labels to expensive designer Italian seats.” In summary – tread with caution regarding brand alliances.





BRANDS WILL NEED TO ENSURE THAT THE CUSTOMER EXPERIENCE IS PERSONAL, FAMILIAR, ANTICIPATORY AND ENGAGING



finish, which is often the most painful part of any airline project because suppliers simply don't understand the process. Their only solution is to throw money at the problem."

FUTURE FIRST In broader terms the attitude of the whole travel industry needs to change, as Martin Raymond of The Future Laboratory makes clear in its *Leisure and Hospitality Futures Report*. After all the dropped prices, reassessed service offerings, redundancies, debt restructure, brand merging and unprofitable routes have been pared back, "brands will need to ensure that the customer experience is personal, familiar, anticipatory and engaging," he says. "Success is not in the large gesture but in the intimate, the ordinary and the everyday, carrying out basic tasks with consistency and humanity – a notion that exists in short supply in an industry that should be driven by the desire to please and to surpass guests' – not GMs' – expectations."

On a more micro aviation level, while first-class airline passenger numbers have fallen and may not ever recover fully for years to come, if ever, almost all those interviewed believe such a cabin and level of service has a viable future. While JamesList's Perski believes short-haul flights are better served by private jets due to their convenience, he also believes there will always be a place for first-class sections on long-haul flights.

But how will those spaces and services differ in 10 years' time compared to those available today? Perski envisions more multifunctional spaces that will be able to cope with work and leisure interests better and cater for group travel more ably by being configurable in their engineering – i.e. seats will be able to be moved around to suit customer needs – and he also foresees changes to the colour, lighting and trim being easier to achieve.

Qantas's Newson hopes for more subtlety, modernity and quality while Priestmangoode's Nigel Goode predicts a more 'loungy' feel "rather than tiny pods where you are cocooned in your own little area" but is ultimately optimistic for the segment, as he concludes: "It's being clever with the space, you've still got to be economic in terms of the number of seats but it could be about making things a little less symmetrical, so it's not just rows and rows of the same product. I don't think for a minute that first class is dead, let's put it like that." ☒

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multiplechoice

Operating the world's longest sectors has inspired Air New Zealand to develop an innovative 777-300ER cabin that breaks new ground in accommodation, entertainment and service

BERNARD FITZSIMMONS, AIRCRAFT INTERIORS INTERNATIONAL



Genuine lie-flat space in economy class is a notable enough first, but the 777-300ERs that Boeing is due to start delivering to Air New Zealand next November will also feature a new concept in premium-economy seating and an even better iteration of one of the best business-class beds, plus service and IFE innovations to match.

The headline-grabbing Skycouch is a triple seat with a legrest-like extension that lifts up to form a flat platform on which couples or parents with a child can recline. Due to be installed at 33in pitch in the first 10 window rows of economy class, it offers a sprawlable 5ft 6in length and 6in of recline, but does not pretend to be a true bed. "That's why we call it a couch and not a bed," says ANZ group general manager international airline Ed Sims.

Seats on the new aircraft were due to go on sale at the end of April. Standard economy pricing was expected to remain more or less unchanged, but the Skycouch naturally attracts a premium. For three people, typically two adults and a child, the three seats will cost NZ\$200 (US\$140) on top of the standard triple price. A couple, on the other hand, would pay standard price for two single seats and get the third at half price.

Sims expects demand to be heavy. The new seats will be masked off for customers who want to fly as either a couple or a triple, and "all the forward signals are that we're not going to have any problems selling them as Skycouches."







01

01. Each 777-300ER will feature 50 premium-economy 'Spaceseats'
02. ANZ's Business Premier cabin features a new chalk and deep ink colour scheme

Historically, ANZ boasts typical load factors of around 80%. "This season, coming out of the global recession, that's been closer to 83%," he says. "We're pretty confident that we can move that further up with the advance sales of the Skycouch, so I don't anticipate them sitting empty."

In fact, he is more concerned about demand outstripping supply. There are provisions to add up to another 14 rows, "but I'd rather withhold judgment on that until we've seen how the service works in conjunction with the seat and we get a reasonable chance to assess the demand."

Along with 246 economy-class seats, 60 of which constitute the 20 Skycouches, ANZ's 777-300s will offer 50 premium-economy seats, 39% more than its 777-200s and

28% more than its 747-400s. And the seats themselves promise to set a whole new standard for their class.

SPACE IS THE PLACE The new Spaceseat originated in 2007 with early concept work carried out in conjunction with California-based design consultancy IDEO. After various stages of structural design with New Zealand-based seat manufacturers, ANZ worked with Contour to build it into a fully certified airline seat. "But it's entirely our own design," says Sims.

"The reality is that no airline has actually constructed a dedicated premium-economy seat until now," he elaborates. "The real dilemma for seat manufacturers was that they



updated classic

ANZ's new Business Premier cabin (pictured below) will feature an improved version of the Virgin Atlantic Upper Class Suite the airline originally licensed in 2004 for its 747s. "We had a full refurbishment programme for our jumbos in 2005, and we didn't have time to develop concepts ourselves," recalls Ed Sims, ANZ's group general manager. Having flown a lot of business-class products, he and CEO Rob Fyfe, "felt the Upper Class Suite at the time really stood out in terms of its comfort."

ANZ has tweaked the concept, adding an inch of extra foam to the mattress on the reverse of the seat and another inch to the underlay that cabin crew lay out on top of it. A redesigned footrest is more durable and will offer improved storage. The angle of the reading lights has been changed to stop them shining into other passengers' eyes. And the IFE monitor has grown 2in bigger. "But they're tweaks rather than reinventions," Sims says. "It's broadly a similar concept, it's at the same angle into the cabin and we still think it's a great seat – full credit to Virgin Atlantic – I've not flown on a more comfortable business-class bed."

02



IT'S BROADLY A SIMILAR CONCEPT, IT'S AT THE SAME ANGLE INTO THE CABIN AND WE STILL THINK IT'S A GREAT SEAT





03

03. Premium economy sees an innovative, angled 2-2-2 layout

04. Centre seats angle outwards from each other, providing ultimate privacy

never wanted to make a seat that was so good that most airlines interpreted it as a business-class seat and therefore saw it as dilutionary. Historically, they have been very reticent about getting involved in premium economy.”

The result, he says, is that “every airline flies either an economy seat with more seat pitch or an old-fashioned business-class seat and calls it premium economy.” ANZ’s approach was to make a seat that without offering the sleep quality of Business Premier was clearly more comfortable than a standard economy with slightly more legroom.

The end product is a seat in a fixed shell, installed at a slight angle, with recline created by a base that slides forward and angles up. None of these features are new in themselves, Sims accepts, “but the combination of all those features make the seat unique in every aspect.” The scalloping effect of the recess from the fixed-shell seat also creates additional legroom space in the recess forward of the customer: “When you use the recess for the leg stretch you’re talking about 46 to 48in of full stretch, which makes it considerably more generous than conventional premium-economy seats.”

The seats are installed in 2-2-2 configuration. The centre seats are angled away from each other for privacy, or can be



04

close advisor

Altitude Aerospace Interiors, the former design engineering division of Air New Zealand Engineering Services, provided engineering, certification and design advice for ANZ’s new 777-300ER interiors – dubbed the ‘Kupe programme’, after the country’s legendary Polynesian discoverer. “Altitude has already made a name for itself in the BBJ market,” says ANZ’s Ed Sims, “but it’s also designed the bars on V Australia’s 777-300s – increasingly its work is being seen on other commercial operations.” An Altitude team comprising a project manager, engineering lead, technical lead, design lead and at least four specialised team members worked on each of the three separate zone programmes.

combined so couples can snuggle up or dine at a common table, while window seats are angled to offer privacy for individual passengers.

For all his pride in the Spaceseat – “I genuinely believe there is no premium-economy seat that can come close to it” – Sims is no more keen than the seat manufacturers to dilute the appeal of ANZ’s Business Premier cabin. “On average we fly sectors that are 90 minutes longer than any other airline,” he says. “Because New Zealand is relatively isolated every journey is a long journey, so for us there is always going to be a significant premium for the ability to lie flat, get seven or eight hours’ genuine sleep and arrive at the destination ready to work or ready to go and enjoy a holiday.”

The seat itself was licensed from Virgin Atlantic: “It was a costly agreement,” he comments, “but it’s been worth it in terms of the yield on 24-hour journeys between the UK and New Zealand.”

PLACE YOUR ORDER Having moved to AVOD in 2005, Sims says, ANZ and Panasonic have developed further innovations on the vendor’s eX2 platform, including the ability to order food and beverage through the IFE. “It’s not new,” he accepts. “We’d looked at the Virgin America buy-on-

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05. The first 10 rows of economy seating on ANZ's new 777-300ERs will convert into Skycouches

board system and thought that had some good opportunities for us." Rather than buy on board, though, "ours is an order-on-board system and we're carrying it through all three cabins."

The intention, he says, is to give a lot more control to customers, who will no longer have to press a button, wait for a flight attendant to walk to their seat and wait again for delivery. "We actually cut the number of passes through the cabin in half by having an order registered in the galley that says 37K would like a diet coke and sandwich." It also spreads the workload for the cabin crew, rather than concentrating it in a conventional meal service, with the aim to avoid trapping passengers in their seats with trays or trolleys in the aisle.

The food service will be supported by new oven technology in the five galleys to cook food from scratch. "It means we will be able to offer previously unheard of meal options in flight," says Sims. "Real crispy bacon and eggs or a steak cooked any way you like it in Business Premier, a pizza or tapas to share with your companion in Premium Economy or even a classic Kiwi toasted sandwich."

In terms of content, he adds, "we're negotiating at the moment with YouTube to have more user-generated content. And we'll be trying to work with Panasonic to get a bit more interactivity so people can indicate to us what they like and what they don't like about that user-generated content. We're going to build flight planning facilities into the IFE so that people can actually map out their time when they're on

Key features

- The Skycouch is a specially designed row of three seats that converts into a flat surface ideal for couples to share
- Each Skycouch is 66in long and just under 33in wide
- ANZ's 777-300ERs will feature 20 Skycouches (the first 10 window rows) in total
- The flat surface is created by the raising of large legrest-style cushions and armrests that retract out of the way
- ANZ's 777-300ERs also feature a premium-economy cabin with 50 'Spaceseats' in an angled 2-2-2 configuration
- ANZ's 777-300ERs feature 39% more premium-economy seats than its 777-200 aircraft and 28% more than its 747s
- Each Spaceseat features a fixed hardback shell for privacy
- Angling the Spaceseats provides 'inner' and 'outer space' options offering either privacy or shared space for couples
- Couples have the option to share a dining table

board with us for 10 hours plus." The plan is to upload selected YouTube content to an onboard cache before every flight. There will also be updated news and weather, including a local New Zealand news feed arranged by ANZ's content provider, London-based Inflight Productions.

The YouTube move is a reflection of ever shortening innovation cycles, says Sims: "With the growth of social network sites and the migration from the lean-back view of



07



06

06-07. The secret warehouse used to hatch ANZ's new interiors



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conventional broadcast TV towards the lean-to use of the PC, we've got to be able to reflect that in the way that we provide not only the in-flight entertainment but also the seating arrangements on board. The lifecycle of so many products that felt incredibly innovative just five years ago has shortened dramatically."

PROFIT PROPHECY Sims says he is looking forward to exploiting the intellectual property generated by the project. The Skycouch and Spaceseat have been licensed to manufacturers Recaro and Contour, respectively, and Sims is keen to recoup both the development expenditure and some of the seat licence fee paid to Virgin Atlantic: "In the early stages of the development, we had the intellectual property of the two new seats [early designs that ANZ later rejected], the development of the IFE and the service flow valued at around NZ\$350 million (US\$247 million). We know other airlines are interested from the phone calls we've received already."

top secret

The six-strong team behind the 777-300ER cabin had previously worked on the refurbishment of ANZ's 747-400s and the introduction of its 777-200s at the end of 2005. With representatives of external suppliers, design consultants such as IDEO and cabin crew coming to test the service flows, the project has involved anything up to 60 people at a time, all working in secret in a central Auckland warehouse.

Keeping the activity covert for three years in a relatively small city was "a minor miracle in itself", says Ed Sims, ANZ's group general manager. Staff removed their ID cards before approaching the unmarked building. No one was allowed inside without signing a rigorous non-disclosure agreement. And the secrecy extended to active disinformation when filming of publicity material before the unveiling sparked rumours among the local media community: "We were aware that a lot of them were on Twitter thinking it was to do with the Yogi Bear movie [then being filmed in New Zealand], so I got our project team to make sure they were carrying costumes when they went in," says Sims. "I thought the idea that this was a clandestine film location would guarantee that no one would think there was actually an aircraft fuselage in there."

Virgin Atlantic is one airline interested in the Spaceseat, but airlines seen as competitors will not be considered: "There are a number of airlines with whom we won't even start that conversation," says Sims. "They may be interested but we wouldn't be interested in selling it to them, that's written into the contract with manufacturers right from the outset."

MIDDLE MARKET Boeing, meanwhile, is interested in offering the Spaceseat as a business-class option on the 737. "They obviously recognised that for an airline flying the sector length that we do it's a suitable premium economy. But for airlines who fly more medium-haul, six to eight hours, their belief is that is quite possibly the next generation narrow-body business class. Provided it doesn't infringe on our differentiation, everything can be commercially negotiated."

In the meantime, Sims can look forward to seeing his work fly for the first time next November, followed by an inaugural revenue flight scheduled to depart Auckland for Los Angeles on 12 December. "I can't wait," he says. "Now it's out in the open, if anything we're even more impatient to actually see it on the aircraft. It was a big call, but it feels like it's paying off now." ✉

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safetyzone

For passengers, aircraft seats are just a more or less comfortable place to spend the journey – but in regulatory terms, the main consideration is the protection they provide in the event of a crash

BERNARD FITZSIMONS, AIRCRAFT INTERIORS INTERNATIONAL

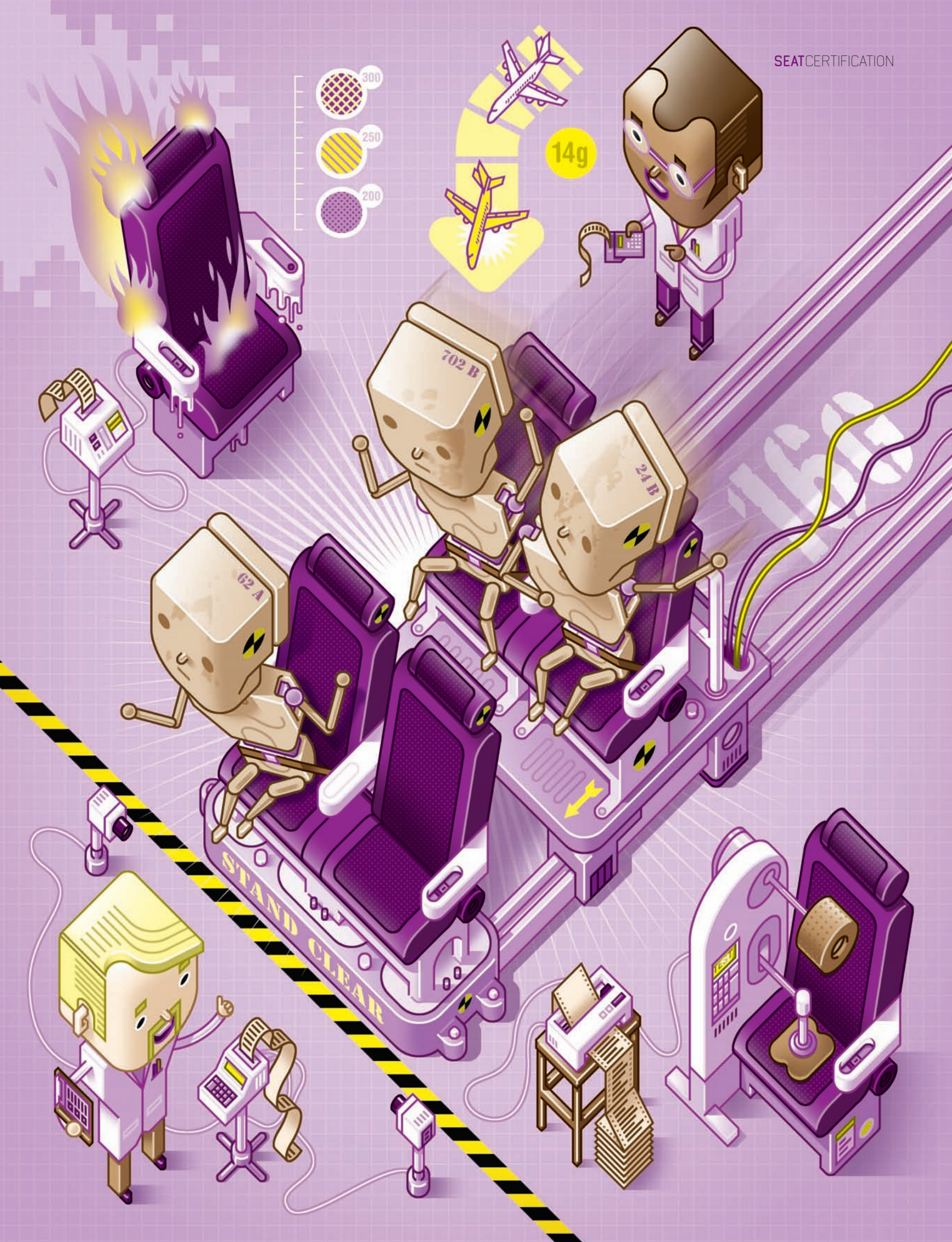


A manufacturer is found to have supplied aircraft seat coverings that have not been tested for flammability. The ensuing investigation reveals unapproved alterations to designs, unchecked corrections of suppliers' inspection records, sampling rather than 100% inspections of parts, and the substitution of internal test results for data recorded during unsuccessful official tests – does it matter?

The occupants of the Airbus A340-300 that was still doing nearly 100mph when it reached the end of Runway 24L after landing at Toronto Pearson in August 2005 might well think so. The aircraft was already catching fire by the time a ravine brought it to a halt, 300m beyond the runway, but all 297 passengers and 12 crew survived, though the captain, a crew member and 10 passengers were seriously injured during either the crash or the subsequent emergency evacuation.

During the 15-20 seconds that elapsed between the aircraft leaving the runway and coming to a stop, the Transportation Safety Board of Canada (TSB) found, it bounced violently and repeatedly, with at least three distinct impacts: "On each impact, cabin occupants were propelled upwards from their seats, their arms and legs flailing."

Luckily for them, the seats had been certified to European joint airworthiness requirement JAR 25.562. Like the equivalent Canadian and US federal aviation regulations governing emergency landing dynamic conditions, CAR 525.562 and FAR 25.562, the European requirement stipulates that seats should demonstrate their ability to withstand a forward load of 16g and a downward load of 14g. Unlike their transatlantic counterparts, however, the European standard does not apply to crew






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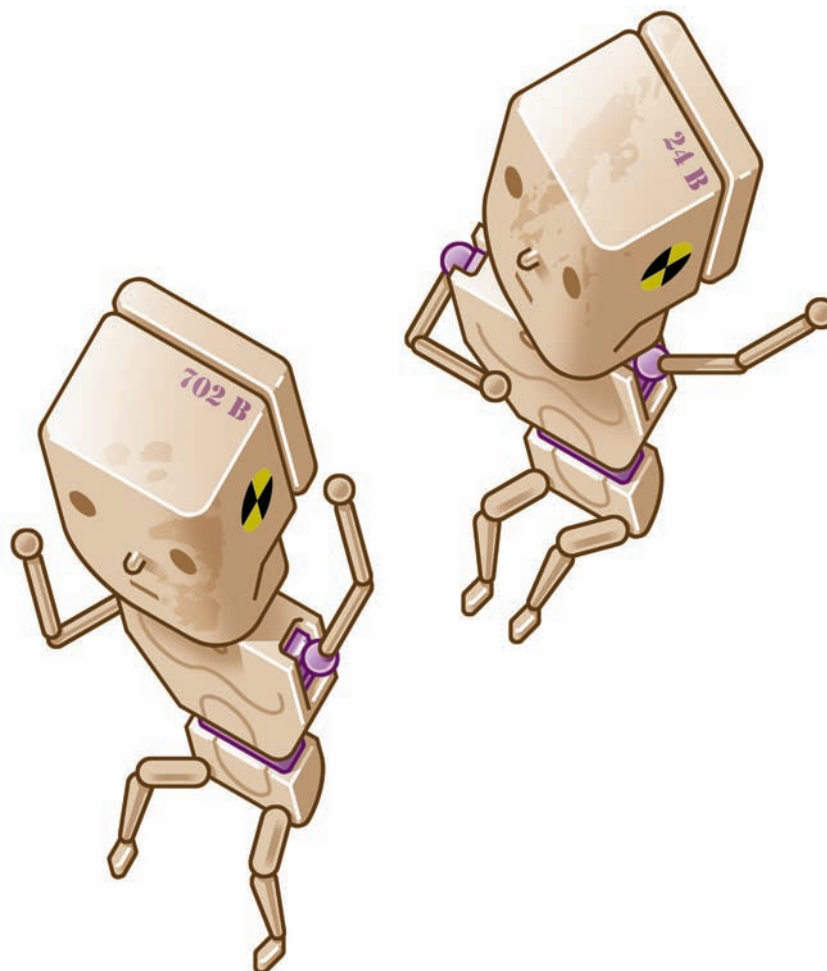
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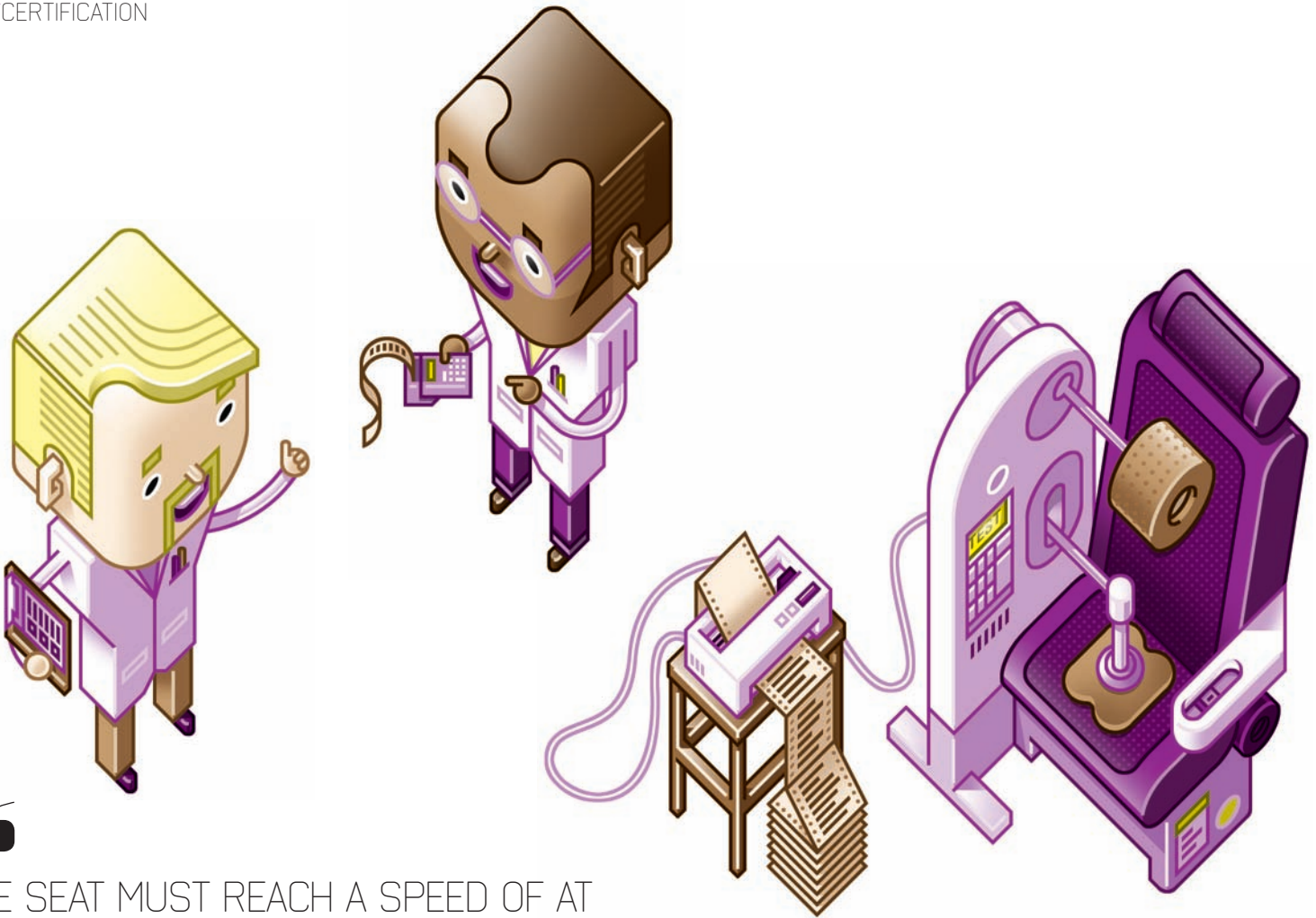
seats, which must be certified to withstand a force of 9g. In the Toronto crash the passenger seats stayed put and even those seriously injured during the impacts could still walk. The captain's seat, on the other hand, had been certified to JAR 25.561, which does not require the 16g capability – it became detached. The investigation could not determine the maximum g forces attained in the accident, nor whether the failure of the captain's seat alleviated the impact loading on his body or added to his injuries. But to fulfil its role of protecting the occupant, the seat should remain fixed to the aircraft floor.

STRUCTURAL SPECS As Transport Canada points out, for an accident to be survivable the fuselage structure must remain substantially intact and provide a liveable volume for the occupants throughout the impact sequence. Cabin furnishings must not break loose, and each occupant must be safely restrained until the aircraft comes to a complete stop.

To achieve that end, the seat and occupant restraint system must be designed to provide the same level of impact injury protection as the aircraft structure. So the seat must not break loose from the floor, the occupant's head must not suffer serious injury when striking adjacent furnishings, and the seat must minimise the likelihood of spinal injury under high-descent crash loads.

The minimum performance standards (MPS) for aircraft seats are prescribed in the FAA's Technical Standard Order TSO-C127a and the European equivalent, ETSO-C127A. MPS, qualification and document requirements for transport aircraft seats are detailed in Society of Automotive Engineers (SAE) aerospace standard AS 8049A, while dynamic testing requirements are described in FAA advisory circular AC 23.562-1B, Dynamic Evaluation of Seat Restraint Systems and Occupant Protection on Transport Airplanes. Compliance with the AC is not necessary for TSO-C127A authorisation, but is required for installation approval of seats occupied by passengers or crew during take-off and landing. The application of the various requirements can vary according to the date of the aircraft type's original certificate of airworthiness and the date of seat manufacture.

TESTING FOR DUMMIES FAR 25.562 requires testing with a 170 lb anthropomorphic dummy sitting in the upright position while the seat is subject to downward deceleration of at least 14g and forward deceleration of at least 16g. The downward test is carried out with the aircraft longitudinal axis canted downward at 30°. The test dummy must be instrumented to collect lumbar loads, and the maximum load on the spine must not exceed 1,500 lb. For the forward test, the longitudinal axis is horizontal but



THE SEAT MUST REACH A SPEED OF AT LEAST 35FT PER SECOND AND STOP IN NO MORE THAN EIGHT MILLISECONDS



yawed 10° right or left, whichever would make an upper torso restraint system more likely to move off the occupant's shoulder. Floor rails or fittings used for the forward test must be at least 10° out of parallel vertically with the adjacent set of rails or fittings and one must be rolled 10°. The FAR requires that occupants must be protected from serious head injury. Where head contact with seats or other structure can occur, an equation is used to derive the number of head injury criterion (HIC) units from the curve of total acceleration against time – the result must not exceed 1,000 units. Legs, too, must be protected against injury. Where leg injuries may result from contact with seats or other structure, the protection must prevent axially compressive loads exceeding 2,250 lb in each femur. The seats must also remain attached at all points of attachment, even if the structure has yielded, and they must not yield to the extent that they would impede rapid evacuation of the aircraft occupants.

SLED TESTS AC 23.562-1B's 98 pages detail the testing required to demonstrate compliance with the FAR. As well as the 14g downward and 16g forward tests carried out with single rows, seats installed in repetitive rows must be

tested in tandem pairs or rows with anthropometric test devices, (ATDs, otherwise known as dummies), in the rear seat or row positioned so the head will strike the seat ahead on the most critical surface within the 10° yaw envelope. During the drop test, the seat must reach a speed of at least 35ft per second and stop in no more than eight hundredths of a second. In the forward test, the minimum speed is 44ft per second and the maximum stopping time is nine hundredths. The shape of the pulse representing deceleration against time is also specified.

To ensure the seat protects the widest range of occupants, the dummies used must represent the 50th percentile male. Optimising seats for the heaviest or lightest occupants would result in stiffness characteristics incompatible with the occupant at the other extreme – the seat would be too stiff to absorb energy for lighter passengers or too flexible to protect heavier ones. Because there are typically variations in the design and installation of a single seat model, the AC requires additional tests if the variations cannot be addressed by analysis. It also defines the concept of a family of seats that use similar legs, beams and spreaders in the primary load path. Changes to a certified seat may also require retesting. New material used in a seat leg, for example, may require a



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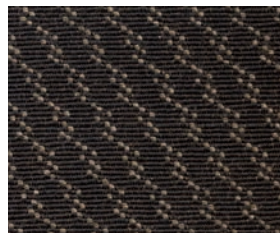
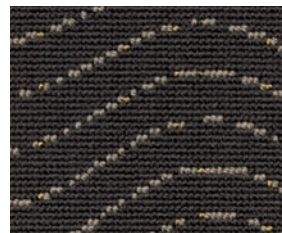


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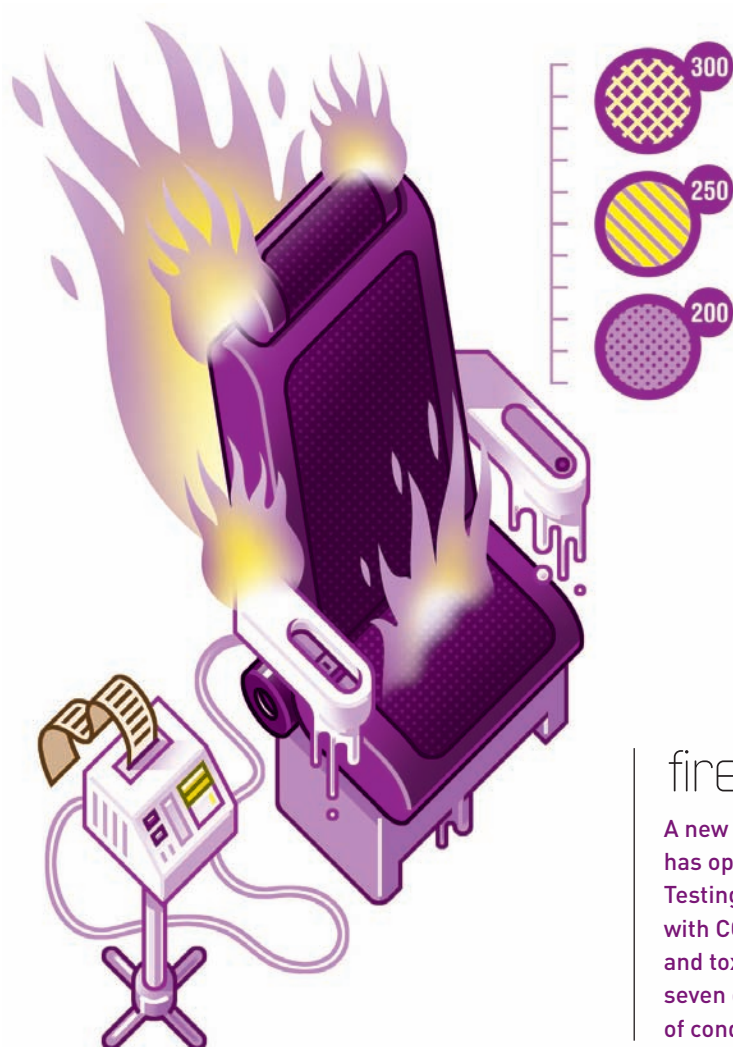
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fire starter

A new burn test facility, specifically for the aircraft cabin interiors industry, has opened in the UK. Initially offering vertical burn testing, Chiltern Burn Testing Services (CBTS) will also offer kerosene burn testing in accordance with CCS25.853 App F part II. It also hopes to offer ABD0031 smoke emission and toxicity testing in the near future. CBTS says its test facility will be open seven days a week, and that turnaround will not exceed 48 hours, inclusive of conditioning. The facility is located in Chesham, Buckinghamshire.

new 16g forward structural test, but would not need additional HIC or lumbar tests.

Front row seats, whose occupants' heads might contact bulkheads or monuments in front of them, are covered by the FAA policy statement ANM-115-05-14. Dynamic testing must show that the resulting HIC does not exceed 1,000 units or that the seat is installed so that there would be no contact by the ATD head. The tests must be carried out with the reference point of economy-class seats installed 42in from the potential contact point; for first- or business-class seats, the seatback distance must be 45in or more.

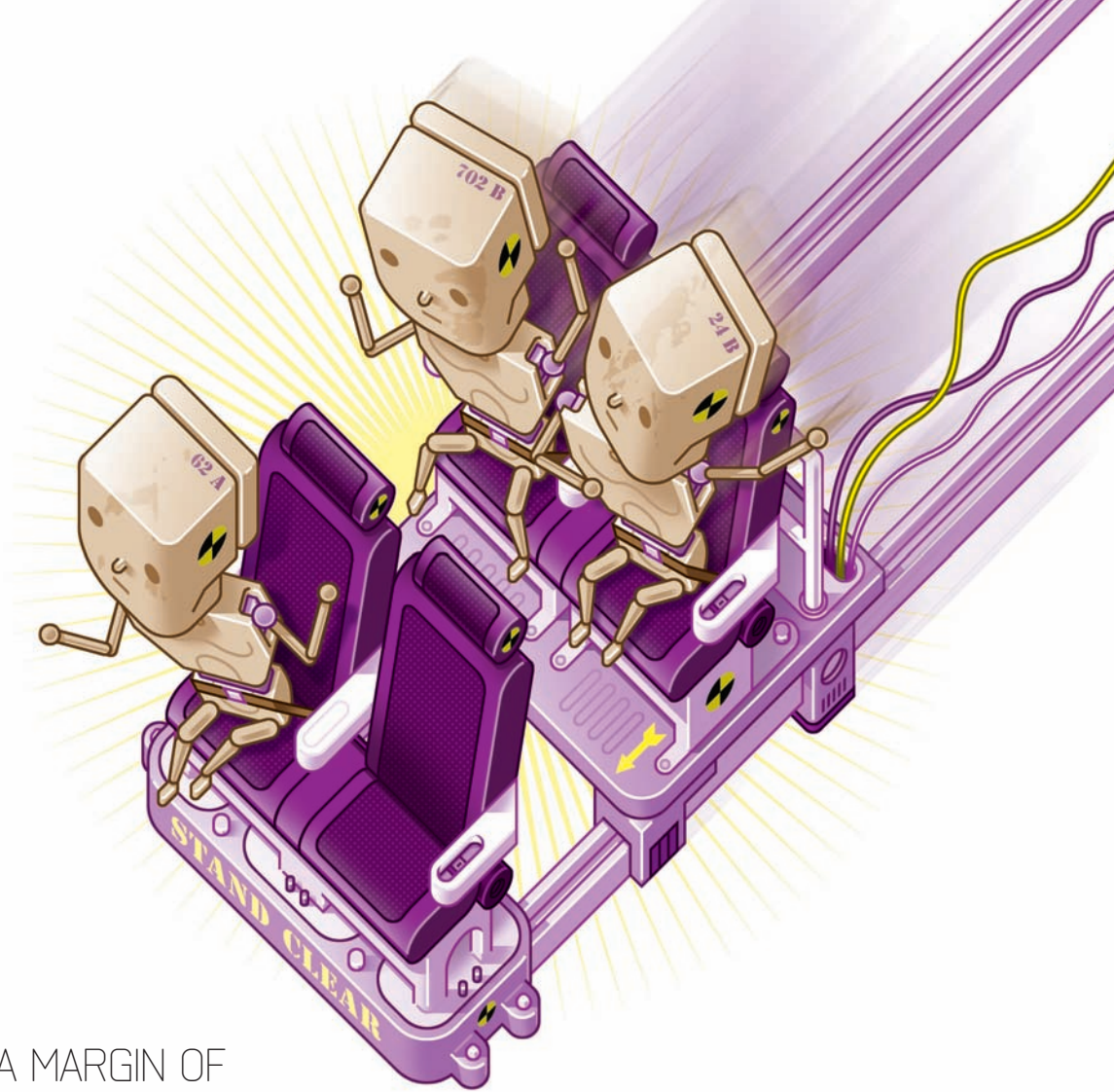
Seat cushions contribute to lumbar protection, and to avoid the need for fresh dynamic testing if replacement cushions use a new design or material, the FAA developed seat cushion component tests to measure the reactive load while a cushion is compressed and decompressed.

FIGHTING FIRE Having survived a crash, passengers need to be able to get out of the aircraft. That means they must not be incapacitated by smoke or heat from fires, so seats and other interior parts have to demonstrate acceptable performance in the event of a fire. Tests for flammability are specified in Appendix F to FAR Certification Standard CS 25.853, which

lists minimum ignition times plus maximum extinguishing time and burn length for samples of material exposed to the flame from a bunsen burner. Seat cushions are tested using an oil burner with a flame temperature of approximately 982°C.

There are also additional requirements imposed by the manufacturers themselves, such as the smoke and toxicity tests listed in Airbus Directive ABD 0031 and Boeing Specification Support BSS 7328 and 7329. And in some cases, such as the amount of heat released when a material is burnt, the airframers may apply more stringent standards than those listed by the regulatory agencies.

New upholstery fabrics with the same material composition, weave style and weight of an approved fabric can be certified using a simple Bunsen burner test as long as the results are at least as good as those for the original material. The FAA's AC 25.853-1 stipulates that material blends can be considered similar as long as there is no more than a 6% variation in the constituent material fractions. But the severe shrinking and unpredictable distortion experienced by leather dress cover materials precludes the use of similarity testing. In fact, variations resulting from the tanning and dyeing processes mean that a new seat test is required for a different colour of leather, even if it is of the same grade.



DESIGNERS TEND TO ADD A MARGIN OF STRENGTH TO MAKE SURE THEY PASS THE DYNAMIC TESTS



DIGITAL DRIVE Regulatory requirements cannot be statements of the ideal – they must be capable of being complied with, so they must be based on the existing state-of-the-art. That implies that the next seat to be tested will be similar to the last, and difficulties can arise when designers turn to unconventional materials or configurations.

The crash test requirement for distortion to the seat structure ahead of the impact, for example, makes it harder to demonstrate compliance using carbon fibre components: essentially, metal can be bent, but carbon fibre tends to break. And whether the material is old or new, the testing itself is difficult and expensive. That means designers tend to add a margin of strength to make sure they pass the dynamic tests, which in turn tends to increase weight. Those are just some of the reasons why the industry is working towards compliance demonstration using digital rather than physical models. The methodology for ‘dynamic seat certification by analysis’, as the FAA terms the procedure, was published back in 2003 as AC 20-146, and simulation is already used as a supplement to physical testing. The ultimate aim is to develop models and tools that will enable manufacturers to show compliance with structural and HIC requirements by simulation alone. That

means demonstrating that the values derived from simulations are consistently close to those recorded in physical tests.

DOES IT MATTER? The manufacturer with the regulatory compliance problem seems to have had difficulty reconciling the commercial pressure to deliver seats with the admittedly complex procedures for demonstrating that they met the required standards. The documentation covering seat testing and certification is certainly both voluminous and minutely detailed.

On the other hand, the stated aim of the 23.562 certification standard is to “evaluate aircraft seats, restraints, and related interior systems in order to demonstrate their structural strength and their ability to protect an occupant from serious injuries in a survivable crash”. Structural and crashworthiness requirements are framed to achieve these objectives in what the regulations describe as “a minor crash landing”. The fatality-free outcome of the Toronto crash suggests they are not completely wide of the mark. ☒

CONTACT

FAA, Web: www.faa.gov/about/initiatives/cabin_safety/regs

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selectfew

Airbus has just published its catalogue of approved cabin equipment for the A350 – so who's in and who's out, and what are the options available?

BRENDAN GALLAGHER, AIRCRAFT INTERIORS INTERNATIONAL





01

01. Rendering showing 2-4-2 premium-economy cabin
02. A 3-3-3 standard economy cabin would feature 18in-wide seats



In the days when air transport was all about getting the customer from A to B, the cabin was something of an afterthought. Plenty of time to work out the details once the aircraft has been developed, the reasoning went. But in today's ultra-competitive world the passenger experience is paramount, and now the manufacturers devote almost as much time to seats, lighting and entertainment as they do to airframe fundamentals like aerofoils and engines.

The change of philosophy will be plain for all to see just over 18 months from now, when the second prototype of Airbus's new A350 medium-sized long-hauler takes to the air for the first time. It will be fitted with a fully representative cabin to help the engineers get a clear picture of how the interior behaves in relation to the aircraft's largely carbon fibre fuselage. The behaviour of a composite fuselage will be different from that of a conventional metal structure, and Airbus wants to understand how that might affect things like cabin noise levels.

This is typical of the emphasis that Airbus has placed on the cabin ever since the overall design of the new aircraft finally stabilised in 2006. Conceived primarily as a competitor to Boeing's 787, the A350 aims to exceed Seattle's new twinjet in terms of key cabin characteristics.

Key suppliers

- Seats: Recaro, Weber (Zodiac Aerospace), B/E Aerospace, EADS Sogerma
- IFEC: Panasonic, Thales
- Cabin lining and lighting: Diehl Aircraft
- Galleys: B/E Aerospace
- Galley inserts (GAINs): B/E Aerospace, Ipeco, Monogram (Zodiac Aerospace)
- Lavatories: C&D (Zodiac Aerospace)
- Water and waste: AOA
- Crew rests: Diehl Aircraft
- Cabin attendant seats: Goodrich



02



AIRBUS ASSERTS THAT IN A TYPICAL 2-4-2 PREMIUM-ECONOMY LAYOUT THE SEATS CAN BE UP TO 19.5IN WIDE



Airbus asserts that in a typical 2-4-2 premium-economy layout the seats can be up to 19.5in wide, half an inch roomier than in the same configuration on the 787. The company claims a similar advantage for the 18in-wide seats of a standard 3-3-3 layout. Boeing's marketing for the 787 stresses the work it put into proving the passenger comfort advantages of a 6,000ft cabin altitude. The A350 will match that, throwing in for good measure an air management system that adapts cabin airflow to passenger load to provide draught-free circulation and improved humidity levels.

TIGHT GRIP As well as trying to outdo the 787, Airbus has also shown itself ready to learn from the Boeing programme. Determined to avoid a repeat of the customisation headaches that added to the early A380 delays, the European airframer has taken tighter control of the cabin supply equipment supply chain, as Boeing did in the early days of the 787.

The A380 production planners were frustrated by problems with the integration of IFE systems into seats, the two having been procured separately by the customers as buyer-furnished equipment (BFE). So the IFE hardware and seats for the A350 cabin will be supplied under a new model, with a limited number of vendors selected as Airbus Contracted

Suppliers (ACS). To win ACS status, the companies have contracted to meet Airbus's technical and performance specifications. For its part, the airframer is validating their products and has taken on responsibility for ensuring that the equipment reaches the production line on time.

The airlines that have selected the A350 – United's recent firming up of a 25-aircraft deal brings the customer total to 33, and the order book to 530 – will deal directly with the ACS to negotiate prices. Most of these companies were selected early in the aircraft's development so that they could take part in the joint definition phase. The manufacturer expects the resulting benefits to include significantly reduced lead times – the target is eight months, 30% better than on the A330 and A340 – as well as better systems integration and high reliability from entry into service.

Everything else for the cabin – lavatories, galleys, lighting, window shades – is available on a seller-furnished equipment (SFE) basis from a range of options laid out in the latest A350 XWB catalogue. Premium seating is procurable 'off-catalogue' as buyer-furnished equipment (BFE) from approved ACS suppliers – B/E Aerospace, Weber, Recaro and EADS Sogerma – though Airbus cautions that this could involve lead times of up to 30 months for development and qualification.

Airbus says it has answered airline demands for price competition and freedom to differentiate their cabins by ensuring multiple sources of SFE supply – the galley inserts, for example, will be available from B/E Aerospace, Monogram and Ipeco – and by specifying modular designs that can be combined in a wide variety of ways.

WHO'S IN? Several other key vendors – both ACS and SFE – have been known for some time: Recaro of Germany will offer economy-class seating, and IFE market leaders Panasonic and Thales are developing versions of their respective eX2 and TopSeries systems. Each will also offer connectivity – Panasonic via its own Ku-band satellite Global Communications Suite; Thales through the hardware of Airbus-owned L-band satellite service provider OnAir. Diehl of Germany will supply lighting, B/E Aerospace leads on galleys, and the lavatories will come from C&D Zodiac.

Recaro's new CL3620 seat is designed to draw the sting of long-haul flights in economy. Derived from the established CL3610, it weighs less and offers what the company describes as exceptional legroom. Like its predecessor, it is based on a single-beam structure designed to replace the two support beams of conventional designs and so provide extra space for the passenger. Other innovations include flexible material in the headrest, a footnet and an ultra-thin backrest.

B/E Aerospace and Weber (part of the Zodiac group) are the latest economy seating suppliers to make it into the catalogue. B/E will offer its newest coach seating platform, Pinnacle, designed to reduce cost of ownership, simplify maintenance and increase overall passenger living space. "The cost of ownership savings are a direct result of a 15% weight saving over the lightest seat on the market today, achieved through an increased use of composites, an integrated lightweight comfort suspension system and a new design methodology that reduces parts by more than 25%," says Dede Smith, director of marketing.

Weber is yet to confirm exactly what seat model will be available, but its Model 5750 is likely to feature – already in service on the A380, it combines a lightweight single beam structure with a patented energy absorption system.

While there's no doubt about who Airbus wants to supply IFE hardware for the A350, it remains to be seen what exactly

will be on offer for installation on early A350s. The programme schedule – first flight in 2012 and entry into service in mid-2013 – means that the versions of Panasonic's eX2 and Thales' TopSeries developed for the new aircraft are unlikely to differ fundamentally from today's products. Large-scale wireless streaming of content can be ruled out, for example. But the manufacturer is trying to stay abreast of the rapid evolution in passenger expectations, as well as looking for opportunities to save weight and cost.

Semi-embedded IFE, offering improved failure tolerance and rapid exploitation of consumer electronics trends, is one of the technologies that Airbus has under scrutiny. It is just completing an evaluation of the wIFE system from British supplier Bluebox Avionics in the A380 Cabin Integration Test Rig in Hamburg. After proving the system's basic functionality, the test programme focused on its ability to deliver new content loads wirelessly to the autonomous in-seat passenger units.

THREE MARKET Ultimately the A350 IFEC offer will reflect Airbus's segmentation of the market into three categories, dubbed Primary, Efficient and Comfort. Bob Lange, head of aircraft interiors marketing, explains: "Even a Primary system will offer AVOD and connectivity. And Primary and Efficient-class systems will include options to bring them up

Key features

- A350 XWB features a 220in-wide cross-section – 5in wider than direct competitor
- 6-8 independently controllable temperature zones
- Increased relative humidity levels
- Maximum cabin altitude of 6,000ft
- Full LED cabin illumination

03. Business-class cabin rendering

03



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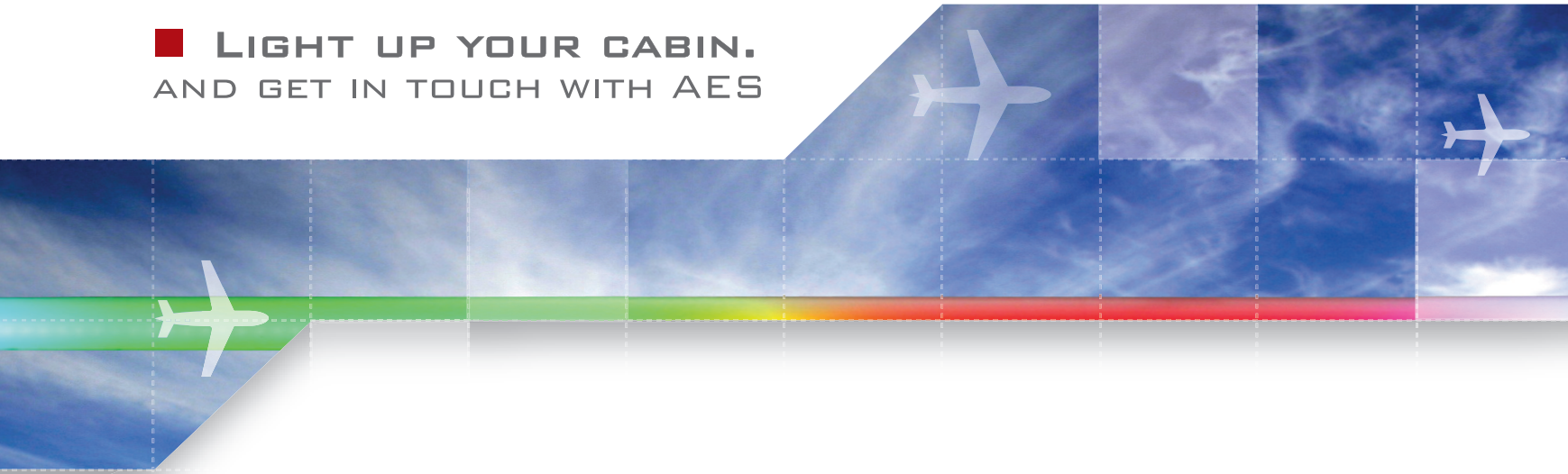
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- for Airbus A400M aircraft: Support of electrical integration in the final assembly line
- for design documents, e.g. harness routeing with electric harness installation tool (EHI) by CATIA V5 for galleys, bars, stowages, crew rest compartments etc.
- for equipment, e.g. control panels and boxes, household appliances (COTS), ground test bench units for LD-MCR, monitors and test units for fire extinguisher etc.
- qualification support
- preparation of documentation and drawings

HARDWARE PRODUCTS ...

- power supply systems and
- lighting systems
- LED lights and light controls

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04

to the level of the category above, giving the airlines flexibility to tailor their IFE by service class if they want to.”

The latest development on the A350 connectivity front was the announcement earlier this year that Panasonic would include its Global Communications Suite (GCS) as part of its overall capability on the aircraft. Integrating eX2 with a megabit-rated Ku-band satellite air-to-ground link, GCS comprises three services – onboard mobile phone, broadband internet via the in-seat screen and passenger devices, and live television.

Branded eXPhone, the phone service will be offered in collaboration with AeroMobile, the Telenor-owned provider currently best known for its Inmarsat L-band satellite-supported service for Emirates. The eXConnect broadband service, due to be launched soon by Lufthansa, is based on satellite capacity leased from several Ku-band operators and will provide internet and corporate VPN access. The Panasonic Airborne Television Network (PATN) will stream live news and sport content over the satellite link. GCS equipment will be installed on the second A350 prototype, MSN002.

The move finally laid to rest speculation that Airbus was blocking AeroMobile’s access to its aircraft in order to favour OnAir, which it jointly owns with SITA. However, it does leave open the possibility that some A350 operators might decide to mix-and-match their connectivity, opting for eXConnect and PATN but preferring an OnAir mobile phone solution.

OnAir itself is already cleared for the A350, having demonstrated the compatibility of its onboard hardware – leaky-line cabin antenna, picocell and Thales TopFlight Inmarsat satcoms terminal – with Airbus’s ALNA V2 communications backbone. The airframer says that this is a prerequisite for anyone seeking to offer connectivity on its long-haul types, so it’s a hoop that Panasonic is preparing to jump through, not only on the A350 but also on the rest of the Airbus range.

mix and match

Although C&D Zodiac is the sole supplier of lavatories for the A350, Airbus says customers will still have plenty of opportunity for differentiation – a modular design approach teams a range of pre-developed furniture options with a near limitless combination of trim and finish options. For example, there are three countertop, four mirror and two cabinet modules to choose from, and airlines can also customise colour and material selections for walls, countertops and flooring. The same approach sees a wide range of galley models with “hundreds of distinct galley configurations”.

LIGHT TOUCH Nuremberg-based Diehl Aerospace was named 18 months ago as supplier of the complete A350 cabin lighting package, including the emergency provision. The company’s success reflects years of preparatory work in cooperation with airlines and aircraft manufacturers. Activities included measurements of passenger response to lighting scenarios in the cabin mock-up Flight Test Facility at the Fraunhofer Aviation research centre in southern Germany.

Diehl’s full-LED mood lighting for the A350 features new accent lights and strip lights with segments that can be individually controlled to yield harmonious colour transitions and flowing effects designed to reinforce the airlines’ branding. They also lend themselves to the development of even more authentic day/night simulations and the fine tuning of illumination appropriate to work, sleep, dining and relaxation.

The A350 system builds on Diehl’s work for the A380 and provides a full-LED lighting solution offering both white and coloured lighting. The company says it is superior to earlier installations on long-range aircraft because its Modular Enhanced Low Dimming (MELODY) technology allows for a

04. Rendering showing standard 3-3-3 economy cabin



05



THE LIGHTS CAN BE DIMMED TO 0.1% OF THE MAXIMUM AND THEN VERY GRADUALLY RAISED AGAIN TO SIMULATE DAWN



05. A350 windows will be wider than those on the 787, but not as tall

wider variety of scenarios than ever before – the lights can be dimmed to 0.1% of the maximum and then very gradually raised again to simulate dawn.

WINDOW OF OPPORTUNITY All has still to be revealed about Airbus's decisions on window shades and who will supply them. The A350's windows will be wider but shorter than those of the 787. Following extensive simulations, the manufacturer concluded that wider windows yielded a more satisfactory effect for passengers over a broad range of seat pitches, while the reduced height allows the airlines a choice between mechanical shades and electrochromic self-darkening windows. Potential suppliers include Aerospace Technologies Group, offering electrically operated pleated-fabric shades, and electrochromic specialist PPG Industries of Seattle.

Emirates and one other carrier have ordered ATG shades for premium cabins in their A380s. ATG says that they consume less power and produce the total blackout that continues to evade electrochromic solutions. Each window unit comprises a pair of shades – one translucent, one opaque – plus two Swiss-made precision 28V DC electric motors and a Kevlar toothed drive-belt. Lowering the translucent blind produces a gentle natural light while the opaque shade produces a blackout as complete as that specified for conventional manual shades.

The traveller can control the shade with an up/down switch on the window bezel and also with the in-seat passenger control unit (PCU), and flight attendants can operate all the shades in the cabin from a central point.

PPG Industries already supplies its electrochromic solution as an option on the 787. The system gives the passenger a five-position switch with which to vary the amount of light passing through the glass between clear and 99.9% opaque. The flight attendants can also control the shades from a central station.

ALPHABET SOUP Compared with complex and sometimes problematic systems like IFE, the humble galley can look like a straightforward piece of work. In fact the food storage and preparation arrangements for the A350 provoked more analysis and consultation than most other aspects of the cabin.

Hoping to promote increased efficiency at food service time, Airbus originally proposed a D-shaped layout for the rear galley. Following consultation with the airline customers – some wanted a more traditional layout, others pushed for refinements to the D-shape – the manufacturer went back to the drawing board to answer concerns about workspace, turnaround times and serviceability. The result, described as “more of a V-shape,” has now been agreed with the airlines.

B/E Aerospace is the single source for galley equipment, offering a basic structure with a standard interface with the aircraft. At the same time it will provide a wide selection of modular inserts to allow the airlines to customise the unit to meet their specific requirements.

With three years to go to A350 entry into service, Airbus seems to be on the right side of the drag curve when it comes to the aircraft's interior. A robust list of suppliers is about to come into full focus, and every effort has been made to head off knotty problems with IFE/seat integration. It would be surprising if final assembly and flight test didn't throw up an issue or two, but there's a good chance they won't be in the cabin. ☒

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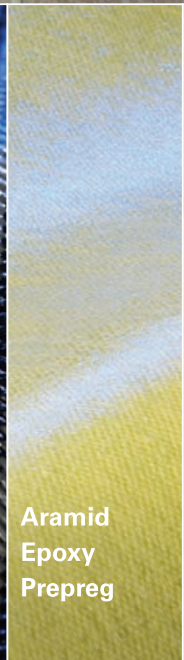
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A new wave of IFE entrants are taking a fresh look at how entertainment is delivered on board by shifting storage and processing power from the head-end to the seat

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Not so long ago, tracking IFE technology was a little like watching paint dry. Steady, evolutionary change was the name of the game. The hard discs got bigger, the networks faster, but the core concept stayed the same – content stored on head-end servers and dished out on demand over copper cables to dumb screens in the seat. Then came the first genuinely disruptive development for years – the birth of handheld IFE. Attracted by the apparently low cost of entry, would-be suppliers flocked to market. Five years later, many have fallen by the wayside. But the survivors are not only sticking to their handheld guns, but are also looking to use the lessons learned to take on the big boys with cheaper, lighter, more failure-tolerant seat-based architectures.

The product development teams at market leaders Panasonic and Thales have not been idle recently. Last year Panasonic unveiled its Fusion concept for a huge improvement in the packaging of IFE in the seat, while Thales introduced TopSeries Digital Single-Aisle, a unique hybrid broadcast/AVOD system. But both are still wedded to a server-centric view of the IFE universe.

For all its innovative drive, even the newest entrant to the in-seat AVOD market remains convinced that head-ends are the way to go. This is Lumexis, which should see its fibre optic-based FTTS system fly in full revenue service with a launch customer later this year. With a typical system weight a third less than that of the current competition, and dazzling content delivery speeds of up to 1Gb/sec, FTTS nevertheless depends on an array of centrally located server units to hold and dispense content.



DIGECOR IS OFFERING A STRAIGHTFORWARD OPTION TO SEMI-EMBED AN EXISTING HANDHELD IN THE SEATBACK



DIFFERENT APPROACH Challenging this orthodoxy is a trio of handheld providers, and a seat supplier turned IFE aspirant. They are market leaders The IMS Company and digEcor, UK-based Bluebox Avionics, and Sicma of France. DigEcor is offering a straightforward option to semi-embed an existing handheld in the seatback. Bluebox combines a semi-embedded approach with wireless system management. And the other two are making a genuine bid to give complete autonomy to a passenger-facing unit intimately integrated into the seat.

Last year digEcor announced a deal to working on a new generation of players with Lefeel Media Technology, which came from nowhere in 2007 to serve the Chinese domestic market. Production of the digEplayer L7 and L10 – the numbers indicate screen size – is due to start in the next few months. Features include 20-hour battery life, optional WiFi card and built-in optical mouse to support connectivity, and an ultra-bright capacitive touchscreen. The company is preparing to offer a semi-embedded solution, describing it as “logistically simpler,” and says that the L7 and L10 can be converted readily for this mode of operation by replacing the front and rear cases.

01. digEplayer L10
02. digEplayer L7



- 03. Bluebox Ultra portable unit
- 04. Bluebox wireless semi-embedded IFE system installed on a VIP BBJ

BLUE BLOOD British company Bluebox Avionics offers a range of lightweight IFE products – the ultra-mobile PC-based Bluebox Lite handheld, a semi-embedded system (Bluebox wIFE), a broadcast version (Bluebox Core), and a very compact personal media player-based handheld (Bluebox Ultra).

The Bluebox semi-embedded offering is based on Bluebox Lite, which is in service with Latvian national carrier airBaltic, El Al of Israel, low-fare operator Iceland Express, the UK's bmi and an unnamed airline, with about 4,500 units in the field. “We expect to announce two more soon,” says managing director Rick Stuart. “We also have one wireless semi-embedded system flying in a VIP Boeing BBJ, with three more due on-line shortly.”

The semi-embedded system is based on the same hardware platform as Bluebox Lite, but configured for wireless control via a crew management terminal. In the BBJ control is exercised via the aircraft’s own WiFi network. Functions include cabin public address, and IFE pause, forced play-

back and system disable. As well as AVOD, the system supports PC gaming and moving-map information from a Rockwell Collins Airshow system.

The Bluebox units are installed in seat-arm mounts and draw on aircraft power. The passenger can remove the unit from the arm mount and place it on the in-seat table for more convenient viewing.

Bluebox is also trialling a version of the system with Airbus, using the A380 cabin mock-up in Hamburg. Airbus wants to find out whether a wireless solution really can deliver the weight savings and other efficiencies promised but not delivered by the abandoned Thales and Panasonic WiFi programmes for the Boeing 787. “We have completed a 12-month first phase last year and have just started Phase 2,” says Stuart. “This phase will look specifically at our wireless content loading solutions, which are now running at close to wired speeds.”

Stuart has high hopes for his wireless product line. “Development of wireless systems was a deliberate strategy that I believe will pay dividends in the long term as we get closer to new aircraft programmes,” he says. “We cracked a tough nut to get where we are today, with some unique patented technology.”

ALL THE RAVE The IMS Company is generally seen as leading the handheld market, running several customers and a few thousand fielded units ahead of digEcor. The Brea, California-based company is also the only vendor to

“BLUEBOX IS ALSO TRIALLING A VERSION OF THE SYSTEM WITH AIRBUS, USING THE A380 CABIN MOCK-UP IN HAMBURG”

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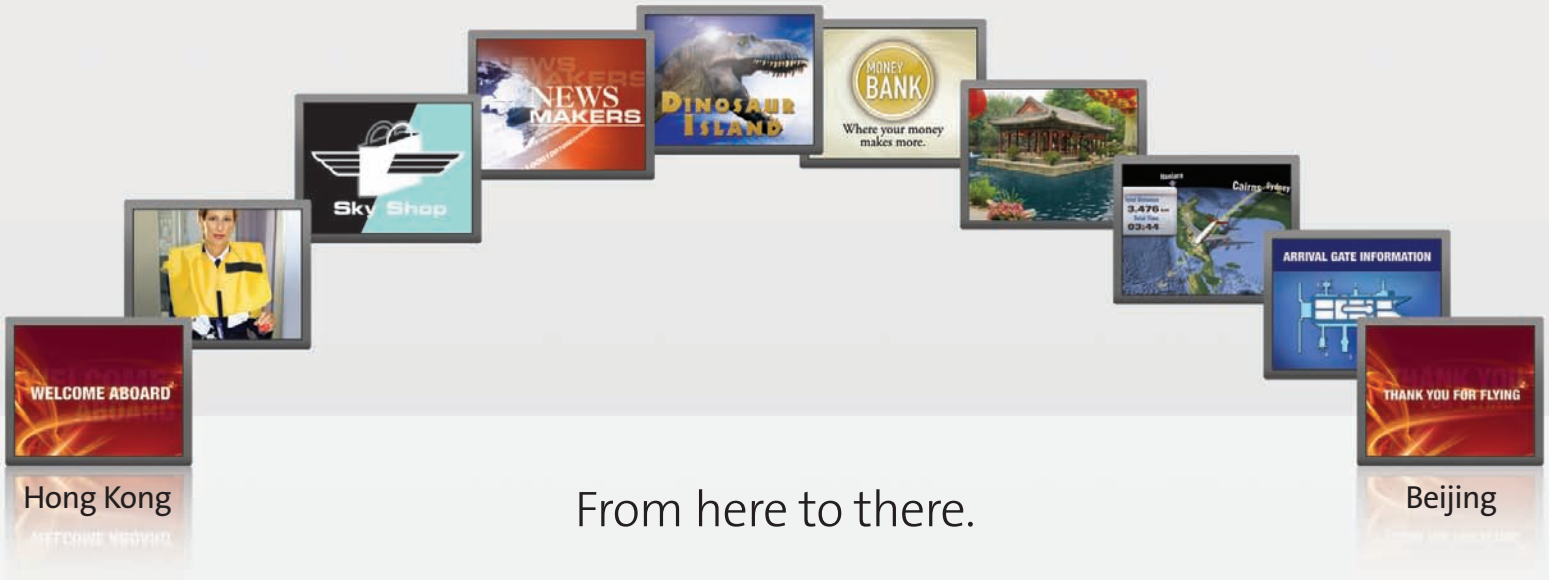
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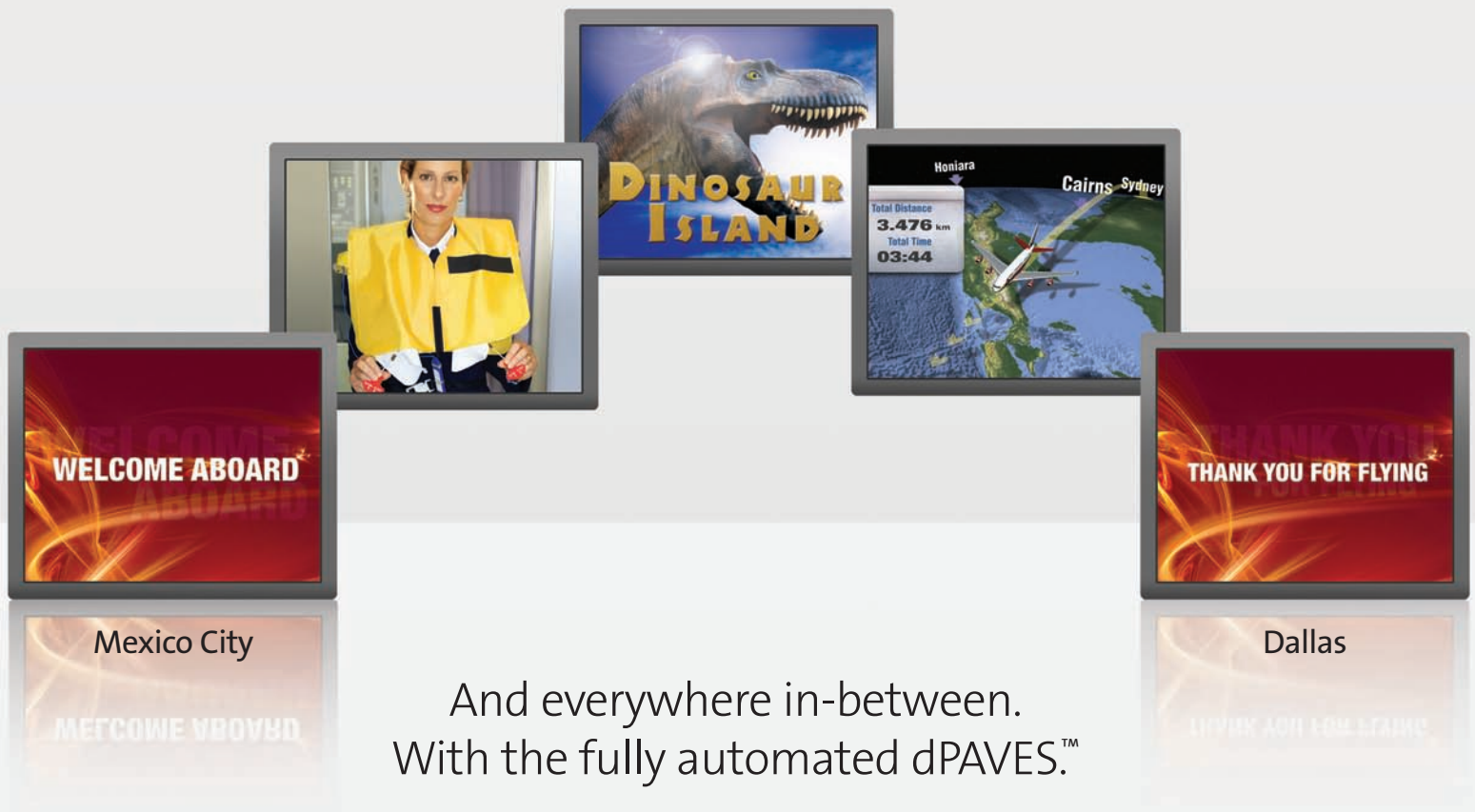
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05

date with anything resembling a semi-embedded installation in full airline service. In business class in American Airlines's Boeing 767-400s a seatback slot allows an IMS portable to be slid into place and provided with power, while on Delta, US Airways, British Airways's OpenSkies and London City-New York all-business service the players click into a swing-out arm for comfortable viewing.

As semi-embeddedness goes, this is the minimum – the handheld unit receives nothing in the way of content data from its location in the seat. But IMS's latest product carries the concept all the way.

Announced last year and due for commercial availability in 12 months' time, RAVE (Reliable Audio Video Entertainment) fits into the seatback, where it receives power and content via aircraft systems, and can be removed only by the cabin staff. Therein lies RAVE's unique selling proposition – loaded with its full content set pre-flight by cable or wirelessly from a lean head-end, the in-seat unit is fully autonomous. If it fails, it can be replaced by a cabin attendant while normal service continues at every other seat.

The price to be paid for this level of functionality is the need to obtain DO-160 certification, required for all equipment regarded as permanently installed on the aircraft. But the central benefit, in an era when the reliability of conventional IFE still causes airline cabin service VPs to lie awake at night, is compelling – RAVE differs from head-end-centric systems by effectively eliminating the possibility of failure over blocks of seats or throughout the cabin.

load hard, fail easy

Of all the arguments advanced in favour of seat-centric IFE systems, the most persuasive is their ability to recover quickly from localised equipment failure. Conventional architectures centralise content at the head-end and then distribute it on demand via networks that include the notoriously failure-prone seatboxes, located on the floor every three or four seats to provide power and processing. If a seatbox gives out, service to the seat group is lost and there's nothing the crew can do about it during the flight.

A seat-centric system has to work harder at content loading time on the ground, pumping the complete load to every in-seat unit in the aircraft (although IMS offers an optional single-function head-end for content loading and aircraft interfaces only). But if a unit fails in flight, it fails alone, and it can be replaced in minutes by a flight attendant from a small stock carried for service recovery purposes. Complete failure of a conventional IFE head-end is very rare. It can happen, however, resulting in denial of service throughout the aircraft. Once a seat-centric system has done its job of loading content to each seat, only a total loss of cabin power can deprive every passenger of entertainment.



IF IT FAILS, IT CAN BE REPLACED BY A CABIN ATTENDANT WHILE NORMAL SERVICE CONTINUES AT EVERY OTHER SEAT

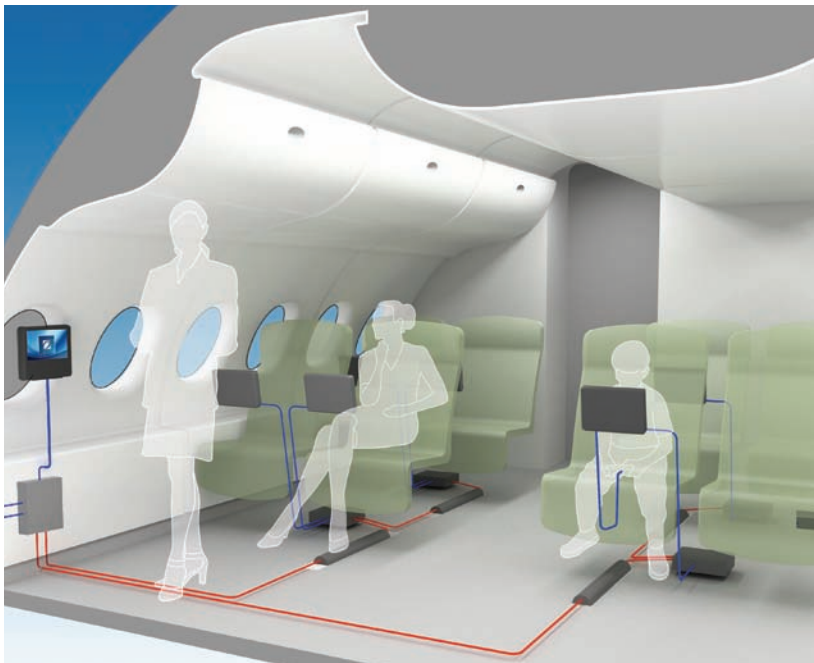


RAVE comprises just two types of box – the seat display unit (SDU), which can also be configured as a crew control panel, and the head-end server (System Control Unit, SCU). The SDU has an input for power and a choice of wired Gigabit Ethernet or wireless ports. The SCU, which acts as the aircraft interface as well as supplying content, is based on IMS's successful Terminal Data Loader (TDL). The two units incorporate highly reliable solid-state storage, expandable from four to 12 terabytes, and there will be a choice of 8.5in, 10.6in, 12.1in and 15.4in screens.

"The airlines will need to carry a small stock of replacement SDUs to be absolutely sure of rapid service recovery," comments IMS chief executive Joe Renton. "However, our experience in handheld operations so far suggests that the chances of unit failure will be very low."

There are cost advantages too, according to IMS. "We know that handheld players cost less than the seat-mounted client devices tethered to the head-ends of traditional IFE systems," says Renton. "So we focused on making the SDU very much like a personal media player, reduced the number of different types of box from around 10 to two, and turned the head-end into a content loader and aircraft interface. As a result, we think we can supply

05. The IMS Company's RAVE unit



06



07

- 06. Sicma's Seat Integrated Technology (SiT) will enter service with Royal Jordanian Airlines
- 07. SiT SDU screen sizes include 8, 10, 12 and 15in options and they can be backrest, arm or wall-mounted

a system at less than half the current price for conventional IFE; we can also be significantly cheaper than the emerging fibre optic competition.”

FRENCH REVOLUTION Sicma, a member of France's Zodiac Aerospace group and a seat manufacturer by original calling, makes similar claims for its Seat Integrated Technology (SiT), which is due to enter service on four Airbus A340-200s operated by launch customer Royal Jordanian Airlines this autumn.

Like RAVE, SiT is designed to put all of the available content into every seat, storing it at the passenger's fingertips in the seat display unit (SDU). Capable of being mounted in the seatback or on a fold-out arm, the SDU is essentially a standalone PC with a high-resolution screen, a 1GHz processor, 1Gb of RAM and a 250Gb hard drive – enough for 85 typical films, 400 hours of MP3 audio and 30 3D games.

Sicma says that as well as minimising the possibility of the multiseat failures and speeding up response when the passenger selects new content, this approach means that the IFE hardware can be built into the seat right from the start, eliminating some of the integration and retrofit issues that currently add cost and complexity.

The rest of SiT is lightness and simplicity itself: a small (1kg) SiT Interface Box (SIB), which also integrates other functions such as air-to-ground connectivity and a moving-map display; a Gigabit-rated optical Ethernet network for the delivery every few weeks of new content loads to the SDUs; one power box for every four seats, one passenger control unit per seat, and a crew control unit.

Sicma claims superior installability by virtue of its ability to deliver the seats with their IFE provision already in place. Then it's just a matter of securing the seats on



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their tracks, installing the power supplies and other small boxes, running the content-delivery Ethernet cable along the existing raceways in the floor, plugging in power and switching on.

“We estimate that the complete installation will weigh around 2.9kg per passenger across 30 seats in business class and 229 in economy aboard Royal Jordanian's A340s,” says SiT product manager Loic Bouet. “This compares with a figure of at least 4.5kg for a typical conventional system. Our cost, depending on aircraft type, is US\$4,000-6,000 per passenger, half as much as for the competition, and power consumption is 35W per passenger against 66W.”

There's a tide in the affairs of the IFE industry, and it's sweeping a host of new players towards inevitable confrontation with the incumbents. The latter, with their advantages of market presence and well-established global product support, believe that continuous improvement of their client-server architectures will win the day. The emerging competition is flying the flag of devolution to the seat. Let battle commence. ☒

CONTACT

Bluebox, Web: www.blueboxavionics.com; digEcor, Web: www.digecor.com; The IMS Company, Web: www.imsco-us.com; Sicma, Web: www.sicma.zodiacaerospace.com



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fastmover

Oman Air is spending heavy on luxury interiors and the latest cabin technology – CEO Peter Hill explains the airline's strategy

MARCELLE NETHERSOLE, AIRCRAFT INTERIORS INTERNATIONAL



Peter Hill is a familiar face in aviation circles around the Arabian Gulf. His career began with BOAC, before moving to Gulf Air, which he then left to help launch Emirates. After a spell heading Sri Lankan, he has now taken up the challenge of making Oman Air an airline to be reckoned with. Eighteen months into the job and the world is suddenly taking notice as the small, primarily

regional carrier battles with the big boys, introducing new aircraft and leading the rest of the world with the introduction of both onboard mobile phone services and broadband internet access across what Hill argues is probably the most luxurious cabin on a commercial carrier today.

Oman Air began life in 1993 in private hands as a regional player, but following the break up of the four-



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nation ownership of Gulf Air, it became the country's national carrier – since 2007 it has been 99% government owned. Public ownership brought significant capital investment, helping the airline to grow, as well as ensuring Muscat continues to develop as a popular destination in the Middle East.

“The government has a 2020 plan,” says Hill. “It sees a changing role for Oman – much of the focus is currently on oil and gas, but as we know, those stocks, like in many countries, are declining.” He says the government is therefore keen to diversify into other industries and – due to Oman's position, climate, and natural beauty – tourism has become a huge focus: “The government is investing in Oman Air to develop a conduit between Oman and countries they perceive as being forces of either business or tourism in the future. There will be a lot of investment within these sectors in the next 10 years. It also gives investors the opportunity to travel in and out of Oman directly from their countries. So we are developing Oman Air to reflect the aspirations of the government,” says Hill.

Hill's strategy is to make Oman Air the obvious choice for direct flights to Muscat and for links to other Omani domestic destinations. “We aim to provide top quality air services to destinations that we and the government feel are potential growth areas for the future of Oman,” he says. “We are developing prime time scheduling for flights to and from Oman. We're not so interested in developing Muscat, the capital, as a hub. Our schedules are rather focused on departure and arrival times out of Muscat and in to points in

Oman Air opts for ERJ-175

Oman Air purchased five Embraer ERJ-175 aircraft at last November's Dubai Airshow. Four of the jets will be operated by Oman Air and one will serve with the Royal Omani Police. The deal also includes purchase rights for another five aircraft. Each ERJ-175 will be configured with 72 seats in a full-service, dual-class layout, with 12 seats at 40in in business class and 60 seats at 30-32in pitch in economy. “Oman is a substantial country with 2,000km of coastline,” says Peter Hill, Oman Air's CEO. “We have four or five domestic airports and we wanted an aircraft that was able to serve them, as well as other regional routes. Every passenger will have seatback IFE and it will be very comfortable for a regional jet.” Oman Air will receive its first ERJ in March 2011, with a second in April, a third and fourth in 2012, and the fifth in 2013.

01



02



- 01. Oman Air's business class features an impressive 82in pitch!
- 02. First class is available on Oman Air's A330-300s, but not its A330-200s



03



WE HAVE AN ONBOARD LOUNGE IN FIRST CLASS, BUT WE STILL NEED TO SEE IF THAT WILL WORK FOR US ”

04



- 03. First class onboard lounge area
- 04. First class mini-suites offer exclusive privacy

Europe or say the Far East that suits the local point-to-point traffic. There should be no reason why anyone wanting to go to Muscat should want to go via one of the other regional hubs unless it was for cost,” says Hill.

INSIDE EDGE To entice passengers on board, Oman Air has invested heavily in new aircraft and a new cabin product. The carrier’s much-anticipated first-class mini-suite, along with new business- and economy-class seats, menus and uniforms, was first unveiled five months ago on a brand new A330-300 – these products have since been rolled out on services operating from Muscat to London, Frankfurt and Paris.

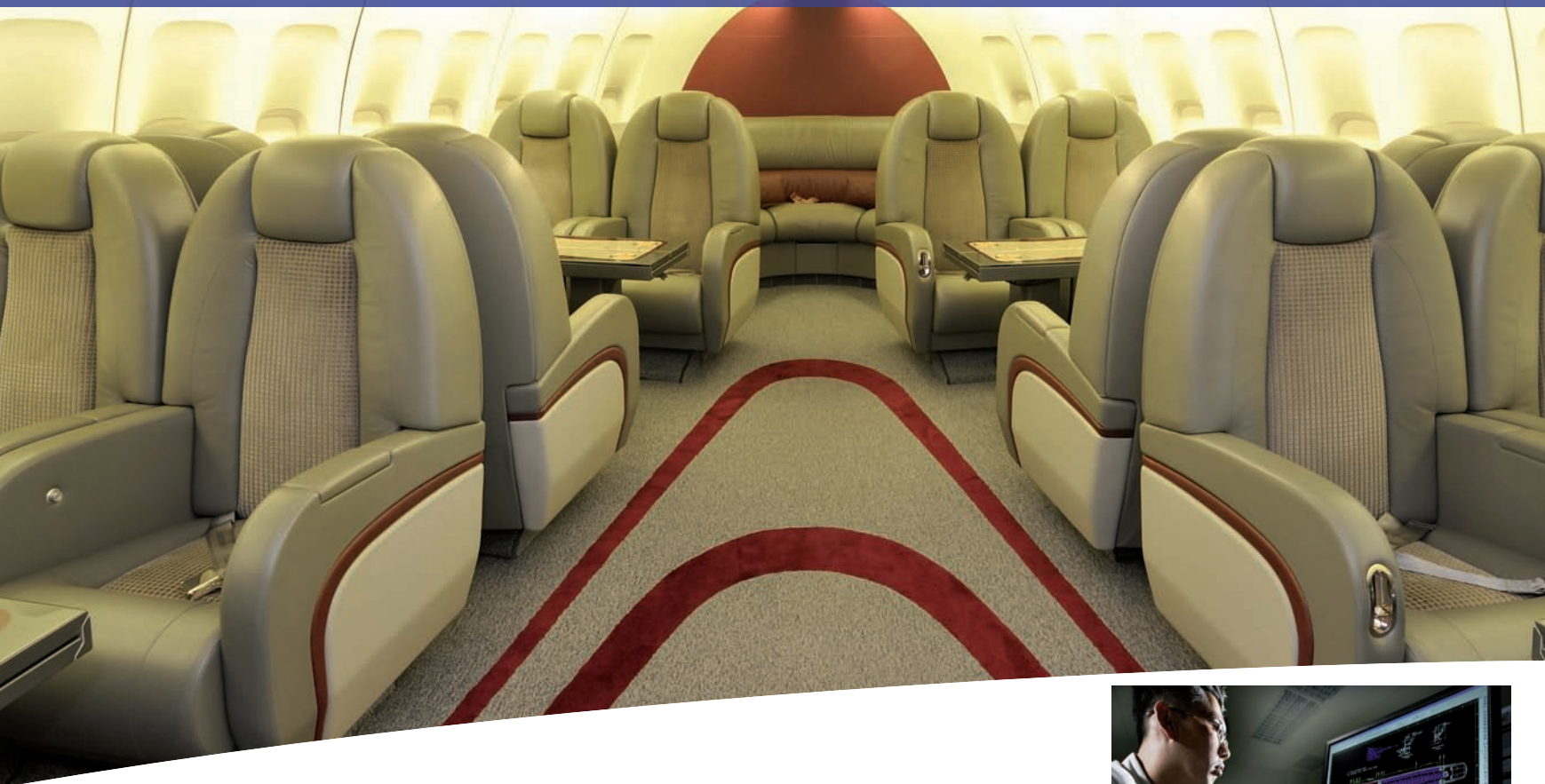
Each first-class mini suite features an 82in-long, fully flat bed within a pitch of 85.5-87in, a seat width of 25.5in, electrically operated backrest, leg rest and seat depth controls, and an eight-point massage system. And with just six suites per aircraft, privacy should never be an issue.

First class also features an onboard lounge – but Hill admits the airline is considering whether to continue with it on future aircraft: “Five months in, all is looking great but

we still don’t know for sure the future outcome of all our strategies,” he says. “For instance, we have an onboard lounge in first class, but we still need to see if that will work for us. If the local families use that, then great, if not, then perhaps we can convert it into two more seats.”

Despite carriers such as Gulf Air and Qantas deciding to ditch first class, Hill defends the decision to invest in such an elite product: “The prime reason we’re keeping first class is we see a demand today and a continuing and growing demand as and when the world economy returns to normal,” he says. “The investment in the company is not for the short term – we’re investing for the future and the future of Oman. We see a serious need for premium quality products in all classes, providing people with the best they can buy in these markets. First class is geared towards a very select audience, with just six seats in the cabin. There is demand locally for that, but only to selected markets. We currently have two of our A330-300s in a three-class configuration and we took delivery of another at the end of March – again in a three-class configuration – and that is how we will stay.”

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05. Business class features 17in IFE screens
06. Economy sees seats at 34in pitch and 10.6in IFE monitors

05

However, Oman Air is not offering first class on its new A330-200s: “Not every route requires a first-class cabin and having a mix of three-class A330-300s and two-class A330-200s gives us a very flexible, high-quality fleet, which allows us to respond quickly to passenger demand.”

OMAN MEANS BUSINESS Oman Air hasn't exactly scrimped on its business-class product either, offering an experience equal to many carriers' first class. Each 22in-wide business-class seat converts into a 77.5in-long bed, and is set at an extraordinary 82in pitch in a four-abreast 1-2-1 configuration that sees just 20 seats in total. There's also a 17in IFE monitor, two USB ports, an Ethernet socket (RJ45), RCA plug, PC power outlet, cocktail table, one-piece meal table, buddy seat and ample stowage.

“Our business-class cabins are full,” says Hill. “We were late starters in the Gulf Cooperation Council (GCC) region and we're trying to brand ourselves as a bit of a niche carrier in a developing market where we believe traffic will develop quite robustly as we bring more and more things on in Oman. Our customers are buying seats with us as we have one of the best, if not the best, business cabin in the air. We have had great feedback from our customers.”

Even the carrier's economy class features a spacious 34in pitch. Its two-class A330-200s offer just 196 seats in a 2-4-2 configuration, while its three-class A330-300s feature 204 seats. “These are not huge numbers of seats – at my former carrier, we were putting in 280 or 290 seats,” notes Hill. Each seat features adjustable head and footrests, a 10.6in IFE screen, USB port, and one power outlet for every two seats.

06



growing network

Founded in 1993, Oman Air is the flag carrier of the Sultanate of Oman. The airline currently operates direct international flights from Muscat to major Gulf destinations, such as Abu Dhabi, Bahrain, Doha, Dubai, Jeddah, Kuwait and Riyadh. In addition, Oman Air flies to ten destinations in India, as well as Chittagong, Bangladesh; Karachi, Pakistan; Cairo, Egypt; Beirut, Lebanon; and Amman, Jordan; and London and Bangkok. Oman Air also offers four weekly flights to Frankfurt and three weekly flights to Munich, as well as four weekly flights to Paris (CDG) from Muscat.

At the end of 2009, its fleet consisted of 15 B737-800s, two A330-200s and two A330-300s. During 2010/2011, three additional A330-300s will be delivered. For the future, Oman Air has ordered six Boeing 787 Dreamliners, which are scheduled to arrive from 2014.



07



BY AUGUST ALL OF THE A330 FLEET WILL BE OPERATIONAL WITH WIFI AND MOBILE PHONE SERVICE THROUGHOUT THE CABIN



07. Oman Air is the first carrier to offer full onboard WiFi internet and mobile phone service in all classes

For now, Hill sees no reason to add premium economy into the mix: “We looked at that option, but we have just invested a lot of money in the economy cabin to make every seat in it feel like you’re in a premium-economy cabin – our 34in pitch is designed in a way that makes you feel like you’re actually sat at 36in pitch,” he says.

“Of course to make money we need to fill our seats and charge rates that may not be cheap in the market, but we all face that challenge,” Hill continues. “Going forward, we’re focusing on more traffic coming in and out of Oman and a fare structure that will allow us not to have to dilute the yield too much with trying to carry traffic over a hub and going in and competing in the bargain basement area,” says Hill.

WELL CONNECTED Oman Air’s commitment to connectivity for all three classes of travel hit the headlines earlier this year, when it became the first airline in the world to offer mobile calls and broadband internet. The carrier’s IFE is provided via the Thales i5000 in-seat AVOD system, which is integrated with Rockwell Collins’ Tailwind live satellite TV system, broadcasting across eight channels. The airline has also opted for full WiFi and GSM connectivity from OnAir.

high flier



Peter Hill joined BOAC (now British Airways) in 1961 as a commercial trainee – his last BOAC posting was as chief reservations officer, Kampala, Uganda where he spent nearly two years under the regime of the infamous General Idi Amin. In

1974 he joined Gulf Aviation in Bahrain as reservation superintendent and was part of the team that created Gulf Air. Four years later he joined Maurice Flanagan at DNATA, before becoming Emirates’ commercial manager in 1984. He left Emirates in 1996 to pursue a private business venture in London, but in 1998 he was persuaded by Emirates to return to manage their recent investment in Air Lanka, based in Colombo. Hill spent the next 10 years as the CEO of Sri Lankan Airlines. In 2007 he became CEO of Dubai’s first low-cost carrier (now Fly Dubai). He took up his current post of CEO of Oman Air in 2008.

“Mobile phones and broadband internet are so much a part of everyday life, we felt if you’re not offering those in the air, you’re missing out somewhere,” explains Hill. “So we took the bold step of going for it and we are pleased to say we are the first carrier to offer both. Passengers on board Oman Air’s A330 flights need never be out of touch with the world, even as they fly.”

Passengers can make and receive calls at all times other than during take-off and landing: “The system is switched on at 10,000ft in the climb out and turned off at 10,000ft in descent.” Calls are charged at international roaming rates, while WiFi internet usage costs US\$29.95 for 26Mb per flight. “By August all of the A330 fleet will be operational with WiFi and mobile phone service throughout the cabin,” says Hill.

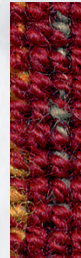
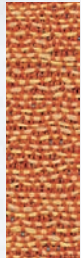
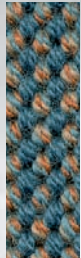
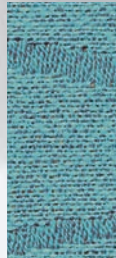
SHORT-HAUL MAKEOVER The airline isn’t just content introducing new product on its medium- and long-haul fleets: “We took on six brand new 737s last year,” says Hill. “In those aircraft we have a 32in pitch in economy and 42in pitch in business class. We’re changing all of the fabrics of the cabin to make it look and feel like our long-haul fleet. We’re changing carpets and bulkheads and all of that to reflect the look of our A330s.”

Hill says he’s also looking at taking out one row of economy seats to improve legroom, as well as upgrading the meal service on board. “As you can see we have a lot going on,” he laughs. “At the moment our product stands out well compared with other airlines – our aim is to offer top quality at lower prices. What more can passengers ask for?” ☒

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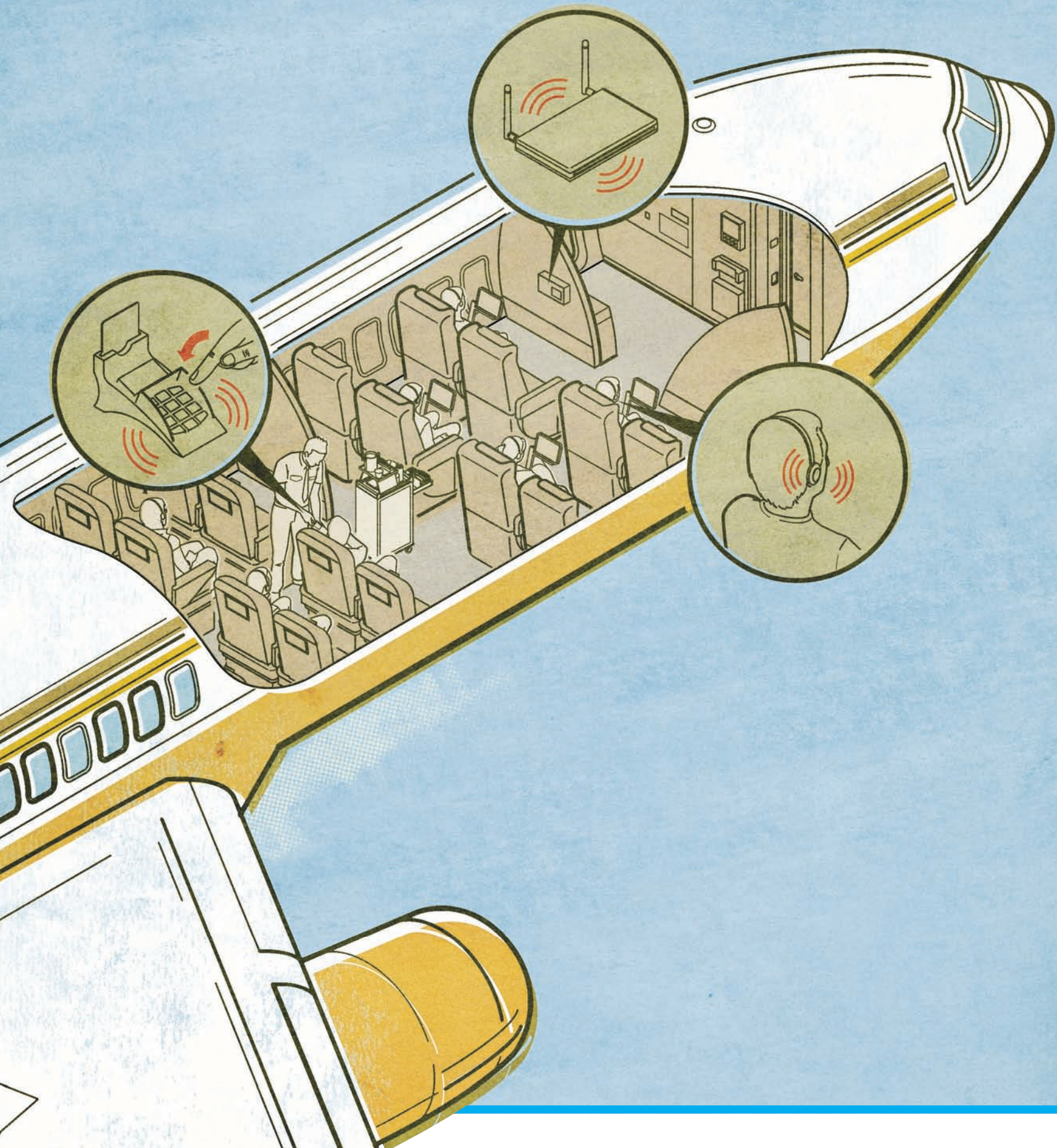


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wireless

Wireless was to be the next big thing for the IFE industry, but now the top two suppliers have tuned out, leaving an ambitious newcomer to try its luck

BRENDAN GALLAGHER, AIRCRAFT INTERIORS INTERNATIONAL



Encouraged by a Boeing 787 development team hungry for weight savings, market leaders Panasonic and Thales spent the mid-2000s beating the drum for wireless IFE. It would eliminate many kilograms of cable, they enthused, and it would make cabin reconfigurations quicker, easier and cheaper. The airlines could hardly contain their impatience. But, like the protagonists in the play *Waiting for Godot*, they waited in vain.

As the developers in Lake Forest and Irvine rolled up their sleeves to work the detail, it began to dawn on them that wireless wasn't the silver bullet they dreamed of. Cable there would still have to be, for power to the seats. The wireless access points needed to deliver content made a not insignificant contribution to the weight budget. And the WiFi-based wireless area networks were overwhelmed by the volumes of streaming data required for on-demand audio/video to several hundred seats.

In the end, and for public consumption at least, the engineers' blushes were spared by a regulatory sideshow. Early in 2007 Boeing pointed to the possibility that the new 802.11n version of WiFi underpinning the wireless systems might not be mature in time, and to a lack of licences to use WiFi frequencies in certain national jurisdictions.

At the same time, Boeing alluded to potential bandwidth shortcomings and to the fact that, far from being lighter than a wired solution, wireless would have imposed a 40kg weight penalty. Whatever the real reason – too much weight, too little bandwidth, or too much labour with national telecoms authorities – the airframer was out of love with wireless and by mid-2007 the Panasonic and Thales programmes were on ice.

PIONEERING SPIRIT They weren't the only games in town, however, and thousands of miles away from the Californian labs a small British company was persevering



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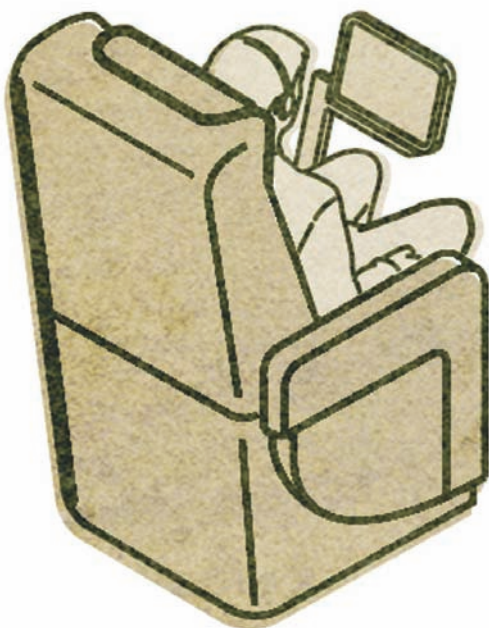
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ILLUSTRATION BY TOBY LEIGH



about turn

Boeing abandoned its plan to install wireless IFE on the 787 Dreamliner back in January 2007. At the time, Mike Sinnett, director of 787 systems, argued that a conventional wired system would save weight, as well as speed aircraft deliveries, compared with a wireless solution. "We're putting in about 50 lb of wiring and taking out about 200 lb of other gear, including wireless antennae, wireless access points and thickened ceiling panels," said Sinnett. "And from a schedule point of view, it makes life easier for us."

with its own vision for wireless IFE. Called Bluebox Avionics, it had been set up in 2005 to combine wireless control and content loading with commercial off-the-shelf (COTS) semi-embedded screen units to produce a system capable of outdoing the competition on cost, weight and reliability.

In the intervening years Bluebox has exploited its COTS contacts and proprietary operating system software to address the airline handheld market with some success – customers include the UK's bmi, El Al of Israel and, most recently, Kazakhstan's Air Astana. But it has also kept its eye on the wireless ball, selling its system to a number of VIP clients and working with Airbus on a proof-of-concept programme.

"Our foray into the handheld market was somewhat forced – if people ask you to do something for them you're not going to turn them down," says managing director Rick Stuart. "But what we're really interested in is Thales' and Panasonic's OEM line-fit market with Airbus, Boeing and the other airframe manufacturers."

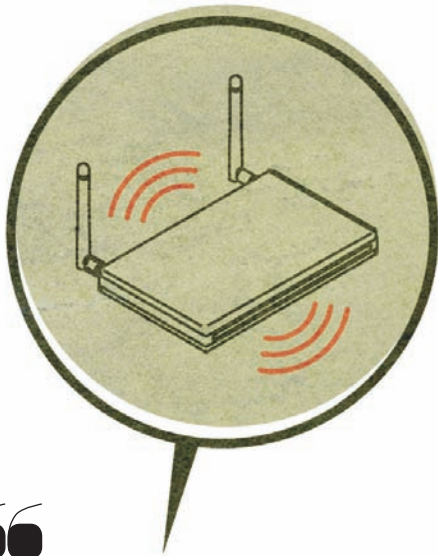
The company is currently showing Airbus what it can do on the A380 Cabin Integration Test Rig (CITR) in Hamburg. Called "wIFE," the system comprises 20 in-seat

units arm-mounted and powered by cable in the rig's 20 business-class seats, plus the Bluebox cabin management terminal (CMT) at the head end.

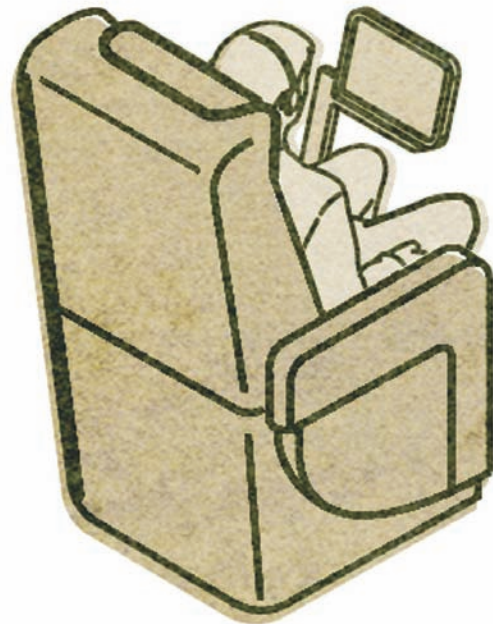
AIRBUS TRIAL The passenger unit – a 7in, 16:9 touch-screen with its own hard drive – is wirelessly controlled by the CMT, which also provides content loading. This is the aspect of the system's performance now under Airbus scrutiny after a three-month first-phase trial of its basic functionality that was completed in May last year. A second phase began in January to address the practicability and reliability of Bluebox's 802.11g WiFi wireless data loading, developed in conjunction with Cisco Systems.

"We use the time needed to load 1Gb as our metric," says Stuart. "Competing systems can take as much as ten

“ WE USE THE TIME NEEDED TO LOAD 1GB AS OUR METRIC – COMPETING SYSTEMS CAN TAKE AS MUCH AS TEN MINUTES ”



“
 STREAMING TO EACH SEAT SIMULTANEOUSLY
 AND ON DEMAND COULD NEVER WORK IN
 A MILLION YEARS”



minutes – we’re much faster than that, close to wired speeds. In fact if you look at the way data is currently loaded to a conventional AVOD installation, we’re at no discernible disadvantage in terms of speed.”

Bluebox also uses its wireless capability to stream content on demand – but within strict limits. “People are far too focused on the streaming of data wirelessly to individual devices,” says Stuart. “Streaming to each seat simultaneously and on demand could never work in a million years – the power levels needed would microwave a chicken!”

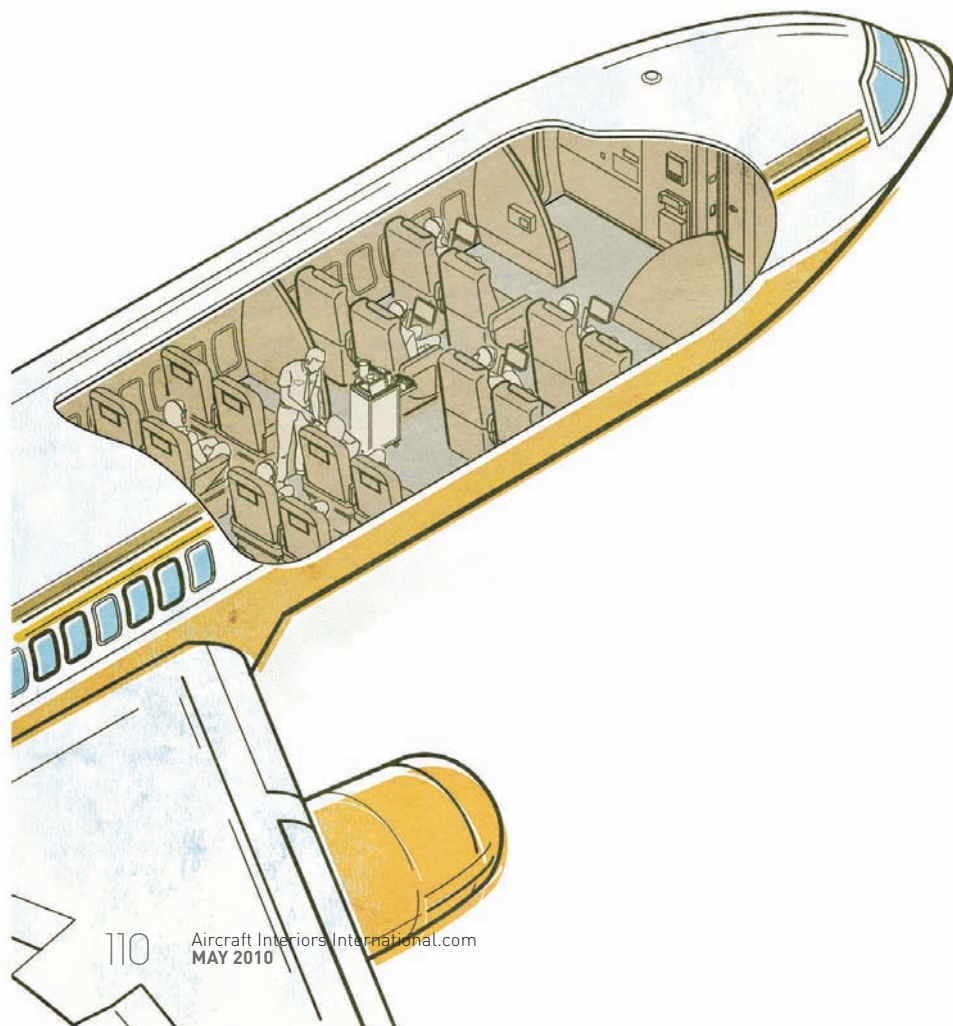
Instead, Bluebox ring-fences wireless streaming of the distribution of real-time content such as moving-map and external camera imagery. “It works because the resolutions are low and the data streams modest,” says Stuart.

The Bluebox boss is careful not to read too much into the Hamburg programme: “Could it lead to our becoming an Airbus supplier? Only they can answer that. But we’re definitely taking on the two big boys of IFE with their present systems – that’s where we want to be, no doubt about it.”

SECOND OPINION If the sight of Bluebox snapping at its heels has come to the attention of Thales, the market’s second biggest player shows little sign of taking another look at wireless by way of a competitive response.

At the end of 2006 Thales was in the happy position of being able to announce orders from no fewer than four Chinese airlines for installations of the TopSeries i-8000 wireless system in their Boeing 787s.

At the time, the company had decided to base its i-8000 system on the emerging 802.11n flavour of WiFi, which was expected to offer a data rate of at least 40Mbit/sec per channel, with a total of 19 channels available on the aircraft. The company spoke of being able to guarantee at least 2Mbit/sec per seat, good for MPEG-2 content at 205 seats simultaneously.



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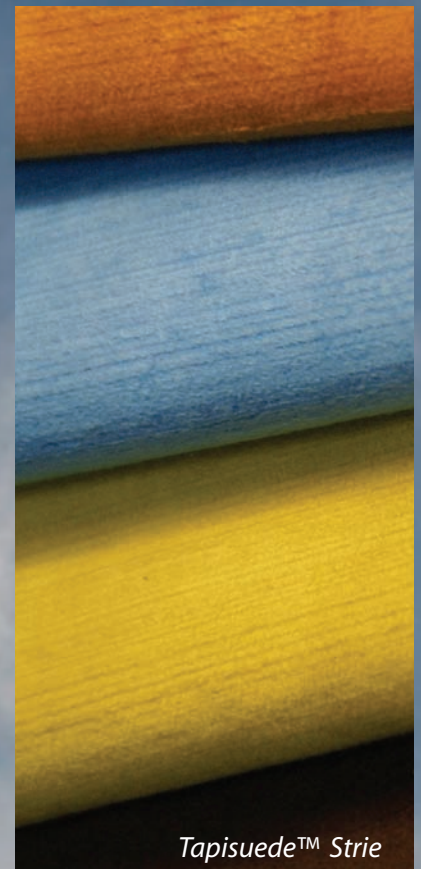
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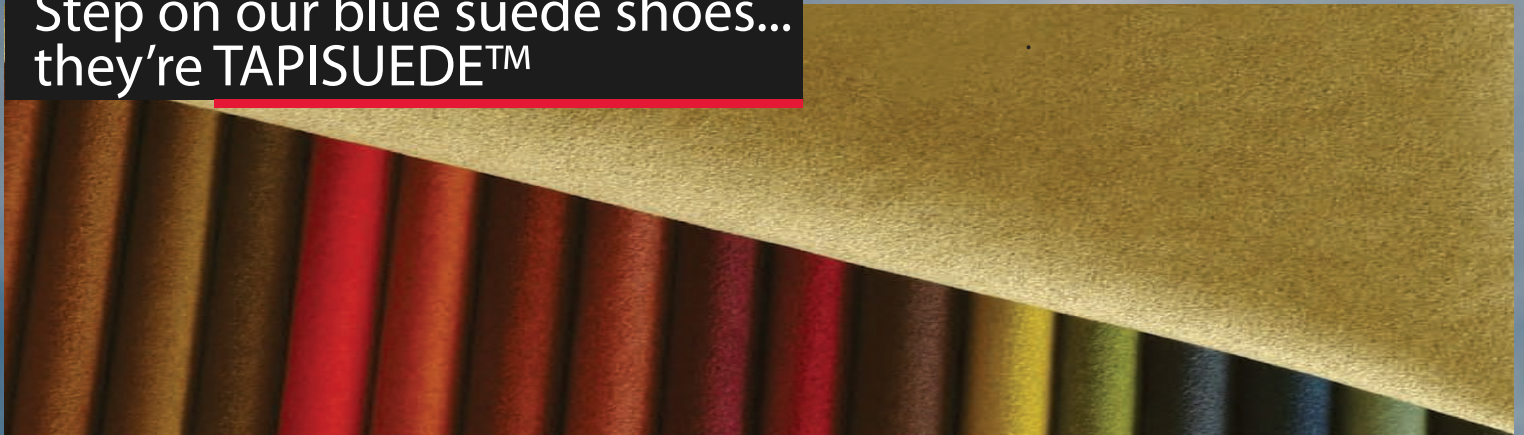


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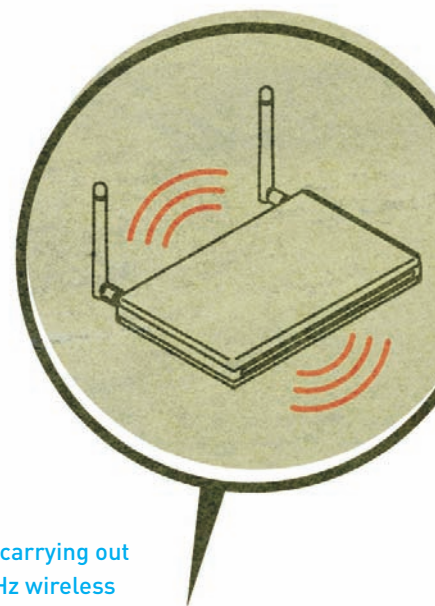
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big easy

EADS Innovation Works Germany is currently carrying out a feasibility study examining the use of a 60GHz wireless communications system for IFE in the passenger cabin. A key part of the 'EASY-A' project includes the integration of a complete 60GHz IFE system (consisting of one ceiling module and five seat modules) into an A340 cabin mock-up at EADS Innovation Works Germany. The work package includes defining the best locations to install the antennae and how best to integrate the antenna modules into the ceiling and seats of the cabin; the development of higher-layer protocols and application software for the IFE system; and the development of the man-machine interface for the passenger. See www.eads.net for more details.



Then the Boeing axe fell and TopSeries i-8000 was consigned to the back burner. Three years later, according to spokeswoman Lori Krans, it's still there. "Our focus on wireless IFE is limited and we have not put any real efforts forward since our original designs for Boeing," she says.

While Panasonic's Neil James, executive director for sales and product management, tells a similar story, he does not rule out returning to the wireless fray: "We really got started in 2005 in response to a Boeing request for information," he says. "We put a lot of capital, thought and engineering work into it, including building an anechoic chamber capable of accommodating an entire shipset of equipment."

The aim, according to James, was to investigate the possibility of creating a wireless network to deliver high-quality video on demand to at least 300 passengers. "It was hoped that the benefits lay in an ability to change cabin configurations without worrying about large amounts of wiring running through the tracks, and in taking significant amounts of weight out of the aircraft."

WEIGHT WATCH Weight proved to be among the first showstoppers. "We looked at power-harvesting technology as a way of eliminating the power cables too," says James. "But it just didn't yield enough wattage to drive the seat processors of the time. So we were left comparing the weight of wireless data distribution versus that of a twisted-pair Ethernet backbone and came to the conclusion that the savings weren't significant enough."

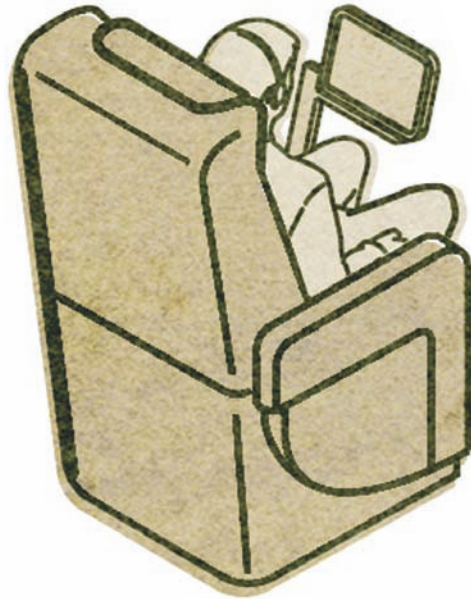
The programme was wound up and now Panasonic is successfully pitching a wired version of its eX2 system to the 787 customer base. So was the diversion into wireless a waste of time? "Definitely not," insists James. "Panasonic is fundamentally an innovator and an R&D company, and we learned an awful lot about what to do and what not to do."

If wireless AVOD proved an innovation too far, the technology still has a substantial place in the Panasonic offering. "We still want to be able to use it for crew cabin management devices," says James. "It's built into the handheld supplied for passenger control of the version of eX2 installed in Emirates' premium classes. And we want to be able to stream some content to a limited number of devices – moving-map data, perhaps, and certain types of video. We're putting a big effort into being able to 'super-serve' a lower number of devices for crew efficiency and for streaming data to people's laptops."

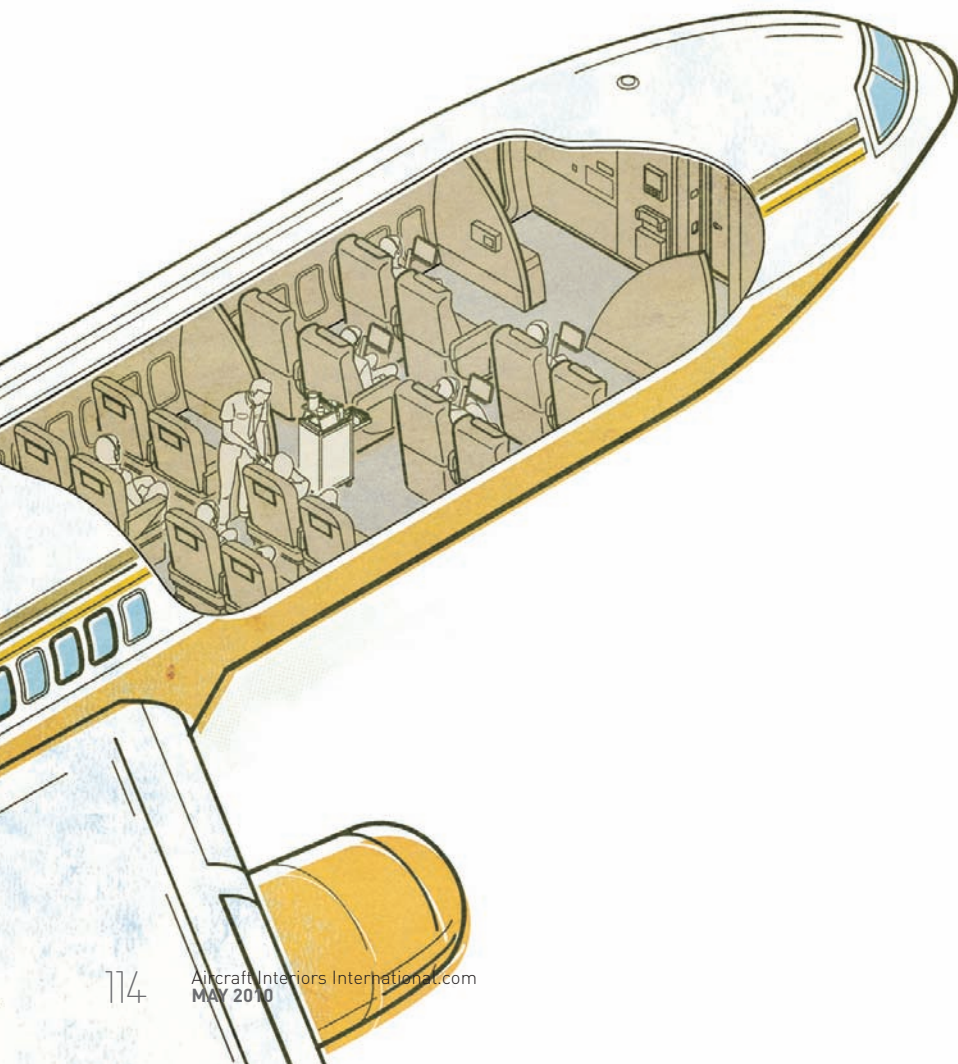


THE BENEFITS LAY IN AN ABILITY TO CHANGE CABIN CONFIGURATIONS WITHOUT WORRYING ABOUT LARGE AMOUNTS OF WIRING





THE WORK WE'RE DOING ON OUR FUSION SEAT PROJECT SHOWS THAT POWER CONSUMPTION IS GOING TO DROP SIGNIFICANTLY



James does not see the big airframers demanding another look at full-up wireless IFE any time soon. “None of them is saying the next generation has to be wireless,” he observes. “So I think it will be wired, while the generation beyond may feature technologies that have emerged to make wirelessness much more feasible.”

Panasonic continues to keep a constant eye on developments against the day when they might finally aggregate into a workable wireless system. “The work we’re doing on our Fusion seat project shows that power consumption is going to drop significantly – possibly one day to the point where power harvesting could do the job,” he says. “And we continue to watch the wireless technologies – Bluetooth, ultra-wideband (UWB), wireless HDMI (high-definition multimedia interface), and the Zigbee specification for small, low-power digital radios supporting wireless personal area networks (WPANs).”

HEADSET CONUNDRUM Applications for the last could include wireless IFE headsets in the passenger cabin. “That could take some weight out of the aircraft, and allow passengers a little more freedom,” says James. “But first you have to solve the problem of how to synchronise 300 headsets in 300 seats. How do you avoid the possibility that one passenger will end up with his neighbour’s choice of audio rather than his own? So we keep on testing, bouncing ideas off the customers, and making sure we’ll be ready for what the airlines will want in a few years’ time.”

The long wait for wireless continues, and Neil James believes it still has several years to run: “A system fully implemented, ready to fly and approved by an aircraft manufacturer? The next five years would be way too soon. But I wouldn’t rule it out for the end of the decade.” ☒

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firstoption

Condor is the first airline to retrofit its A320 fleet with the new Enhanced Cabin from Airbus

LIZ MOSCROP, AIRCRAFT INTERIORS INTERNATIONAL

“Wir Lieben Fliegen,” cries Condor. Not only does the airline say it “loves to fly”, it has proved it by installing a bold, comfortable and fun cabin on board its first freshly refurbished A320. Rainer Kroepke, Condor’s director of product management and marketing explains: “We always try to offer as modern aircraft as possible and renew our interiors when the aircraft are around 10 years old. When Airbus made us the offer to be its launch customer for the Enhanced Cabin retrofit programme, it was not a difficult decision.”

The A320 Family Enhanced Cabin was launched as a line-fit option at the beginning of 2007, offering better luggage stowage and a quieter cabin packaged with a more modern look and feel. The new interior also offers operators a 50kg combined weight saving. The Enhanced Cabin became available as a retrofit option for in-service aircraft in 2009 – with Condor the first to take the plunge.

The German carrier reckons it has a hit on its hands – decked out in the colours of Thomas Cook, Condor’s parent company, the retrofitted cabin is bright and inviting. Airbus designed the interior to look larger than its predecessor and it is proving popular with cabin crew. Purser Verena Lake explains: “The fresh colours mean you like to come on board,” she says. “The aircraft looks better and it feels like you are going on holiday when you enter.” To add to the fun, Condor plays upbeat music and destination videos during boarding.

So is it worth the expense of installing a new cabin on an older product? Yes, according to Peter Fornell, vice president upgrade services and customer services, Airbus.

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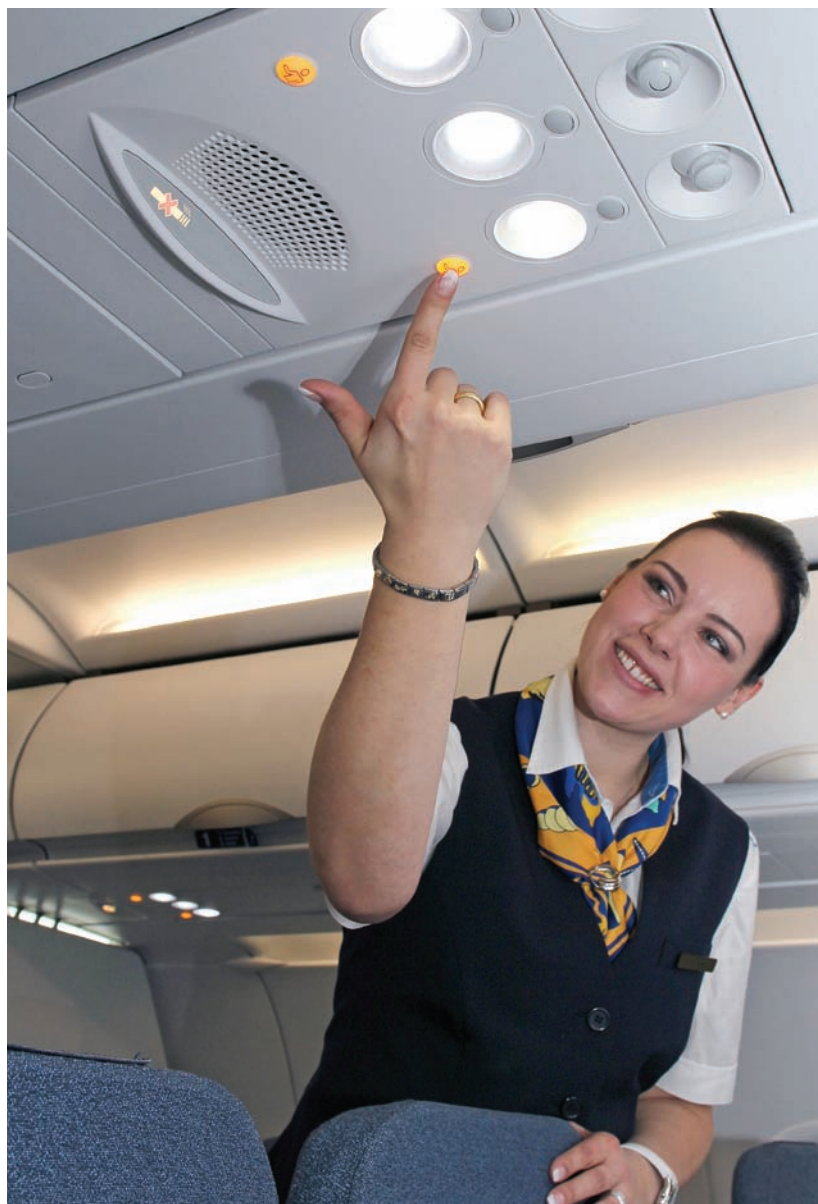
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He says: “Neither Airbus nor Boeing is going to offer a new narrowbody before the middle of the next decade. Therefore it is crucial to offer an upgraded cabin design for our existing products – we brought the A320 into service in 1988.” Although the aircraft already has a spacious cabin, the Enhanced Cabin gives the impression of even greater space by ensuring fewer panel breaks along the sidewalls. “Fewer lines in the field of vision add to the feeling of space,” says Fornell.

The Enhanced Cabin’s new window surrounds, which are an inch wider in diameter than the units they replace, let more light into the cabin, providing an additional 320in² of visible glass. Re-sculptured sidewall window panels also ensure customers sitting in window seats benefit from extra shoulder room.

Most importantly of all, short-haul operators benefit from improved boarding times, as cabin congestion is eased with more overhead stowage capacity. The baggage compartments have been revamped to offer 10% more volume, and 15% more usable space due to a full frame construction with no brace inside. This means there is room for five roll-on bags, speeding up boarding times and allowing extra hand luggage.

A continuous grip rail helps to keep passengers moving and stable, and Condor has also added new seat numbering, easily viewed from the aisles, so people no longer have to crane their necks to check they are at their assigned seat.



02

SEAT REFRESH The all-economy cabin has retained its original seating, built by B/E Aerospace. German firm Paustian Airtex reupholstered the seats, while Frankfurt-based Aircraft Equipment Services (AES) revamped the cushions. There is also space for a moveable cabin divider, should the airline wish to create a two-class configuration, although this is unlikely for the time being.

The seats have a 30in pitch, apart from the XL exit rows, which have a pitch between 33-34in and are available to buy for a premium on top of the regular fare. Passengers can also opt to buy the middle seat for a further few euros should they wish to have more room on board with no one sitting next to them.

The Enhanced Cabin package also includes a new sleek and easy-to-understand passenger service unit (PSU), first introduced on the A380. Operators can choose to replace the traditional ‘no smoking’ light with a more useful ‘no mobile phones’ light – few airlines in the world still allow their passengers to light up on board. Retractable 10.4in

01. The Enhanced Cabin PSU sees 10.4in IFE screens every three rows
02. The new PSU includes LED reading lights and an attendant call button

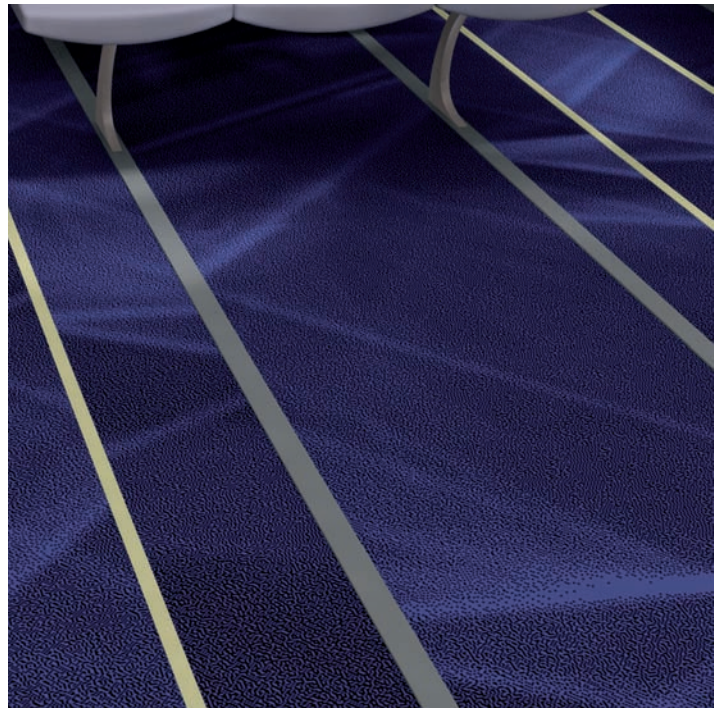
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MANUFACTURING OF INTERIOR FURNISHING



THE UPGRADE ALSO SEES NEW LED LIGHT FIXTURES, ALTHOUGH CONDOR HAS DECIDED AGAINST FULL-ON MOOD LIGHTING



03. Operators can choose to replace the 'no smoking' sign with a 'no mobile phone' sign, if they wish

03

LCD screens, which feature every three rows, can display safety announcements as well as films during the flight. Passengers plug in their headphones at their armrests and can opt for either German or English language.

The upgrade also sees a move to LED cabin light fixtures, although Condor has decided against full-on mood lighting. Fornell says: "Our long-haul customers are more likely to choose this in order to control the mood over several hours and time zones."

Meanwhile, Airbus reckons it has shaved 15kg of weight from the new Cabin Intercommunication Data System (CIDS) included in the upgrade. A flat-panel touchscreen replaces a vast array of manual switches previously found in the entrance area, improving crew ergonomics. CIDS offers several useful features, such as immediate detection if a single LED malfunctions over a passenger's head. Crew are then able to isolate the individual PSU to help them in quickly troubleshooting the problem remotely. They can also easily adjust music and lighting.

"The new screen is extremely helpful," says Condor's Lake. "You can immediately see what is happening." All crew are able to get an overview of onboard systems at any time. For example, it is possible to see how full the aircraft wastewater tank is and make a decision on whether to add water or not at a stop – a full tank of water can add an extra 200kg to a flight.

passenger appeal

The A320 Family Enhanced Cabin offers passengers a bright new look, a 10% increase in usable overhead stowage capacity, one inch more room at shoulder level in some locations, dramatic LED ambience lighting options and a noticeable reduction in noise. In addition, LEDs feature on the new optional continuous grip rail with enlarged seat row indicators so that passengers can more easily identify their seats. Travellers will also appreciate a new slimmer Passenger Service Unit (PSU) with easier-to-use controls and LED reading lights.

The bathroom has also been streamlined. There is a new design for the countertops and surfaces, which are made from a speckled grey Corian. The basin is made from hardwearing steel and the mirror covers the entire wall, making the room appear larger. Airbus says it is also easier to clean and maintain and is more durable.

FINE DINING The aft galley remains the same, but Airbus continues to work on its new SPICE galley. SPICE aims to replace today's trolleys with a system of lightweight boxes that slot into foldable service carts. The design of these carts will maximise efficient use of the available volume, while also weighing less, reducing crew workload,



04. The new CIDS is easy to operate and provides airlines with a 15kg weight saving

and facilitating easier waste recycling, according to the aircraft manufacturer.

In the future, SPICE may even be available as a retrofit option, says Jan Thielebein, Airbus's customer services upgrade FCO director: "We think ahead to ensure that wherever it is possible, customers will be able to retrofit some of the ideas we are looking at for the future, such as the SPICE Galley."

For now Condor continues to make the most of today's technology – providing a hot meal on every flight is a key service element of its overall brand, with customers also given the option to pay for a superior menu.

Condor's customers also benefit from reduced cabin noise levels as a result of improved sound insulation and new lens covers on the sidewall lighting that block a critical sound path to the cabin. "We are also looking at humidifying air one day with lightweight devices installed on board all our aircraft," says Fornell. This could create

huge weight and fuel savings – currently when a carrier replaces its insulation, it can find up to 400kg of water absorbed in the old barrier material.

The airline realised further weight and space savings by installing Panasonic's dMPES IFE system. Its previous IFE system was housed in an overhead bin, but the new server is installed in the electronics bay under the cockpit, easing maintenance access.

Condor's technical division at Berlin Schönefeld Airport worked with Airbus and Lufthansa Technik to install the enhanced cabin during a regular heavy check. "At the end of the process our flight attendants flew with our engineers for a final check," says Kroepke. "They were the final judges as they use the systems all the time."

The carrier is considering retrofitting its entire A320 fleet with the new cabin and may move scheduled heavy checks forward to enable it to outfit the other 11 aircraft as quickly as possible. "The first aircraft took longer because it was the first one, worldwide," says Kroepke. "However, everything will speed up now we are through the initial learning curve. We are confident that we can complete the next cabin installation within the four weeks downtime scheduled for its regular check – depending on the aircraft. There is no reason for it to be longer." ☒

“ WE ARE CONFIDENT THAT WE CAN COMPLETE THE NEXT CABIN INSTALLATION WITHIN FOUR WEEKS ”

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oceanview

Philippine Airlines has introduced new interiors inspired by the carrier's home coastline on its latest 777-300ERs

KENJI HALL, AIRCRAFT INTERIORS INTERNATIONAL



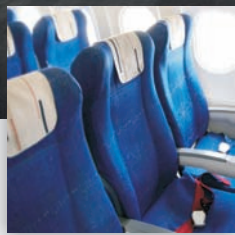


Designer Daniel Baron is standing in his Tokyo office, throwing lavatory floor samples onto the carpet. After a moment of staring at brown and blue vinyl rectangles from French manufacturer Gerflor – left hand on his chin, right on his hip – he smiles. “This is what I do all day,” he says. “Sometimes I put carpet patterns under the table so I can gauge what the passenger is actually going to see. It’s not going to be this bright on an aircraft.”

It’s not how you would expect key aesthetic decisions to be made for an aircraft interior redesign like the one Baron did for Philippine Airlines’ (PAL) new 777-300ERs. The first of the airline’s two £170 million aircraft debuted in late November; the second joined the fleet in January.

Baron, who runs design firm Lift Strategic Design, is using a bit of hyperbole to make a point: that unless you work for those few airlines with deep pockets, there’s always a bit of improvisation involved. “It can be primitive,” says Baron, who grew up in cities along the US East Coast. “There isn’t the money to make a mock-up centre where you can do this. You have to innovate while you simulate.”

MORE FOR LESS The world’s richest airlines boast big product development teams, fancy design centres, and plenty of cash. Like most, though, Philippine Airlines has to make do with a lot less. So when the Asian carrier hired Baron to redo the interior for its 777s, it mainly asked for new seat covers, carpet, lavatories and decorative laminates.



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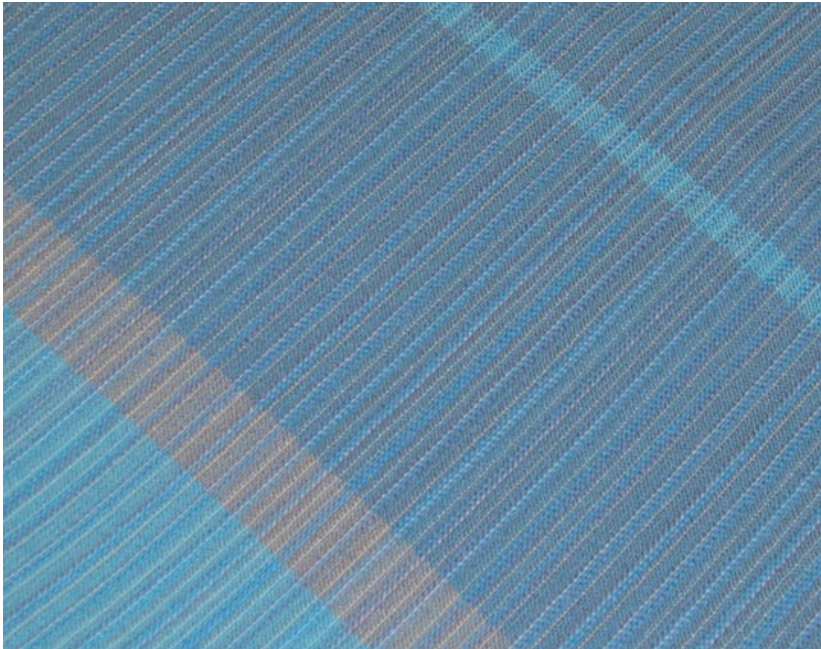
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02



01



AS WITH ANY MAKEOVER, BARON HAD TO FIND THE RIGHT BALANCE BETWEEN NOVELTY AND FAMILIARITY



Back in June 2007, Baron had pitched three themes to the airline's product development team in Manila. Two stuck: evening breeze and ocean view. The company's senior management liked the second idea, which would hint at the country's coast seen from the window of a resort. "It had to communicate to the two main groups," says Baron. "There are a lot of people from the Philippines who work overseas. When they get on a Philippine Airlines aircraft after being away for several years they should instantly feel at home... and for the foreigners, it should instantly say you're almost there."

The work began three months later. As with any makeover, Baron had to find the right balance between novelty and familiarity. The cabin interior had to look new enough so that passengers would notice. But it couldn't be too radical for the country's oldest and largest airline, whose loyal customers might not want too much change.

The airline had asked Baron to work off a coastal theme that it had introduced for its medium-range A319 and A320 aircraft in 2006. Maver Mayuga, a manager in the airline's cabin and inflight entertainment development division, says the company wanted it to be obvious to anyone who set foot on board the 777s that these were brand new aircraft.

The 777-300ERs have 42 Recaro CL 6510 business-class (which PAL calls Mabuhay Class) lie-flat-at-an-angle

seats at 78in pitch; and 328 seats at 33-34in pitch in economy (Fiesta Class). Seats in business are arranged in a slightly staggered 2-3-2 layout, while economy sees a 3-4-3 formation. Every seat has access to the Panasonic eX2 IFE system. Philippine Airlines is waiting on four more 777s, according to Boeing.

TOUGH TIMES The redesign comes months after the airline announced that it was cutting jobs and overseas flights. Last August, the company said it had posted a £200 million loss in the fiscal year through March 2009, and blamed the global financial crisis and economic downturn. Meanwhile, the company has begun to rely more on medium-sized aircraft for regional flights. "We haven't heard any update on the cuts so I think they're still ongoing," says Grace Cerdania, head of research at F. Yap Securities. "It's a step in the right direction."

As PAL struggles to turn things around, its low-cost rivals are thriving. Cebu Pacific Air, the country's second-largest airline, got its start in 1996, but its discounts for price-conscious travellers and offbeat services – flight attendants lead passengers in sing-alongs and games – have helped shake up the domestic market. On 9 March, Cebu said it would raise about £175 million through an initial public offering to fund the purchase of more aircraft as it expands its overseas routes. Analysts say the rivalry has

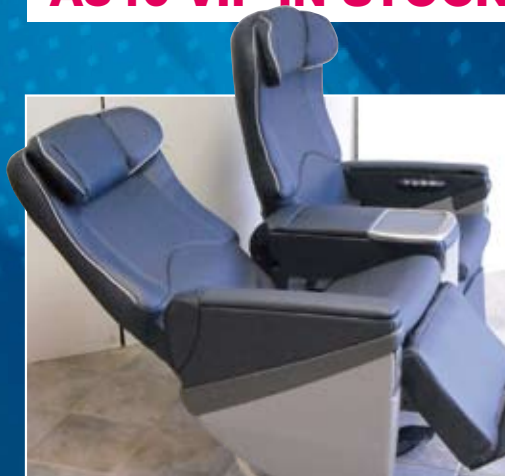
- 01. New business-class fabric, supplied by Botany Weaving
- 02. Each PAL 777-300ER features 42 business-class seats at 78in pitch

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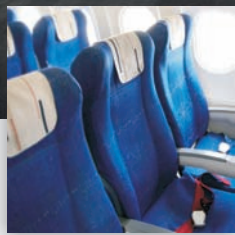
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“CONSERVATIVE BUSINESS PEOPLE PREFER THE SAFETY OF BLUE – BUT THERE ARE A LOT OF WAYS TO FINAGLE BLUE”



03



04

forced Philippine Airlines to work harder to defend its domestic market share, currently around 37%. “Consumers don’t base their decisions to fly Philippine Airlines just because it’s the oldest or the largest airline,” says Cerdenia.

PAL wouldn’t comment on whether the cost-cutting had affected design decisions on the new 777-300ERs. Baron also declined to talk about the project’s budget. But it’s hard to imagine that the company-wide restructuring didn’t have some effect on the redesign.

SHADES OF BLUE PAL asked Baron to work with the red-blue-yellow motif of the company’s logo and the country’s flag. The airline’s aircraft have been blue on the inside for years. On older aircraft, the seat covers were medium light blue with leaf-shaped patterns in beige and faint orange. Its walls were grey, except for the front partitions facing passengers, which had silhouettes of palm trees.

“For the airline it was, ‘People know us for blue and so blue should be the predominant colour,’” says Baron. “If you’ve been using blue as your base colour for decades and you suddenly shift to orange or red you’ve got a lot of conservative business people who will prefer the safety of blue. But there are a lot of ways to finagle blue.”

How did he ‘finagle’? Baron ended up studying how numerous shades of blue would work alongside other

colours. Two he knew to avoid were brown and purple: “In a country like the Philippines, which is humid, if you show a lot of brown, customers perceive it as dirty,” he says. “Purple is a colour they use for funerals.”

Baron proposed a blue-grey carpet with tiny orange and sky blue spots, slightly brighter than what the airline had in the past. In his office, in Tokyo, Baron opens a pine-coloured cabinet and pulls out a carpet sample the size of a hardback book cover. It’s a tad brighter than the pattern that the airline chose. He had intentionally proposed brighter hues because they create the illusion of space where there isn’t much, he says. Make the carpet too bright or too monochrome and it will show dirt and signs of wear too quickly. “If you have a plain colour it’s more likely to show heavy usage,” says Baron. “The tracks from the cart will eventually make a line. So the pattern of the carpet has to trick the eye.”

For the carpet material, Baron and PAL chose wool, providing consistency with the airline’s other long-haul

- 03. Economy-class curtains supplied by Lantal
- 04. 777-300ER economy cabin features 328 seats at 33-34in pitch
- 05. Business class sees a staggered 2-3-2 layout



05

06



IT'S ABOUT THE TINY DETAILS: THE FABRIC, THE COLOUR, THE PATTERN – HOW TO BUILD THE 'WOW' INTO SOMETHING WITHOUT MAKING IT COST MORE



- 06. Two new 777-300ERs have joined PAL so far
- 07. PAL has also refreshed the lavatories with new sink tops and flooring

fleets. “To the average person, a carpet is a carpet,” he says. “You don’t really notice until you see the bad stuff.”

Variation throughout the cabin was key. For the business-class seats, Baron came up with a cross-hatched pattern of different shades of blue and beige stitching for the seat covers. Rather than use a repeating pattern that would look identical on every seat, he developed one with Botany Weaving, in Dublin, that would vary depending on where the bolts of cloth were cut. “It’s about the tiny details: the fabric, the colour, the pattern,” he says. “It’s also about how the customers perceive the cabin when they walk in, where you can build the ‘wow’ into something without making it cost more.”

He went with a more conventional pattern for the economy-class seats. They are blue-on-blue covers, with short, wavy lines running horizontally (supplied by rohi, Bavaria, Germany). Baron didn’t want the entire section to look the same – “like a cattle car” as he puts it. So he suggested alternating shades of light blue and violet for headrest covers, known among designers as a colour way. “It’s a method of breaking up the space,” he explains.

In the lavatories, PAL agreed on a cobalt granicoat sinktop from US supplier SAFAS and a burgundy-brown faux-wood floor made by Gerflor Transport Flooring. The debate there was between a matt or glossy finish. “Oily fingerprints are easy to see on the matt finish but water leaves marks on the gloss,” says Baron. Ultimately, Philippine Airlines opted for gloss.

07



COAST TO COAST Something was needed to pull all the elements together. For that, Baron made a subtle decorative laminate pattern that he calls ‘coastlines’, which is applied to all cabin bulkheads. The asymmetrical wavy, vertical bands in four shades of light blue resemble the colours of the ocean as the sandy bottom goes from deep to shallow. The powder blue curtains, from Lantal in Switzerland, match the darkest shade of the laminate.

The whole project, from proposal to final management sign-off, took 13 months. Baron stresses that while a lot of thought went into the parts, the concept is more important. In future, if PAL wants to add more – say, a blanket or tray liner – the decorative laminate offers an obvious pattern to do that with. “I wanted to give the airline a concept that was expandable,” he says. ☒

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EADS Sogerma's
Ultimate Sleeper

SHOWPREVIEW

Aircraft Interiors Expo 2010



Aircraft Interiors Expo 2010 will be held at the Hamburg Messe, Germany, from 18-20 May. With over 500 exhibiting companies expected to attend, we have cherry-picked some of the most interesting concepts and products heading to what promises to be an event packed full of innovation.

Talking of which, this year's show will debut an Innovation Lounge, sponsored by Autodesk. One of Autodesk's clients, the Envisage Group, will be displaying a 40% scale model of a futuristic aircraft

seat that has been designed using Autodesk's Sketch Book Pro software. In addition to this, the ultramodern first-class cabin interior design that accompanies the seat can be viewed in high definition, 3D glory courtesy of HoloVis, which is displaying this concept on its 3D screens. Visitors will be able to pick up 3D glasses at one of the show's entrances.

The Innovation Lounge forms part of an Innovation Zone at the exhibition this year; this area also includes the Crystal Cabin Award gallery and the opportunity to win a

WACOM Intuos 4 tablet each day. The show will also boast a dedicated IFE zone, and, in association with IFSA, an Inflight Services Focus, featuring over 35 inflight services providers.

The show coincides with two important award ceremonies for the industry – the Crystal Cabin Awards on the first night, and the Skytrax World Airline Awards on the last day.

The Crystal Cabin Awards recognise innovation in cabin interior design and are voted for by a panel of industry experts. This year the awards

will be presented in the customary passenger comfort, industrial design/interior concept, greener cabin, health and safety, material and components, and entertainment and communication categories, as well as a new category for entries from universities. The judging panel will also award the Judges' Commendation Prize.

Meanwhile the Skytrax World Airline Awards, which are based on a survey of airline passengers from around the world, will be presented in around 40 categories.

NEXT IN LINE

Aviointeriors will display the results of a huge research programme – a complete new range of products and cabin concepts. There will be a new seat concept for every class – from long-range first to regional economy. Aviointeriors is implementing a deep change in its organisation, and has set about outlining the aircraft cabin of the next decade. The main aim of the research – in which industrial design, engineering, marketing and external consultancies worked together – was to produce next-generation seats with a unique appearance and mechanical simplicity. The company says that more and more customers want a distinctive look that will positively impress the passengers, while at the same time reducing the seat's components, weight, cost and interface complexity by cutting rarely used and redundant functions.



all rounder

Zodiac stablemates **Sicma Aero Seat** and **Weber** will both display seats at this year's Expo – including Cirrus (pictured right), a business-class suite developed by Sicma Aero Seat and James Park Associates, and Weber's 5751 long-range economy-class seat (pictured below).

Cirrus has a reverse herringbone layout with window-facing outboard seats and centre double, so passengers can travel side by side. As well as the fully lie-flat bed, core features include electric pillow headrest, touchpad control, lumbar, leg support, footstool, in-seat table, centre console and LED reading lamp. Clients can also specify additional features, colours and materials.

Zodiac provides a full spectrum of products, from economy-class seats for regional jets up to high-end premium seating. It owns companies including CDZ, Driessen, Precilec, Adder, and Intertechnique, so it can provide a package deal including seats, surrounding shells, galleys, monuments and IFE. At the show it will focus on solutions for a light weight and optimised living space and seat count.



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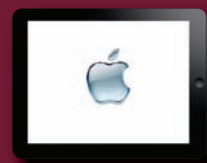
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nice and spicy

For the very first time at an exhibition, **Airbus** will feature its SPICE (SPace Innovative Catering Equipment) galley prototype, which has been developed through strong cooperation with airlines, suppliers and caterers.

Airbus is celebrating 40 years of innovation, and this will be the theme of its presence at the show. The company will display 1/20-scale cutaway models highlighting the cabins of the latest members of the Airbus family – the A380 and the all-new A350 XWB, providing a view on typical interior configurations.

The stand will also feature a life-size mock-up of the upper forward fuselage of the new A350 XWB, with an immersive 3D film showing inside – enabling visitors to experience the development of the latest Airbus programme, including previously unseen views of the cabin.



Of course, the Airbus cabin strategy goes beyond new aircraft. Airbus' upgrade services division will exhibit new products and services with a focus on retrofittable innovations, including the new A320 Enhanced Cabin.

CUSHION THE IMPACT

Franklin Products will introduce a global recycling programme for cushions. Airlines can now return their cushions for conversion into alternative cushioning products and electricity. Franklin Products has made substantial investments in green technologies, including installing a photovoltaic solar array electricity generator at its facility in Texas, USA. The company will also showcase its Soft-Touch comfort foam. Designed to improve weight distribution and reduce pressure points leading to improved comfort, Soft-Touch comfort foam is formulated to have a very soft feel, but with the chemistry of higher density polymers for long-lasting durability. The company will also share the results of its research on aircraft seating living space.

NET MEETING

Panasonic will display its latest IFEC solutions, including updates to its Global Communications Solutions and mission control centre. It will also showcase its latest integrated products available from collaborations with seat vendors, and launch its new network operations centre.

NEW PLAYER

Optimares will enter the aircraft seating market with five new seats, one each for single-aisle economy-class, twin-aisle economy-class, and premium-economy; a 'mini' business-class seat for single-aisle aircraft (pictured), and a twin-aisle business/first-class seat (to be displayed in a separate room, by invitation only). Optimares boasts the experience of five professionals from the aircraft seat industry and an automotive partner, Gruppo Prima, which designs and manufactures plastic parts for cars and consumer goods. The company is focusing on more space for passengers, differentiation and options for airlines, and efficiency for OEMs.



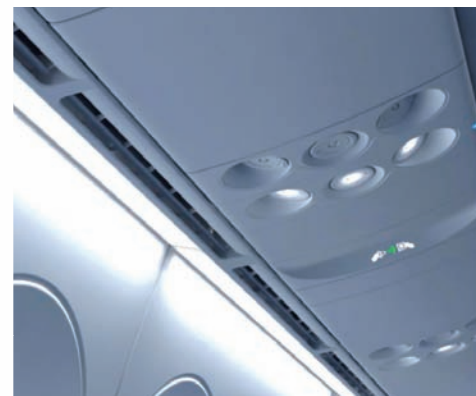
MORE FOR LESS

DK Aviation will show a range of aluminium carts, including an improved Atlas full-size cart that weighs from 15.8kg. The carts are also designed for better thermal performance, without compromising durability and strength. A semi-composite version is also available with an empty full-size weight of 14.5kg. Half-size carts are available from a weight of 9.8kg. Despite the weight loss, the certified gross weights remain at 113.4kg for a full-size cart and 68kg for a half-size cart.



MODERN CONVENIENCES

B/E Aerospace will exhibit its latest passenger service units (PSU), featuring PulseOx technology. The PSU was designed to take advantage of the modularity behind PulseOx technology, where each panel is a self-contained unit, allowing individual rework or replacement for faster and easier maintenance. Additionally, the company says the use of advanced materials and technologies results in an oxygen delivery system that is nearly 50% lighter than traditional systems and frees up an extra 45ft³ of cargo space for additional revenue generation. The PSU system includes the patented PulseOx system, which eliminates traditional oxygen tanks or chemical oxygen generators on board by integrating individual PulseOx vessels directly into the PSU. The company will also display its Crystal Cabin Award-winning vacuum waste system, as well as its new composite vacuum toilet system, which is available for retrofit on commercial aircraft. B/E Aerospace says the new vacuum toilet offers weight savings and increased reliability, achieved by combining proprietary composite system components into optimised integrated systems.



CARBON TRADING

Andrew Muirhead & Son will showcase its range of leathers and focus on its green credentials. By continuing to review its production process, the company has reduced its carbon footprint year-on-year over the past five years. "We are supplying the cream of the airline industry and we need to make sure that we are dedicated to helping customers achieve their own low-carbon objectives," says Archie Browning, sales director at the company.

**PAVE THE WAY**

Rockwell Collins will give a demonstration of its next-generation, high-definition (HD) capable dPAVES HD single-aisle IFE system, which includes 12in 16x9 retractable displays. Rockwell Collins will also highlight the availability of dPAVES HD on the new Boeing Sky Interior 737 cabin refresh programme. The exhibit will also include Version 2 updates to its Airshow 4200/D moving map system, and information on the company's extensive global service and support capabilities.

PUBLIC IMAGE

Chameleon Products will introduce ADP, a technology that applies any image, pattern or effect onto aviation-approved plastics such as polycarbonate, ABS, PMMA or PSSU. The process can be used to apply images onto any flat substrate, which can then be vacuum-formed into any 2D or 3D item by any manufacturing organisation. Chameleon Products will also unveil its Visionary technology, which can be used to create 3D images on substrates, which can then be attached to aircraft bulkheads or other areas.

breakout space

Contour Premium Aircraft Seating has been awarded the contract to manufacture Air New Zealand (ANZ)'s new premium-economy seat, Spaceseat. Laid out in a herringbone configuration, the design offers two options – an angled double seat suitable for couples travelling together, or a more private option for single travellers. Initially to be installed on ANZ's B777-300ERs, the design allows couples travelling together

to dine at the same table, while also providing extra lounging space.

"The ANZ Spaceseat takes premium-economy travel to a new level of experience for passengers and will set the direction for premium economy in the future," says Bob Lovell, technical sales director at Contour. "Contour is proud to have worked in partnership with ANZ on this innovative project and looks forward to further developments of this product."

**RAVE ON**

The IMS Company will display its newest portable media players (featuring 20-hour batteries), its fourth-generation terminal data loader (TDL-G4), and its new embedded AVOD system, Rave. Rave is based on a simple architecture, designed for ease of installation, low lifecycle costs and high reliability. The TDL-G4 features the solid state and wireless technology for high-speed, bi-directional data management and content loading services.

**LEADING LIGHTS**

Wessex Advanced Switching Products (WASP) will launch a new range of cabin lighting systems. Using the latest LED lighting technologies, the new systems include mood lights, wash lights, reading lights and customised lighting products, designed to satisfy requirements including variable lighting intensity and low voltage/low power solutions using either aircraft or independent power. WASP will also show its latest seat/suite control designs.

CLEAN UP

Zenda Leather will unveil a new and improved formula of its eZclean technology. eZclean is applied during the leather manufacturing process, and is designed to repel dirt and stains, making cleaning easier, and reducing maintenance costs.



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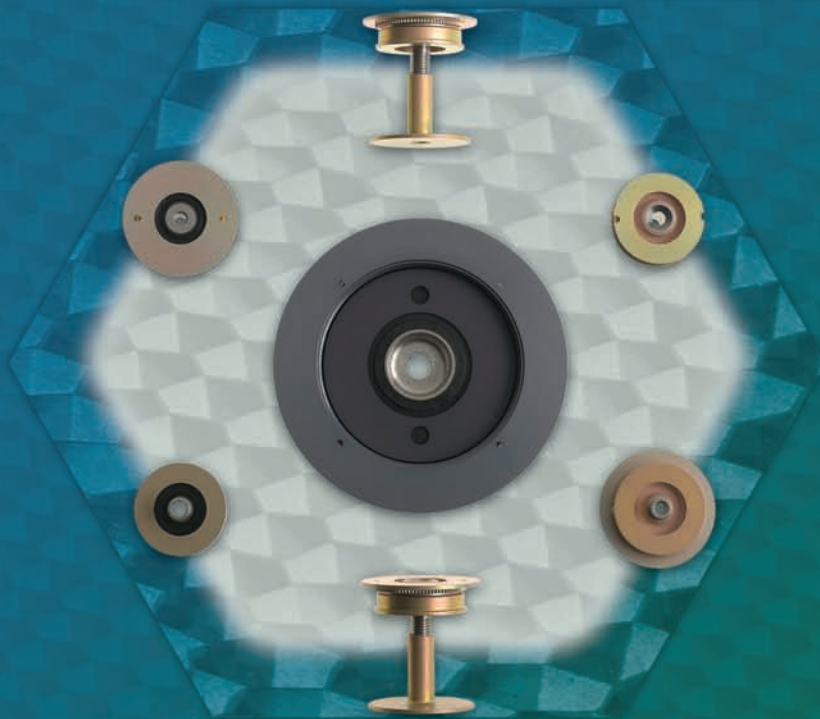
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height of fashion

B/E Aerospace will unveil its newest economy-class seating platform, Pinnacle. Pinnacle utilises advanced proprietary technologies designed to reduce cost of ownership, simplify maintenance and increase overall passenger living space. The company says the seat offers a 15% weight saving over the lightest seat on the market today, achieved through an increased use of composites, an

integrated lightweight comfort suspension system and a new design methodology that reduces parts by more than 25%. Pinnacle is designed for both narrow- and wide-body aircraft, and can accommodate a variety of comfort features and options.

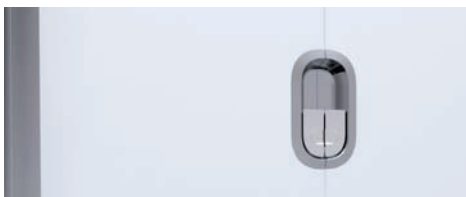


HOT PLATES

HighTech Finishing will introduce three new decorative plating finishes. "We were approached by Airbus to develop a finish based on a look they had seen," says Rick Niefeld, vice president of marketing at HighTech. "This led us to create a very unique Oil-Rubbed Bronze finish, which combines our electroplated product with a 'cold staining' process to achieve the desired look. The final outcome is an exceptional architectural look that is being reviewed by several aircraft interior designers and refurb centres." HighTech has also developed Spanish Bronze, an offshoot of Oil-Rubbed Bronze but with more of a visible brushed pattern. A third new finish, Crescent Gold, was created at the request of several European completion centres for use in their VVIP programmes. This electroplated finish is available in polished, satin, pearllite, frosted and hammertone textures. In addition to the new finishes, HighTech recently increased the size of its production tanks and installed new plating equipment.

GOING GREEN

Altitude Aerospace Interiors (Altitude) will focus on its new composite material, which is made from renewable resources and can be recycled after use. The material was developed in conjunction with the University of Auckland's Material Accelerator. The 'skin' is made from natural fibre – either hemp or flax, while the resin on the 'skin' is made from thermoplastic, which can be recycled. Altitude's eco-solution composite material has so far been made into a rigid panel, suitable for partitions, but the company is also looking to develop a flexi-core for curved panels. Research and development is currently under way into further reducing weight, and increasing strength and durability. Flammability and other material testing is also under way.



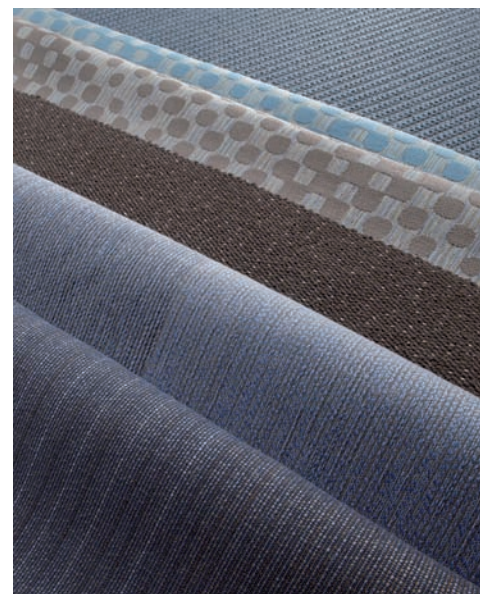
SMELL OF SUCCESS

Global Solution will display its complete range of travel bags, cotton items, electronic headsets and porcelain. The company can now offer fragrances created by Leonard Paris – L' Orchidee, Tamango, Eau Fraiche and Eau Fabuleuse – as well as the Ugo Vanelli perfume line.



CLOSE HARMONY

rohi will present Contrast in Harmony, a textile concept featuring three distinct environments which, although they communicate the differences between the cabin classes, are designed to do so in a restrained manner. The fabrics feature a variety of pattern-repeat lengths, materials and patterns, designed for a subtle, relaxed effect. Contrast in Harmony also features coordinated aircraft carpets from Anker.



COOKING UP A STORM

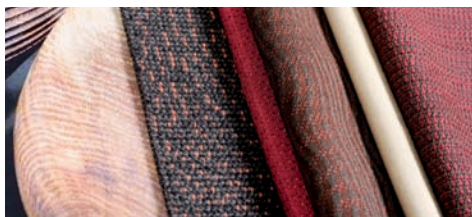
Sell will preview its new iP series of galley inserts, which are available in Atlas and Arinc versions and have been designed with user- and maintenance-friendly materials. Sell will also provide a multimedia view of a wide range of products, including its new oven, a coffee and beverage maker, bun warmer, water boiler and the latest in galley developments.

POWER UP**Astronics Advanced Electronics Systems**

(AES) will unveil three new power products, including its latest EmPower in-seat power supply (ISPS). This latest ISPS provides 200VA output, and is designed for high efficiency and low weight in a reduced form factor over the previous-generation ISPS. The new ISPS also boasts an integrated +5VDC output to charge up to three independent USB devices simultaneously. A new outlet unit that accommodates 110VAC and +5VDC USB will also be on display, and Astronics AES's new 150W DC Power Supply (DCPS) will be available to review. This new power supply provides four outputs of +28VDC current limited at 1.5A each. The 150W DCPS can be mounted on the seat in traditional seat-box fashion or on other non-seat locations such as the sidewall.

**CLOSE FOR COMFORT**

Lantal, building on the trends carefully researched and captured by its designers in its Conceptual Forecast 2010, will present products designed to contribute to a greener cabin and guarantee cost-effectiveness. These products include Lantal's range of Climatex LifeguardFR fabrics, which boast a climatizing function to improve passenger comfort, and are fully biodegradable. Their visual appeal is based on the themes of nature and privacy – themes that recur in a vast selection of hard wearing fabrics, lightweight carpets, and curtains. Lantal has also earned acclaim for its pneumatic comfort systems, which were introduced to commercial wide-body service with Swiss over a year ago, and will be installed and presented for the first time in a premium-economy seat with ZIM FLUGSITZ.

**eco warrior**

Recaro Aircraft Seating will show its complete economy-class seat portfolio, including the Crystal Cabin Award-winning SL3510 (pictured), an economy-class seat for short-range flights of up to four hours. Although the seat weighs just 9.1kg, Recaro designed it to also offer durability, material quality and comfort.

In addition the company will display a new business-class seat for seat pitches ranging from 45-55in. This seat is designed to offer maximum privacy and allow each passenger to select individualised seating positions while having no effect on surrounding passengers.

Recaro will also present its successful PL3510 seat with added legroom and comfort features, designed for premium-economy seating on long-haul flights.

**BOUNCING BACK**

Cabinair Services, a first-time exhibitor, will highlight its new rubberised arm cap repair service. The new system gives worn-out and faded arm caps a makeover by filling holes with a flexible material and replicating the surface texture before adding a new paint finish. The system is water-based and conforms to CS25.853. "When our customers put sets of seats through our workshop, the arm caps can sometimes be a bugbear. Typically, the arm substrate is okay, but the rubber looks tatty. In the past we had to order replacements, which caused delays and higher costs. With the new system, projects can go ahead more quickly and at a fraction of the cost of a replacement," says Tony Balazs, managing director of the company.

HOT ROD

GMT will exhibit a new generation of tie rods for suspending aircraft interior components (including galleys, lavatories, toilets and hat racks), developed for the A380. Based on a modular system, tie rods can be individually designed in line with requirements. To decrease weight, GMT developed the rod body out of carbon fibre material instead of metal, which it says leads to a weight reduction of up to 30%, depending on the length of the tie rod. Moreover GMT has optimised the assembly of the rod ends to the rod body.

LIFE-CYCLE PARTNERS

Townsend Leather Company and **Hulshof Royal Dutch Tanneries** will be exhibiting together as the Townsend Hulshof Partnership (THP). THP will exhibit a range of commercial aviation products and speciality leathers, demonstrating its maintenance and aftermarket care services, advising about pattern cutting capabilities, and introducing a newly engineered leather designed for a light weight.



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package deal -
innovation - know.
how - 100 years
experience - crea-
tivity - high end
products - leadership
- worldwide
support network -
added value - Know how
Long term par-
tnership - reactivity
- package deal - in-
novation - know.
how - 100 years of
experience - creativi-
ty - high end products
- leadership - worldwide
support network - added
value Long term partnership
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deal - innovation -
know.how - 100 years of experience

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tivity - high end
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partnership
reactivity -
package deal -
innovation
know.how -
100 years



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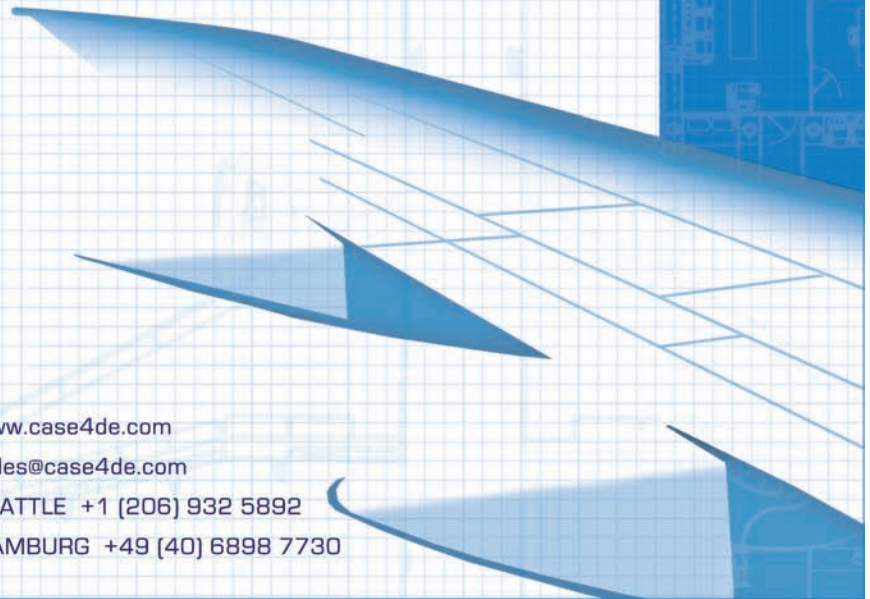
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to the letter

capricorn AUTOMOTIVE will exhibit the K-concept seat leg, a K-shaped composite component designed to combine innovations in weight and security – while offering a weight reduction of 1kg per component, the leg offers outstanding rigidity and mechanical strength, anchoring aircraft seats to the floor.

In designing its new product, the company drew on years of know-how gained from manufacturing high-performance motor parts and composite products for the international motor sports industry's most avant garde.



DESIGN FOR IFE

digEcor will display its new digEplayer L Series handheld IFE product. The digEplayer L7 and L10 offer 7in and 10in capacitive touchscreens respectively. They also feature a built-in optical mouse to aid with gameplay and internet browsing. Believing that an IFE programme can and should generate revenue, digEcor will also demonstrate its portfolio of revenue-sponsored entertainment programmes, such as advertising and shopping. In addition, the company will have a selection of FAA-certified cabin interior parts on display, including LCD monitors, LED lights, and audio and video reproducers.



LASTING IMPRESSION

Yarwood Leather, in conjunction with Regent Aerospace, will premiere a next-generation aviation leather that it says offers a panacea for many in-service issues caused by leathers in high-wear areas and a desire by airlines to extend aesthetic durability. Yarwood will also present its second-generation heat release compliant leather, Kalorlite, which it says meets OSU 65/65 alone and within many composite applications – enabling it to be used for both vertical panels and seating, particularly for first- and business-class consoles. Other products on display will include regular SupaLite leather (which weighs 600g/m²) and SupaLite Nano (which weighs 450g/m²).

MAGICAL MYSTERY TOUR

Heath Tecna's UK division will showcase its capabilities within the feature furniture, closet and stowage, seat furniture and composite board sectors, via an interactive tour utilising intelligent modern technology. Heath Tecna was recently selected by Qantas Airways to upgrade and reconfigure nine B747-400 cabin interiors. The arrangement calls for the company to provide its integration expertise to oversee the programme, produce reconfiguration kits, manage the delivery and installation of buyer furnished equipment from suppliers and obtain a supplemental type certificate (STC) from the FAA for all aircraft modifications. In addition, Heath Tecna will design and install new cabin furnishings for the main and upper deck of each aircraft, including new closets, coat locker stowages, floor-mounted stowages, furniture or monument-mounted stowages, partitions and composite curtain headers. Many of the new furnishings will feature stowage for literature or magazines, compartments for stowing shoes, integrated laptop stowage, fold-down baby bassinets and include provisions for emergency equipment.

TALK TALKS

AeroMobile will run a series of short seminars focusing on the realities of connectivity, covering subjects from determining the right bandwidth to the cost of remaining disconnected. AeroMobile will also showcase some of the latest developments to its technology, including the integrated connectivity and IFE on-screen notifications passengers can receive about incoming calls and SMS text messages via the Panasonic Global Communications Suite and eXPhone. The AeroMobile system is currently in service with Emirates and Malaysia Airlines. Customer launches this year include V Australia, Turkish Airlines and Lufthansa.

TRUE BREW

Iacobucci HF Electronics will unveil a new version of its Iacobucci HF Americana coffeemaker, made in compliance with the Arinc standard. The company says the use of a techno-plastic instead of aluminium for the body has reduced the unit's weight and power consumption. Other products on display will include an Arinc-standard rail for Iacobucci HF machines, and the WastePak trash compactor. Built in small dimensions and combining two tonnes of compacting force with low-level power consumption, this product can be installed in most long-range aircraft. Iacobucci HF Electronics, which is an official worldwide sales representative of MGS Galley Systems, will also demonstrate MGS's new Induction Heating Unit and cooking station, designed to deliver real restaurant-quality food on board the aircraft.

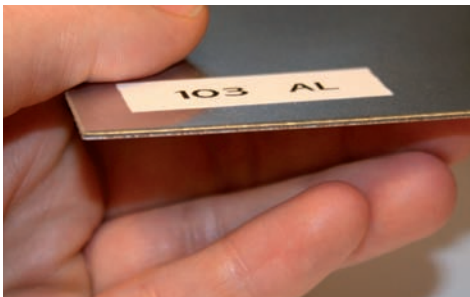
GET THE MESSAGE

ICG will exhibit the NxtLink 120A and 220A Iridium Communications Systems (ICS). These are designed to provide the flight crew with reliable communications facilities for both AOC and ATS messaging. The ICS-120A is a dual-transceiver device while the ICS-220A is a three-transceiver device that combines a single or dual channel of global voice and 2400 BPS data service with a second short burst data (SBD) channel in a single 2MCU LRU. This device provides the flight crew with an exclusive global voice channel and a dedicated Datalink channel to support ACARS, FANs messaging and CPDLC.



LIGHT AND SHADES

Lamera will display samples of its new Alubrix (aluminium Hybrix) material. The company won four Crystal Cabin Awards in 2007 for developing Hybrix, a hollow stainless steel sheet, and has applied this technology to aluminium to make it even lighter. "Alubrix is very promising and, as we hoped, even lighter than the successful original stainless Hybrix," says Mattias Grufberg, one of the founders of Lamera. Lamera was also nominated for a Crystal Cabin Award in 2008 in cooperation with Sandvik for introducing DecoBrix – colour integration in steel, essentially a nano-technology to produce pre-coloured metal on coil, so that neither painting nor decorative laminates are needed.

**BLU SKY THINKING**

Flight Display Systems, a first-time exhibitor, will show its next-generation Blu-ray Disc player, which enables passengers to watch Blu-ray and DVD movies, from any region in the world. The company will also display an iPod adapter cable for European customers, which incorporates some fire safety designs requested by EASA. The product allows customers to plug in their iPod to share video and music throughout the aircraft cabin.

**STICKING POINT**

Simalfa will show its new Simalfa adhesive programme for aircraft interiors. The water-based adhesive is specifically designed as a flame-retardant, environmentally friendly and non-hazardous alternative for the industry, allowing seat manufacturers to bond flexible foam and fabric instantly.

change is in the air

Driessen-Zodiac Aerospace will exhibit its new B737 MaxFlex2 galley, as well as its lightweight trolley developments. MaxFlex2 was jointly developed with Boeing for the new B737 Sky Interior and is designed to improve passenger service.

The flexibility of the new design will allow airlines, leasing companies and BBJ owners to select from a large selection of galley modules. Configurations can be customised with multiple completion kits or modules that are pre-certified. These configurations can be changed to a new arrangement at any time during the life cycle of the aircraft, as catering requirements, marketing strategies, routes and even operators change. Galley inserts from all approved suppliers can be selected to complete the final configuration.

**FIBRE PROVIDER**

Lumexis will provide a demonstration of its Fiber To The Screen (FTTS) AVOD IFE system, which is designed for the lightest weight possible. The system's 1Gbps fibre-optic channel eliminates all network and seat boxes.

NET GAINS

Row 44 will showcase its global inflight broadband system. The solution can provide high-speed internet, video entertainment, mobile phone support, and airline operational inflight communications.

FULL CIRCLE

Thales will feature its end-to-end IFE product and service offering by taking booth visitors through a journey from aircraft departure to arrival. The Thales IFE end-to-end solutions are designed to enable airlines to further streamline operations, personalise the flying experience and monitor the system and its impact on passenger satisfaction.

SOFT SPOT

Tisca Tiara will present a new collection of carpets, seat cover and curtain fabrics incorporating global trends in terms of designs, textures and colour combinations. Another collection on display, available off-the-shelf, has been developed for customers that need quick deliveries and short implementation schedules. Furthermore, Tisca Tiara will showcase novel and ultra-lightweight fabrics and carpets designed to lower kerosene consumption, reduce maintenance costs and minimise replacement and refurbishment costs. Another innovation on display will be a non-woven, ultra-lightweight carpet.



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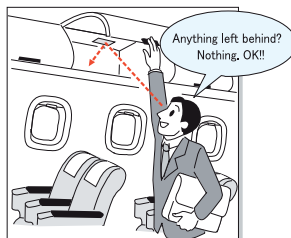


Passenger Convenience & Quicker Aircraft Turns

● For Passengers

Bin Check Mirror

To check your belongings



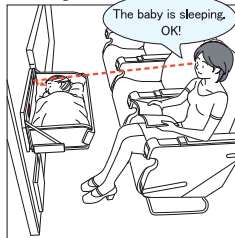
Cosmetic Mirror

Use as a magnifier to shave



Baby Check Mirror

To check your baby while sitting down

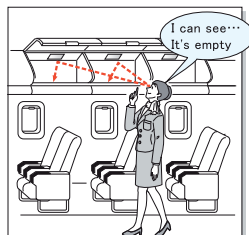


737NG Storage Bin

● For Flight Attendants

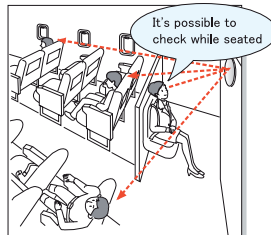
Bin Check Mirror

For security check



Cabin View Monitoring Mirror

To check passengers when putting on seat belts



Smile Check Mirror

To check your smile



the first in the world

KomyMirror PAT.

KomyMirror

Search

Komy Co., Ltd.

light duties

STG will showcase its SaftGlo photoluminescent floorpath marking systems, which are fitted to over 5,000 aircraft worldwide and supplied as OEM to Boeing, Embraer, Goodrich Lighting, Fokker and BAe Systems. STG will also display its ColorMatch OC system, which is designed to simplify installation.

In addition, STG will exhibit its newest product, WEPPS, which manages and powers emergency lighting systems with a built-in wireless monitoring and diagnostic capability. STG says WEPPS is a 'fit for life' solution that needs no charging and no scheduled maintenance. WEPPS is certified for Boeing, Bombardier, Fokker and BAE aircraft, with certification for other aircraft types under way.



ALL IN ONE

Diehl Aerospace and **Diehl Aircabin**, will demonstrate its ability to provide floor-to-floor lining and finishing, combined with all-LED mood lighting systems and electrical components such as starlight-ceilings, e-latches. Diehl Aerospace provides cabin lighting and avionics systems, while Diehl Aircabin is responsible for cabin lining and monuments.



TOTAL ECLIPSE

Replin Fabrics will launch Eclipse, a new collection of fabrics. The fabric has been in development for the last three years and will carry Replin's own anti-stain finish, which means it will be wipe clean. For use on bulkheads, class dividers and seating pods, the fabric complements the company's signature WNN seating and curtain material. Eclipse will be released in a collection of patterns and colourways, but the Replin design team will also offer custom design and branding. The stain-resistant finish can also be used on seating fabrics and is currently being trialled. Replin says tests to seating fabric have shown an 80% reduction in dry cleaning with the subsequent benefit of reduced cleaning bills, improved cover life and reduced downtime. "The Eclipse collection is a world-beating product with full accreditation for all aircraft fire, toxicity and smoke requirements," says Hamish Campbell, business development director at Replin.

DOUBLE ACT

TIMCO Aviation Services subsidiaries TIMCO Aerosystems and Brice Seating will display two new products – a galley concept and a premium-economy seat, B3050. The new galley concept is designed to more easily meet operator configuration preferences during the development stage. TIMCO says it will also be more easily adaptable to meet service change requirements over the life of the aircraft, and features lower overall weight to promote greater fuel cost savings. The B3050 premium-economy seat is the latest in TIMCO's Featherweight line of passenger seats. In addition to providing greater passenger comfort utilising less space, the B3050 is designed to deliver significant weight savings. TIMCO says that both the new galley and the B3050 seat make efficient use of fewer parts and innovative materials, supporting a lower ongoing cost of maintenance.



COZY UP

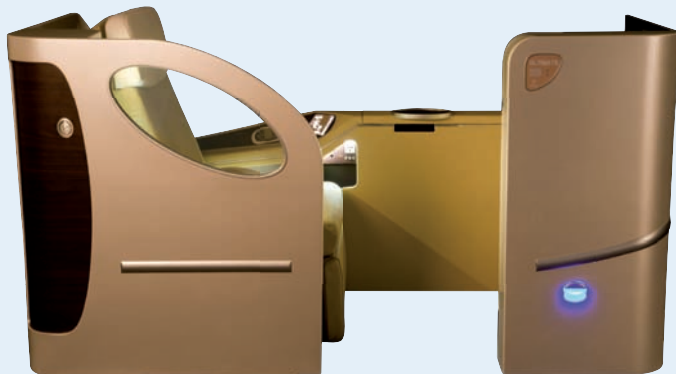
Thompson Aero Seating will display the economy-class Cozy Suite (pictured), which the company says can enable up to 14% additional seats to fit into a typical wide-bodied economy-class cabin. The Cozy Suite features two armrests for each passenger, more legroom and an improved sleeping position. The company will also display the new premium-economy Sirius seat, and the business-class Vantage seat. Vantage is a lie-flat seat that Thompson says can enable up to 30% more seats to be installed compared to other lie-flat seats.



test bed

EADS Sogerma will exhibit a mock-up of Ultimate Sleeper, the premium-class bed assembly it is developing in cooperation with Lufthansa Technik. EADS Sogerma will offer Lufthansa Technik's aerosleeper concept as an integrated superior variant of its Ultimate 17 first-class seat (Ultimate 17 pictured).

EADS Sogerma is responsible for transferring the concept to production



and plans to offer its customers the new model this year.

Lufthansa Technik will assist with technical expertise and developing the bed assemblies.

FAMILY AFFAIR

ZIM FLUGSITZ will display its ECO-01 family of economy-class seats. The family, based on a common modular structure, ranges from a short-haul seat up to a new premium-economy seat equipped with IFE and Lantal's air cushion system. The company is also currently developing a new business-class seat, BC-01, to complete its product portfolio. The company can also certify the entire aircraft layout under its Part 21J approval.



PICK AND CHOOSE

Tapis will display its Ultraleather faux leather, which is made from polycarbonate. The company offers a custom-grain service with Ultraleather, which allows airlines to match any texture or colour they want, as an alternative to using a laminate or painted surface. Tapis's operations are ISO 9001:2000 certified.



CUTTING EDGE

Cutting Dynamics will showcase its 16g-compliant, 1.5 lb 100% thermoplastic/composite seatback, as well as 100% thermoplastic/composite armrests, beams and supports. The company's goal is to help customers reduce weight, while meeting their strength requirements.



IT'S A WRAP

Thermax will display its Seamless Wrap PTFE tape. The company says its Seamless composite wire demonstrates improved performance when pulled through air-frames, around pins, and when inserted into connectors – showing no tearing or nicking. The company will also showcase its Gigabit-Plus Ethernet cables, which are designed to accommodate increased data rates without the cost of reinstalling cable.

FOAM COMFORTS

Greiner PURtec will show its latest aviation foam cushion and upholstery technology solutions, including isoBLOX, STIMUlite, All-in-One, areas and bio-sphere, as well as concepts for weight-saving foams.

SITTING COMFORTABLY

Aeristo will unveil several new products designed to enhance inflight seat comfort and save weight. These include VentiMesh, described by the company as a passive seat ventilation and comfort material with excellent fireblocking capabilities. Also on show will be Fyairheat, a nanocarbonfibre foil heating system that can be installed in seat cushions, panels and flooring, and is designed to be extremely lightweight, also qualifying as a RFI shielding material. Another new product is Aerovitt, a pneumatic seat adjustment system for lumbar and side support with optional massage systems and seatwalking.



CONFERENCE CALL

TriaGnoSys will concentrate on its Voice Compression and Enhanced Multiplexing technology (VoCeM), designed to increase Inmarsat or Ku-band by a factor of between four and ten, and increase the number of simultaneous calls available. Vocem can be added to any existing GSM, 3G/UMTS or VoIP satellite communications system, provided by any supplier, with a simple software upgrade. TriaGnoSys will also demonstrate its vision for the wireless distribution of IFE content and onboard wireless sensor networks.



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Demand for in-seat power is soaring with the increase in connectivity installations



power surge

With the recent flurry of airlines worldwide expanding off-aircraft data services (internet, mobile phone, SMS, etc), Astronics says the complementary nature of in-seat power systems and connectivity services is further driving demand for its EmPower systems.

"Most airlines installing new data services on their aircraft are taking advantage of this opportunity to also install in-seat power, and have chosen to add it in all classes of service," says Dennis Markert, director of new business development at Astronics. "Demand for in-seat power is increasing as passengers carry multiple digital appliances such as laptops, DVD players and mobile phones onboard. PED power is an increasingly expected amenity and brand discriminator for airlines."

Astronics has performed extensive battery life testing on the most popular laptop brands. Markert says the research demonstrates that when using WiFi to surf the internet, send emails, or stay connected, passengers are likely to experience a 34% reduction in laptop battery life. "So with the average laptop battery lasting around two hours, passengers actually have an approximate 1.2-hour operating period. This assumes they boarded the aircraft with a fully charged battery," says Markert. "Connectivity take-up rates will be negatively impacted if passengers cannot take full advantage of the communication service because of laptop battery performance. Business cases for aircraft connectivity must therefore consider the installation of in-seat power systems such as the Astronics EmPower system, to keep their paying passengers connected and satisfied."

Virgin America, for example, cited its inflight power outlets as a factor in passenger airline selection, based on a survey of its frequent flyers in the third-quarter of 2009. Likewise, American Airlines reported in May 2009 that dead laptop batteries topped frequent flyers' complaints in an online survey sponsored by HP. A combined 67.7% of those surveyed said a dead battery (41.4%) and no place to plug in (26.3%) were their largest complaints. Power outlets were in high demand at the gate and onboard – 24% said access to electrical power is the most important technology amenity onboard.

Markert says that in-seat power is now an expected amenity on all long-haul aircraft, and in all classes of service. "We used to provide (CBB) wireless broadband on our B747-400 fleet," says Virginia Mau, general manager of China Airlines' product planning department. "The product was greatly welcomed by our passengers. However, we didn't equip the aircraft with power outlets beforehand, so we received quite a few complaints from our passengers for the inconvenience."

Astronics thus believes in-seat power will play an ever-increasing role in passenger satisfaction and the success of connectivity business models. "Passengers willing to pay a fee for data services may not do so if power is not available," says Markert. "In-seat power is a complementary system that will promote usage and increase the take-up rate of such connectivity systems, as well as provide passengers with the ability to generate their own entertainment experience or work, via their own personalised digital environment."

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rave review

IMS believes that IFE has become over-complicated, resulting in unreliability, increased weight, power and higher cost. "We asked ourselves: can we combine our knowledge as a leading provider of portable media players with our experience working behind the scenes in the development of many of today's embedded IFE systems to deliver a solution?" says Joe Renton, founder and CEO of IMS. "The next natural step in the evolution of IMS was to combine our knowledge and experience in systems, portables and world-class content management solutions into a single engineered system that was first and foremost reliable, affordable and very easy."

The system that resulted is called Rave. IMS has re-engineered embedded IFE, with the aim of taking out weight and power and giving back reliability. But no matter how reliable a system is, it is only as good as the last flight leg. "Airlines need 100% seat availability, so we developed a patented dockable seat display unit (SDU) that allows the flight attendants to restore service inflight," says Rod Farley, president of IMS.

The company also wanted to address scalability. "Larger numbers of passengers require larger servers or more of them, more distribution boxes and faster networks. This means complexity, power, weight and expense; and often it means unreliability," says Renton.

The secret to Rave's simplicity is a unique system architecture built around a fully independent and autonomous SDU, designed to deliver a feature-rich experience to passengers.

SDUs can be installed in a standalone fashion, or a single system controller (SCU) can be added to provide a fault-tolerant network that doesn't require area or seat distribution boxes. Additionally the SCU provides broadcast media, background content loading and the interface to the aircraft.

For IMS this all adds up to excellent reliability. "Since the seat does not depend on large complex networks and media servers to stream content, a failure of the head-end or the network does not impact passenger audio/video on demand entertainment," says Renton.

IMS went back to basics with its new embedded IFE system

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Sabeti Wain
Aerospace examines
the advantages of
laminated seat covers

coverall

Many top airlines have some form of laminated seat cover, many of which are supplied by Sabeti Wain Aerospace, which has its own in-house lamination facilities. In fact customers to date include Emirates, Etihad, Qatar Airways, British Airways, Qantas, Jetairways, Jet 2 and Fly Dubai.

Paymen Sabeti, director of Sabeti Wain Aerospace, emphasises the flexibility and uniformity that laminated seat covers can offer. "Lamination takes the limpness out of the fabric or leather and allows a 3D shape to be tooled so that every seat looks identical and maintains its fresh and neat appearance for longer," he says. "Both fabric and leather can be laminated, allowing airlines to choose materials that suit their budget and the class of service. The flexible nature of laminate also makes it easy to incorporate customised add-ons such as life vest pockets, seat supports, arm-caps or acoustic panels to facilitate rest."

Sabeti Wain Aerospace's lamination process, coupled with its expertise in traditional pattern making, enables it to incorporate bespoke design and style features into its seat covers. "Our robust lamination process has not only been tried and tested in-house over

the last 13 years, but also for 10 years with a major airline," says Sabeti.

With their first purchase of Sabeti Wain Aerospace's laminated seat covers, Emirates, Thomas Cook and First Choice undertook detailed studies of the benefits involved. "When they came to replace the seat covers, they all chose laminated again," says Sabeti. "The enduring visual appeal was just as important as the ongoing cost savings."

Cost savings are always high on the agenda for airlines, with profits being squeezed at both ends by rising fuel prices and competitive industry pricing. Each laminate cover that Sabeti Wain Aerospace supplies comes with a 5mm bonded foam backing, so the traditional foam back that sits on the seat structure can either be reduced or done away with completely. "Not only does this keep the initial cost of the seat down, but it also reduces the total weight of the seat, which translates into a direct reduction in fuel costs," says Sabeti.

The company has also invested a lot of research into the cleaning, maintenance and replacement of laminate seat covers. As well as an easy-fit design for quick installation, the company offers a comprehensive post-sales service.

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Luxurious veneers and finishes could become a differentiator throughout the cabin

atouchofclass

Luxurious interior finishes once limited to private jets are now making the crossover to some first- and business-class commercial cabins. "Until now, it has been a long, hard and mostly cost-intensive procedure to apply common private jet interior features such as veneer and chrome-plated surfaces to commercial aircraft interiors," says Ugur Ipek, director of uguripekdesign. "It is needless to list all the hurdles of higher certification demands and quality requirements, but because of the success of fractional jet ownership, first-class cabins are facing a real competitor. Passengers are demanding more than ever – whether the issue is the cabin, seating comfort, pricing, service, or the first impression on boarding the aircraft."

Ipek believes that efforts by airlines to differentiate the seating classes more visibly, combined with efforts by suppliers to improve quality, mean that we are now stepping into a new era in terms of surface and finish in the commercial sector – beginning in first class.

"The first applications began in first class, and as the technology developed and became more affordable, it has expanded already into business- and economy-class," says Ipek. "A similar model can be seen from the automotive sector. When airbags, anti-blocking systems and so on were first introduced, they were the signature of the very top-end cars. Nowadays, every car manufacturer offers those features."

One supplier making its mark by designing high-quality surface applications that can also

meet commercial demands is Decorative Products, which supplied products for Emirates' new A380 – in first, business and economy class. The finishes used include a synthetic veneer that the company says is 10 times lighter than real veneer. The company has subsequently become a Hydro Transfer Printing Technology (commonly known as Decorative Film Coating) supplier for Airbus.

Ipek says these finishes could be interesting for many airlines. "Premium economy has been attracting many business-class travellers into lower-revenue seats. Sooner or later this will result in airlines upgrading the look and feel of the business-class cabin to achieve higher differentiation between the classes – a difference that passengers can see and feel," he says.

Following this logic, Ipek believes the next potential customers could be regional and low-cost carriers. "When fares are harmonised the differentiation issue will arise. One of these carriers will start serving free drinks, free food, put more emphasis on the cabin etc," he says. "It is not just about an exclusive and expensive look. It is about welcoming your passenger by offering them an atmosphere worth spending time in, even if their fare is modest. The low-budget design hotel chain Motel One is a shining example."

Ipek again looks to the automotive world as a lesson in how differentiation might be achieved. "As innovative technologies, safety features, reliability, comfort, and gadgets become omnipresent in all cars, differentiation is achieved via the design and the image."

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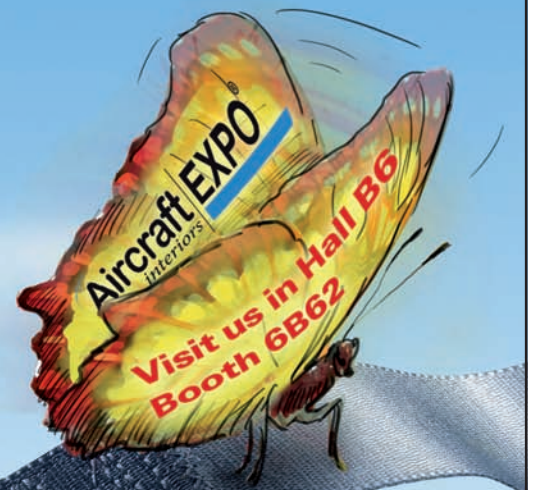
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Rockwell Collins continues to update its IFEC offerings in line with ever-evolving expectations

moving on up

Rockwell Collins continuously enhances its IFEC portfolio to address changing passenger needs. Its popular overhead dPAVES system is one of the most recent products to undergo a facelift, and has been selected for over 200 aircraft since its 2008 introduction. Dave Vernon, director of airline marketing for Rockwell Collins, believes the product's success relies on flexibility, reliability and cost-effectiveness. Non-encrypted content can be handled by airlines independently of Rockwell Collins' content management group, enabling airlines to respond to commercial opportunities by replacing local content at a moment's notice, anywhere in the world.

Adding to the value of the dPAVES system is the Airshow moving map, today used by more than 140 airlines and 4,000 business jet operators. As part of Airshow's ongoing enhancements, Rockwell Collins unveiled the development of 3D maps last year. With no extra hardware required, the product showcases high-resolution topographic/photographic map sets, flight information, ocean floor details, place names in many languages and a point of interest database. Upcoming software updates will include more than 100 new features and enhancements.

The company has also placed a priority on working with the major aircraft OEMs to ensure IFEC system upgrades are in sync with their aircraft interior upgrade roadmaps. Right now, Rockwell Collins is working closely with Boeing to incorporate updates to the dPAVES platform as part of the new B737 Sky Interior cabin offering. Updates include retractable 16:9 LCD high-definition (HD) ready displays, an enhanced

touchscreen flight attendant interface, and USB port for easier data on- and off-loading. A similar programme is also in the works with Airbus for the A320 aircraft family.

Another area Rockwell Collins monitors closely is the airline applicability of features from its Venue cabin management system for business jets. Venue provides high-speed connectivity, a suite of business applications, and a wide range of HD entertainment and information options.

"Working with the aircraft OEMs is crucial, as is having options to utilise innovations from our business jet cabin product portfolio," says Vernon. "By leveraging all these resources, we achieve outstanding reliability and quality." One example Vernon points to is the migration of a Venue cabin control touchscreen panel into an air transport flight attendant IFEC control interface, which he says "significantly reduces workload".

Refresh programmes are also in works for existing twin-aisle systems. "Rockwell Collins remains committed to ensuring all of our existing systems stay current," says Vernon. "We place special emphasis on aligning with the needs and wants of our airline customers and their passengers, with improvements in efficiency and usability from a logistical perspective."

Vernon is also excited about innovations yet to come. "We will continue to explore all IFEC product evolution options. This includes distributed and interactive entertainment for various air transport aircraft platforms, as well as different forms of cabin connectivity," he says. "Rockwell Collins remains committed to the IFEC business in a big way."

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Over the last two years, the programme has seen Tapis develop custom grains and finishes for the 2009 Skytrax World Airline Award-winning first- and business-class cabins of Singapore Airlines (best first class), Etihad Airways (best business class), Swiss Air (best airline, Europe), and Kingfisher Airlines (best airline, India/Central Asia). For each, Tapis created a customised programme to meet the designers' and airlines' precise needs for texture and colour.

"Our custom grain capabilities allow airlines to use luxurious and consistent soft goods that match hide used in other parts of the aircraft, rather than use a laminate or painted surface. As a result, the designer is able to create an innovative and distinctive cabin design," says Jason Estes, sales manager at Tapis.

Tapis's fabrics can also be found in the cabins of Cathay Pacific (airline of the year and best airline, Asia), Qantas (best airline, Australasia), Qatar Airways (best airline, Middle East), and LAN Airlines (best airline, South America).

All Tapis' Ultraleather products are made with polyurethane polycarbonate, which the company says boasts strong green credentials compared to alternatives such as vinyl. "Finished fabrics made out of polyvinyl chloride (PVC) are nearly environmentally indestructible and can release hydrochloric acid and other toxic compounds

when produced or burned. Our polyurethane products don't contain the volatile plasticisers and stabilisers found in vinyl," says Estes.

Ultraleather is also designed for the lowest possible weight, to help reduce fuel consumption and save money for airlines. "Ultraleather weighs in at half the weight of genuine leather, which reduces the fuel consumption on every flight. It also has 100% yield, which means low cutting waste," says Estes. "While natural leather can weigh 700-800g/m and lightweight leathers can weigh 370-400g/m, Tapis's Ultraleather weighs in at just 310g/m."

Ultraleather is offered in many different patterns and grains, including Contour, a multi-stretch fabric for curved surfaces. Other recent innovations include the lightweight TapiSuede Strie and TapiSuede Flannels, which Tapis says pass FAA commercial testing, including AN61 heat release and smoke toxicity requirements. These products offer yet another elegant option for vertical surfaces.

Headquartered in Armonk, New York, Tapis also has a facility in Dallas, Texas, and boasts a distribution network that spans the globe. Founded in 1977, the family-owned company is a qualified vendor for Boeing, Bombardier, Cessna, Dassault Falcon Jet, Gulfstream Aerospace, Hawker Beechcraft, Duncan Aviation, Midcoast Aviation, Jet Aviation and various completion centres and commercial airlines around the world. The company's operations were certified to the ISO 9001:2000 International Quality System Standard in October 2008.

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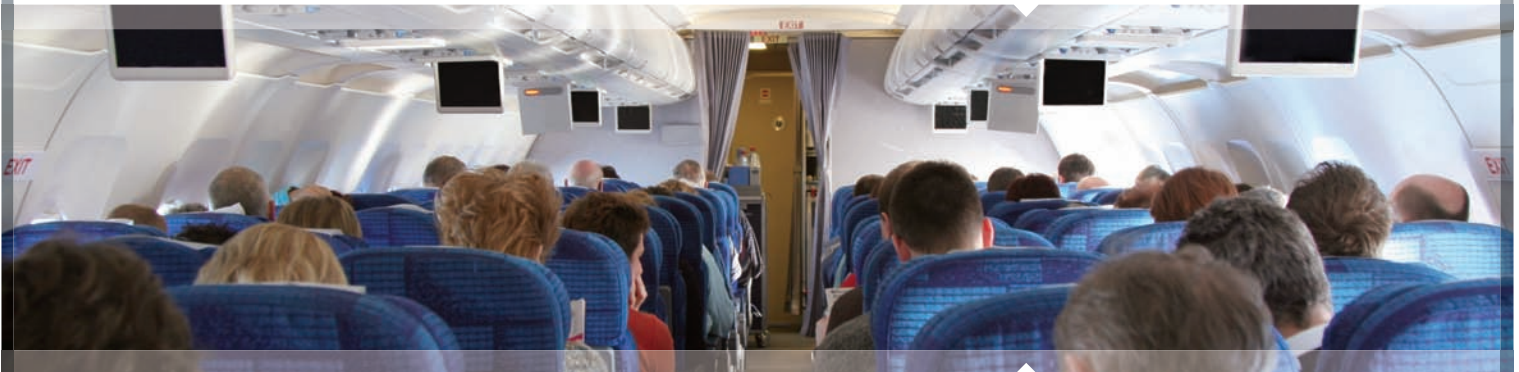


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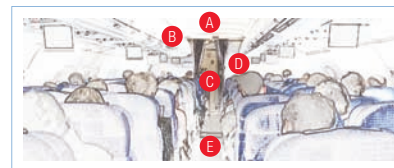
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Peter and Angelika Zimmermann, CEOs of ZIM FLUGSITZ, give an update on the company's ECO-01 economy-class seat



offtheground

What are you focusing on at the moment?

We have successfully completed our launch phase and we are now ready for new customers. This is borne out by our status as a certified Lufthansa supplier. We delivered the first ship sets of our ECO-01 economy-class seat in December 2009. During 2010 we will deliver ship sets each month for installation on A300, A310 and B747 aircraft.

How does your product meet demand?

ECO-01 is based on a modular structure and can therefore be customised for short-, medium- and long-haul flights, making it suitable for a wide range of customers. It's like buying a car – the customer can select from a catalogue and compose their own seat. The product is made in Germany, 16g certified and optimised for the lightest weight possible.

Where does your company fit in the market?

We are prepared to handle orders from one ship set up to the retrofit of an entire fleet. At the moment we are targeting customers with smaller demand, for whom flexibility and a swift response are vital. With our medium-sized organisation we are extremely effective and respond to any customer requests within a very short period of time. We also have short lead times for each volume ordered, as well as for our spare parts, and we can offer full customisation. For anybody who is looking for a 'no-worries' package, we can handle the design, layout work and coordination with authorities.

ZIM FLUGSITZ aims to offer each and every customer a product that yields low total cost of

ownership, without compromising quality. This strategy also extends to our after-sales and spare parts services.

How challenging has it been getting ECO-01 off the ground?

It all went according to plan. From the beginning we established a second-source strategy for each supplier, so we could control quality and output and react swiftly in the case of irregularity. Of course we have faced typical optimisation challenges. After delivering the first ship sets, we fine-tuned our engineering and production processes, so our highly motivated teams are now ready to ramp-up production.

What other products do you offer?

We offer seating solutions for all cabin classes, based on the same basic structure. Our business-class seat, BC-01, is currently under development. We also have a premium-economy seat that is available with Lantal's innovative air cushion system for long-haul flights.

We have devoted a lot of time to ensure we are able to integrate almost any IFE system on the market. We will also be able to certify the entire layout, and this makes us an all-round supplier.

How are you preparing for the future?

We will continue with weight reduction. ECO-01-S weighs just over 9kg, but we are confident we can reduce this to less than 9kg in the near future. With the basic modular principle, these weight savings will be applied throughout our entire product range, even on our premium-economy- and business-class seats.

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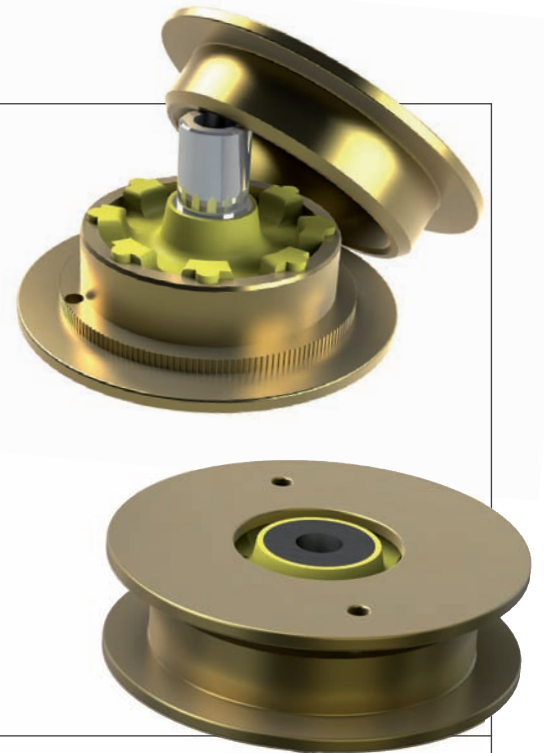
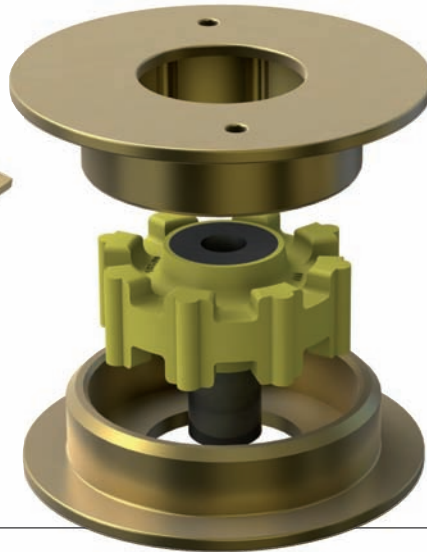
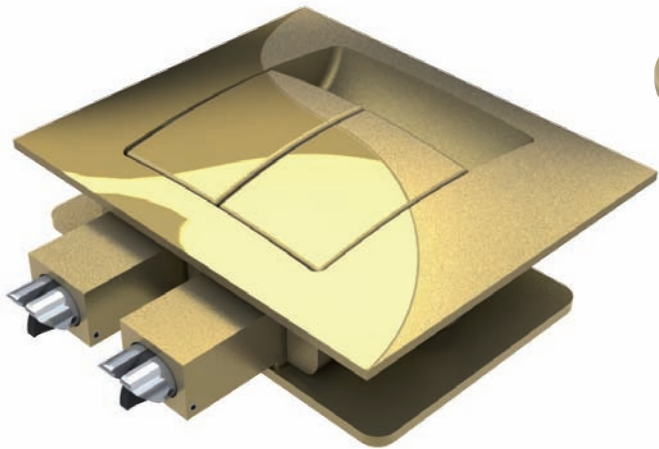
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When every ounce counts, even the fastenings need to be lightweight

in the detail

As designers and engineers search for ways to lighten aircraft interior structures, The Young Engineers (TYE) continues to design and develop new fastening products made from high-strength composites such as polyamide-imide (PAI) and polyetherimide (PEI).

The company recently added a composite/metal self-locking threaded fastener to its range of composite honeycomb panel fasteners, which also includes clearance hole, shear, floating nut and self-locking threaded fasteners. This latest variant is designed to give the security and stability of a metal self-locking thread, with a non-corrosive, lightweight and environmentally sensitive composite shell. Composite fasteners are currently being used and tested in a wide variety of interior structures, including lavatories, galleys, floor structures and stowage bins.

TYE's management team boasts nearly 200 years of collective experience in the aerospace fastening arena. The company has also partnered with design and development company Applied Concepts Aircraft Solutions (ACAS) to bring the patent-pending Loret Latches and Loret Isolator Insert product families to the marketplace. These two ranges define the companies' 'open source approach', where customer input helps drive the design and development process. Not only is user input sought from an engineering and functional standpoint, but also as it relates to aesthetics.

The Loret Latches can be customised with passengers' aesthetic requirements in mind. The latches' two-part design consists of an actuation

device (the visual part of the latch) and the mechanism assembly (the operational part). The mechanism can be teamed with a wide selection of actuation devices, including push button, rocker button, paddle or multipoint.

TYE says that the latches are easy to install, can be mounted to various panel sizes and each includes an integrated backplate. While standard styles will be available, TYE will also work with designers to develop signature latches designed for specific aircraft programmes or types, including corporate or private logos, customised finishes, and specialised actuation devices.

Meanwhile, Loret Isolator Inserts incorporate an elastomeric isolation device into a panel fastener. The Isolator Inserts are installed in a similar fashion to standard fixed inserts, but provide isolation from vibration and noise. They can be incorporated into a panel or component (including cabinets, galleys, bulkheads, ceiling/sidewall/dado panels, and bulkheads) that can be directly secured to the airframe or bracket via a wide variety of internally threaded, externally threaded or clearance hole attachments. Certain styles even have the capability to attach to seat tracks or are adjustable linearly and/or around the centreline of the part.

TYE is an ISO9001:2000, EN/JISQ/AS9100:2004 and Nadcap-certified manufacturing and design company that also maintains FAA TSO C148 authorisation and US Defense Logistics Agency QSLM approval. The company is based in southern California, USA.

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A new galley equipment manufacturer is aiming to balance a light weight with a light price

finebalance

As airlines look to reduce weight and save on fuel burn, a new manufacturer of inflight galley equipment is concentrating on delivering products to meet these needs at realistic prices.

Korita Aviation, part of the Netherlands-based Direct Aviation group, was established in 2006. Its challenge has been to balance the production of a reduced weight trolley, while still offering innovative design and competitive pricing.

"Over the last few years lightweight trolleys have proven expensive and financially difficult for airlines to justify replacing within a fleet," says Jamie Mellene, sales and marketing manager at Korita Aviation. "By redesigning the trolley to reduce weight, yet retaining traditional design and quality materials, a lighter trolley is now available at pricing levels more acceptable for airlines to realistically consider replacing older, heavier equipment."

Korita Aviation's modern manufacturing facility is located in Suzhou, China, a two-hour drive by car from Shanghai Pudong airport. The facility boasts combined Chinese and European management. Within four weeks of production, Korita's products are shipped to Korita's base in Nuth, in the south of the Netherlands, from

where they are exported globally. The company operates under ISO 9001 and AS9100 certification, and EASA and FAA certifications were granted in 2009.

Many European and Asian airlines have already chosen to fly with Korita equipment, including Air Berlin, Austrian Airlines, bmi, Singapore Airlines, Air China and Thai Airways. "Today's aviation market remains competitive and demanding, and we believe airlines welcome a new manufacturer that can offer flexibility and choice with the ability to deliver at shorter lead times," says Mellene. "Offering a weight reduction on equipment is essential for today's market. However, what is just as important is offering airlines a product that will meet the demands of the harsh working environments that trolleys encounter on a daily basis, and reduce maintenance issues to a minimum in the future."

Korita's trolleys are available in standard or custom sizes and specifications, with options including lightweight wheels, CNC-milled doors and slam-shut locking systems – so each airline can specify the right equipment to meet their individual onboard requirements. The range also includes containers, oven racks and drawers.

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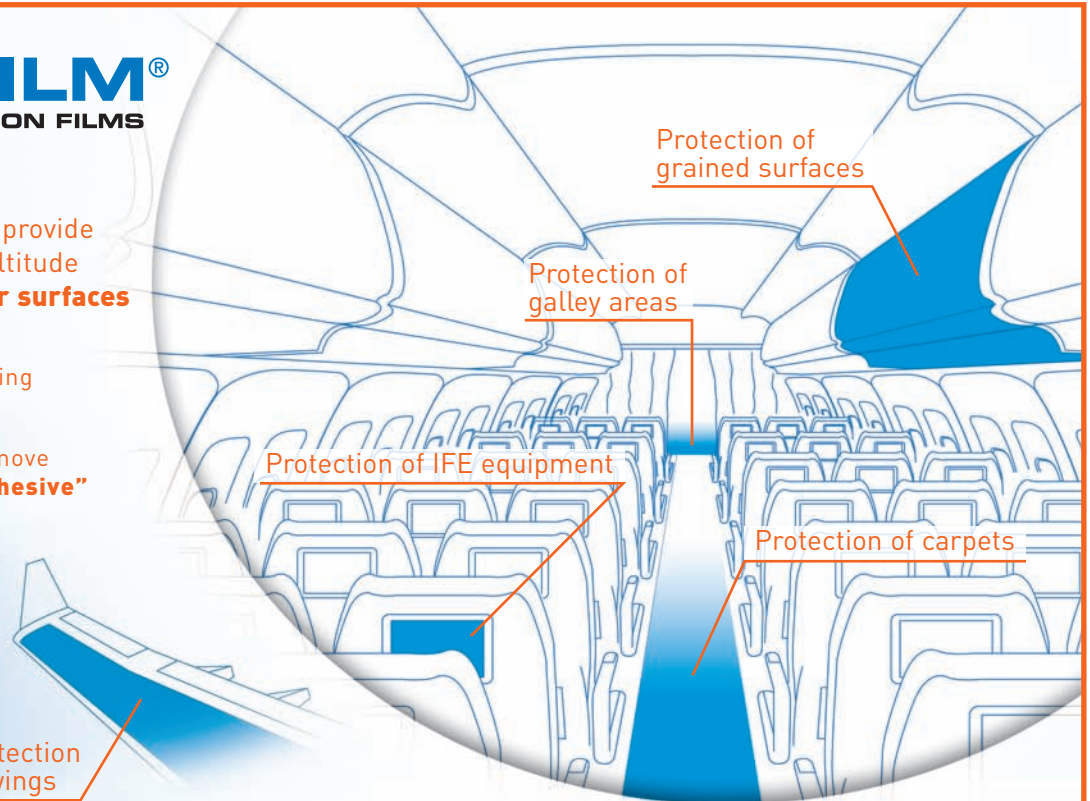
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A new container system is enabling airlines to keep food and drink at optimum temperatures for longer periods

the long run

B&W Engineering's new A-LogEqu container system, EVO II, is designed to allow airlines to keep food and drink hot or cold for longer – meaning that edibles can be prepared solely at the caterer's facility for a more controlled and cost-efficient catering process.

For example, sandwiches can be kept at 4-8°C for up to 17 hours, and coke and beer can be kept below 8°C for up to 30 hours. Meanwhile wine can be kept at optimal temperature for up to 17 hours, ice cream for up to 23 hours, coffee/hot water for up to 24 hours, and dry ice for around 110 hours until it is up in smoke.

B&W says that goods can be kept in the Hazard Analysis Critical Control Point (HACCP) chain for a very long time without any connection to the aircraft, and EASA confirmed that no certification is needed. This can lead to cost-savings, as well as increased onboard sales – food and drink can be served at their best, and hot food can realistically be served on short-haul flights.

The company says that because edibles can be stored for longer, or even left in the aircraft overnight, airlines can save a lot of money on catering stations using A-LogEqu EVO II. Money can also be saved on dry ice, as less is wasted,

and in addition the solution negates the need for ovens and coffeemakers.

Another benefit highlighted by B&W is reduced power consumption and weight savings, which it estimates can save more than 3,000 tonnes of CO₂ a year for a fleet of 100 narrow-bodies if 50% of the galley inserts are replaced.

A-LogEqu containers are manufactured to be Atlas- and KSSU-standard compatible, but customised dimensions are possible as well – the insulation material is not limited to the Atlas dimensions. As a result of their high-insulation performance, the A-LogEqu containers could be kept thin-walled, to provide maximum space.

The latest A-LogEqu EVO II generation, recently awarded a 2009 International Travel Catering Association (ITCA) Mercury Award, represents another big step in development over its predecessor EVO I, which won an ITCA Mercury Award in 2008. B&W Engineering has won a total of four ITCA Mercury Awards since the company's foundation 15 years ago. A-LogEqu EVO II Hot Water Dispensers have already completed more than 500,000 unit flight hours since being put into airline service in November 2009.

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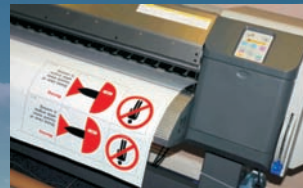
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changingroom

Blue Sky's cleverly redesigned architecture makes it possible to seamlessly convert economy-class seats into economy plus or premium-economy seats without physically changing the seat pitch, permitting the cabin seating layout to be changed on every flight in response to passenger demand. The facility to upgrade effortlessly, whether online, at check-in or onboard, enables airlines to optimise revenue and passenger yield, increasing operating profits. Conceived to resolve the conundrum of maximising space within economy class while eliminating the physical elements that can contribute to the onset of DVT, Blue Sky's Premium seat won British Invention of the Year's top Diamond Award in October 2006.

Blue Sky says the Premium seat is scalable for premium-economy and business-class cabins without weight penalty and provides up to 6in more legroom and 40° recline. There is no undercarriage to obstruct under-seat access and no need for the back to recline into the passenger envelope behind. New models for 2010, to complement the Premium seat with its single actuator, include the Economy 28 and the Economy Plus, which will have a horizontally sliding seat platform.

cleanliving

PSA has worked alongside airlines for more than 30 years, offering a complete range of products and equipment for interior cleaning, while keeping pace with international regulations, environmental considerations and airlines' constraints. Because the first impression counts as passengers board the aircraft, cabin appearance has become a cornerstone of a company's brand image. And in a world of harsh competition, the company says basic interior cleaning is simply not enough – skimping on hygiene is a false economy, considering the negative impact it can have on a company's image. "The worst discomfort, especially during long-haul flights, comes from the toilets," says Marie-Thérèse Houriez, of PSA's sales department. "If not treated, bad smells can spoil a journey, especially for passengers sitting near the lavatories." PSA's solutions for this potential odour problem include the liquid Lavodor Eliminator for the toilet bowl, and Aircraft Odor Eliminator spray for the cabin, galleys and lavatories.

For disinfection, the company offers a steam machine called Extravap 3000 for basic disinfection without chemicals, Aseptik #380 tissues, and Netbiokem Dsam, a liquid disinfectant tested against a large range of bacteria, fungi and viruses. "As far as disinfection is concerned, constant anticipation should be the norm," says Houriez. "Some airlines have learned the hard way from previous sanitary crises, and taking to heart the safety of passengers and crew, have integrated disinfection into their standard cleaning procedures."

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Jetliner Cabins

by Jennifer Coutts Clay

2006 Laminated softcover edition 450+ pictures, most in colour

ISBN: 0-470-01933-6



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**Jennifer will be speaking about 'green' cabins at
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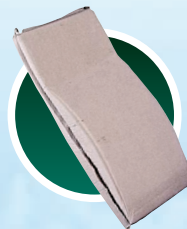
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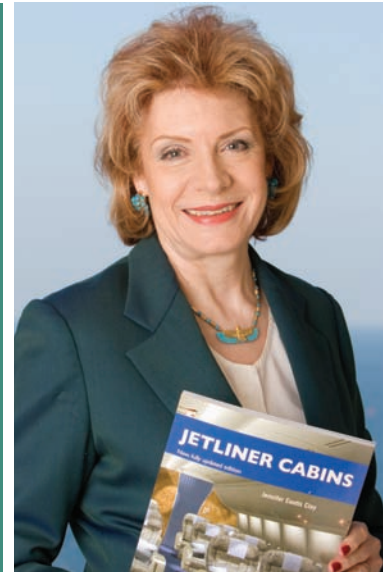
In a recent study published by the *Harvard Business Review – Why Sustainability Is Now the Key Driver of Innovation* – the coauthors, Ram Nidumolu, CK Prahalad, and MR Rangaswami, said: “By treating sustainability as a goal today, early movers will develop competencies that rivals will be hard-pressed to match.”

Jennifer Coutts Clay, author of *Jetliner Cabins*, says that this guidance is of particular relevance to the aviation sector. “The article explains how product development cycles can be accelerated by building sustainability into the design of products, and incorporating after-use design and execution into the DNA of the enterprise,” she says. “Despite the global recession, it is forecast that more than 24,000 new commercial aircraft of more than 100 seats will be required by 2028. For manufacturers currently developing high-tech cabin products

there will be a huge range of opportunities – both for new aircraft and retrofits.”

Coutts Clay says that many eco-friendly initiatives are already being implemented by forward-looking airlines, and points to smart window shades, LED technology, composition leather and synthetic fabric seat covers, carbon-fibre-reinforced seat frames, bungee-type net literature pockets and footrest hammocks, stain-proofed nylon carpet and non-textile floor coverings engineered for subsequent re-use, canvas life-vest holders, composite oxygen containers, special filters for recycling bathroom shower water, and air-filled seat cushions.

“As Darwinian scientists remind us, the battle for survival does not depend on being the fastest, biggest or strongest, but on being the most adaptable,” she concludes.



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dressedforsuccess

While many airlines been forced to delay fleet upgrades and refurbishment programmes, Air New Zealand (ANZ) recently unveiled a range of eye-catching new interior seating products – Skycouch, Spaceseat and Business Premier. The company ANZ contracted to develop and produce the bespoke upholstery for these new concepts was soft-trim specialist Flight Interiors, which is based in Auckland, New Zealand.

Flight Interiors has over 20 years’ experience in the design, manufacture and maintenance of aircraft upholstery. Directors Carol Thompson and Russell Holdem say it wasn’t just the quality of their upholstery finishing that led to their involvement in such a prestigious project: “Our clients know they can rely on us to add value right from the concept stage. We interface with the airline’s designers, seat manufacturers, fabric/leather suppliers, even the maintenance staff.”

With any interior redesign of this size, there will always be challenges that could never be

envisaged on paper. “No computer-generated rendering can anticipate all the issues which arise when creating upholstery that interfaces successfully with foam parts and seat structure; only people with extensive industry experience and skills can do that,” says Russell.

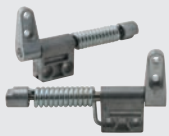
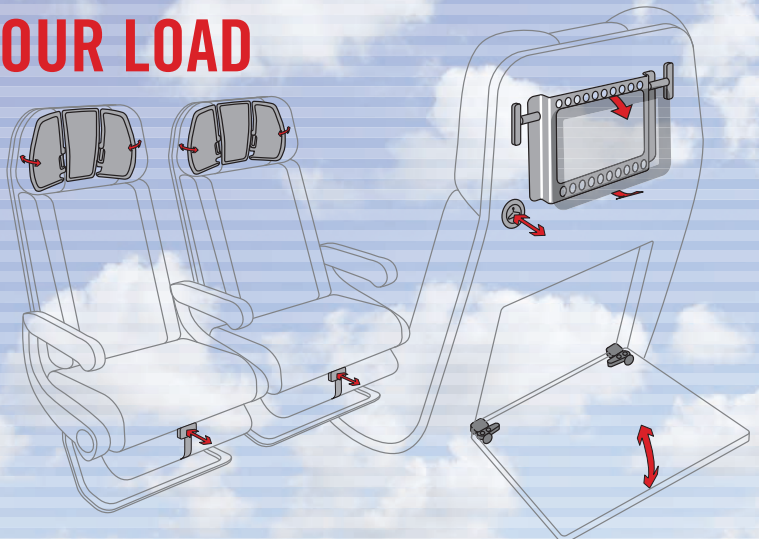
Having met these challenges, Flight Interiors can justifiably be proud of its input into the Skycouch, Spaceseat and Business Premier seats.



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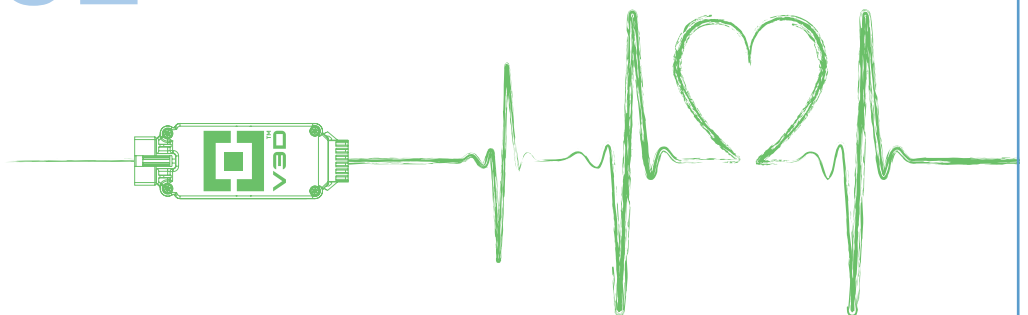
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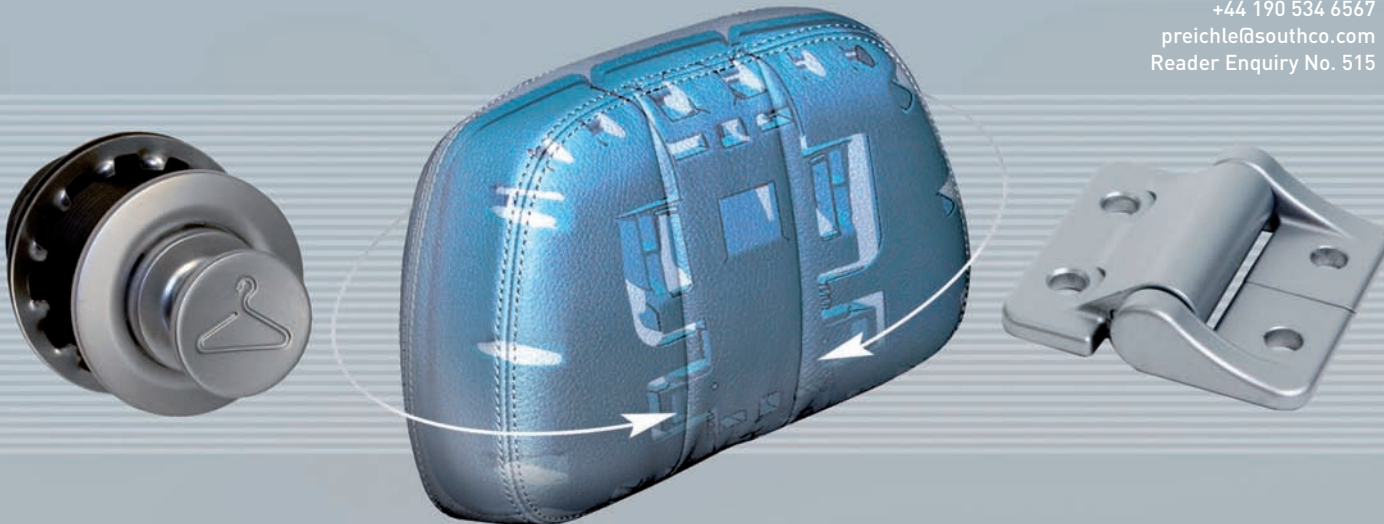
To weather the global economic climate, improve cost-effectiveness and meet rising passenger expectations, aircraft operators are reshaping their operations. Key drivers are modernisation, differentiation and weight saving.

Southco established its credentials with aircraft designers through a range of positioning control devices – including headrests, armrests, foldable tables, and entertainment systems with adjustable screens. The company is now taking this up a level with an extensive next-generation range of bespoke products developed to help airlines upgrade their fleets.

The new products – many of which are modifications of existing lines developed for other applications – include lightweight fully integrated plastic headrest systems, friction hinges for entertainment systems and dropdown tables, coat hooks, push/push latching technology to open armrest lids and deploy folding tables, and galley turn buttons to hold trolleys in place.

“Leading manufacturers of aircraft interior systems are now designing-in many of our next-generation lines and looking to establish long-term partnerships with us,” says Alex Wakeley, industry manager for transportation at the company.

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photofinish

Green Sky Textile's carpet product is designed to be a lightweight (920g/m²), economical and green answer to aircraft fuel savings. The carpet is made completely of PET, a polyester that the company says meets FAR 25.853 burn, smoke and toxicity tests for aircraft interiors, as well as all Boeing spec (47064 A-M) wear tests.

Green Sky Textiles estimates the fuel savings can be as great as US\$100/m² (£65/m²) each year with fuel at US\$40 (£26) per barrel. As well as translating into significant CO₂ savings, the carpet is fully recyclable after use.

Other benefits include non-fraying edges so serging is not necessary, and a Velcro tape for installation that can be reused between six and eight times, allowing maintenance crews access to the floor underneath, and for cleaning-up serious spills.

The top surface is actually printed, so airlines can match existing tufted carpets or become even more creative using photos, intricate shapes, perfect circles and colour variations, which are easily reproduced. The carpet can even be used to display advertising.

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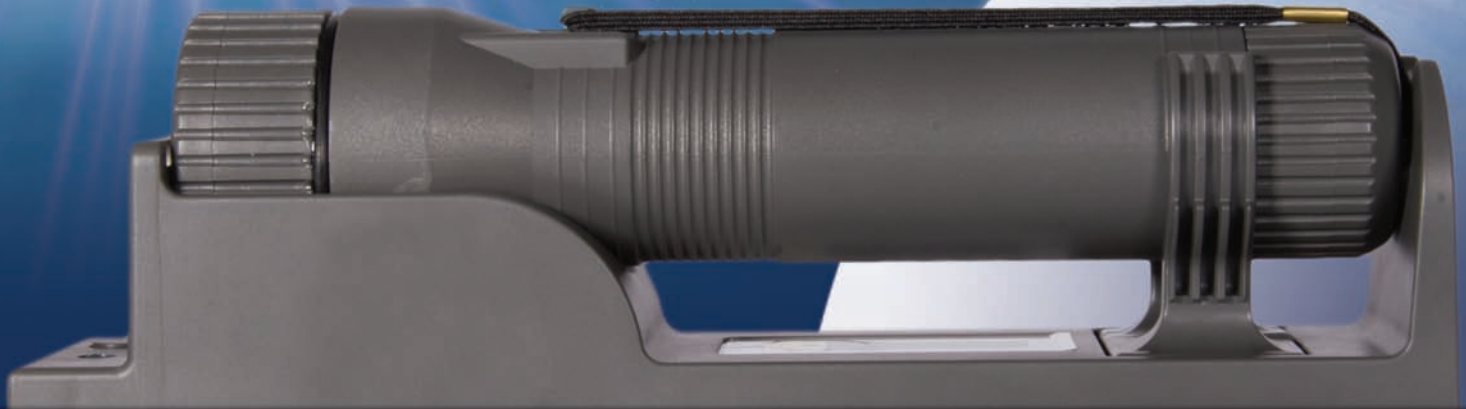
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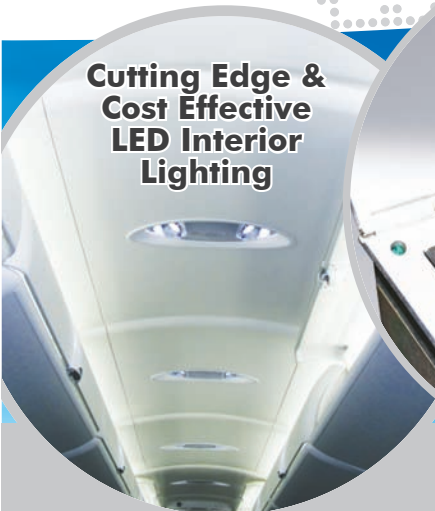
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highwireact

With the aviation industry constantly trying to cut development times, AES says it has to be (as far as possible) done virtually with 3D software. "This eliminates sources of error before the actual production starts, particularly if several systems have to be integrated into a complete system," says Jörg Barkemeyer, deputy head of electrical engineering at AES. "For the design engineer, the advantage of such systems is that they are comparatively inflexible and therefore precisely defined in their dimensions. These systems are quite easy to handle for the engineer, who has to keep the future assembly in mind, as they can only fit together in one specified way."

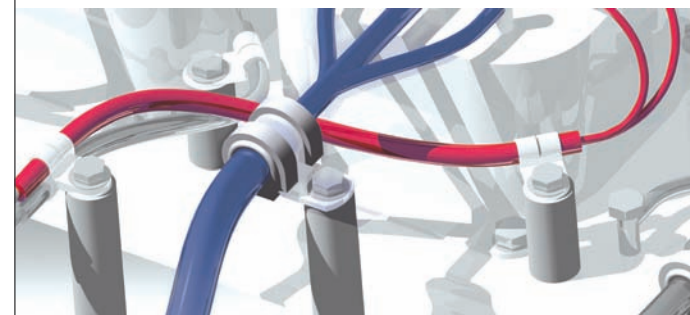
Barkemeyer says there are more challenges for the design engineer if electrical components such as cables or wiring bundles are added. "System integration becomes more complex when wiring is affected than if objects with given dimensions have to be handled," says Barkemeyer. "Thus a variety of requirements have to be taken into account to guarantee long-term functionality."

During system integration, the flexible cables have to be connected to the structure with mounting materials, and the wires have to be equipped with standard parts such as contact sections, cable sockets and connectors. "As the subsequent integration also provides more tolerances (e.g. bending radii can be modified), the electrical design requires comprehensive knowledge and experience from the design engineer," says Barkemeyer. "There is a predominant understanding that wires can be fitted in somehow because of their flexibility. Therefore the topics of electrical system and cable routing are rather side issues in design and development, which causes difficulties in many projects."

AES is a professional partner for electrical wiring (definition and integration) with more than 10 years of experience. Its portfolio includes consultation, as well as the design of complex assemblies in 3D, and documentation.

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clubtogether

Two of the key elements in any new seat development are comfort and appearance. Over the past 25 years, MGR Foamtex has worked hard to bring these two areas together with a holistic approach to seat foams and dress covers. Increasingly MGR is working in partnership with airlines and OEMs at the onset of each programme to ensure comfort and appearance is considered throughout. Development is carried out at the company's fully equipped facility in Thame, UK, where it manufactures, tests and approves complete upholstery systems. Prolonged sitting/sleep trials, pressure mapping and blood-flow measurement are all used during development.

"For rapid refurbishment programmes, where, for example, a short-haul operator needs a cabin to be rebranded quickly, our expertise allows us to deliver not just a smart new look, but the most cost-effective mix of weight-saving and enhanced comfort. Fast delivery is obviously critical too," says Les Simpson, CEO of the company. "For premium cabins all the same considerations apply, but with a different balance of priorities, larger and more complex seats, and often lie-flat beds, where our advanced bedding technologies can also make a measurable difference to comfort."

In all cases, the ultimate goal is to provide a high-comfort low-weight product that looks gorgeous and to this end MGR Foamtex has developed a new range of lightweight foams and covers, including MPS and Ecomfort Lite seating foams. The company's Style Cover product has also been modified for a lower weight.

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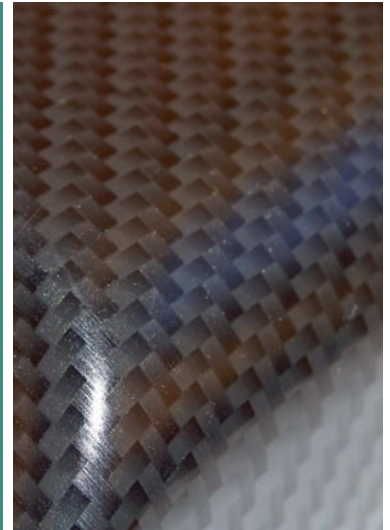
Chameleon Products says it can change the way an aircraft interior looks and feels and also save weight with its decorative film and covering technologies. The company specialises in making plastics look like marble, wood or any other image desired, using technologies including a water transfer process, technical imaging and the company's new Visionary technique. "We can apply our décor, for example, to aircraft seat plastics, bulkheads or galleys and make them look fantastic and realistic," says Trevor Whetter, managing director of the company. "Airlines can get the veneer effect at a much lighter weight."

Visionary allows designers and airlines to place 3D images on interior bulkheads. "Our new technology is environmentally clean and it's great fun," says Whetter. "It's like being a magician or

an artist, we can change and recycle items and make them something more interesting."

The company also recently launched ADP, whereby organisations send their material in flat sheets to Chameleon and the company will apply any of its decorative patterns or a customised design onto it. "If the material is already an approved aircraft material then after our decoration technology is applied it has a good chance of complying with all relevant fire, smoke and toxicity tests and if required we can even apply a suitable lacquer," says Whetter.

The technology can be applied to seat parts, bulkhead coverings and sidewall panels. "This is a superb addition to our existing technology, which has been used by so many airlines and VIP customers," says Whetter.



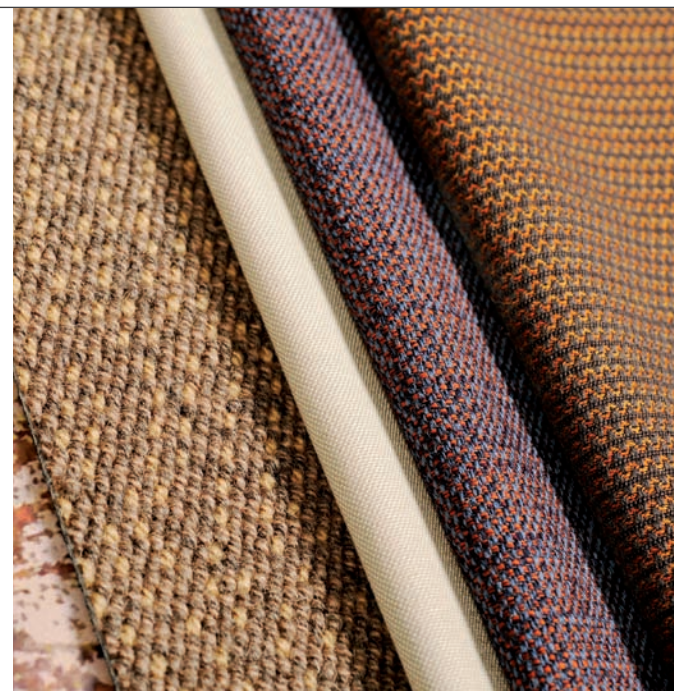
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movingforward

Every year, talented designers at Lantal Textiles focus on the development of the company's Conceptual Forecast, a preview of soft interior trends, meant as a treasure chest of ideas for project managers to use in creating aircraft interiors.

The Conceptual Forecast 2010 is based on two complementary topics – nature and privacy. It relies on nature-inspired designs that are translated into large patterns to make interiors come alive, combined with smaller and calmer structures. They are designed to interact and radiate a sense of intimacy and comfort, contributing to a balanced, optimistic mood. The colour palette includes calm and sensuous browns and beiges, melded with refreshing green and peony accents.

These concepts are woven into Lantal's textiles, which are designed to be highly functional, hard wearing, lightweight, safe, and cost-effective. Lantal's new seat cover fabrics come in two wool-blend qualities, one with a three-dimensional texture, the other with a subtle silky gloss. Lantal says its range also includes fully airworthy, biodegradable Climatex LifeguardFR fabrics for



climatized seating. In carpets, the company proposes lightweight Wilton weaves with mélange and mouliné effects, while for curtains it offers washable and steam-pleatable Trevira CS, the latest version of which has a fine three-dimensional structure.

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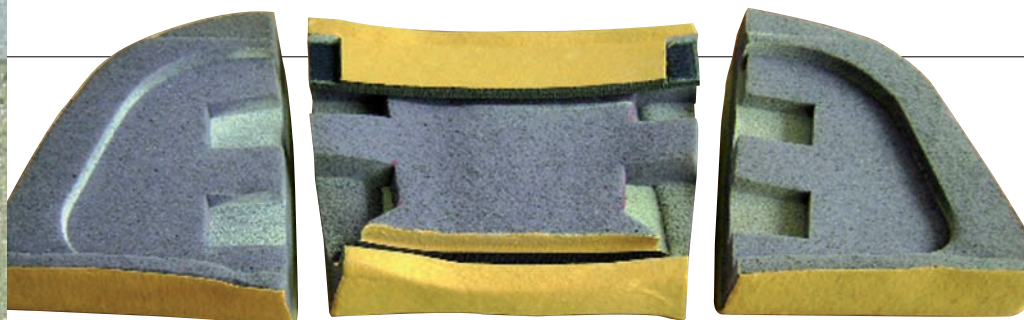
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foamhome

Aerofoam is a seating foam manufactured in Melbourne, Australia, by Dunlop Foam and supplied worldwide by Seats of Australia (SOA). The foam is used for passenger seating, beds and headrests, as well as cabin crew rest bunks. As well as being used by Australian carriers, Aerofoam is exported to Asia, the USA and Europe. Comfort levels can be optimised and tailored to match the requirements of individual operators.

Aerofoam has an open-cell construction to enable quick regeneration and reduce the build-up of heat during long-haul flights. It is available in a low-resilience (LR) grade, which is made using a special PU blend and an extender. When compressed, LR foam recovers to its original shape slower than conventional foams. When under

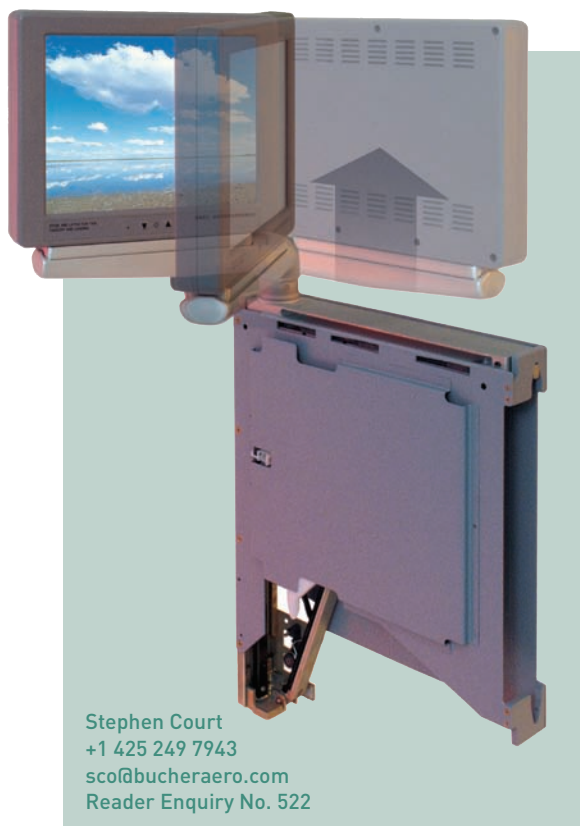
pressure, it provides fluid-like support and reduces pressure points, moulding around the body.

SOA says that LR foam can also be used in combination with other grades of foam (such as the high-resilience version of Aerofoam), to improve overall comfort levels.

In addition, Aerofoam boasts the built-in protection of Ultrafresh, an anti-microbial agent that inhibits the growth of a wide spectrum of infectious bacteria, fungi, moulds and mildew.

Ongoing research and development into new cushioning materials ensures compliance with customer and statutory requirements. SOA says all Aerofoam grades comply with F.A.R. 25.853/App. F/Part I, and with F.A.R. 25.853/App. F/Part II when used in combination with an approved dress cover.

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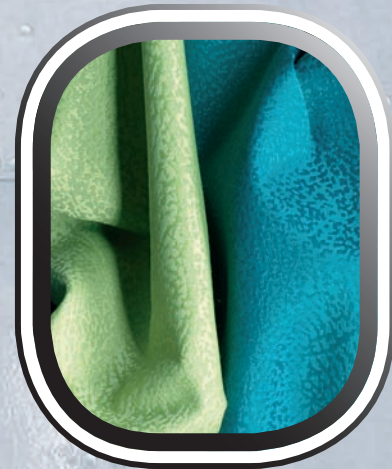
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populardemand

Bucher Aerospace Corporation offers its customers a wide range of business- and first-class IFE video deployment systems, one of the most consistently popular being its Pop-Up model. Designed to be elegant, lightweight, compact, robust, reliable and service-proven, the unit can accommodate a 10.4in smart monitor and today's large-diameter wire harnesses.

The latest version, which will be on display at Bucher Aerospace's stand at Aircraft Interiors Expo in Hamburg (18-20 May), even includes an iPod docking station for charging and video feed to the larger screen. By simply pressing down on the top of the monitor, the push-to-unlock feature disengages and the screen deploys smoothly and vertically from the furniture or console. The user can then rotate and tilt the screen to the optimal viewing position and enjoy the IFE. Push and click once more and the video screen is stowed and locked with similar ease, and, to add to the sense of effortless operation, is shut down automatically.

With thousands of Pop-Up units in use by multiple airlines, Bucher Aerospace credits the system's success to careful and effective design concept selection. Insisting on the ruggedness of a system of rigid links and guide bearings, over a cable-driven concept, Bucher developed the system to be reliable (35,000 cycle-tested), strong (SAE ARP 5475 compliant) of high quality, and modular. Its efficient use of space allows for additional features with which to pamper passengers.



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medical advances

Bucher set about designing its new 16g-compliant Air Transport Stretcher (ATS) as a response to both customer enquiries regarding the new B787 Dreamliner, and changes in seat geometries over recent years.

In addition to capabilities such as sustained engine imbalance (SEI), the ATS can also adapt to differential spacing between seat tracks up to and including A380 aircraft dimensions. Bucher says the ATS's key benefits include an extremely short set up time of 8-10 minutes without tools, height adjustment for optimal installation with all seat configurations, and flexibility in use for conventional as well as B787 seat rail designs.

The ATS is an expansion of Bucher's emergency medical product line. Its forerunner, the 16g NGS stretcher, has also been used as basis for the StepX product, which is certified for use on regional jets such as the Embraer ERJ170.



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softfocus

Baumann Dekor, based in Austria, is a well-known fabric producer with over 90 years of experience and its own weaving, printing, dyeing and finishing facilities. The company attaches utmost importance to research and development, and has produced textile treatments such as B-Guard (a stain repellent), BFresh (which neutralises bad odour) and Bio Tex Plus (which is anti-microbial). These technologies can be applied to almost any of the company's standard and Trevira CS fabrics.

Baumann Dekor's most recent success is the development of jacquard woven fabrics with a leather appearance. "Almost every leather type can be faked with this embossed fabric, from buffalo to calf, croc, you name it," says Maximilian Baumann, head of production, logistic, IT, quality assurance and purchasing at the company. "The product is available in nearly every colour shade, starting from 400m². It is an extremely interesting alternative to existing aircraft interior materials."

The family-owned company boasts an annual production of approximately two million metres of upholstery and decorative fabrics, and offers various types of yarns and fibres, including a large Trevira CS collection. The company says its 160 employees and distribution partners around the world guarantee that customer enquiries and orders are processed promptly and flexibly.

Conservation of the environment and safety are also core elements of Baumann Dekor's corporate identity. An advanced wastewater treatment system and the use of natural gas enable a sustainable and cost-efficient production process.

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In Geven's constant quest for innovation and towards seat models that can significantly improve the flight experience, the focus is on reducing weight via a more minimalistic design approach and clever solutions, which it hopes will make maintenance easier, and consequently, cheaper.



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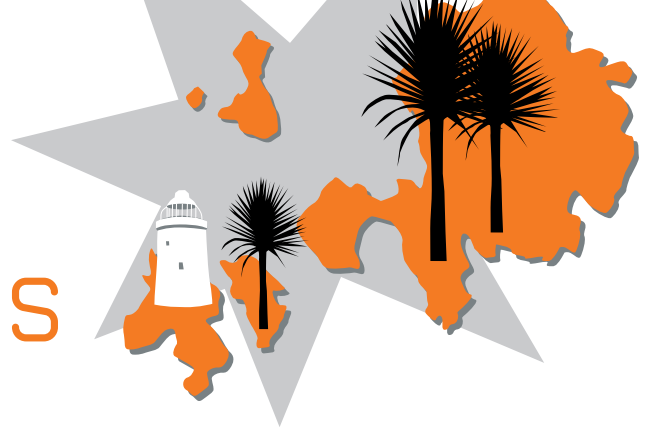
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richardstevens



Want to know more about key industry individuals, but haven't got the time to search for their Facebook profile or LinkedIn page? May's 'FaceSpacer' is **Richard Stevens, managing creative director at forpeople – a London-based design firm that recently worked with British Airways on its new First cabin, and advises on all aspects of luxury.**

01 EXPLAIN FORPEOPLE'S OVERALL DESIGN APPROACH?

We're not gurus, theorists or design superstars. We're simply a group of people who share open minds, commercial understanding and an absolute commitment to craftsmanship. We look at how people live then find a way to offer them something better. We are careful who we work with but we work in diverse industries – as long as clients share our belief that people are more important than things. We're also discreet – we have to be as our clients tend to be highly competitive.

02 WHAT'S YOUR BACKGROUND? Forpeople was born out of ingeni, Ford's global creative design centre, in London. While at ingeni, the founding members of forpeople (there are four of us and I was chief product designer) led advanced design programmes for Ford's (then) premier brands including Aston Martin, Jaguar, Land Rover and Volvo. We left ingeni in 2004 to create forpeople, following a brief stint at global branding agency Fitch. That experience provided us with a deep understanding of the automotive industry and in particular, advanced research and development processes. Our work with brands such as Aston Martin also helped us gain a deep understanding of the luxury sector and core customer groups around the world. We have also worked with Boeing's Payload Concept Center and Teague – we helped create an intuitive passenger 'touch point' vision on board the new 787. From the outset, forpeople has also worked extensively in the luxury consumer product and fashion sectors, with brands such as Alfred Dunhill and Bill Amberg.

03 WHEN DID YOU FIRST GET INVOLVED WITH BA'S FIRST? We were invited to present our credentials to the British Airways team back in August 2005. British Airways has led the industry in terms of premium product and service innovation for so long that we were obviously extremely proud to be chosen to develop its new flagship experience. A 90-year heritage of unrivalled innovation clearly demonstrates the passion, commitment and rigour that has always been applied to the design of the company's products and experiences. What really impressed us was the collective expertise/knowledge within the British Airways project team – from procurement, engineering and operations through to marketing and design. That experience and knowledge is what really sets the airline apart. When it does something, it doesn't shout loudly about it, it just focuses on getting it right, for the benefit of its customers.

04 AND YOUR IMPRESSIONS OF THE WIDER INDUSTRY? There is a lot of debate about what the airline industry can learn from other industries, particularly automotive. From a manufacturing and logistics perspective, the scale of supply base, processes, low volumes and customisation requirements within the airline world are in most cases vastly different. However, I do think airline suppliers need to change their mindset to better empathise with (end) customer need and remain relevant. The way Boeing has managed to reposition itself from an engineering company that purely delivers engineering products to airlines, to a company that sees the value in understanding the airlines' customer base to simply see people as their customers too, has been a paradigm shift. The 787 is testament to this way of thinking and sets a great example for the industry.

05 WHAT ARE THE CHALLENGES OF AIRLINE PROJECTS? One of the most exciting challenges of working for the airline sector is dealing with the constraints, the disparate supply base and the fundamental need to invest time to fully understand the complexity of the business and stakeholder agendas and requirements across the business while at the same time retaining focus on the end customer. I think that this plays to our strengths as thinking as a person rather than a designer is the only way of making sense of all the problems/issues and delivering relevant solutions that meet all the requirements.

06 HOW IS LUXURY CHANGING? The democratisation of luxury over recent years through high consumerism has only reinforced the inherent qualities of 'true' luxury. The essence of true luxury is to indulge in perfection in all aspects of everyday life. The ability to get the basics of product and service right time after time is the key. Consistency is a fundamental in this sector and is particularly important (and difficult) to get right when threading together the disparate elements and seams within an airline journey. I believe that the future of true luxury, existing alongside new wealth and attainability, will be the resurgence of pure exclusivity, provenance and a focus on simplicity, quality and consistency.

07 WHAT DO YOU CONSIDER TO BE A REAL 'LUXURY'? I have to say that being born and brought up on the Isles of Scilly is what I consider to be a real luxury. We are extremely fortunate in that my wife, children and I now live back in Cornwall and I split my time between there and London. Being able to watch my children grow up in such beautiful surroundings and indulge in my passions since childhood – windsurfing, rowing and sailing every weekend – while also spending time in London indulging my passion for design makes life seem pretty good!

08 WHAT EVERYDAY LUXURY COULD YOU NEVER GIVE UP? Other than time spent with my family I would have to say it is the luxury of working in a company that we have set up from scratch, now with a team of 24 people that we have painstakingly put together, working with amazing clients who respect what we do... for people, of course!

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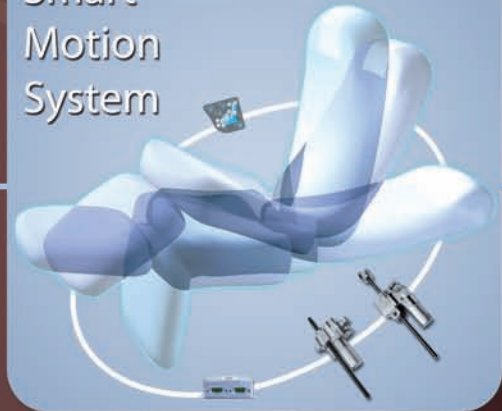
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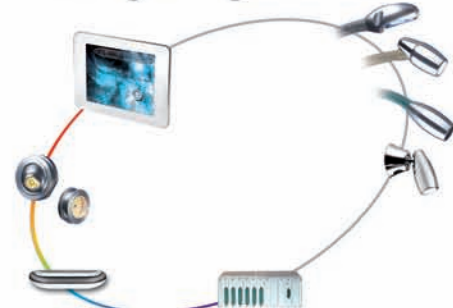
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