

JUNE 2011

Aircraft *interiors* INTERNATIONAL

THE INTERNATIONAL REVIEW OF AIRCRAFT INTERIOR DESIGN AND COMPLETION



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INSIDE THIS ISSUE: THE MOST INNOVATIVE
AND EXCITING NEW PRODUCTS AND CONCEPTS
FROM AIRCRAFT INTERIORS EXPO 2011

RECARO

the seat of innovation



Winning with RECARO

Two Crystal Cabin Awards 2011 for
the seating innovations Air New Zealand
Skycouch™ and Basic Line 3520



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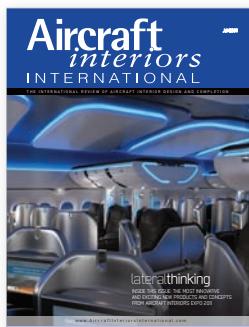
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WITH THE CURRENT SHORTAGE OF CAPACITY IN THE INDUSTRY
THERE IS LITTLE INCENTIVE FOR THIS TO OCCUR



growing pains

Business is booming – B/E Aerospace announced a 49% jump in earnings for the first quarter of 2011, while Zodiac Aerospace declared a 35.6% increase in sales revenue growth for the first half of its 2010-11 fiscal year, with its cabin interiors segment enjoying 49% growth. To keep up with demand, Zodiac's Californian-based subsidiary C&D Zodiac is in the midst of a major recruitment drive, having already added 250 new staff this year alone. Meanwhile its newly formed design studio, whose work graces the cover of this issue of the magazine (see page 25), is currently looking for new talent, having already recruited Ben Orson from JPA Design to oversee its creative output going forward.

Unfortunately the major suppliers can't grow quickly enough – airlines at Aircraft Interiors Expo were quick to share their frustration regarding the limited manufacturing capacity offered by the existing supply base. "The seat vendors are really stretched too thin in terms of engineering resources," confided one designer doing the rounds with his airline client. "If you can't fly flat two years from now, it's only because nobody could handle the programme – will somebody please open a factory in India soon!"

New facilities are not going to open overnight – the more cynical suggest that existing suppliers may not be in too much of a hurry to expand anyway, as the current situation enables them to keep prices high. Aircraft manufacturers are also cautious of adding new names to their catalogues of approved suppliers. Air New Zealand's Kerry Reeves warns that this lack of competition threatens future progress: "Many of the innovations seen at the show never make it through the certification or regulatory environment to be actually fitted to an operating aircraft," he says on page 120. "Suppliers have to be bold to attempt something new but with the current shortage of capacity in the industry there is little incentive for this to occur."

Hence it would seem for now that the airlines themselves must bear the burden of finding and investing in the next cabin breakthrough. Any such innovation will rely upon the most detailed and thorough passenger research – I recommend our feature on customer profiling on page 36 as essential reading in this regard, while our round-up of new seating on page 74 suggests that not all is lost with the current situation.

Fortunately new companies have already sprung up to help satisfy demand. Thomson Aero Seating will begin producing seats from its own factory in Northern Ireland by the end of the year. ZIM Flugsitz GmbH of Germany continues to mature and win new clients, boosting its output by adding a third production line late last year. We even have news of an Italian-Chinese joint venture on page 115. None of these are situated in Hamburg, of course, but it's likely the German city will benefit the most from future growth – and that's no accident as our feature on page 66 makes abundantly clear.



Anthony James, editor



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Lufthansa's new Boeing 747-400 upper deck cabin offers first-class passengers their own full-length bed alongside each seat – with just eight seats in total

**ANTHONY JAMES,
AIRCRAFT INTERIORS INTERNATIONAL**

individualquest

Airlines that take the time to really understand passenger needs through the use of customer profiling are realising increased revenues through game-changing products

**GUY BIRD,
AIRCRAFT INTERIORS INTERNATIONAL**

bluenomore

Virgin Blue has been rebranded as Virgin Australia, and its latest aircraft feature new business- and economy-class seats designed to provide a contemporary twist to the cabin

**ANTHONY JAMES,
AIRCRAFT INTERIORS INTERNATIONAL**

028 side show

Lufthansa's new Boeing 747-400 upper deck cabin offers first-class passengers their own full-length bed alongside each seat – with just eight seats in total

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036 individual quest

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044 blue no more

Virgin Blue has been rebranded as Virgin Australia, and its latest aircraft feature new business- and economy-class seats designed to provide a contemporary twist to the cabin

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X-Light R (pictured here)

medium to long range economy class
seat model,
for 30 to 36" pitch with IFE provision.

Weights:

A32X – 9.3 (10.8) Kg per pax*
B73X – 9.0 (10.5) Kg per pax*

Weight Notes:

* excluding seat belts and covers
* (...) with IFE provision



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X-Light FB (pictured here)

short-medium range economy class seat model, for 28" pitch.

Weights:

A32X - 6.3 Kg per pax*

B73X - 6.0 Kg per pax*

Note: * excluding seat belts and covers



multi tasking 050

The latest control units offer new ways of interfacing with IFE systems, enabling passengers to replicate the multi-device environment they typically enjoy at home

BERNARD FITZSIMONS,
AIRCRAFT INTERIORS INTERNATIONAL



restroom rethink 058

Lighting, décor, accessibility, functionality and hygiene are among the considerations in lavatory design, and new approaches promise both operational and aesthetic benefits

BERNARD FITZSIMONS,
AIRCRAFT INTERIORS INTERNATIONAL



hamburg hothouse 066

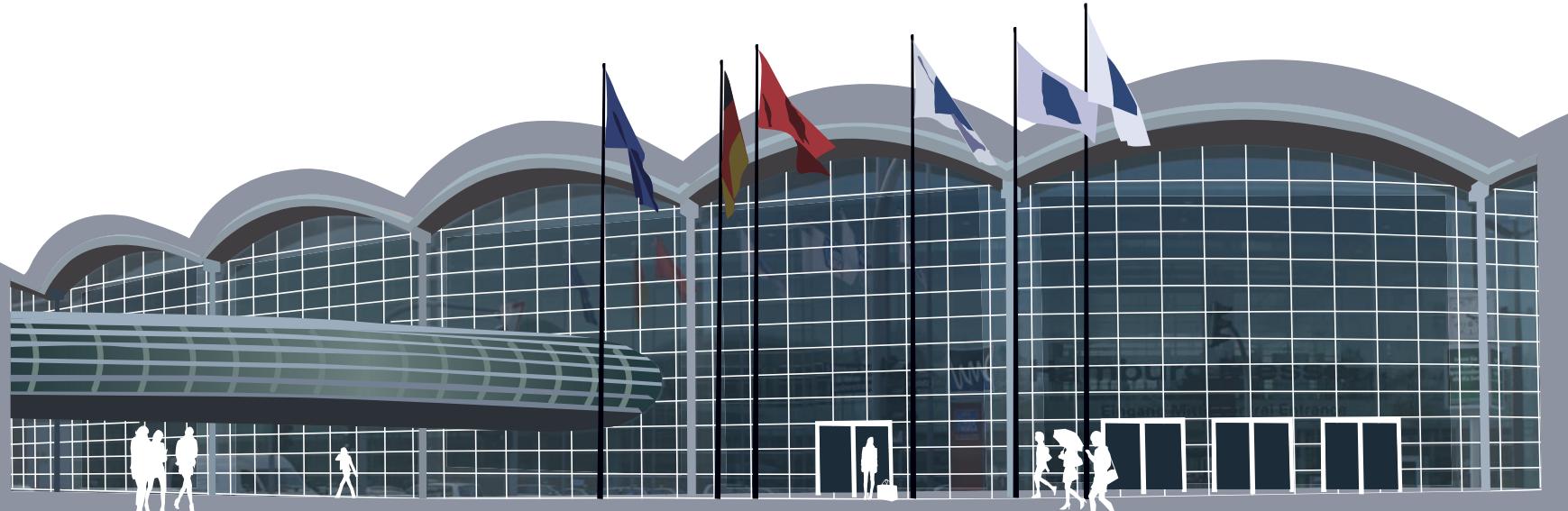
What are the secrets behind Hamburg's rise as the undoubted global centre for excellence and innovation in cabin design and technology?



hamburg hothouse

What are the secrets behind Hamburg's rise as the undoubted global centre for excellence and innovation in cabin design and technology?

BRENDAN GALLAGHER,
AIRCRAFT INTERIORS INTERNATIONAL



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seven eleven 074

Seven super seats from Aircraft Interiors Expo 2011 – including the latest thinking in the fast-moving high-density business-class and ultralight economy-class sectors

ANTHONY JAMES,
AIRCRAFT INTERIORS INTERNATIONAL



084 trip wire

Despite fears of rogue radio frequencies running loose in the cabin, onboard mobile phone use continues apace without incident with inflight WiFi rapidly following in its wake

BRENDAN GALLAGHER,
AIRCRAFT INTERIORS INTERNATIONAL



092 stars of the show

The most exciting products launched at Aircraft Interiors Expo 2011 in April – and who triumphed in this year's Crystal Cabin Awards

IZZY KINGTON,
AIRCRAFT INTERIORS INTERNATIONAL



The stylish ultra lightweight Hybrite trolley line by Driesssen



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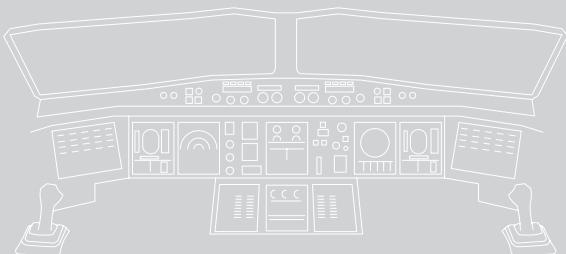
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World's first onboard duty-free shop opens on Korean Air A380

Korean Air has received its first of 10 A380s, featuring an extra-spacious layout for 407 passengers in three classes. It has 12 first-class and 301 economy-class seats on the main deck, and 94 business-class seats on the top deck – Korean is the first carrier to devote one full deck to a single class. Other features include a duty-free area at the back of the main cabin, and a premium bar and lounge on the upper deck.

The first-class Kosmo Suite, designed by Acumen and supplied by Contour,

boasts 83in pitch and 27in width. The business-class Prestige Sleeper, from B/E Aerospace, has a 74in pitch and 21.6in width. Both products feature full-flat beds. New economy seating from Weber offers 118° recline, 34in pitch and 18in width.

All classes feature Panasonic's eX2 IFE, with 23in screens in first, 15.4in for business and 10.6in in economy.

The duty-free shop, developed with AIM Aviation, can display up to 64 items (cosmetics, alcohol, fragrances and accessories), placed on magnetic shelves.

Big order for all-composite trolley

Almost 30,000 Quantum trolleys from Norduyn will enter service on Lufthansa flights over the next three years. They will be introduced gradually from summer 2011 until mid-2014 on all the airline's long-haul intercontinental flights.

The new model is one third lighter than its predecessor, and is expected to save about 9,000 tonnes of kerosene and 28,350 tonnes of CO₂ annually for the airline.

The trolley, which won a Crystal Cabin Award in 2010, was developed by LSG Sky Chefs and is manufactured by Norduyn. It is made entirely of lightweight composites and has already been tested in flight.

American tests streaming IFE

American Airlines is testing a new inflight streaming video product from Aircell. The product will allow passengers to wirelessly stream content such as movies and TV shows from an inflight library to their personal WiFi-enabled devices.

The system is being tested on two Boeing 767-200s in transcontinental service, and customer testing is planned for early summer 2011. The airline's goal is to roll out this product on WiFi-enabled aircraft from autumn 2011, pending FAA certifications. Pricing for the new streaming video offering will be determined closer to launch and at the completion of customer testing.

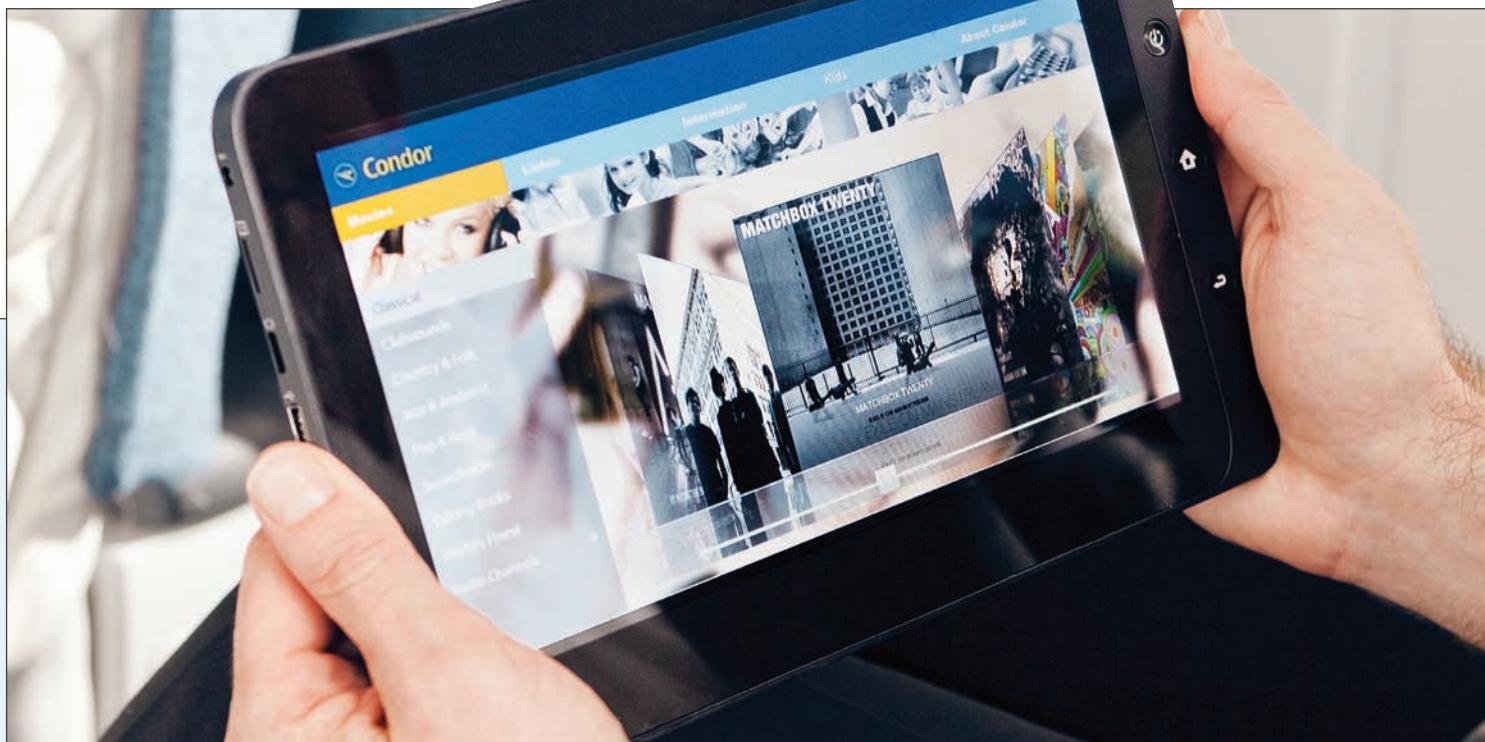
Massive retrofit project harmonises Korean Air's fleet

Korean Air has completed a six-year project to install next-generation premium seats and the latest AVOD IFE on all its 68 passenger aircraft, at a cost of KRW360 billion (US\$0.33 billion). As well as acquiring 19 new aircraft with the latest cabin, the airline refurbished 49 aircraft (Boeing 777s, Boeing 747s and A330s) – which entailed the replacement of 14,441 seats.

The refurbishment began with 17 Boeing 747-400s. The second phase, from 2009 to 2011, encompassed 32 Boeing 777 and A330 aircraft. Eighty-five engineers from around the world worked from March 2007 to September 2009 to study more than 12,000 pages of interior design prints and reports as part of the effort to upgrade each cabin. In total, 40,000 staff were involved in the mammoth project.

The next-generation seats include Kosmo Suites, Kosmo Sleepers and Sleeper seats in first class; Prestige Sleepers and Prestige Plus seats in business class; and New Economy and Economy seats in economy.

The Boeing 777s, which often operate on long-haul routes, have been fitted out with Kosmo Suites, at a cost of KRW250 million (US\$0.23 million) per seat. This seat is the same product as featured on the airline's A380, detailed above left.



Condor plans to launch Lufthansa Systems' new IFE system, BoardConnect, on its Boeing 767 aircraft in summer 2011. The system is based on a WiFi network that passengers can log on to through seatback screens or their personal laptops, tablet PCs, smartphones or other WiFi-enabled devices. It enables access to a wide range of video and audio on demand, as well as games and other content.

Unlike conventional IFE systems, BoardConnect does not need to be wired into every seat. The cabin of a Boeing 767, for example, will only need five access points, connected to a central server.

"The system is much easier to install because there is no wiring required," said Dr Jörg Liebe, CIO of Lufthansa Systems.

Condor to launch Lufthansa Systems' WiFi IFE

"It can be integrated during a regular maintenance check, so there's no need for extra downtime. BoardConnect is also very reliable and gives airlines maximum flexibility as regards cabin rearrangement, the integration of new technologies and the development of new services."

Lufthansa Systems says eliminating wiring and data distribution hardware can lead to weight savings of nearly half a tonne for a Boeing 767-300.

Seat and IFE integration deal

EADS Sogerma and Panasonic have signed a cooperative agreement to jointly develop integrated seat solutions. This helps pave the way to a seamless integration of Panasonic's IFE solutions into Sogerma's first- and business-class products.

"We look forward to extending the IFE and seat supplier relationship beyond the cooperation required for the A350," said Paul Margis, chief executive officer of Panasonic. "Our companies have a unique opportunity to develop truly integrated products and services that benefit our mutual airline customers."

SIA adds mags without weight gain

Electronic versions of 20 magazines are now available on Singapore Airlines (SIA)'s KrisWorld IFE system. The airline also offers printed publications, but the electronic selection offers more choices without the extra weight. SIA will provide the service across its A380 and Boeing 777-300ER fleets equipped with KrisWorld.

The airline trialled the technology with three of its own publications and plans to expand it to e-books, e-newspapers, and more magazines later in 2011. It will be progressively brought in on SIA's A330-300 and A340-500 fleets.

Recaro business-class on Malaysia Airlines' first A330-300

Malaysia Airlines has unveiled its A330-300, the first of 15 aircraft to be delivered over the next four years. The aircraft has 283 seats – 36 in business and 247 in economy.

All seats are equipped with AC power supply and USB port for laptops and other electronic devices. The new interiors are installed with mood lighting in all cabins and spacious overhead baggage compartments.

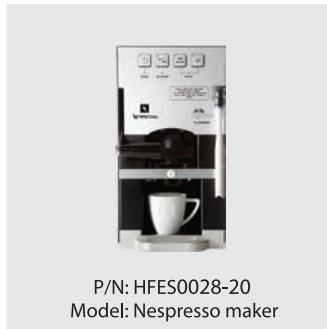
The new business-class cabin features angled lie-flat seats with a fold-out privacy divider and six-way adjustable headrest. The seats are Recaro's long-range Comfort Line 6510 model, which will be provided for all 15 of the A330-300s. Meanwhile, the economy cabin features slim-design seats each with a four-way headrest and AVOD screen. Movies, TV programmes, moving map and games are available for both cabins.

"We are delighted to launch our first A330-300 five months after the delivery of the new Boeing 737-800 in November 2010," said Tengku Dato' Sri Azmil Zahruddin, managing director and CEO at Malaysia Airlines. "These aircraft will serve the growing markets of South Asia, China, North Asia and Australia."

TECHNOLOGY



P/N: MR4AA1-01
Model: microwave



P/N: HFES0028-20
Model: Nespresso maker



P/N: HFA2000-10
Model: beverage maker



P/N: HFWF2003-01
Model: trash compactor



P/N: FT048
Model: folding trolley



P/N: HFE2007-01
Model: espresso maker



P/N: MK190
Model: full size trolley



P/N: R4AD2-01
Model: induction oven

INNOVATION



P/N: IHP4
Model: induction hot plate



P/N: HFA2007-01
Model: beverage maker



P/N: HFE95-20D10
Model: Nespresso maker



P/N: HFAWB2005-01
Model: water heater



P/N: MB0000750
Model: trash compactor box



P/N: HFWH2003-02
Model: trash compactor



P/N: 9501D
Model: espresso maker



P/N: AAD4-07
Model: induction oven



P/N: HFN2007
Model: beverage maker



P/N: HFA28V
Model: beverage maker



P/N: HFE95-20D
Model: espresso maker



P/N: SHF2010-002
Model: vip seat



P/N: HFWH0028-02
Model: trash compactor



P/N: MK279-00
Model: half-size trolley



P/N: HFEJ2008-10
Model: Nespresso maker

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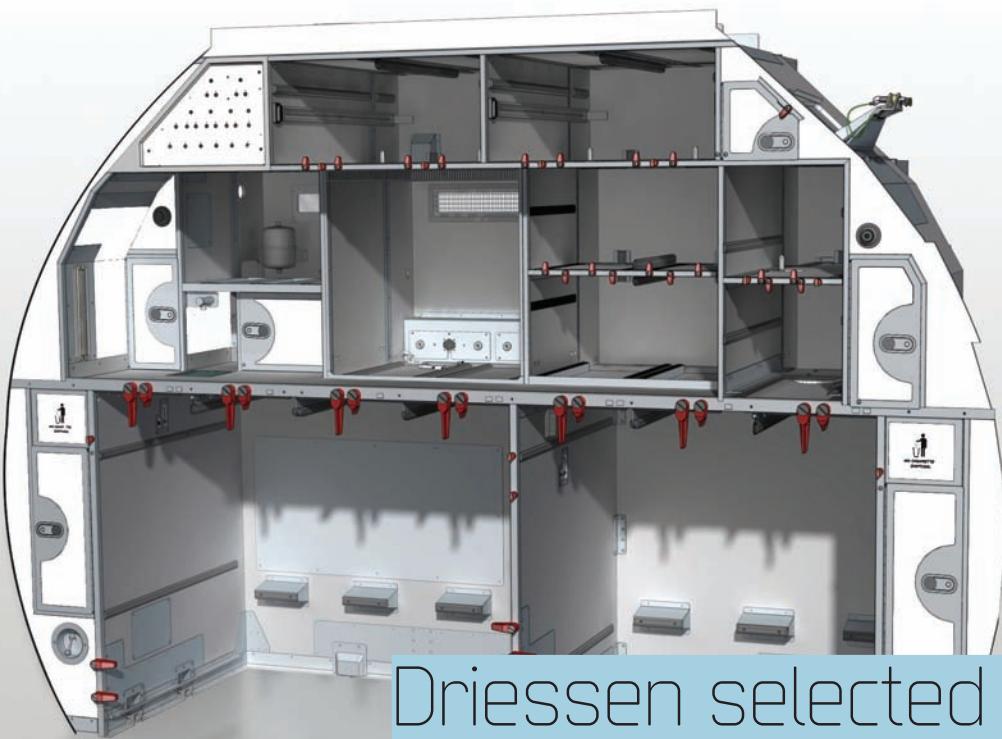
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Driesssen selected as sole A320 galley and stowage supplier

Driesssen-Zodiac Aerospace and Airbus have signed an agreement on progressively introducing galleys and stowages as single-source supplier furnished equipment (SFE) on the A320 aircraft family. The new SFE approach will start with deliveries from mid 2012.

The modular concept is designed to optimise initial configuration and ease

later re-configurations. Pre-assigned customer support conditions will complement existing support from Airbus for all SFE cabin equipment.

"This close partnership with Airbus will improve the robustness of the supply chain, supporting the increase in production rates," said Paul Verheul, CEO of Driesssen-Zodiac Aerospace.

Lufthansa revamping Boeing 747s

Lufthansa plans to refurbish 10 Boeing 747-400s by November 2011, with a new eight-seat first-class cabin (see page 28). Window seats will be converted into lie-flat beds (from Lufthansa Technik) with a sleeping surface over 2m in length, so each first-class passenger will have both a seat and a separate bed. Other highlights include sound-absorbing curtains and noise-dampening insulation beneath the carpet, and luxurious materials such as scarred leather. The cabin will also feature new 17in monitors and temperature-regulating blankets and pillows.

Business- and economy-class cabins are also being refurbished. The entrance area will be revamped in the latest design, and all lavatories refreshed. New slimline economy seating will improve passenger living space.

Portable IFE embedded on Gulf Air

digEcor's digEplayer L7 is available on Gulf Air as a semi-embedded IFE offering. Launched on a Boeing 737-700 in April 2011, economy-class passengers can now access the same content normally available on the handhelds, via the new seatback units. The embedded L7 uses in-seat power, features a PA interrupt, and is seat-centric as all content is stored locally on the device.

"Gulf Air has been flying the L7 as a portable for several months and now has embedded the player," said digEcor CEO Brent Wood. "More aircraft will follow this conversion and L10 (10in) players are also being prepared for other aircraft and premium passengers. This allows an airline to purchase an L series portable player and then at any time in the future, embed that player into the back of the seat."

Virgin unifies Australian brand

The Virgin Group is consolidating its operations in Australia under a unified brand, Virgin Australia. Domestic service Virgin Blue has already been incorporated, with international operators V Australia and Pacific Blue to follow by the end of 2011. Virgin Australia has also revealed its new domestic economy- and business-class cabins (see page 44) with the addition of a new Boeing 737-800 and an A330-200.

The new Boeing 737-800 cabins (with the Sky Interior) will be rolled out across the majority of Virgin Australia's domestic fleet by the end of 2011. The aircraft boasts eight business-class seats in a separate cabin (2-2 configuration, 37in seat pitch); 168 next-generation economy seats; a custom-made hard cabin divider; and a 'privacy enhancer' in front of the first row to enhance privacy from the galley/entrance.

The A330 features 27 leather business-class seats with 62in pitch; 251 leather economy-class seats; and seatback IFE. Other highlights include Luke Mangan-inspired food options that are prepared on board in business class; toiletries from Bvlgari and Grown; plush blankets, pillows and noise-cancelling headsets for business-class passengers; and barista-style coffee.

Virgin Australia's creative director Hans Hulbosch led the cabin development.

Virgin Atlantic's first two A330s have entered service – operating on leisure routes with 59 seats in premium economy and 255 in economy. The remaining eight A330s (to be delivered over the next two years) will have three classes – upper, premium economy and economy.

The aircraft feature a new touchscreen IFE system ('Jam'), developed with Panasonic and featuring over 300 hours of content. The system is available in all classes on all the A330s – via 9in seatback touchscreens in economy and 10.6in screens in premium economy.

Passengers can swipe across screens, scroll through text and jump around the system, with a touch of a fingertip. Key features include content rating, whereby passengers rate what they watch or listen to, helping to inform future passengers; critic reviews and cast/director interviews; a 'save for later' application; and a section with the airline's recommendations. Kids have their own menu with specially selected entertainment and games.

There's also an option for passengers to connect their own personal devices to the system. Other features include a travel tips section; live news (updated during the flight and including news and sports radio bulletins from Sky News); destination videos; and an interactive map.

Transaero chooses Lumexis IFE

Russia's Transaero Airlines has selected Lumexis's Fiber-To-The-Screen (FTTS) IFE system for retrofit on four 373-seat Boeing 777-300s (in 2011) and three 522-seat Boeing 747-400s (from the first quarter of 2012). The system will deliver full AVOD HDTV to every passenger in every cabin.

"As the wide-body launch customer for our second generation of FTTS, Transaero Airlines demanded not only unparalleled, leading-edge performance, but most importantly, the highest reliability," said Doug Cline, CEO of Lumexis. "The unique FTTS fibre optic network is so simple to install – at less than half the cost and weight of earlier generation, copper-based systems – that installation time is reduced to less than a third of the time required for other, more complex systems. Thus, Transaero will be able to complete its first four Boeing 777-300 cabin retrofits in the fourth quarter of this year alone."

Lumexis secured flydubai as the launch customer for FTTS in 2010.



Virgin Atlantic launches A330 with touchscreen Panasonic IFE

SafTGlo set for ARJ and MRJ

Two new regional jet programmes will include STG Aerospace's SafTGlo floorpath marking system. STG will be the baseline supplier of photoluminescent (PL) floorpath lighting systems to Goodrich, which will supply the product to COMAC for the ARJ21, and Mitsubishi Aircraft Corporation for the MRJ100/200 regional aircraft.

Meanwhile airline orders of the system have recently come in from Southwest (SafTGlo ColorMatch for retrofit during maintenance over the next few years), and from charter North American Airlines (fleet-wide). The latter also opted for STG's Wireless Emergency Primary Power System (WEPPS) for its fleet of Boeing 767-300 and Boeing 757-200 aircraft. WEPPS is designed to eliminate the emergency lighting system's maintenance schedule, replacing NiCd battery/charger packs with 'fit-for-life' non-rechargeable batteries.

Other recent WEPPS orders include Atlantic Airways for its Avro RJ fleet, and Privilege Style for Boeing 757-200 aircraft.

Beds on all Continental 757-200s

All Continental flights operated with Boeing 757-200 aircraft now feature flat-bed seats in BusinessFirst, marking the second major milestone in the installation of flat-bed seats throughout the airline's international fleet. Continental completed the retrofit on its 22 Boeing 777s in December 2010.

Sister airline United completed its retrofit of Boeing 747-400 and international Boeing 767-300 aircraft with flat-bed seats in its premium cabins in 2009.

On retrofitted aircraft, the airlines offer premium customers flat-bed seats that recline 180° and offer AVOD, a 15.4in video screen, power ports, headset, USB plugs and iPod connectivity.

United also plans to expand Economy Plus (extra-legroom economy) seating to all Continental aircraft beginning in 2012.

In other news, Continental has executed a letter of intent with LiveTV to offer inflight WiFi via Ka-band from 2012. It plans to offer the service on more than 200 domestic Boeing 737 and Boeing 757 aircraft.

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First Boeing Sky Interior for airberlin with A330-200s to follow

airberlin has received its first Boeing 737-700 with the Boeing Sky Interior (BSI). Its first Boeing 737-800 with this interior (pictured) was delivered in February 2011. The Boeing 737 has an all-economy layout for 144 passengers. The Recaro seats feature 30in pitch and 16.7in width.

With the Sky Interior, the cabin has been given a new look with new sidewalls redesigned to be less curved, and larger window recesses to make the cabin look more open and modern. The luggage compartments have also been redesigned with an integrated pivoting mechanism, giving more headroom in the aisle and greater stowage capacity. The design also includes concealed LED lighting. airberlin cabin crew can use a touchscreen monitor to select eight different lighting modes for the cabin ceiling, thus creating different atmospheres. The design of the buttons above passengers' seats has also been optimised, again with LED lights. Noise levels are reduced by 2-3dB using noise-dampening materials inside the aircraft

and redesigned ventilation grills at the bottom of the cabin side walls.

The airline is also improving long-haul comfort by equipping its entire A330-200 fleet with new business and economy seats from November 2011.

The new business-class seat (from Contour) features 170° recline, allowing it to transform into a 181cm-long surface. Its pitch is 59-60in and its width is 19.7in.

In economy class, a customised version of Zim Flugsitz's modular ECO-01 model seat has been chosen. Amenities such as adjustable headrests, literature pockets, coat hooks and special DVT cushions are included. Zim Flugsitz estimates that the seats will give airberlin a 575kg weight reduction per flight, reducing fuel consumption by 800 tonnes per year.

As part of the A330-200 cabin upgrade, airberlin has opted for RAVE, IMS's new AVOD IFE system. A 'plug-and-play' monitor will be built into the backrest of each economy seat. In business class, the monitor will be attached to a swing arm.

Improvements on Malaysia Airlines

The airline has launched a new service in first class on flights between Kuala Lumpur and London, Amsterdam and Sydney that enables passengers to pre-order a main course 24 hours before travel, by phone or online. New headphones with full ear cups are also being introduced in first and business on Boeing 747 and Boeing 777 flights between Kuala Lumpur and Europe.

First 737-800 BSI for American

American has received its first 737-800 featuring the Boeing Sky Interior (BSI), with 16 seats in first and 144 in economy. It is part of an ongoing initiative to modernise its 737 fleet. American started receiving new Boeing 737-800s without BSI in April 2009 – it received 31 in 2009, 45 in 2010 and plans to receive 15 in 2011, 28 in 2012 and 11 from 2013. The airline is also updating its old Boeing 737s, the last of which was delivered in 2001, to match the new 737 deliveries without the BSI. Upgrades include new seats in first and economy, new IFE and bigger bins. It is also updating its 757s.

Dassault Falcon has launched a new business jet that it says brings a large cabin aircraft to the super-mid-sized market. The Falcon 2000S is based on the Falcon 2000, but updated with features including a new BMW Group DesignworksUSA interior. Certification is expected by the end of 2012 with deliveries beginning in early 2013.

The 2000S is available in a standard floorplan with seating for ten passengers, along with three colour and material schemes. 'Sedona' features earthy beige colours for a desert-like ambiance, 'Havana' has a palette of browns, while 'Alpine' offers the crisp colours of an alpine peak and the darker colours of earth and rock. Dassault and DesignworksUSA also collaborated on the interior option for the Falcon 7X.

"By building on the Falcon 2000 platform, we were able to substantially reduce development costs which will benefit our customers with a very competitive acquisition price," said John Rosanvallon, president and CEO of Dassault Falcon.

The 2000S has the same dimensions as the Falcon 2000 – a maximum width of 92in; height of over 6ft, and volume of over 1,000ft³. It will be delivered with a Rockwell Collins CMS and AirCell's Axxess II satcom.



Dassault introduces Falcon 2000S with BMW interior

747-8 and BBJ 2 contracts for LHT

Lufthansa Technik (LHT) is to complete a Boeing 747-8 for an undisclosed customer. The project is scheduled to start in 2012.

It has also signed a letter of commitment with Freestream Aircraft for a BBJ 2 VIP cabin completion. That project is scheduled to start at the end of 2012, and to be handed over in mid 2013. The cabin will be designed by MNAerospace, renowned designer Marc Newson's UK-based aviation design studio.

Meanwhile, BizJet International, LHT's US-subsidiary, has signed a completion contract for an A319 CJ with an undisclosed Asian customer. The project will start at the beginning of 2012.

LHT says it has only a few remaining layover slots to offer over the next two years.

Fourth ABJ from BAE and Design Q

BAE Systems and Design Q have unveiled the fourth of five VIP concepts for the Avro Business Jet (ABJ) – the ABJ Eleganté.

The interior is aimed at those who require a regional product for everyday use. It has a fluid layout. Rooms include a large galley that can be shut off from the main cabin; a forward lounge with two sofas and a dining area fitted out for work; and a lounge, private office and VIP bathroom at the aft.

The entire rear section can be converted into a private bedroom with a full-size double bed and en-suite.

"A fully converted ABJ of this level of quality can be put on the ramp for between US\$12-15 million," said Chris Sedgwick, technical sales executive for BAE Systems.

Mercedes Benz EC145 realised

Eurocopter's EC145 Mercedes-Benz Style helicopter – tailored for the corporate, executive and private market – made its debut at EBACE in May 2011. It has already secured its first customer, based in Europe.

Conceived in a styling project led by Mercedes-Benz, the interior is inspired by its range of high-end vehicles. It is also designed for high flexibility – the seats are mounted on rails and can be easily reconfigured for four to eight passengers, or removed to make room for luggage. Multipurpose storage is made possible by numerous attachment points on the floor and walls.

Eurocopter has launched two other major initiatives for this market in the last eight years – the Hermès EC135 and the Stylence.

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BRIEF: C&D Zodiac chose this year's Aircraft Interiors Expo in Hamburg to show off its 'C3' premium cabin concept – underlining its ability to offer a complete turnkey service: "We really believe that the next step in premium cabins is to provide the entire solution, as we say internally, 'from one mind',," explains Scott Savian, executive vice president, customer and product, C&D Zodiac. "Our goal for this project, and going forward, is to provide complete cabin solutions consisting of linings, lighting, lavs, monuments, storage systems, seats and seat furniture – all designed, produced and supported by one company."

DESCRIPTION: The C3 concept is an attempt to reinvent the wide-body cabin environment, by switching from a twin-aisle to a single-aisle design, with a cabin featuring a 3-3 premium seating layout. The other striking feature is the repositioning of the overhead bins, which now run laterally across the cabin, rather than longitudinally. "We really wanted to push the envelope," explains Savian. "Aside from being a complete cabin environment, it is a single-aisle wide-body. This drastically alters the cabin dynamic, from seat placement, to catering possibilities to the simple fact that two carts or passengers can easily pass in the widened aisle." The cabin is effectively turned 90° – a point most clearly emphasised by the personal storage solution of C&D Zodiac's patent-pending transverse overhead bins mounted to the seat furniture. "The overall effect creates an entirely new feel to the cabin, yet we've focused on the passenger experience as well," continues Savian. "The C3 project refers to our flexible seating and shell solution, which provides companion, club and conference seating arrangements, along with complete privacy when desired."



VERDICT: This concept should hopefully alleviate airline fears over increasing supply base consolidation: "The key point for us is that a solution from one company should actually be able to introduce more innovation and creativity – not less," says Savian. "The industrial design team works directly with our advanced concepts team. Gone are the days of the pretty picture that everyone gets attached to, only to see much compromise in the final product." C3 was developed in under six months, including complete fabrication by C&D's in-house mock-up and prototype shop, the final cog of its newly formed innovation group. ☒



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Web: www.zodiacaerospace.com

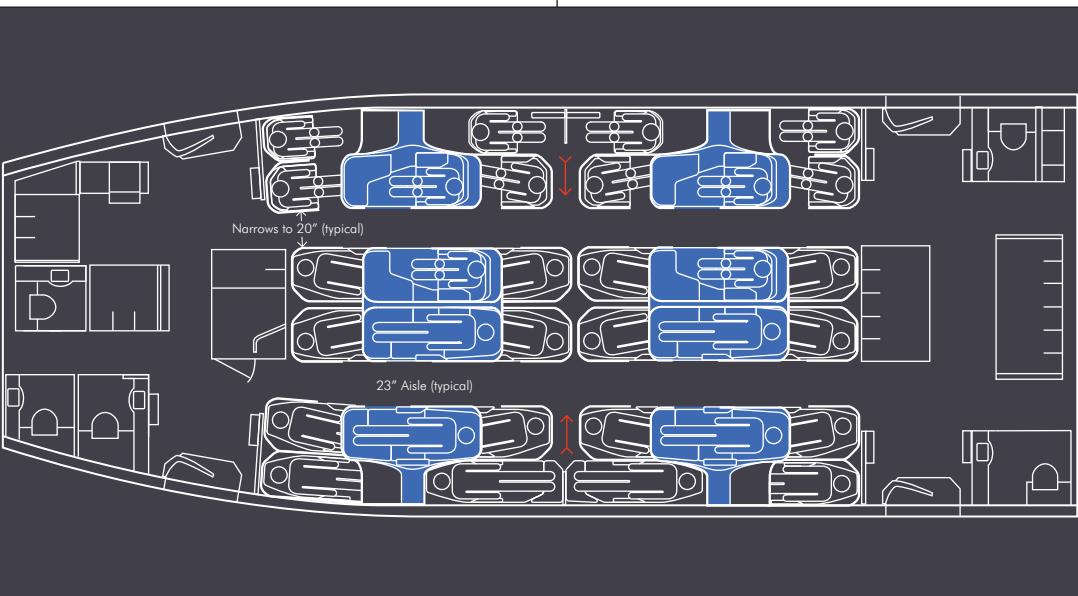
stepchange

BRIEF: Formation Design Group's premium seating concept is based around an inline arrangement of two forward-facing seats and one rear-facing seat where the centre forward-facing seat is raised a few inches from the floor. The raised centre seat allows the leg areas of the lower seats to underlap the raised centre seat. This allows seat pitch to be reduced down to around 60in while still providing a bed length of approximately 80in.

DESCRIPTION: The concept was first shown at Aircraft Interiors Expo USA in September 2010. "Since then, we have focused on maximising aisle access while still leveraging the efficiency inherent in the fore/aft underlapping concept," explains Formation's Bob Henshaw. "As examples, we've shown forward cabin LOPAs (between Doors 1 and 2) for both the A330/340-300 and Boeing 777. The Airbus layout features 32 fully lie-flat seats arranged with direct aisle access and 79in-long lie-flat beds." The 777 layout (pictured, below) uses a unique arrangement of the centre row seats that allows the reduction in the total length of the three-seat module by having the lower seats' footwell angled towards the centre, which brings the pitch down to 54in. "This is particularly conducive to the B777's comparatively wider but shorter forward cabin area," says Henshaw. "This LOPA is also a high-density business-class arrangement with 32 seats with all but four seats with direct aisle access. However, we're able to offer eight 'premium' seats offering an 80in x 30in bed, as well as wider seat bases on the lower seats along the aisles."



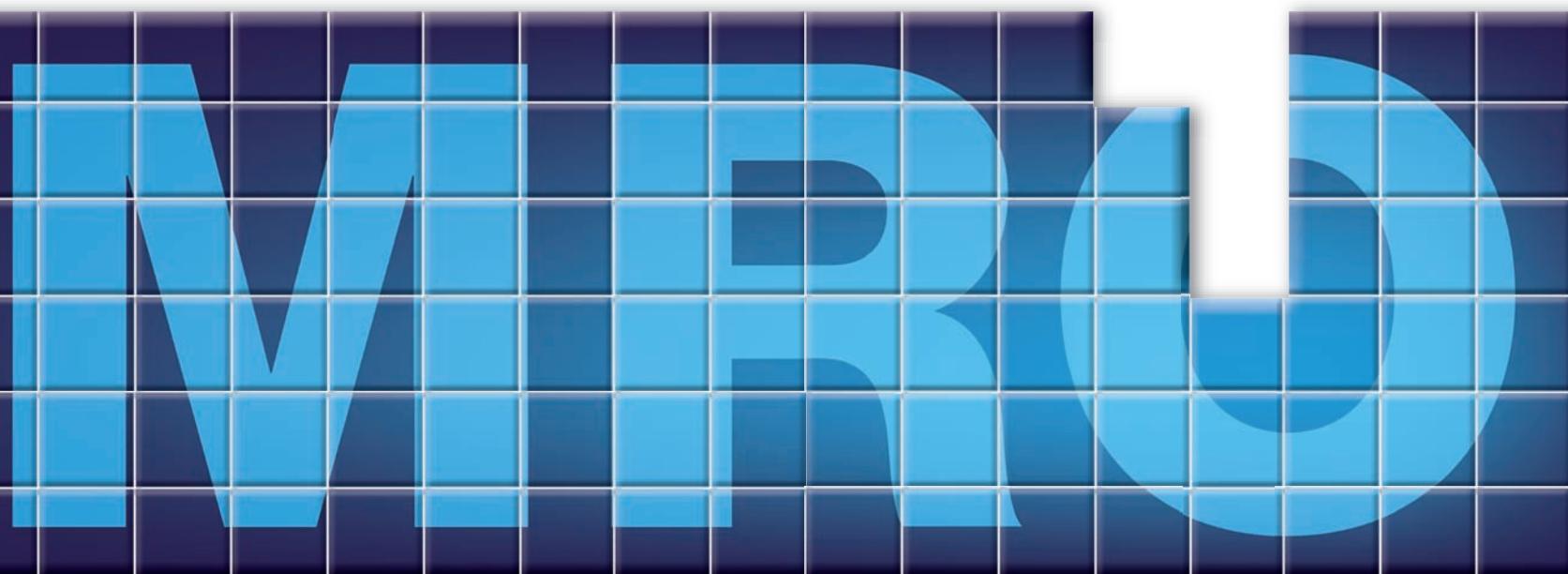
VERDICT: Formation's latest LOPA offers both a high-density business-class product and a potential 'first class': "The premium seats allow face-to-face meetings with a guest as the foot rest doubles as a guest seat – this feature is quite common in first class and many low-density business-class cabins," says Henshaw. Formation is currently in negotiations with a seating manufacturer on licensing its original pending patent, while continuing to explore high-density applications using 2-2-2 and 2-3-2 configurations. ☒



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bob@formationdesign.com
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sideshow

Lufthansa's new Boeing 747-400 upper deck cabin offers first-class passengers their own full-length bed alongside each seat – with just eight seats in total

ANTHONY JAMES, AIRCRAFT INTERIORS INTERNATIONAL



Those in search of a proper bed in the sky need look no more – Lufthansa is currently overhauling its first-class cabin on the upper deck of 10 of its Boeing 747-400s, with the work due to finish in November this year. In a move to ensure a quieter and more exclusive atmosphere, seat count is being slashed from 16 to just eight – enabling the airline to introduce full-length, dedicated beds next to each refurbished seat.

The beds have been crafted by Lufthansa Technik's VIP department, and measure about 8ft in length. A dedicated mattress from leading German supplier, Paradise, as well as temperature-regulating blankets and pillows are included, while sound-absorbing curtains and noise-dampening insulation beneath the carpet further ensure a good night's rest. There's also a new 17in IFE monitor, while matt-brushed metal and scarred leather finishes echo the airline's first class on its A380s. Each passenger has a drawer below their bed for luggage storage, as well as plenty of stowage possibilities for personal belongings in the seat consoles.

"We want to offer customers the same value proposition across our entire fleet," explains Christina Foerster, Lufthansa's outgoing general manager of intercontinental product (she has since been appointed vice president of network and fleet development). "Sleeping comfort, a quiet cabin and flexible privacy are the three key things that we try to give each first-class passenger on all our aircraft," she continues.

"The task was to develop a product with characteristics already familiar to passengers on Lufthansa's A380 first-class cabin but one that was also independent," adds Jochen Müller of müller/romca Industrial Design, which advised on the overall cabin scheme.

01. A dedicated bed
beside every seat
– pure, simple
luxury!



02

02. Lufthansa's 747-400 upper deck features eight first-class seats in a 1-1 layout

03. The seat offers up to 45° of recline for maximum comfort

TRIAL AND ERROR The airline tested multiple mock-ups of new seating products before deciding to revamp its existing seats and introducing individual beds: "We looked at a variety of different seats and layouts – similar to those we have on the A380 and some completely new ones," explains Foerster. "However nothing seemed to offer the feeling of openness we were looking for and there were also issues with privacy. We also wanted something that gave direct aisle access to every customer."

Foerster insists the final decision to refurbish its existing product was not based on cost – but rather the limited proportions of the 747's upper deck: "We looked at different products but they all had really high walls and they just didn't look 'first class' in that particular environment," she says. "They didn't give the same feeling as the first class we

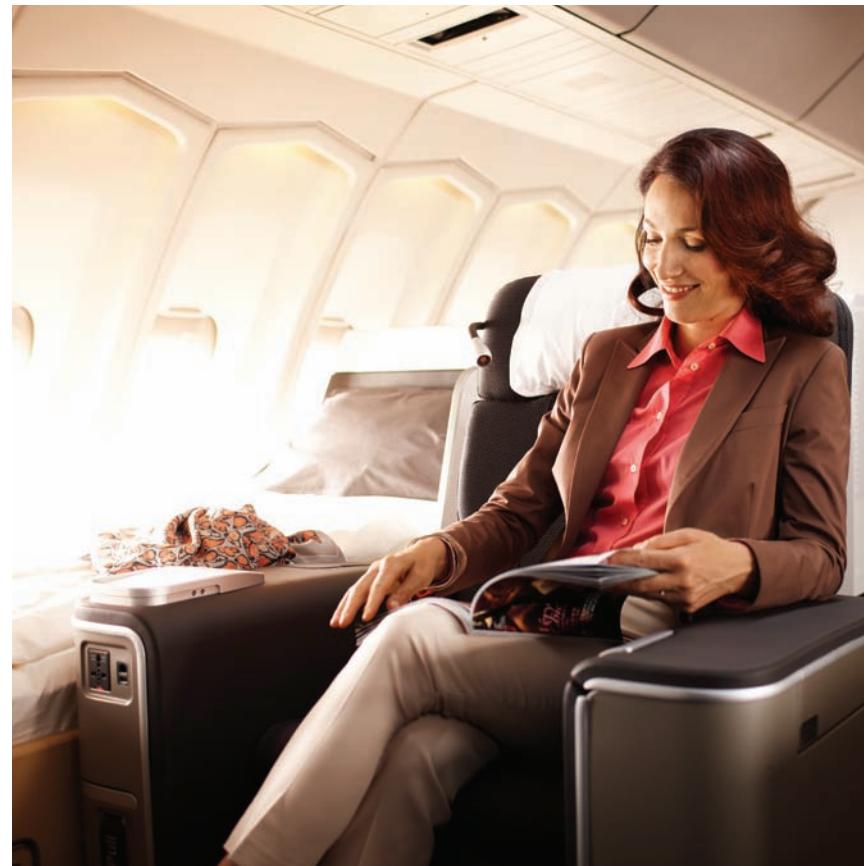
have on our other aircraft, where we have tried to create a more open, club-like atmosphere. We even looked at asymmetrical layouts where we had two people on one side of the aisle and one on the other – but it didn't look right. We said, 'either we do it right or we don't do it at all.'"

If the upper deck was causing so many problems, why not just move first class onto the main deck? "We could have moved it to Zone A like we will on the 747-8I, but it's very tough to use the upper zone in a different way to bring more revenue," says Foerster. "The upper deck on the 747-400 is not as stretched as on the 747-8I and the emergency exits prevent you from installing lots of seats – even if you moved business class to the upper deck. If you moved, you would also have to lose seats make room to build an entire new first-class galley on the main deck."



further improvements

Lufthansa's 747-400s will feature a revamped entrance area, as well as refreshed lavatories on both the main and upper decks: "We didn't think investing in new bathrooms would be as important to our customers as investing in seat comfort," explains Christina Foerster, Lufthansa's intercontinental product manager at the time of the project. On the main deck, economy passengers can enjoy a new AVOD IFE system that delivers films in up to eight languages to individual seatback screens. Brand new economy seats feature a redesigned backrest that provides a further 2in of living space.



03

Currently the galley is in non-revenue space at the rear of the upper deck."

Foerster says the decision to refurbish still represents a sizeable investment: "I would say it is approximately 60% less to refurbish than what it would cost to buy and install new seats. But I think the investment in space is a lot more, so I wouldn't say that we really saved money. Obviously to revamp is not as expensive as buying a new seat, but the value of the space we are offering is much more expensive than any seat could ever be."

With a maximum of only eight first-class passengers, the airline is reducing the number of first-class crew from three to two. "It's all relative – we had three crew for 16 passengers and now we have two for eight. The ratio is actually better from a customer perspective," maintains Foerster.

AGE CONCERN Clearly Lufthansa was not going to splash millions on what is now quite an old aircraft type, which it may well retire in the not-too-distant future. "We had to ask ourselves how long will this fleet actually stay with us," says Foerster. "How much are we willing to invest to put first class on board? And how many will we retrofit?"

In the end, it took the airline three years to come to a decision: "For most projects, the concept phase is very short and the realisation phase is much longer, but in this case it was the reverse. It took just a year to implement as we didn't have to certify a new seat, while the bed itself is considered as a monument so testing is less complex as it is not occupied for take-off and landing."

"The first project meeting was in March 2010 and the first aircraft underwent conversion by April 2011," adds Müller of



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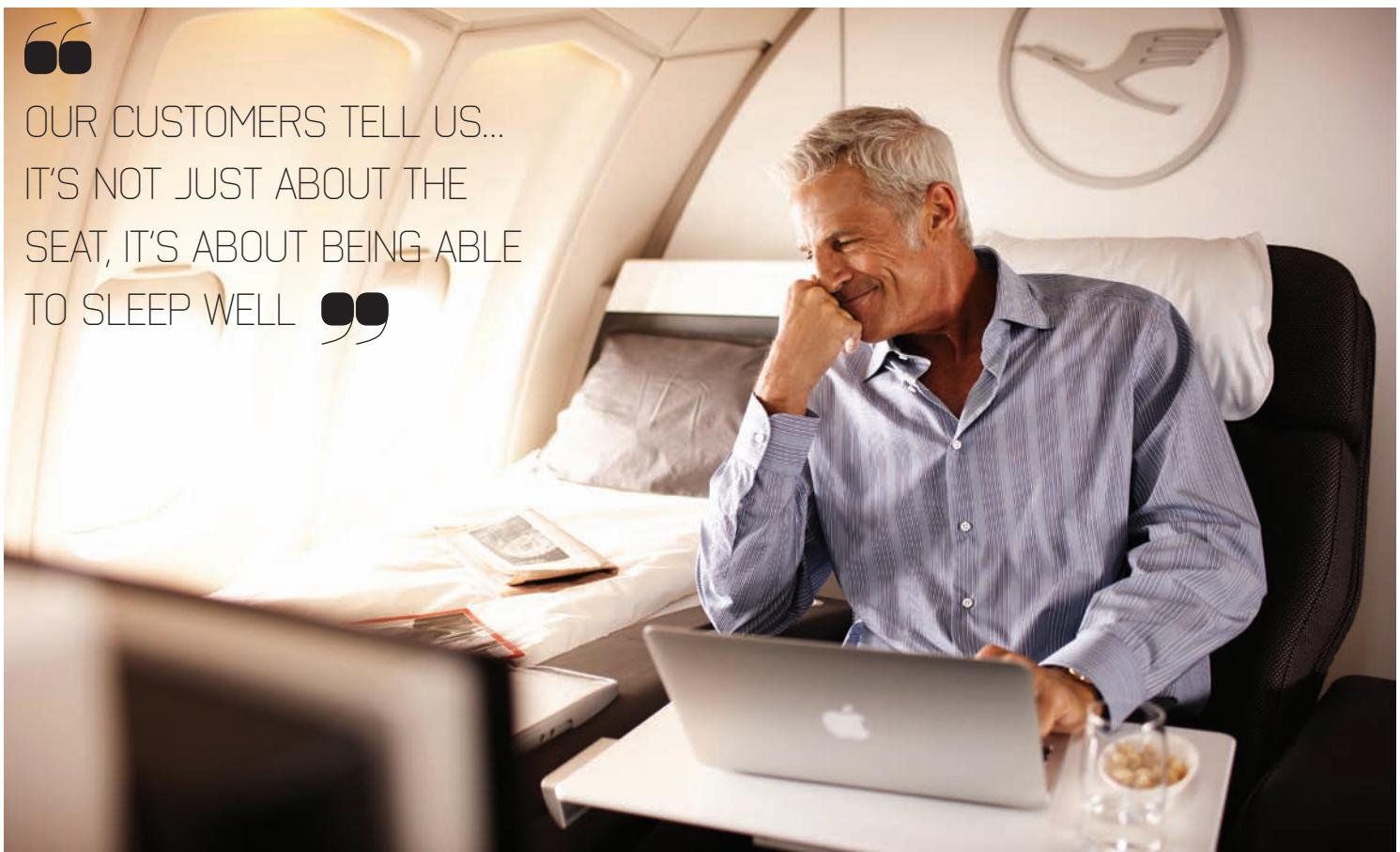
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04



05

müller/romca industrial design. "The timeframe for realisation was a challenge for every member of the project team. Our attention during the construction and prototyping process was particularly focused on having perfect stitch lines, wrinkle-free seat covers, smooth edges, clean curvature of all bump strips and the best haptic and optical finishes, even behind the covers and inside the stowage bins."

Refurbishment not only saved time and money, it also ensured a stock room full of spares: "The seats we are taking out can be used in the future to maintain those that remain on board," says Foerster. This is a shrewd move as the seats, which were originally delivered in 1998, are no longer available from Weber. "It's actually better to do it this way, otherwise we wouldn't know where to get the spare parts from any more," says Foerster.

Key features

- Upper deck cabin features just eight seats
- Each seat is 20in wide and offers 45° recline
- New seat upholstery and high-quality wool seat covers
- Each seat has its own adjacent 27in-wide and 80in-long bed
- Additional stowage options for carry-on luggage under the bed
- Sound-absorbing curtains and noise-dampening carpet
- 17in IFE monitor, separate handset, USB socket, and in-seat power
- Climate-regulating bed covers and pillows in high-quality linen
- Porsche Design amenity kits featuring La mer products

MIX AND MATCH Lufthansa is currently offering a mix of first-class products across its long-haul fleet (A330, A340, A380, 747-400) – but all for the same price. "We will charge the same across the entire fleet," says Foerster. "Basically the customer pays for a first-class flight from A to B. We never differentiate in price based on aircraft type in case there is an aircraft change. Today, people pay the same price for an A380 as they pay for the rest of the fleet, which doesn't have the new first class yet. First class is not only about the product in the air but also the product on the ground – the first-class terminal at Frankfurt, the lounges, and the dedicated security channels. Most important of all, our customers tell us it's about exclusivity – the right environment and the right number of people. And it's not just about the seat, it's about being able to

04. The bed doubles as a convenient space to spread out work and reading items

05. A 17in monitor provides ample IFE options



06

07

- 06.** The 80in-long and 27in-wide bed provides a comfortable night's sleep
07. With two crew for eight passengers, you shouldn't struggle to get a drink!

sleep well – all of our first-class products offer a completely flat bed with good dimensions and very few seats overall for added privacy and peace and quiet.”

As a result, Foerster sees no reason to compensate passengers that find themselves flying on aircraft awaiting refurbishment, as the airline will only sell eight of the 16 available seats: “This is where I think it’s important to educate the customer because they are paying the same today with 16 passengers as they will pay from April with eight passengers, so it’s a great deal,” she says. “We are giving a little two-headed rose to let people know that it’s not a mere coincidence that they have two seats to themselves.”

Ultimately some passengers will decide they prefer the A380 product, while others may favour the 747: “It’s tough to choose because one has the better personal space and the other one has the better overall experience,” admits Foerster. “The A380 has the better overall experience with a completely new cabin interior, more cabin volume and the new lavatories but the 747 has amazing personal space. Overall our goal was to give sleeping comfort, a quieter cabin and flexible privacy to everybody but we did it in different ways to accomplish it as best as we can on each of the different models.”

Foerster says there are no plans to specifically advertise the fact that the 747 offers a separate bed: “We will promote having a first class throughout the entire fleet and the fact that it is a really good first class,” says Foerster. “That’s what we stand for – we are true believers in having three

classes on board our aircraft – first, business and economy. Many other airlines only offer business, premium economy and economy. Anyway, the Airbus A380 gets really good ratings for seating comfort, which are likely to still surpass the Boeing 747s after their retrofit because the A380’s seats are more modern. The A380’s first class seat also has a separate mattress for sleeping comfort, so it gets extremely good ratings from customers.”

NEXT STEP What about Lufthansa’s new 747-8Is, the first of which is due to be delivered in the first quarter of 2012? “All I can say is that it will have a fabulous first class, based on the first class on board our A380s,” says Foerster.

The airline has revealed that the 747-8I will seat 386 passengers in total: eight in first class, 80 in a brand new business class and 298 in economy. Foerster refuses to label the new business cabin as ‘high density’: “It’s tough to say what’s high density and what’s low density – from an airline’s point of view everything is lower density to what we have today.” However she says the new product will feature a fully flat bed with a choice between window or aisle seats, with no middle seats. “I like to think more in terms of bed length and sleeping comfort rather than density because that’s what really matters in the end – and whether you have a smart configuration or a stupid one.” ☒

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Lufthansa Technik aerosight™ cabin surveillance camera system.

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- **Easy to install.**
- **Both day and night modes.**
- **Up to 16 cameras.**
- **Network-capable.**
- **Small and lightweight.**

**Muhammed
Haqq**


"I hope that I can use those tiny utensils and operate the remote control OK – otherwise I'll get very bored and very hungry!"

- 37 years old
- Single
- Computer programmer
- Broken wrist

**Lisa
Robertson**


"I hope the kids cope OK with the flight, but I'm really looking forward to just getting there"

- 35 years old
- Married to Dan
- Primary school teacher
- 2 children, Zac (6) and Chloe (2)

individualquest

Airlines that take the time to really understand passenger needs through the use of customer profiling are realising increased revenues through game-changing products

GUY BIRD, AIRCRAFT INTERIORS INTERNATIONAL



'Know your customer' is an oft-repeated business mantra, but the number of airlines that truly take the phrase on board when developing new products and services is debatable. Too often complacency leads to a lack of innovation and stagnation and ultimately poorer profitability or worse. Profiling is one way to get to know your customer better, and if done well can make a massive difference to designers, marketers and managing directors sometimes more used to acting on their hunches. As Richard Stevens, creative director of Forpeople, the design agency involved in British Airways' new First experience candidly declares: "Most airlines and designers fall into the trap of designing for this sector based on assumption rather than any real understanding."

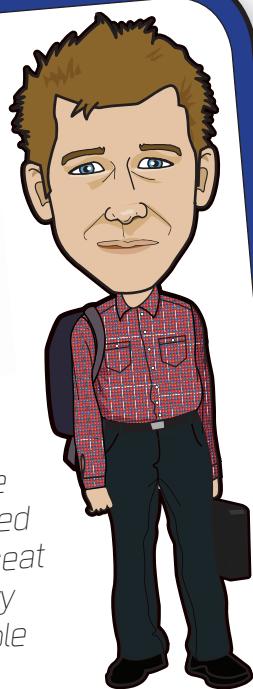
Getting those parties to understand the importance of customer profiling is key. For some businesses like Air New Zealand, necessity proved to be the mother of invention. After a period of financial turmoil in the early 'noughties' with an ageing fleet and dwindling fortunes, the company

was reborn with new management that acknowledged they needed to take a completely new look at long-haul travel in order to survive.

The resulting research created a series of customer profiles that were amusingly equated to characters from the TV show *The Simpsons* for ease of understanding – more of which later – and spawned among other new products, the critically acclaimed Skycouch. Now entering service, the three-seat economy product can be converted into a couch via a lift-up extension to the seat base to allow a couple or a parent and kids to get some sleep. A formal adaptation of what some long-haul economy customers try to achieve anyway when the seats around them are free, it's nonetheless a genuine breakthrough that is proving very popular with passengers. Crucially, the decision to make it only came after detailed customer research.

"If you look at the Skycouch it looks like a leg rest on a seat and essentially that's what it is," says Air New Zealand's manager of aircraft programmes, Kerry Reeves. "A lot of

**Arne
Rijkssen**



"My knees are always crushed against the seat in front. I envy smaller people when I fly!"

- 33 years old
- Furniture designer
- Single
- Dutch

**Phillip
Anders**



"I'd rather fly Business but unfortunately the company can no longer afford it"

- 49 years old
- Married with a teenage son
- Plastics sales manager

**John and Anne
Throsby**



"Travelling in economy plus was a real treat, but not worth the added expense for this trip"

- 67 and 66 years old
- Married
- 2 children and 4 grandchildren
- Retired, used to own and run a café

**James
Strathfield**



"I can't hear any of the announcements, so I'll be no use if there's an emergency!"

- 65 years old
- Deaf
- Divorced with one daughter, Lou 32
- Retired military

**Claire
Ashford**



"I'm really excited about my trip but Mum's terrified I'm going to get lost or miss my flight or something..."

- 18 years old
- Single
- Just finished school
- Wants to be a social worker



01

02

- 01.** Air New Zealand's Spaceseat offers two experiences: central 'inner' Spaceseat pairs offering a social environment; **02.** While 'outer' Spaceseats are better suited to those who would rather not be disturbed

people have said to me, 'that's so simple, why didn't someone do that before?' but you have to understand that it is the outcome of all of the work we've done."

DIFFERENT APPROACH Air New Zealand is an interesting case study because of the amazing depth and time spent on this research. The firm picked San Francisco-based innovation company IDEO to start the process back in 2006 and took their time to really establish what the brief should be before they even tried to meet it. "We didn't race ahead to develop ideas," says Reeves. "That's probably the mistake many organisations make. They want to innovate but they don't, they just improve on where they are. Going back to understanding what your whole proposition and customer journey should look like then creates the questions we used to develop products to answer those questions. Evolving existing product isn't true innovation."

Andy Baker of Davis Associates, which has provided user insight research for projects including British Airways' First offering to staircase solutions for the Airbus A380, agrees

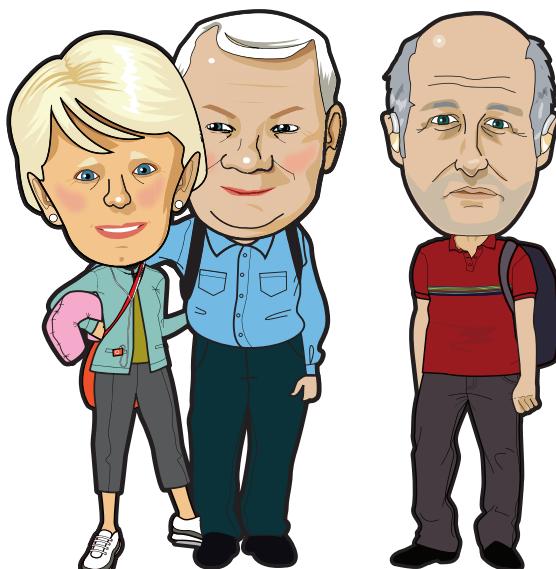
carriers need to adopt a more scientific approach: "An airline may have a stereotypical view of a business-class customer," he says, "but as ergonomic experts we consider the profiles that really test the design."

Baker cites the case of a young mum travelling with two kids who might be familiar with business class as a solo businesswoman but now has a new mindset and priorities. "Customer profiles, or 'personas', provide the airline and the design team with a precise, shared vision of the range of customers to be considered. The profiles help to define and illustrate the functional and emotional needs of customers and, by doing this, inform the prioritisation of design options. It is this guidance of the requirements process which is the true benefit of customer profiling for the final design."

Air New Zealand's Reeves says carriers really need to go the extra mile in their efforts to understand latent passenger requirements: "We thought we'd done customer research previously but really we'd only scratched the surface," he says. "The work we did for Skycouch was much more in-depth and structured. For our observational research we sent people on actual flights as passengers and even trained the IDEO people as crew to observe customer behaviour from a crew perspective."

Customer surveys were also involved but ultimately Reeves found the observational research more useful: "It's very difficult to put down your true feelings in a couple of lines or by ticking a box. But when you're flying on an aircraft and watching what people do all the time, how they sleep, what positions they take, where their feet go, that's a very powerful way of understanding their needs."

Reeves confesses to a whopping 12 months researching – a serious commitment in money as well as time but one his team was ultimately able to convince management about. "A year might sound like a long time," he says, "but it wasn't until the last three to four months that we started to get real clarity. It was very important to bring the management along on the journey too. If you disappear into a cave for 9-12 months and pop out at the end and say 'well this is what our passengers need', especially when some of the findings are quite radical, it could be very easy for a management



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team to dismiss it. They have to be a part of that process or they will never buy into the outcome.”

And indeed the Air New Zealand management team were involved. Reeves says all the senior management train as flight attendants and, at various times of the year, still operate as cabin crew.

BART OR BURNS? The upshot of all this research was the identification of a series of customers with different personalities and thus onboard requirements that were allied to characters from the *The Simpsons*. Reeves explains: “*The Simpsons* reference was simply a way for us to easily understand customer segmentation and the types of people we were designing for. They’re universally known characters. Rather than a very detailed description of a particular character type, saying a person was a ‘Bart Simpson’ or a ‘Mr. Burns’ was just so easy for the designer to know exactly what that person is like.”

The biggest customer group (29%) in Air New Zealand's findings was defined as 'Socialites' or 'Bart Simpsons' – i.e. those that are highly involved in the flight and those around them. The second biggest group (26%) was defined as 'Territorialists' or Mr. Burns – mainly frequent flyers, who know exactly their entitlements and expect very high service. These groups defined the two basic passenger needs – to socialise or be left alone – while other characters acted as off-shoots of these ideas: the 'Positivists' (10%, Marge); 'Cocooners' (17%, Lisa); and the 'Disengaged' (18%, Moe).

digital personas

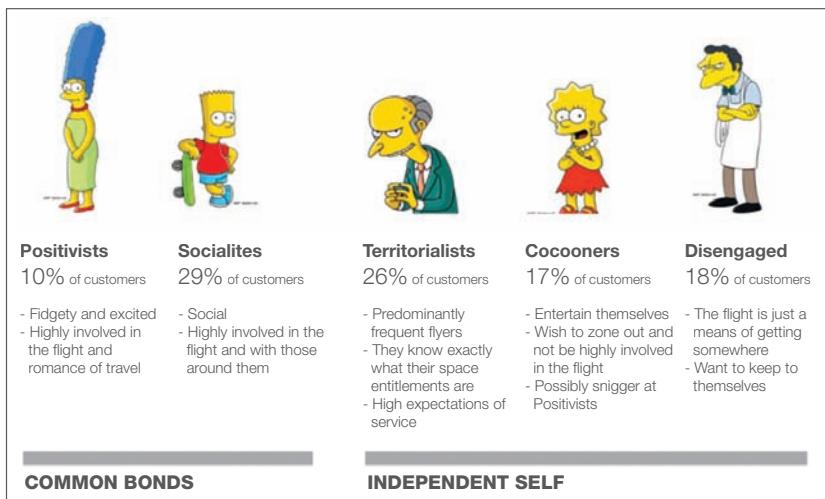
Effective passenger profiling is particularly relevant to an airline's IFE offer. The latest IFE systems allow customers to purchase anything from car rental to theatre tickets via the seatback screen. Tailoring particular services or specific offers more closely to the seat demographic could help boost profits: "Through our technology, we can see who is buying, where they are buying, what they are buying, and when," says Richard Cushing at Guestlogix, which helps airlines to create, manage and control onboard retail environments. "This provides us with extensive insights into product purchasing habits on board."

There are also opportunities to personalise the overall experience: "We're working very closely with a number of airlines on enabling, for example, the creation of playlists, of preferences, of language or other user-driven configuration before the passenger gets on the aircraft," adds Thales' vice-president of marketing, Stuart Dunleavy. "So just as you have a frequent-flier profile with your preferred seat, your preferred destination, your preferred departure points, we want to bring that same one-to-one relationship to the IFE platform. A number of airlines are very interested in enabling their passengers to create essentially a digital persona they can carry from aircraft to aircraft and flight to flight."



03. Persona cards from Davis Associates





04

04. *Simpsons* characters were used to help describe varying passenger needs during Air New Zealand's long-haul product development programme

05. One of the fruits of such a precise research approach – Air New Zealand's Skycouch

The result of identifying characters who wanted to socialise (Bart and Marge) and those who wanted to be left alone (Mr. Burns, Lisa and Moe) led Air New Zealand from the idea of “selling seats to selling experiences”. Three new products were developed as a result. Reeves says the Skycouch – designed for socialisers who also want to get some rest – actually came from an alcove idea to create lounging space for families. “It was a great concept,” he explains, “but we couldn’t execute it efficiently because it took too much space and the value proposition wasn’t right so then we thought how we could create the same environment within the boundaries of what is affordable for an economy passenger.”

Reeves reckons the Skycouch is reasonably priced for economy given the precious option of sleeping and early sales are very positive. In basic terms if one person buys the couch they buy three seats for x2.5 times the price, but if a couple buys it the extra cost is only x0.5 again and if a family of three buys it – say a mum and two kids – they’re already buying three seats so the premium is only a few

hundred NZ dollars. Usefully the Skycouch can act simply as a regular three-seat economy seat as required too.

The second product resulting from the research was the premium economy Spaceseat. Reeves continues: “It’s designed to deliver to the two propositions of travellers we identified: those who want to socialise and those who want to be by themselves. Although the seat is mechanically the same, because of the layout outboard seats deliver a very private experience where you can control who you interact with, while the centre seats are aligned to allow you to interact with your travelling companion or partner. You can turn to face each other and if you want to dine together a central column becomes a dining area.”

TWO IN ONE As Reeves points out, this seat achieves the trick of offering two different experiences within an aircraft class. Indeed although Air New Zealand officially only offers three classes, with the Skycouch and Spaceseat it can now effectively offer five different experiences.

The airline’s final research finding was that customers want to control their space and also their experience – notably when they eat and drink and how they order it. The resulting product – food and beverage on demand – where customers can order snacks and drinks at any time through the IFE via the equivalent of an internal email to the crew in the galley is not an industry first. However, it is strongly appreciated by customers and opens up options for other uses for customer profiling for airlines looking to raise revenue.

Air New Zealand’s story doesn’t necessarily mean every future product development process needs to be so intensive. Reeves concedes that the next phase will be more evolutionary: “The process won’t need to repeat itself as I think we’ve learned what we’ve learned, but how we execute it for the next aircraft fleet will be a little different as we’ve learned a few things along the way that we could have done better.” However, it does show that to really change things, identifying your customers and their real needs – whether he or she is a Bart, Mr. Burns or Marge – cannot be ignored. ☐



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bluenomore

Virgin Blue has been rebranded as Virgin Australia, and its latest aircraft feature new business- and economy-class seats designed to add a contemporary feel to the cabin

ANTHONY JAMES, AIRCRAFT INTERIORS INTERNATIONAL

 Virgin Blue, the plucky Australian upstart that dared to challenge Qantas on its own soil, is being rebranded as Virgin Australia. A Boeing 737-800 and an Airbus A330-200 sporting the carrier's redesigned livery (shown above) were added to its domestic fleet in May. Both aircraft feature new economy- and business-class cabins with dark leather seating, and a gourmet menu created by Aussie masterchef Luke Mangan. The new features underline a desire to transform the low-cost carrier into a modern airline that appeals to both the corporate and leisure markets.

The A330-200, which entered service between Sydney and Perth on 26 May 2011, is the first aircraft within the carrier's domestic fleet to offer a business-class product. "For the first time in almost a decade, travellers will have a choice in business class within the Australian domestic market," said John Borghetti, Virgin Australia's CEO and managing director, during its launch. "With our excellent service, luxury leather seating, multichannel IFE and our range of high-quality meals designed by Luke Mangan, Virgin Australia's A330 service will provide an unparalleled experience in Australian skies."

The airline plans to operate a three times daily service from July, providing a total of more than 33,000 seats each week between Sydney and Perth. As part of an introductory offer, a business-class ticket costs AU\$1,399 (just over £900), and includes complimentary limousine transfers, lounge access and priority check-in.



01

01. Virgin Australia's first two A330-200s are fitted with 27 seats in business class at 62in pitch

02. Plush padding and a charcoal leather finish ensure a comfortable and stylish environment

The carrier's first two A330-200s are equipped with 27 business-class seats from Contour installed at 62in pitch in a 2-3-2 configuration. Its third and all following A330s will feature 24 business-class seats supplied by Weber, set at 60in pitch in a 2-2-2 configuration. In both cases, the seats feature individual seatback IFE screens, a smart dark matt leather finish and generous amounts of recline.

A range of high-quality Luke Mangan inspired meals that are prepared on board rather than merely reheated are included in the price of a business-class ticket. Options include Petuna Tasmanian ocean trout with asparagus and a salad of fennel or a small Caprese salad. There's also a barista-style coffee service and an extensive choice of fine wine, beer, spirits or champagne.

Amenity kits feature toiletries from Bulgari and Grown, while blankets, pillows and noise-cancelling headsets are also available. "Our launch amenity kit is from Bulgari but we are moving to a new range of male and female amenity kits from October this year, incorporating Australian cosmetics from Grown," explains Martin Daley, Virgin Australia group executive of product and guest services.

"Grown produce organic luxurious skincare products – owned and made within Australia."

The economy cabin on its first two A330-200s feature 251 seats from Sicma installed at 31-32in pitch in a 2-4-2 configuration. Its third and following A330s will feature the same number and configuration, but with seats supplied by Weber and set at 31in pitch. All seats will be finished in the same dark leather, with headrests in shades of red, stone or lilac.

The IFE on its first two A330-200s is provided by Panasonic's 2000E broadcast system, while the same company's Ex2 AVOD IFE system will feature on all later aircraft. Both systems provide passengers in both classes access to 12 free-of-charge early release movies split across inbound and outbound flights. There are also 16 TV channels and a range of music videos, radio channels and the latest CDs to choose from.

Meanwhile Virgin Australia's latest 737-800 includes the new Boeing Sky Interior (BSI), which offers larger overhead lockers, mood lighting and sculpted sidewalls to provide an enhanced feeling of space. The airline already operates 54 of



02

the aircraft type, with a further 58 on order – the latter all featuring the Sky Interior. The carrier is the first BSI operator on the continent, with rival Qantas not expected to receive its first one until later this year.

The new 737-800s feature eight business-class seats in a 2-2 configuration at 37in pitch followed by 168 economy seats at 30-31in pitch. B/E Aerospace is providing its Spectrum First unit in business and its popular Pinnacle model in economy. A stylish custom-made plexiglass divider separates the two cabins, while a ‘privacy enhancer’ is installed in front of the first row to shield passengers from the galley and entrance area.

One key feature conspicuous in its absence on the 737s is an in-seat IFE system – some reports suggest this was after negotiations with potential supplier Panasonic broke down. “Our new BSI 737-800 aircraft are being delivered with no IFE installed,” confirms Daley. “We are nearing the completion of our fleet IFE and connectivity strategy review and will make a decision on this shortly. We have been talking extensively to our guests to understand all of their IFE needs and have reviewed the latest IFEC solutions

fresh approach

Virgin Australia’s new onboard retail menu incorporates a range of fresh, local Luke Mangan-branded products, including paninis, a salad box and a premium beef pie, with prices ranging from AU\$3-15 (£2-10). “We’ve also worked with a range of premium Australian suppliers to develop a gourmet range of unique onboard snack and beverage products ranging from old favourites such as Bundaberg Ginger Beer through to tasty premium chips,” says Martin Daley, Virgin Australia group executive of product and guest services. “Our aim is to change the game in buy-on-board airline menus and provide fresh gourmet options to our guests.”

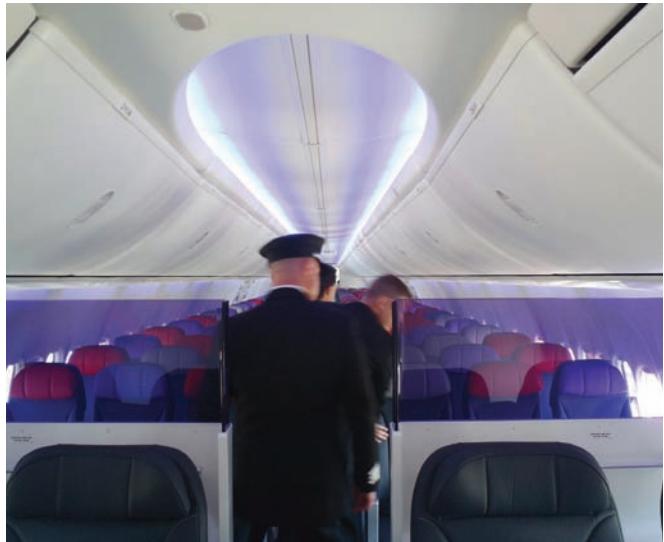
Business-class meals are free, and Mangan has pulled out all the stops to devise a “real food experience” with fresh, local produce individually prepared and plated to order, not simply reheated. Options include three-course lunches and dinners, gourmet breakfasts and tasty snacks complimented by premium Australian wines carefully selected by a wine panel, accompanied by spirits and guest beers. Mangan, one of Australia’s leading chefs, owns and operates the glass brasserie at Hilton Sydney.

available in the market. The latest AVOD systems, WiFi delivery, tablets and everything in between has been considered as part of this review.”

CONTEMPORARY VISION Virgin Australia’s creative director Hans Hulbosch, who previously worked with the carrier’s new CEO, John Borghetti, when the latter was at Qantas, says the interiors of both aircraft types were designed to provide a more modern and luxurious feel: “The brief was to really update the brand – Virgin in Australia – to make it a sexier, slightly more upmarket, contemporary kind of brand – and that’s what we’ve done,” he says. “The seating and experience of these cabins has been designed to say contemporary quality. The aircraft are stunning in their visual appeal, with a very modern simplistic look that creates more space in the cabin.”

Hulbosch partnered with UK-based aircraft seat cover design and manufacturing firm Sabeti Wain Aerospace to maximise comfort for passengers, who face journey times of over three hours on some transcontinental routes. “We pushed the padding to its absolute maximum, to really get as much comfort as we possibly could out of the economy seat,” explains Hulbosch. “And we did the same again of course with the business-class chair.” The custom-designed and built laminated seat covers in both classes are finished in leather supplied by rohi (Wollsdorf).

As for the colour scheme, Hulbosch says his aim was to create a bold contrast: “The seats are all basically dark grey – I wanted a black-and-white look in the cabin to make it very clean, stylish and fresh. The charcoal of the seats is very dark while the wall coverings are almost white. I believe this will last a lot longer and will not date so quickly as so many airline fabrics and designs do these days. It also gives me the flexibility in years to come to be able to make minimal changes to it to ensure it stays relevant.”



03

04

66

THE HEADREST COLOURS ACCENTUATE THE FEELING THAT EACH PASSENGER IS A LITTLE BIT SPECIAL 99

- 03.** Virgin Australia's new uniforms add another bright dash of colour to the cabin
04. The 737-800s feature the new Boeing Sky Interior and custom-made purple plexiglass cabin dividers

The simple scheme also provides the perfect backdrop for what Hulsbosch considers to be the most important onboard feature – the staff. “The crew is the difference between a great flight and a bad flight,” he says. “You always remember a comment a crew member made to you rather than the seat. The crew’s new uniform is a very vibrant red, with a purple scarf. With a black-and-white cabin, the red uniforms really stand out from the rest of the environment, and your eye will always go to that crew member. That’s the other reason why we kept it very graphic.”

RANDOM APPROACH But it’s not all black and white – far from it – the economy cabin also includes headrest covers finished in three colours: a light red to compliment crew uniforms; a stone grey inspired by the seating; and a light purple to pick up on details such as crew scarves, ties and the violet shades of the cabin mood lighting.

Hulsbosch says he wanted to use colour to underline the fact that passengers in economy are individuals, rather than “cattle”, as he puts it. “I wanted to make every seat as comfortable as I possibly could and I wanted to change almost every colour of the seat – to give the impression that every seat – and every passenger – is special,” he says. “I didn’t want all the seats to be all the same. The headrest colours accentuate the feeling that each passenger is a little bit special.”

Interestingly, there is no distinct pattern to the headrests – the variation in colour is completely random. “We’re going to try on every aircraft to make that different, so

you’ll never sit on a chair with the same colour headrest,” says Hulsbosch. “Each aircraft should always look fresh, new and different.”

Unsurprisingly this idea caused some alarm when first presented to the aircraft manufacturers: “They couldn’t understand that we didn’t have a pattern,” he continues. “It took quite a bit with Boeing and Airbus to push it through – each colour had to be individually certified but it’s been worth it as the reaction we are getting is wonderful.”

Hulsbosch freely admits he was also inspired by Virgin America, particularly when designing the new business-class cabin: “I looked very closely at and got a lot of inspiration from Virgin America – they do it really well and have a fantastic product,” he says. “They’ve got white chairs in business – but white for us was just too big a problem in terms of cleaning and caring for the product. We also really wanted it to be the same colour as economy to avoid making too big a difference between the classes.”

Business-class seating features an embossed logo – a detail borrowed from the sports car sector: “We stamped the word Virgin in the seat to give it something a bit special and racey – we really got a lot of inspiration from Porsche.”

SAME DIFFERENCE The rebranding exercise will shortly extend to Virgin Australia’s long-haul fleet, which was previously operated under the brands V Australia and Pacific Blue. “Now we’re able to provide not only one brand and one presentation of the brand but a seamless customer experience as time moves on,” said Borghetti during the launch of the group’s new livery. “And that’s very important – consistency in brand is everything as you know.”

Hence Hulsbosch is currently working on a new interior scheme to be retrofitted to the group’s long-range 777 aircraft: “We’ve just started – the brief is to make it even more upmarket – and it all needs to launch yesterday!” □

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multitasking

The latest control units offer new ways of interfacing with IFE systems, enabling passengers to replicate the multi-device environment they typically enjoy at home

BERNARD FITZSIMONS, AIRCRAFT INTERIORS INTERNATIONAL





IFE systems in the near future may have as many as three interfaces, as developers seek to keep the passenger experience aligned with the options offered by consumer technology on the ground. "Passengers' expectations rise," says Sebastian Petry, managing director of Teague, who helped design Panasonic's Integrated Smart Monitor (ISM) and worked on Rockwell Collins' Venue cabin management system for business jets. "They want to experience something that is similar to or better than what they are used to in their home environment with their big screen TVs, their iPad or smartphones."

That is something of a challenge, given the speed of the consumer chain. "Every year there's a new phone or iPad or whatever," he says. "They last for a year before the next generation comes out. That speed cannot be copied in the IFE market because it takes a year or two years to develop, then it takes a year and a half to certify. So from the point where you start designing it to the time it comes out is a minimum of three years, and it then has to last eight to 10 years in the aircraft for the airlines to get their money back. So you are trying to identify the trend and predict where it is going."

One approach has been to open the IFE platform to passengers' own content via USB and other interfaces. But the likely future direction is indicated by the way passenger control units are evolving into supplementary media devices that can even be used as the sole IFE provision.

ANDROID APPLICATIONS Thales' Touch Passenger Media Unit (PMU) is a case in point: "I think it marked a step change in the industry's approach to developing software and user interfaces," says the company's vice president of marketing, Stuart Dunleavy.

The most significant change was moving to the Google Android operating software, he says. "This enables us to leverage the millions of application developers who are busy building all kinds of creative applications and interface products that previously were closed off to us. So we've moved from being a development house to being an integrator of best in-class applications from the consumer electronics and consumer technology world."

A collaborative project in partnership with Qatar Airways – "it's always wonderful when you've got a visionary airline customer helping to drive the creation of the interface," Dunleavy comments – the unit constitutes a secondary media access device. "The model that we were going for was somebody sitting at home, watching TV and surfing the internet on their laptop or tablet at the same time," he says.

01. An integrated accelerometer function within Thales' new Touch PMU allows passengers to play car games just like they would at home

"The generation Z consumer is really moving to multiple media inputs simultaneously, so we wanted to give the passenger the opportunity to enjoy a range of different applications while simultaneously enjoying the more traditional AVOD entertainment. So you can be watching a movie and surfing through a variety of cached content, news or time-sensitive information; you could be watching a movie and going through the duty free catalogue or the meal and beverage menu; you could be ordering food from the cabin crew; or you could be sending SMS and chat messages both within the aircraft and off the aircraft."

Physically, the Touch PMU is a 3.8in touchscreen enabled device. "It's modelled on the latest mobile phone technologies, so we have an accelerometer function," explains Dunleavy. "The device knows the angle and position it's being held in, so you can play games. You can roll balls around or turn the device into a steering wheel and move it around. It has haptic touch feedback so it will vibrate in certain modes. It has multi-touch capability so you can pinch and zoom much like you would do on a smartphone."

Another consideration was that it had to be usable by everyone on the aircraft: "It's very simple in terms of the buttons and the controls, we wanted it to be very intuitive and be very easy to use." And it is almost infinitely customisable for airlines, too: "We're working very closely with a number of airline customers on enabling, for example, the creation of

playlists, preference and language or other user-driven configuration before the passenger gets on the aircraft."

Qatar Airways, for example, is taking the device in both business and economy cabins, but the user interface will be different: "One reason why that makes sense is that in a business-class cabin you're further away from the main screen so you don't have touchscreen capability, so the device needs to behave in a different way," continues Dunleavy. "We'll also be hosting many Android applications and games, we've got about 25 already validated and loaded on the device today, including massive hits such as Angry Birds. Being able to bring games and applications from the consumer world to the inflight market is a tremendous development and change for us."

Other customers remain unannounced, but two are already confirmed and Dunleavy expects five or six to be flying the Touch PMU by the end of next year.

Touch works with current and all future versions of TopSeries, he adds. "The first deployment will be with Qatar Airways on a Boeing 787, and that is leveraging the current TopSeries platform. Then as of late 2012 or early 2013 we'll be starting to deliver the new TopSeries Avant system for aircraft integration and that will include capacitive touchscreens, as well as the Touch PMU. We've already demonstrated the largest ever touchscreen installation in an economy seat – a 12.1in monitor – and we have multiple screen sizes in multiple seats."

SEEING DOUBLE Before there was Touch, of course, there was Panasonic's Karma, first revealed at the 2009 WAE show and in service since April aboard the first of Virgin Atlantic's new A330-300s. And there are significant differences between the two.

"Probably the thing that's most different about our touchscreen handset is that we have stuck with the tactile feel and



THE DEVICE KNOWS THE ANGLE AND POSITION IT'S BEING HELD IN, SO YOU CAN PLAY GAMES



02. Thales' Touch PMU features a 3.8in touchscreen LCD and can store and host a wide range of applications independently, including those from the Google Marketplace

02



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the kind of haptic feedback that you get from actual buttons," says Neil James, Panasonic's executive director of corporate sales and product management. "We did a lot of research as to whether you can have a touchscreen handset for games, and we just don't believe it, not for the kind of games that people might want to play on board the aircraft – driving games, shoot-'em up games. We've stuck with a slightly larger form factor so that we can keep those gamers happy."

There are other customers for Karma, and most will have an upgraded video device with much higher picture quality, James says: "Believe it or not, people even want to have two different video streams running. They might want to preserve full screen for a video conference with someone else on board and watch a movie on the handset. They might want to have high-resolution moving map and display information as well as SMS text type information on the handset and have a full-screen movie. We just want to be able to give them all the options that make sense."

In economy class, says James, most airlines are looking to lose weight and complexity: "What we expect to be the most prevalent offering will be touchscreen in economy class. The light-touch capacitive touchscreens that we have in our ECO 9 and ECO 11 products are very light. Unlike the older resistive touch where you had to press harder and it wasn't responsive, capacitive touch means you barely have to touch the screen. We're also incorporating the swipe technology where you don't have to lift your finger from the screen to be able to type, you can just slide across the different characters, as people are getting more and more used to that with smartphones."

Some airlines still want to have a handset, or want a Karma handset as well as the display, he adds, "and we can obviously accommodate that." Others have considered using Karma as the only IFE system. The less than 2 lb weight of the ECO screens has reduced interest in that notion, however.

MULTIPLE CHOICE In business class, says James, there may be as many as three different interfaces: "Perhaps a touch surface like the Apple touchpad concept in the armrest with full touchscreen navigation on Karma, because the screen may be four or five feet away from you in first or business class." At the same time, he says, "We do have some customers that would still like to have a touchscreen even in the larger format displays, as big as 20in, because of the way they're configuring their business-class seats." There might need to be a second touch surface for when the seat becomes a bed, "but what we're saying is that our technology supports whatever outcome the airline wants".

Another possibility, already showcased on Panasonic's ECO 9 and ECO 11 lightweight screens, is projected infrared touch or gesture recognition. "It's programmable," says James, "but when you get within about an inch of the display you can in firmware or in software make the display do whatever



03

03. Panasonic's Karma handset includes a touchscreen keyboard and full digital display for movies

04. Thales' Touch units can be customised to suit airline branding

three clicks

Ease of use was a major goal in Virgin Atlantic's implementation of the Panasonic Karma handset, available to premium-economy passengers on the airline's new A330s. With only three clicks required to start viewing content, Virgin says, "It's the most intuitive system from start up to play."

The airline says it worked with London-based Airside and Massive in Sydney to make the technology usable by "anyone from phobic to in tune". And while it suggests passengers can use it to do two things at once, such as follow the moving map without having to stop the movie on the main screen, that may be just the start.

In conjunction with Panasonic's next-generation eX3 system, says the company's Neil James, Karma will enable a passenger to watch live soccer plus the view from the tail camera, and view stock prices, news or sports results simultaneously on the big screen while browsing the wine list on the handset.

"The airline can do whatever it wants with the second screen at that point," he says. "Whether they choose to always preserve the big screen for the big screen stuff and do the navigation exclusively from the handset, that interoperability is what we're providing."

04





WHEN PASSENGERS BOARD THE AIRCRAFT AND BEGIN USING THE IFE SYSTEM, THE TRANSITION SHOULD BE SEAMLESS



you want. It could bring up a subset of the user interface at the top of the screen. As you put your hand near the screen it recognises that you're there and the airlines have control over what happens from that point forward. Nothing is lit on the front of the display, but as you put your hand nearer to the display you can light up buttons like the audio jack, the USB jack, this ubiquitous button in the middle of the screen. It's all programmable, however the airline wants to do it."

Karma is not the only option, James adds. "We still have airlines that want to retain the PCU functionality at the seat, but in a really small package, with text entry, the haptic feedback, the six-axis accelerometers, but in a really tiny package because they're going to super-thin seats."

To accommodate them, Panasonic has designed two new handsets and one PCU. "The AUD PCU, which is basically for airlines that probably have audio only in economy class and maybe some overhead displays, has a little display that lets you see metadata on the screen where you can build playlists, you can look at track names and radio stations."

Then there is the standard handset, which has all the games control functions on one side, a full QWERTY keyboard on the other, and a capacitive-touch 'squash pad' on the top that enables navigation of the on-screen interface with the swipe of a finger.

The third option, which is more of a concept so far, is a handset that fits vertically into an economy-class arm. "You can still get really good functionality from a handset without encroaching on the passenger's living space. We've just turned the device sideways, made it quite thin, and it slots into the arm like a toaster. We got some really good feedback from the seat vendors on that at the Aircraft Interiors Expo in Hamburg."

FAMILIAR FEATURES The IMS Company, whose seat-centric RAVE IFE system won the 2011 Crystal Cabin Award for Entertainment and Communications, believes that consistent usability across user interface platforms is essential; and that capacitive touch is the key to consistency, helping ensure IFEC user interfaces are familiar and intuitive.

"Increasingly, passenger-owned smartphones and similar devices are becoming central to the travel experience," says

IMS CEO and founder Joseph Renton. "They are used for flight check-in, for boarding, for maps of the airport and for electronic flight boards. When passengers board the aircraft and begin using the IFE system, the transition should be seamless – a touchscreen interface with navigation tools that are common across PED platforms."

While the passenger interface and navigation tools should be similar to that of smartphones and tablets, in Renton's view, the system behind the interface should reflect an architecture designed not to emulate that of consumer devices but to meet the unique requirements of inflight systems.

"Smartphones and tablets are an important part of the travel experience," he says. "But they are designed for mobility, and not specifically for the passenger experience on board the aircraft. It still requires the IFE supplier to architect a system behind the interface that improves on what consumer devices can do in flight. For example, watching early-window movies is still the most popular use of the IFE system, and since 16:9 is the most commonly used aspect ratio for theatrical movies, 16:9 is the most suitable aspect ratio for IFE systems. Consumer tablets, like iPad, often use a 4:3 aspect ratio, meaning that widescreen movies viewed on the devices will have black bands at the top and bottom of the screen."

Ruggedness is another essential. For RAVE, IMS uses a capacitive touchscreen technology that is designed to meet the harsh demands found in high traffic, vandal prone access sectors. Designed for graphic-driven applications such as games, kiosks, banking and vending machines, these screens have been tested with over 50 million touches on the same surface. ☒

CONTACTS

www.imsco.us.com; www.panasonic.aero; www.thales-ifs.com



05. Panasonic Elite IFE system with Integrated Seat Monitor and Karma handset



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restroom rethink

Lighting, décor, accessibility, functionality and hygiene are among the considerations in lavatory design, and new approaches promise both operational and aesthetic benefits

BERNARD FITZSIMONS, AIRCRAFT INTERIORS INTERNATIONAL



In an executive lounge at London Heathrow's gleaming new Terminal 5, between flights on his way back from the recent Aircraft Interiors Expo in Hamburg, Teague Aviation Studio vice president Kenneth Dowd found himself underwhelmed by the poor ergonomics and wasted space of the lavatories. "They were at least four times the size of an aircraft lavatory, and they were incredibly unfunctional," he recalls.

Among the faults were a wash basin that was too small; a paper towel dispenser mounted on a different wall, making it impossible to avoid dripping water on the floor; and a good-looking but limited-capacity and hard-to-access waste receptacle in the wall under the sink. "The airflow wasn't particularly good, it had only one hanger for your briefcase or coat, and nowhere to sit," says Dowd. "It had the space to be a really good lavatory, and it wasn't."

As Boeing's design consultant for the last 65 years, Teague has designed a lot of washrooms: "They're the most expensive real estate around next to a seat, and maybe even more expensive because they're taking away space that could be used for revenue," says Dowd. They are also one of the biggest design challenges on an aircraft: "The size of a lavatory is extremely compact, it has numerous functional requirements and we pack an awful lot of things into that tiny little space."

Considerations include sink size and capacity and storage for amenities. "That can take the form of a cabinet behind the mirror in front of your face, but if that cabinet gets too big then you can't get your head down to wash your face in the sink. So that's a real critical issue." Hand towels need to be in a location that avoids dripping on the floor, especially as passengers no longer seem prepared to clean up behind themselves, "so you actually have to design for a different circumstance."

CLEAN SWEEP Hygiene is "a huge issue," Dowd continues. "We've tried really hard to get fixtures onto that aft wall as opposed to coming up out of the sink, because it's just so much easier to keep clean, and anything coming out of the sink is simply a dirt trap." Trash is always a big issue: "It needs to be in a location that's intuitive and convenient and preferably accessible without actually touching that surface to any great degree." Placarding and graphics are further





01. A combined urinal/washroom concept from Dasell allows airlines to gain seats by changing from classic lavatories to a combination of urinals and washroom



02

02. A water temperature indicator is integrated into the mirror of Lufthansa's first-class A380 lavatory, designed by müller/romca Industrial Design

03. A380 standard lavatory - but shown here with a few custom modifications



03



04

“

ONE OF THE FASTEST WAYS TO RUIN A GOOD LAVATORY IS TO FILL IT FULL OF PLACARDS, SO THEY HAVE TO BE INTELLIGENTLY DESIGNED AND PLACED

”



05

considerations: “One of the fastest ways to ruin a good lavatory is to fill it full of placards, so they have to be intelligently designed and placed.”

The flush button needs to be sensibly placed so that first-time flyers and speakers of other languages understand intuitively where it is. And cleanability is “a huge issue,” says Dowd. “On the Boeing 787 we’ve tried to eliminate the big shrouds that go around the toilet, because there’s no way to keep those from becoming soiled during the course of a flight, so by eliminating that you automatically have a much cleaner and more hygienic environment.”

LEARNING CURVE Styling, too, has become more important. “Lavatories in the past were above all functional,” he says. “They had to meet all the functional requirements, and then within that functionality they were styled. I think today we’re finally getting to the point where function and design are complementary, they blend together, and certainly on many premium-class lavatories they have narrowed the ground between a fine hotel or even your home and what you see on an aircraft. Bringing that into the economy-class cabin is the next great frontier.”

That is beginning to happen on the 787, Dowd says, thanks in part to the potential of LED lighting. “One of the

big opportunities we found in the passenger cabin was lighting. It’s used on the 787 in a way that it has never been used before, and the 787 lavatory uses light in much more innovative ways. It also uses light which is sympathetic to the brand and the rest of the aircraft.”

There are also a lot of curves: “One of the things we’ve always known but were able to implement much more strongly in the 787 is that curves and light can create a perception of space,” he says. “That’s because any time you put a sharp defining point it’s something for your eye to go to and it restricts that feeling. Without them you tend to focus on the furthest away point instead of the point that’s right in front of you.”

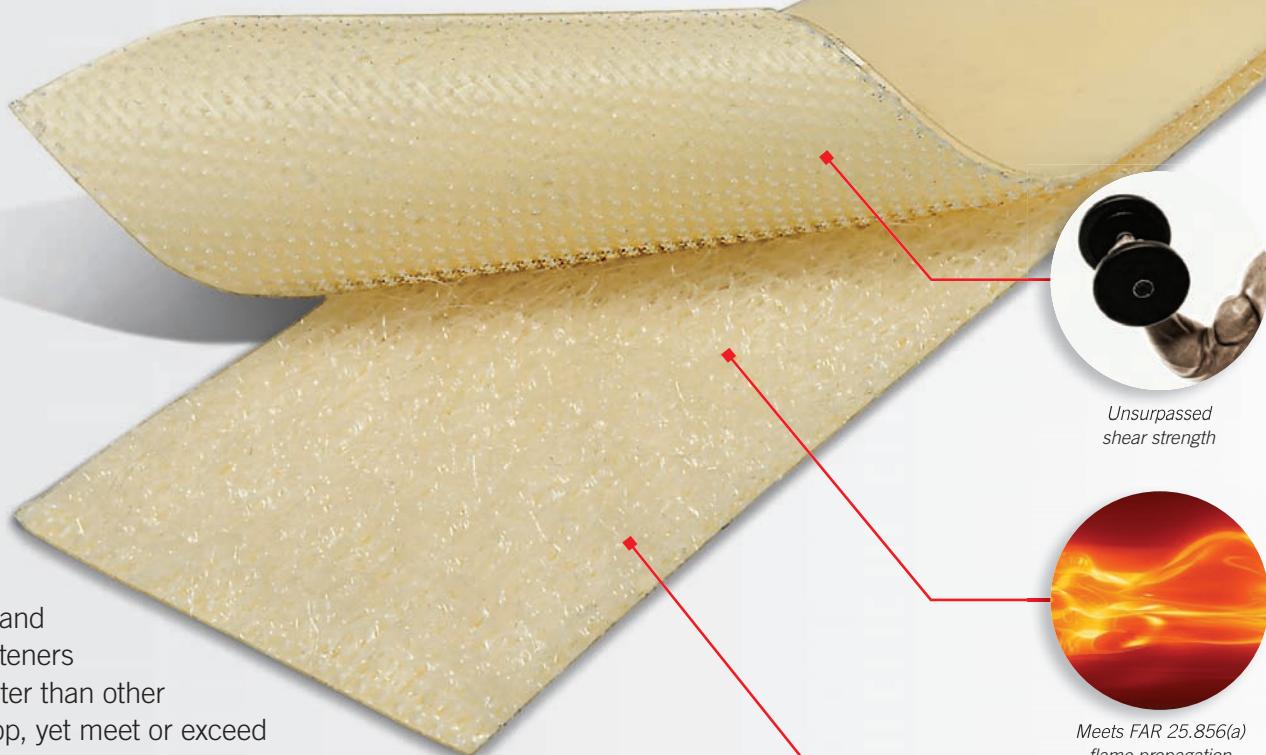
The result is a lavatory that uses curves and light to create a sense of space: “It has the LED lighting to bring the blue sky effect in, it makes a real honest attempt to provide more headroom to get your face into the sink so you can wash and keep the water off the floor. And then it has a series of amenities that are built in that just make it a more comfortable and friendly place for people.” And if it is in the right location it can even have a window as an optional extra.

Another “really cool little feature” Dowd highlights is a small handle on the lavatory seat. “That gives you a two-finger spot that you can pull the seat up.” Other features

04. Amenity storage in the Teague-designed 787 lavatory does not impede face washing, and there is a handle for raising the toilet seat

05. Airbus’ Space-Flex concept replaces the standard full-width rear galley installed on A320 family aircraft with a smaller unit and two lavatories, making room for three more seats

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06

that came out of Teague's advanced design are a fold-out table that passengers can rest their feet on or sit on to change their shoes or socks, and additional mirrors. "Overall," he concludes, "I think it's a really good attempt at bringing those features we've seen in premium class into the economy-class cabin."

DOWN TO BUSINESS The most important element of any washroom is the toilet itself. After failing to buy Envirovac in 2004, B/E Aerospace hired the lavatory-maker's former CEO to found its own waste and water systems business. Now vice president and general manager of the new company, Bob Schafer joined B/E in November 2007. The target was a first order after two years.

"As it turned out," Schafer says, "we captured our first order about eight months after we opened the doors, and there were several others that followed right behind that. Today we have four major customers, we're about ready to add a fifth one, we have five aircraft programmes from a system standpoint, we have delivered and certificated our first system and are just entering qualification for the second and third customers."

Most of B/E's customers are currently from the business jet world: "We knew that the business jet was a way to get our credentials and to grow the business, but the real market is in commercial," says Schafer. So the toilet developed for the business jet customers also constitutes a form, fit and function replacement for all the vacuum toilets currently flying on Boeing aircraft, and the company has also identified a path to use the same technology on the Airbus A320.

wheelchair friendly

Lavatory access for people with reduced mobility (PRM) is likely to be a growing concern in the future. Hence Yokohama Aerospace America presented a new concept lavatory for disabled passengers designed specifically for the Boeing 737 at this year's Aircraft Interiors Expo in Hamburg.

Physically, the module has a dual door for enhanced access and provides increased space inside for manoeuvring. There are ergonomically designed universal assist handles and multiple grab bars. Aesthetically, it combines LED main, task and floor lighting with spa-like colours and materials to provide a more relaxing feel and experience.

Meanwhile the Space-Flex concept (see page 93) that Airbus unveiled at this year's expo can also easily accommodate travellers in wheelchairs. Space-Flex replaces the standard full-width rear galley installed on A320 family aircraft with a smaller unit and two lavatories. A simple conversion process for disabled use makes use of an integrated dividing wall to ease wheelchair access.

Airbus says moving the lavatories from their current location left and right of the central aisle will enable operators to install up to three additional revenue-generating seats on the left – part of the new galley occupies the space vacated by the right-side lavatory – or increase the seat pitch for enhanced passenger comfort.

"We started with a list of all the faults that we see in the current vacuum toilet, and then what can we do to improve upon that," Schafer recalls. "I gave the design team some very specific goals."

One result is a significant weight reduction. "The toilets that are flying in commercial service today typically weigh 16 or 17 lb," he says. "Our toilet weighs just under 8 lb. So we can save up to 9 lb per lavatory today for a commercial airline. For a narrow-body aircraft fleet that doesn't get very exciting, but for a 777, where there's typically 10 or 11 lavatories, or a 747 where there's typically 13 or 14, those get to be big numbers in a hurry."

LIQUID GOLD Further weight savings come from a redesigned spray pattern and bowl shape. "We have been able to determine through test and analysis that we can actually provide a better spray pattern and more velocity for the rinsing situation, using less water than the current guys." The saving is between two and three ounces of water per rinse, and given the number of utilisations on a big aircraft on a long flight "we can come up with numbers as high as, for example, 100-120 lb per 777 on a nine- or 10-hour flight. Combine that with the weight saving of the toilet and you're talking about something in excess of 200 lb in weight savings for the larger twin-aisle aircraft."

That could mean another passenger, or more freight, or better fuel economy. "Or it takes down their cost per revenue passenger mile," Schafer says. "You get one more passenger on for the same fuel, you get a revenue increase. So we have now engendered a great deal of interest with the airlines."

06. Yokohama's 737 lavatory concept, presented at this year's Aircraft Interiors Expo in Hamburg



single sex

All Nippon Airways introduced single-sex lavatories on its long-haul fleet last year, placarding one of the rear lavatories for women only and subsequently reserving another for men. The carrier has specified the washlet – a combination toilet seat and bidet made by Japanese company TOTO – for all the lavatories on its Boeing 787s. Japan Airlines will also have the bidets on its 787s, but only in premium classes.

V Australia had previously introduced a female toilet, complete with piped music, in the business-class cabin of its Boeing 777s. However Lufthansa has attempted the best of both worlds with its first-class washrooms on its A380s. Designed by müller/romca Industrial Design and Dasell, the bathroom includes the world's first flying urinal, as well as a separate washing and changing area complete with leather banquette for seating and storage.

07

TYPICALLY THE MOST JUNIOR GUY IN THE AIRLINE MAINTENANCE ORGANISATION IS ASSIGNED TOILETS

07. Lufthansa's A380 first-class lavatory includes a urinal to improve convenience and hygiene

CLOSE CALL Weight aside, Schafer says maintainability is another vital aspect: "Any failure of a vacuum toilet requires you to take the toilet out of the aircraft," he says. "There's nothing you can do on the aircraft in terms of maintenance." The removal typically takes between 30 and 60 minutes – it is difficult to get to, requires special tools and is likely to be unpleasant. "Typically the most junior guy in the airline maintenance organisation is assigned toilets, as is the most junior guy in engineering. Chapter 38 [Air Transport Association nomenclature for water and waste system documentation] is not necessarily a plum assignment."

For a low-cost carrier aiming for 15-minute turnarounds, he says, "there's absolutely no way you can replace a toilet today. So you can either despatch with the toilet inop and placard the lavatory until you get to an overnight or a maintenance facility where you can swap it out, or you've got a delay or, worst of all, a cancellation." There is no regulatory requirement for operable toilets, but some low-cost carriers have taken a lavatories out of their LOPA, he points out: "So they've only got two lavs, and if they have one down that's a real problem, especially for a high-density flight travelling four or five hours to a vacation destination. They just don't want to despatch with a toilet inop."

B/E hopes to solve this problem by using a base plate that fits the same bolt patterns as a current toilet. "Once that base plate is in place, simply by turning a couple of quarter-

turn fasteners we can get our toilet out of there in literally a matter of seconds. But even better than that is that we can do some maintenance on the toilet without taking it out of the aircraft. We can change the rinse valve, which is the number one mechanical failure in a vacuum toilet today. You get sediment or debris in the mechanism of the rinse valve and you get a valve that's either stuck open or stuck closed, and you either flood the bowl until somebody's got to go in there and turn the water off, or you get a dry rinse, or a dry flush, neither of which is optimum. So we can even replace the rinse valve on the toilet inside that 15-minute turn."

NO TOUCH ZONE The future, as always, holds more opportunities. Teague's Ken Dowd says lighting will continue to be important in making lavatories fresh and clean and more usable; and more functions are likely to be hands-free. Dowd was particularly impressed with Elektro-Metall Export's non-touch waste flap (a Crystal Cabin Award winner at this year's Expo) and thinks it may indicate the start of a trend: "If the water tap could also do that, if the flush button could do that, having hands-free use of things in this day and age with the different communicable diseases that can spread around the world would be major benefit. I think this and the science of anti-microbial surfaces will be the next great step in aircraft. There are mixed opinions today on how effective they are, but you can chemically treat surfaces to reduce bacteria, and I think that science will get better as we move forward."

Dowd's final thought is on the judicious use of water: "Maybe grey water from the sink can be recycled into the toilets," he suggests. "It gets complicated from a plumbing structural standpoint in an aircraft but if you can save water you also save weight." ☒

CONTACTS

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hamburg hothouse

What are the secrets behind Hamburg's rise as the undoubted global centre for excellence and innovation in cabin design and technology?

BRENDAN GALLAGHER, AIRCRAFT INTERIORS INTERNATIONAL



Hamburg a hothouse? Surely not. Most of the residents of this handsome city a few tens of miles inland from the chilly North Sea would probably agree with Lufthansa Technik's Andrew Muirhead, who admits: "Everyone here complains about the weather."

Yet a hothouse for cabin technologies it certainly is, with what Australian Muirhead describes as a concentration of capabilities unmatched by any other city or region in the world. Heading the parade of industry-leading operations is Airbus's Finkenwerder plant, responsible for all A320-family and A380 outfitting; and Lufthansa Technik, where as director of the Innovation business unit, Muirhead oversees the development of a stream of new entertainment, communications and cabin management products.

Joining them from 2013 will be ZAL – Zentrum für Angewandte Luftfahrtforschung, or Centre for Applied Aeronautical Research. To be located alongside Airbus at Finkenwerder, this 20,000m² facility will host companies from all over the world who are interested in carrying out R&D work cheek by jowl with the European aircraft manufacturer (see sidebar). "We want to attract the best companies and institutions in the field of cabin technology,

regardless of where they come from," says ZAL's managing director Andreas Vahl. "It's all about helping to develop the best possible aircraft."

Alongside the big players is an ecosystem of small and medium-sized enterprises belonging to the Hanse Aerospace regional trade association. With more than 300 members, Hanse Aerospace includes on its rolls the likes of Alster Aero, Bishop GmbH and Mühlenberg Interiors, all based in Hamburg.

Hanse Aerospace itself is a member of the Aviation Cluster Hamburg Metropolitan Region Association, formed in January of this year to foster further co-operation among industry, academia and the state government. Along with the players mentioned already, the 15 founding members include Hamburg Airport, the German Aerospace Centre (DLR) R&D organisation, the city's four university-level institutions, the state economic and labour ministry, and the German Aerospace Industries Association (BDLI).

WHY HAMBURG? The picture is one of an ever more tightly integrated effort to propel the Hamburg region to the forefront of international aerospace in general and cabin





01



02

HAMBURG HAS NO FEWER THAN FOUR HIGHER EDUCATION INSTITUTIONS

01. Central Hamburg seen from across the Alster

02. Airbus's presence at Hamburg-Finkenwerder has helped build the city's expertise in interiors

competencies in particular. But why Hamburg? Why not some other German or European city?

Andrew Muirhead has no doubts about the prime mover behind the city's growing pre-eminence in the cabin disciplines. "The most obvious reason for Hamburg's strength in interiors is Airbus and its decision to locate a lot of its cabin outfitting activity here," he says. "The second factor is Lufthansa Technik and its corporate and VIP completions business. Together they provide any cabin provider with two big potential clients in the one place. The result has been the development of a local supply chain, an ecosystem, not to mention the emergence of Aircraft Interiors Expo as the leading event of its kind anywhere in the world."

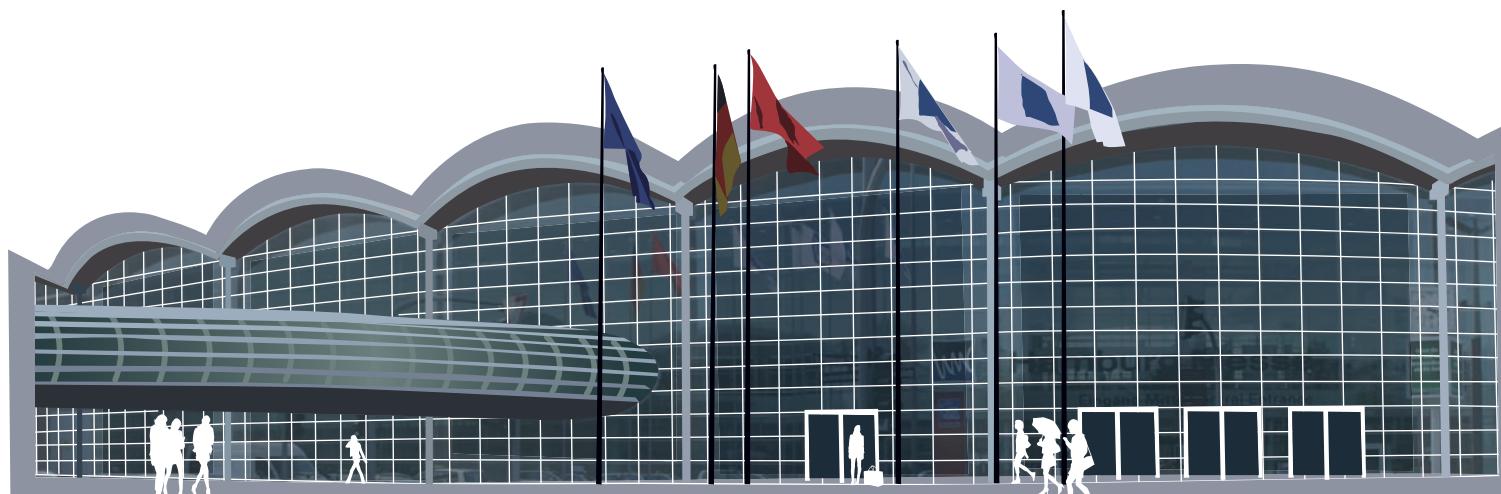
Top bosses are fond of saying that their people are their true capital, and some of them believe it. But in aerospace there's no hiding place: no company can operate, never mind prosper, without a technically capable workforce.

"Germany as a whole has an excellent technical education system, and Hamburg has no fewer than four higher education institutions, including a technical university," comments Muirhead. "Combine that with the attractions of life here and you are in a good position to get the skilled labour you need."

As an 'immigrant' into Hamburg himself, the Lufthansa Technik man thinks quality of life does matter. "It's a very livable city," he says. "There may not be any big tourist attractions, no Buckingham Palaces. But, like Melbourne in my home country, it has cafes and parks aplenty and a rich cultural life. It's a very comfortable place to live, and that plays a big part in getting skilled people to come here."

To the right place and the right people can be added some very supportive policies, Muirhead believes. "Hamburg has been the scene of a number of research programmes in which the city administration has made a big effort to promote co-operative ties among big companies like Lufthansa and Airbus, the SMEs and the universities," he observes.

STRONG SUPPORT The city government deserves much of the credit for the Hamburg success story, according to Muirhead. "In many places the state can be indifferent or even hostile to your business," he says. "Here it's the very opposite: the town hall is extremely interested and is a big



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promoter of the idea of Hamburg as the place for aerospace – it's right there in your face on the posters when you first arrive at the airport."

Walter Birkhan, president of the Aviation Cluster Hamburg Metropolitan Region Association, is the man with the job of ensuring that today's virtuous cycle continues in the long term. He stresses the importance of the 'clustering' concept – selecting promising areas of economic activity and encouraging the development of physical concentrations of expertise.

At national level Germany has a strategy of promoting and recognising "leading-edge" clusters, and the aerospace network that has been emerging in Hamburg since the

beginning of this century was formally awarded that status in 2008. "Hamburg also has its own cluster-oriented economic policy, focusing on the port and logistics, IT/media, life sciences and renewable energies as well as aerospace," says Birkhan. "The aim is to use these innovative sectors to boost the region's economic growth."

The cabin is one of four competency fields being addressed by the Hamburg aviation cluster. "The broad objectives are to try to make flying more economical, more ecological, more comfortable, more flexible and more reliable," says Birkhan. "These are the principles that will help to guide the work that will be done from 2013 at the ZAL Technology Centre."

central planning

A German consortium is set on opening a technology centre with a strong focus on the cabin in Hamburg two years from now, and they plan to offer a welcome to the best industry performers from around the world. ZAL (Zentrum für Angewandte Luftfahrtforschung, Centre for Applied Aeronautical Research) was created in June 2009 by nine shareholders – Airbus Germany, Lufthansa Technik, the city of Hamburg, four universities, the German Aerospace Centre (DLR) and the Association for the Promotion of Applied Aeronautical Research.

Seconded from Airbus to ZAL, managing director Andreas Vahl heads a small team with big ambitions. "At the moment there are just four of us, plus some Airbus and Lufthansa Technik technical people, in our offices at the Hamburg Airport plaza," he says. "This is a good location for the first stage of our work – talking to organisations that are interested in taking space at the Technology Centre we plan to open at Finkenwerder in 2013. So far they include Airbus, which has contracted for 8,500m², and EADS, taking 1,300m² and planning to carry out several projects there."

Ultimately, Vahl says, ZAL will have about 30 core staff operating from Finkenwerder while continuing to maintain a "business centre" presence at the airport and a testing operation at Lufthansa Technik. In the meantime, the organisation is looking to the day when all of the Airbus cabin competencies have been relocated to the Technology Centre, along with a cast of system suppliers, research establishments and universities employing another 300-400 people between them.

"We are acting as an enabler, bringing all the parties together under one roof to expedite the passage of new technologies through readiness levels 4-6 – integration, validation and industrialisation," says Vahl. "We think this will make it faster and easier to apply them in practice. We hope to contribute to shortening development cycles, and to making technologies more mature by the time they are offered to suppliers for commercial exploitation."

Once the Technology Centre is up and running, the activities there will include Airbus's fuel cell lab, along with work by other players interested in the technology. There will also be an emphasis on air conditioning, and on cabin/fuselage integration.

Though Airbus will be a big hitter at the Technical Centre, Vahl is keen to emphasise that it will not be an Airbus facility. "Our investors will build the centre and lease it to us at ZAL. We will then rent space to Airbus, EADS and the rest of the tenants, who will be completely free to work independently on their own projects."





03

66

IF YOU WANT TO WORK IN THE AIRCRAFT INDUSTRY, AND ON CABINS IN PARTICULAR, THIS IS THE PLACE TO BE

99

03. Hamburg looks set to continue to grow as a centre for interiors with the addition of HCAT and ZAL

When it enters service, the Technology Centre will join another new aerospace facility in the city – the Hamburg Centre of Aviation Training (HCAT), which opened at the end of May. “HCAT’s bringing together of the aviation industry with the universities and trade schools will be unique in Europe,” says Birkhan. “The intention is to ensure that the latest useful results from R&D programmes are immediately integrated into the higher educational syllabuses.” HCAT will be home to the Cabin and Cabin Systems (CCS) Laboratory, to be located at Hamburg’s University of Applied Sciences.

Early HCAT programmes will include German Aerospace Centre (DLR) work on how light in the aircraft affects the passenger’s well-being and perception of temperature, a lighter and narrower seat rail from Bishop, improved cabin acoustics from Lufthansa Technik, and Airbus’s fuel cell activity.

These initiatives and others like them are going to keep Hamburg’s burgeoning aerospace community more and more busy in the years to come, and that suits Lufthansa Technik’s Andrew Muirhead. “Before I came here I had always admired German engineering and aerospace,” he says. “This city has lived up to its reputation in that respect: if you want to work in the aircraft industry, and on cabins in particular, this is the place to be. You would be hard-pressed to find anywhere else in the world with such a concentration of cabin expertise.” ☐

CONTACTS

www.hanse-aerospace.net; www.zal-gmbh.de





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seven eleven

Seven super seats from Aircraft Interiors Expo 2011 – including the latest thinking in the fast-moving high-density business-class and ultralight economy sectors

ANTHONY JAMES, AIRCRAFT INTERIORS INTERNATIONAL

EADS Sogerma

Equinox

Equinox is a new high-density, full lie-flat business-class seat that can be installed in a 2-2-2 (A330 or A340) or 2-3-2 (777, A350, A380) layout at a pitch of just 58-60in. "In Zone A on an A330-200 Equinox offers a 24 pax count," says Jeffrey Forsbey, EADS Sogerma's vice president of sales and marketing. "We can get 32 seats in the same zone on an A330-300." The seats are angled to allow for a reduction in pitch, and when converted into bed mode, the seats overlap, with the window seat stretching above the aisle seat.

"Equinox is a side-by-side product, which traditionally require passengers to step over each other," explains Forsbey. "To get the pitch and the density right and to solve the step over issue, we've designed the seats so they are angled inwards and overlap in the bed position. Hence, in bed mode, the window seat goes up and the aisle seat goes down, which allows for a fully flat bed at just 60in pitch."

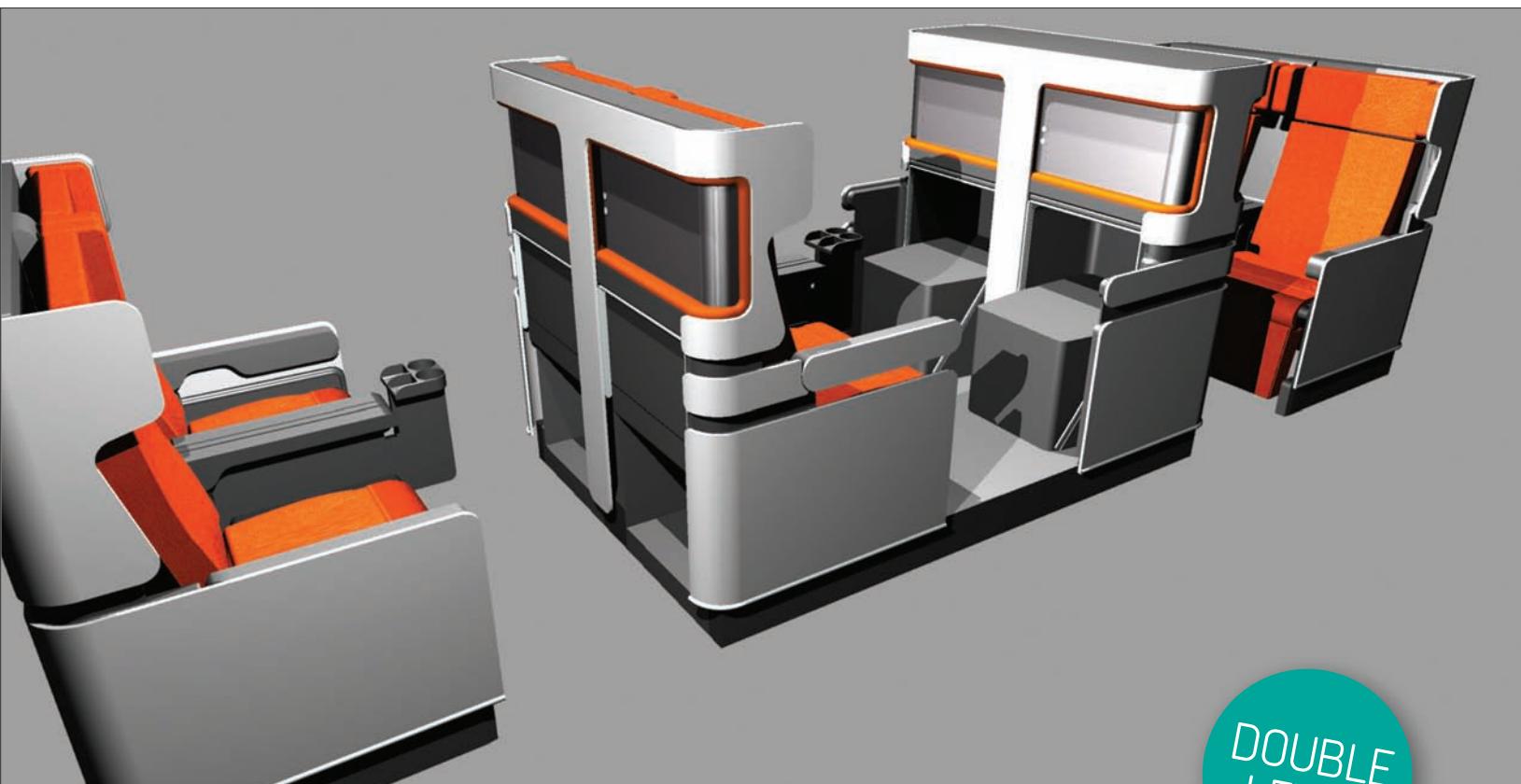
The 22in-wide track-mounted seat converts into a 78in-long bed. A double unit weighs 94kg without IFE. "We think that is competitive in a business-class environment, but once the seat is in full-scale development we hope to make it even lighter."

A joint project between JCE Design and EADS Sogerma's in-house team, Equinox was officially launched after positive feedback from the expo: "Full-scale development of Equinox is now under way with over 80% of the supply chain developed," continues Forsbey. "The seat drive will be through a single actuator reducing weight, decreasing system complexity, and increasing seat reliability. To date the seat mechanism has been through system and structure testing with over 50,000 movements to fully test the seat prior to entry into service."

www.sogerma.eads.net

HIGH DENSITY





Third Dimension

Third Dimension is described as a “compact, double-level, horizontal, lie-flat seat arrangement” ideal for either 2-2-2 or 2-3-2 layouts, depending on aircraft type. Essentially it overlaps seat pairs vertically to provide a true flat bed for the passenger while maintaining a competitive seat count for the airline. “This arrangement makes use of the overlapping of the bed surfaces but with a minimal usage of space in height,” explains Avointeriors’ industrial designer, Giorgio Santero. “This allows for a business-class cabin density that still grants all passengers a flat bed – and it can be installed within a standard cabin as a conventional seat, without the need to remove the overhead stowage bins.”

Santero says the product, which can be installed at 63-67in pitch, provides a flat bed offering comparable sleeping comfort to products normally installed at 80in pitch. “A 320in-long cabin installation of Third Dimension would result in 35 seats on a Boeing 777,” says Santero. “This outperforms the best layouts [herringbone and opposed-facing] by three passengers while granting better levels of comfort and privacy.”

With armrests fully retracted, each seat is 22in wide and converts into a bed 75in long. The raised centre seat platform and furniture are pallet mounted, while the seats are track mounted. “We foresee an average weight of approximately 90kg per pax,” adds Santero.

Although currently a concept, Santero is unconcerned by any certification challenges: “The forward-facing lower seat is similar to a standard forward-facing seat, the aft-facing low seat is similar to a standard aft-facing seat,” he says. “Regarding the centre higher forward-facing seat, the vertical interface loads at the tracks are made comparable to those of standard seats by an increased distance between the front and rear floor-track attachments.”

Santero says the next step will be the engineering design phase, triggered by an effective purchase order, leading to the certification of a specific cabin layout adopted by a launch customer. “In comparison with a herringbone layout, Third Dimension has more room and comfort, as well as a passenger posture that is in line with the flight direction,” he concludes.

www.avointeriors.it

Avointeriors

HDSFC staggered suite

B/E Aerospace revealed an updated version of its high-density super-first-class (HDSFC) staggered suite at this year's expo. Each suite features a 21in-wide seat that converts into a 74-78in-long bed, offering 27in of bed width at the shoulders for a better night's sleep. The suites are designed for installation at 85-90in pitch (including pass-through area).

Previously available in a 2-2-2 configuration, B/E unveiled a 2-3-2 version for the Boeing 777 and Airbus A380 this year, where the centre 'triple' passenger has direct access to both aisles. B/E says the suite offers advantages typically found in products at a far more extravagant 1-2-1 configuration – i.e. high levels of privacy and direct aisle access.

Noteworthy features include a large, single-leaf, sturdy table finished in modern granite and trimmed with chrome plating. "The table offers a substantial area for airline branding in that real wood veneer and hardwood edge trim can be utilised to provide a level of elegance typically found in luxury automobiles and private jets," says Kent Kroener, sales director, SFC products at B/E Aerospace. There's

also an electro-chromatic glass privacy panel option. "At the touch of a button the clear divider gradually becomes a frosted opaque visual and sound divider between adjacent passengers," he continues. The demo suite on display at this year's show was fitted with a simple textile concertina divider.

The product is already in commercial operation. All-business-class EOS Airlines offered 50 staggered suites on its Boeing 757 aircraft, before it ceased trading in 2008. Indian operator Kingfisher currently offers an in-line version, with 30 suites on its A330s across two zones; and 36 across two zones on its A340s. "The density of pax depends on the cabin zone length," says Kroener. "If you go 2-2-2 in Zone 1 on an A330 you can have 18 pax; it's 18 or 20 for Zone 1 on a B787-8 depending on galley and monument configurations; 24 in Zone 1 for a B787-9; and 15 for Zone A on a B747." However, there's no exact figure for the 2-3-2 layout as yet: "We expect the seats to be spread across multiple zones with monuments at each end – as such there is no standard layout."

www.be aerospace.com



DIRECT
AISLE
ACCESS





Basic Line 3520

Recaro Aircraft Seating presented a new version of its Basic Line 3520 unit for short-haul economy use, which is 3kg lighter (30%) than its predecessor. Recaro says the average placard weight of a triple standard pax (without IFE or seatbelt but fitted with leather) is 10.6kg. The saving has been achieved by integrating an innovative netting material into the backrest to reduce necessary foam thickness, while the seat divider is made from a lightweight alloy. A recline function (up to 4.5in) is included as standard and the unit can accommodate audio and IFE systems.

The leaner, slimline backrest in combination with a higher literature pocket help boost living space for the passenger. Recaro says this enables installation at a

minimum 28in pitch, if required. "Instead of being placed in the passenger's knee area, the literature pocket is located above the tray table which ensures an outstanding level of passenger comfort," explains Axel Kahsnitz, Recaro Aircraft Seating's CEO. "We have also worked in partnership with German universities to develop a study on optimal backrest contours, the results of which were fully integrated into the new backrest design."

The BL3520 has already been snapped up by launch customer, Lufthansa Group, which has ordered 40,000 units for installation on 200 of its aircraft, with 30in average seat pitch.

www.recaro-as.com

Recaro

If the seat fits...



ZODIAC SEATS

CABIN INTERIORS SEGMENT

ZODIAC
AEROSPACE



The seat features short armrests to ease access for disabled passengers



Dragonfly

Dragonfly is a short-haul economy seat with a fixed backrest (no recline) weighing just 7.5kg per pax (22.5kg for a seat triple), certified for installation at 28in pitch. A medium-haul version offering 4in of recline tips the scales at just 8.2kg per pax. The backrest, made out of aluminium using a unique stamping technology, has been ergonomically shaped to optimize living space, providing an extra 2in of living space at knee level (by moving the seat spreaders forward). The seat also features short armrests to ease access for disabled passengers; an upper meal tray table fitted as standard; and uses 30% fewer components than its predecessor. Seat width is 18in between armrests. Audio IFE and PC power are available as options. The seat's green credentials don't end with its low weight – 85% of it can be recycled. It complies with both ETSO C127a and FAR 121 requirements, and has six patents pending.

Laurent Stritter, Sicma's vice president of sales, marketing and innovation, says a vigorous digital design process was used to reduce weight: "First of all we have designed a seat dedicated to the narrow-body aircraft segment," he says. "This means that the seat is optimised for this cross-section with its seat tracks. We have used extensive Finite Element Analysis to develop this seat, optimising 3D models for every single part. We then ran FEA to check both the static and dynamic behaviour of the seat, and we concluded this approach with actual testing, all of which were passed statically and dynamically (including HIC) between 28 and 32in pitch, covering both A320 and B737 configurations."

Hence Stritter denies the 7.5kg tag is a marketing gimmick: "It is very important to note our strong expertise on FEA and the specific knowledge we have developed on HIC absorption," he says. "This has allowed us to pass the HIC testing at only 520 at 32in pitch, when in the past we have regularly struggled to land right below the maximum value of 1,000. These tests were done further to a standard conformity of the seat – it means that the 7.5kg weight announced has been validated and is not just an official commitment or target."

Dragonfly is fully certified and offerable for deliveries from early 2012. Sicma is currently in final negotiations with a potential launch customer "for a very wide quantity of aircraft," concludes Stritter.

www.zodiac aerospace.com

Sicma Aero Seat

winning formula

Recaro Aircraft Seating won two Crystal Cabin Awards at Aircraft Interiors Expo 2011. Its Basic Line 3520 picked up top honours in the industrial design/interior concept category; while Skycouch, which it produces on behalf of Air New Zealand, was the winner in the passenger comfort category. Air New Zealand is currently looking to license Skycouch to non-competing carriers – several airlines have already expressed an interest.

Recaro also presented a new armrest console for use with its Premium Line 3510 premium-economy seat. Unlike previous solutions, the console is no longer anchored to the seat and can be raised up to make it easier for disabled passengers to slide from a wheelchair to an aisle seat. The console can be folded up even when equipped with additional video features. Recaro also continues to work on a successor to its long-haul business-class Comfort Line 6510 unit.

Take it.



ZODIAC SEATS

CABIN INTERIORS SEGMENT

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upwardly mobile

Having previously focused on the low-cost carrier business, Acro Aircraft Seating has unveiled its new Superlight Ultra seat, designed for the full-service economy cabin.

"We've had a great deal of success with our Superlight seats in the no-frills sector," says Chris Brady, Acro's commercial director. "With the new Superlight Ultra we are responding to a market demand for all the comfort

and robustness that are the hallmarks of Acro seats, combined with a more conventionally elegant appearance to give passengers a greater sensation of opulence."

Superlight Ultra seats share a common chassis with other Acro seats, whose revolutionary mono-spar modular construction has seen the company win a British Design Week award and finish as a runner-up at this year's Crystal Cabins Awards.

UltraLight Two Eight

Avointeriors' latest addition to its UltraLight economy-class seat family – the UltraLight Two Eight – is, as its name implies, designed for installation at 28in pitch. The non-recline seat weighs just 8.9kg per pax, including seatbelts, life vest pouch, literature pocket, video provisioning and SEB housing. The seat features a variable cushion density (thicker where needed most) to reduce weight. Further weight-saving features include the removal of the overhanging cushion nose and a lower overall part count. No plastic fairings are present, with the exception of a simple fairing on top of the armrests and if requested, the SEB housing.

The seat pans are connected to the cross bars of the main structure by means of a groove system free from rivets or screws; and each seat pan is made from a heated press-cured sandwich of fibreglass-phenolic skin and aramidic paper. "This material combination also offers sufficient strength and flexibility to deal with the floor warping that occurs during 16g forward dynamic testing," says Avointeriors' Giorgio Santero. "The backrest is made from a peripheral aluminium rectangular tube embodied into a heated press-cured composite fairing, while the rear meal table is made from a flat sandwich panel with honeycomb inside."

The UltraLight family also includes the UltraLight R model, intended for installation at 30-32in pitch. This model, which weighs 9.95kg per pax place, offers a recline function and full IFE monitor provisioning.

www.avointeriors.it

MINIMUM PITCH

The seat features a variable cushion density to reduce weight





NEW
SUPPLIER

The seat offers living
space and comfort
more often found at
31in pitch

Close Couple Seat

Pitch Aircraft Seating Systems and Design Q presented a pre-production prototype of a narrow-body economy-class seat at this year's expo. Designed to be installed at 28in pitch, the seat offers living space and comfort more often found at 31in pitch: "This is due to an optimised fixed recline position and a design that creates a lot more legroom by clever positioning of the occupant within the seat, as well as specially sculptured knee pockets," says Stewart Cordner, director of Pitch Aircraft Seating. "Weight is currently just under 23kg per fully dressed triple – that's half the weight of traditional seating currently installed on a lot of jets," he continues. A "very low parts count" helps explain the significant savings.

Cordner says Pitch has an exclusive supply and manufacture agreement with Intier Automotive, a division of Magna International, which promises to deliver efficiencies from the mass production processes of the car industry to the aviation sector: "This results in drastically shorter lead-times, which also results in less financial burden for customers," he says. "They can also expect automotive interior levels of repetitive high quality, a proven global logistics framework and the very real capability to efficiently and quickly manage customer variance and spec changes. Not to mention an aggressive approach to pricing and the latest technology production methods and materials."

Certification is expected April next year according to Cordner. "The seats we had at Hamburg are now in the US doing the rounds with airlines who expressed a desire to see them in the flesh."

www.pitchaircraftseating.com

Pitch Aircraft Seating Systems

industrial strength

Thompson Aero Seating, which moved into a brand new factory in Portadown, Northern Ireland, in February 2011, says the first shipset of its new Vantage seats will roll off its production line by November of this year. Thompson's high-density 'staggered' Vantage business-class product is already in service with SWISS, Delta Air Lines and Finnair. Until now Thompson has only licensed its seat design, with manufacturing handled by Contour. However, Thompson says it has now introduced a

number of improvements to the new version of the seat it will manufacture itself: "These will result in a considerably lighter and more easily maintained seat, offering a lower cost of ownership to the operator," says president and founder, James Thompson.

Meanwhile, Thompson's staggered economy seat, Cozy Suite, has passed 16g HIC development testing but launch customer Delta Air Lines is not expected to take delivery of its first shipset until 2012 at the earliest.

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tripwire

Despite fears of rogue radio frequencies running loose in the cabin, onboard mobile phone use continues apace without incident with inflight WiFi rapidly following in its wake

BRENDAN GALLAGHER, AIRCRAFT INTERIORS INTERNATIONAL



Two or three years ago, when the debate about onboard mobile phone ‘cabin rage’ and interference with aircraft systems was at its height, an FAA specialist addressed an international conference on the subject. In the subsequent question time he was asked: “Has a serious incident or accident ever been formally attributed to mobile phone use on an aircraft?” His answer? “No.”

The regulators took no chances, however, and the dozens of installations now in routine service with airlines around the world are carefully fenced around with devices to minimise the power output of passenger phones and jam any signals that might leak off the aircraft and interfere with the cellular networks on the ground. The drama has gone out of mobiles in the cabin, so the Jeremiahs and headline-hunters have switched their sights to another target – WiFi.

Already a standard offering in the world’s airports, hotels and coffee shops, this wireless Internet access technology is also taking to the air. Until earlier this year the worriers had little to get their teeth into. Then came news of interference with cockpit displays and the ‘Twittersphere’ lit up. Unfortunately for those on the trail of a disaster in the

making, the size of the problem seems to have been greatly exaggerated (see sidebar, overleaf).

In the meantime, WiFi has been steadily advancing into the air transport mainstream. Four air-to-ground service providers use it for Internet links in the cabin, and Lufthansa Systems has just announced the world’s first WiFi-based IFE system.

If WiFi woes were going to surface anywhere, it should have been among the airlines using Aircell’s Gogo North American terrestrially based in-flight Internet service. At last count nearly 1,100 US airliners were equipped for the service, which allows passengers to email and surf the Web via their own laptops and smartphones, WiFi access points in the cabin, a small, simple aircraft antenna, and a nationwide network of cellular towers.

According to Illinois-based Aircell, there will be more than 200 million passenger journeys on WiFi-enabled aircraft in the course of this year. The company adds that its total of installations, achieved in the three years since launch of service in 2008, represents over half of the current predicted tally of WiFi deployments.



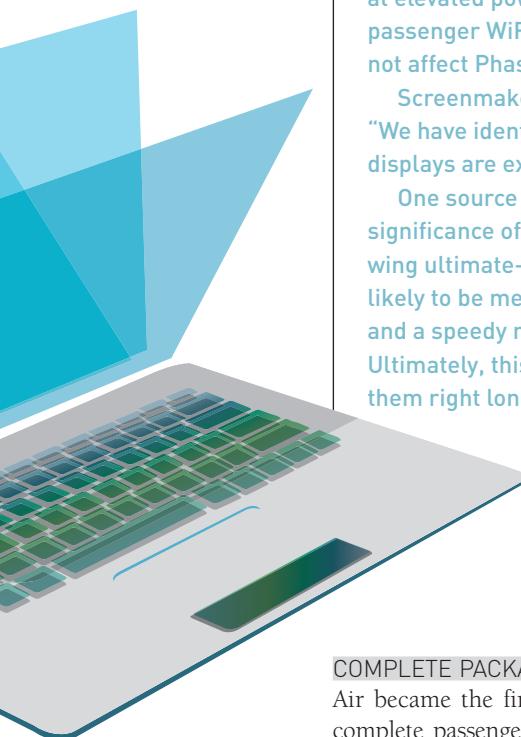
screen sensation

WiFi was knocking out cockpit screens used for the display of safety critical information, according to a flurry of press stories at the beginning of March. The reports related to electromagnetic interference (EMI) certification testing of Aircell's Gogo WiFi system on new-build Boeing 737NGs fitted with the latest Phase 3 version of Honeywell's liquid-crystal flat panel display unit.

"Blanking of the display units was reported during EMI certification testing of wireless broadband systems (WiFi) on various 737NG aircraft," said Boeing. At the same time, the manufacturer revealed that the tests had been carried out at elevated power levels, and said that outputs typical of normal operation of passenger WiFi systems would not cause blanking. It added that the issue did not affect Phase 1 and 2 DUs.

Screenmaker Honeywell described the blanking as "momentary" and said: "We have identified a fix and are working to ensure that this does not occur when displays are exposed to elevated levels of electrical energy."

One source familiar with the EMI testing of new avionics believes the significance of the problem has been exaggerated: "Like the 150% figure used for wing ultimate-loading tests, the power levels for these tests far exceeded those likely to be met in normal operation. The issue is not seen as particularly serious and a speedy resolution is expected, probably by means of a software fix. Ultimately, this is what certification testing is for – to identify problems and put them right long before equipment ever gets to fly in commercial service."



COMPLETE PACKAGE Last year Middle East airline Oman Air became the first carrier in the world to introduce a complete passenger connectivity package – mobile phone and WiFi Internet access. The Muscat-based operator launched the OnAir service, which exploits the worldwide coverage of the Inmarsat satellite system, aboard four new Airbus A330s at the beginning of March 2010. It is now available on a total of six aircraft, with one more due to be equipped and delivered this spring.

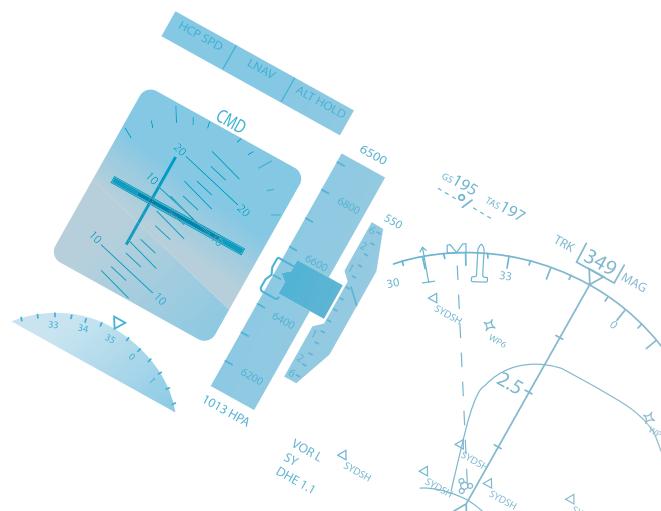
"Over the 13 months since we became the first airline in the world to offer both mobile phone and WiFi connectivity in the cabin, the OnAir service has performed very well, with extremely positive feedback from customers," says Linda Celestino, general manager for inflight services. "Passenger safety is of paramount importance to Oman Air and there have been absolutely no problems with interference with other onboard technologies."

A total of 14 airlines now offer OnAir services, with several more due to join the list this year. Significant numbers have opted for WiFi as well as GSM phone, among them Singapore Airlines. The leading Far Eastern carrier has contracted French engineering specialist Aeroconseil to fit 19 Boeing 777s with the OnAir hardware. "Aeroconseil has an established reputation for the design and certification of inflight connectivity installations," comments OnAir chief executive Ian Dawkins.

Like OnAir, Californian company Row 44 combines WiFi with satellite links to provide airborne Internet access.



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PARAMOUNT IMPORTANCE TO
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Thinking outside the box inside the cabin



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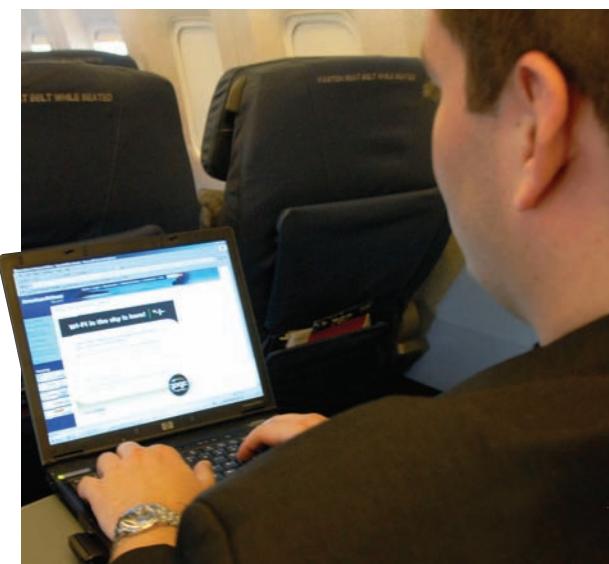
american dream

American Airlines is testing a new inflight streaming video product from Aircell that allows passengers to wirelessly stream content such as movies and TV shows from an inflight library to their personal WiFi-enabled devices. The system is currently being tested on two Boeing 767-200s in transcontinental service, with customer testing to follow early this summer. The airline's goal is to roll out the product on all its WiFi-enabled aircraft starting this autumn, pending FAA certification. Pricing for the new streaming video offering will be determined closer to launch and at the completion of customer testing.

In addition, American is working with Aircell to further enhance onboard connectivity by expanding inflight WiFi to its narrow-body fleet, including additional MD80 and domestic Boeing 757-200 aircraft. It aims to offer WiFi on all its aircraft flying within the continental USA. The WiFi expansion will include 93 domestic Boeing 757s and up to 50 additional MD80s. Installation will begin this summer and continue through 2012. In addition, American continues to install WiFi on its entire Boeing 737-800 fleet.

Southwest Airlines was the first to introduce the Ku-band-based service and is implementing it across its fleet of 540 aircraft. Row 44's first European customer is Norwegian Air Shuttle, which launched the service in February and plans to have 21 aircraft equipped by the end of the year, with the rest to follow in 2012.

PEAK PERFORMANCE The airline reports that on some flights over half the passengers have been online, with a peak of 87 on one sector in mid-April. "We're overwhelmed by the response among our passengers and are gradually installing WiFi on all of our new aircraft," says Hans Petter Aanby, the carrier's chief technology officer. "No other airline in Europe is currently offering this capability, which gives us a huge competitive advantage. Our passengers will soon be able to see in the booking process whether the aircraft has WiFi."



Panasonic launched its eXConnect Ku-band-based Internet service with Lufthansa at the end of last year. The airline, which brands the offering FlyNet, has started with WiFi-borne email and Internet access and plans to add eXPhone GSM service shortly. "We want to offer FlyNet on all of our long-haul flights as soon as possible," says corporate communications manager Klaus Gorny. "Installing the necessary hardware on a fleet of 99 intensively operated aircraft is a complex process, but we expect to have most of the fleet equipped by the end of the year."

KA TO STAR ON JETBLUE Yet another air-to-ground technology is on its way in the form of Ka-band satellite, and it too will be combined with WiFi for 'last mile' delivery in the cabin. The first carrier to commit to Ka is New York-based low-fare operator JetBlue, which plans to introduce a service being developed by its LiveTV subsidiary and hardware and satellite provider ViaSat on around 160 Embraer 190s and Airbus A320-family aircraft from next year. United Airlines subsidiary Continental has also announced that it will offer the service, on more than 200 domestically operated Boeing 737s and 757s.

Linking the JetBlue and Continental aircraft with the ground will be a new satellite to be launched by ViaSat of this summer. It will deliver as much as 50Mbit/sec to the aircraft, bandwidth that will then be made available via WiFi

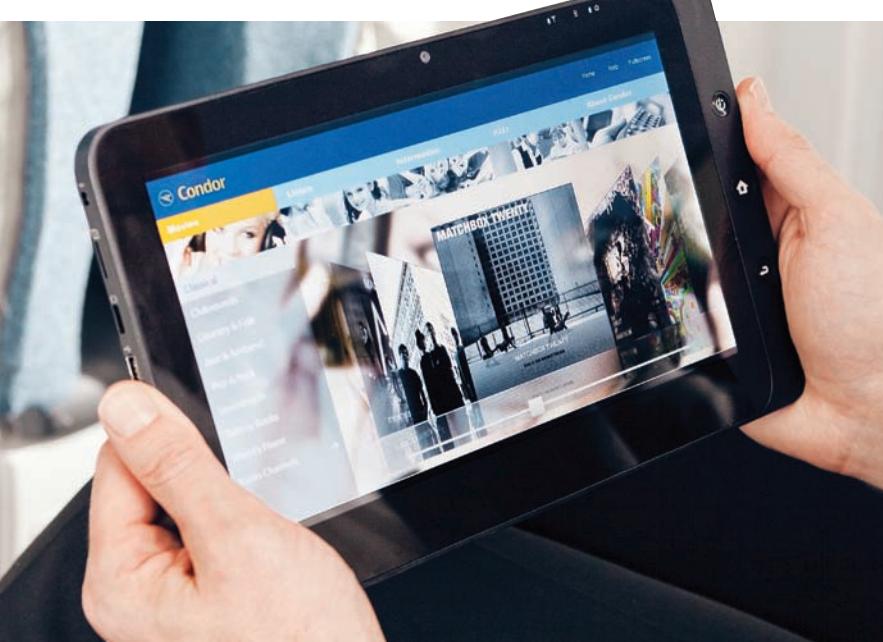
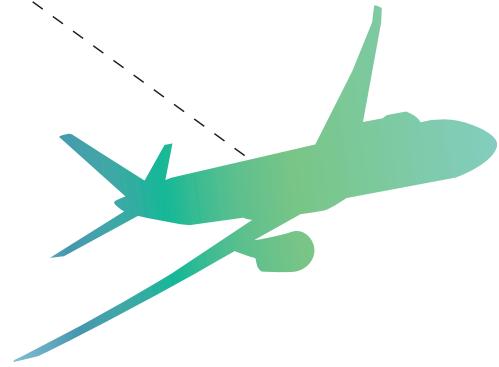
01. A passenger on American Airlines makes the most of Aircell's onboard WiFi system

OVER HALF THE PASSENGERS HAVE BEEN ONLINE, WITH A PEAK OF 87 ON ONE SECTOR IN MID-APRIL



66

WIFI IFE IS MORE LIKELY TO SUPPLEMENT RATHER THAN REPLACE THE CONVENTIONAL IN-SEAT PROVISION



02



03

02. Lufthansa Systems Board-Connect system optimises content delivery for each user device

03. Lufthansa Systems says BoardConnect will require only five access points in Air Condor's 767 cabin – with a potential weight saving of almost half a ton once redundant wiring and data distribution hardware is removed

to passenger laptops for applications such as browsing of content-rich Websites, sending and receiving emails, and downloading large files.

CONTENT DELIVERY Connectivity was the driver that brought WiFi into the cabin – now IFE is adding to the momentum. Earlier this year Lufthansa Systems announced the launch customer for BoardConnect, the first IFE system designed to stream content over WiFi to in-seat screens and passenger devices. German leisure carrier Air Condor plans to implement BoardConnect in a Boeing 767 this summer and could subsequently put it aboard the rest of its fleet. Lufthansa Systems is reported to be talking to other customers.

At the heart of BoardConnect is Microsoft's Smooth Streaming technology, designed to ensure that content is delivered in a form that is digestible by a wide variety of different user devices. When the passenger device first connects via WiFi with the onboard head-end server, the latter interrogates the device to determine its capabilities before selecting from its database and sending a copy of the required content that is as close as possible to optimum in terms of data rate and resolution. This way of working was publicly demonstrated at a Microsoft developers' conference in Las Vegas in mid-April.

Some observers suggest that WiFi-based systems like BoardConnect – others are reported to be in development – could represent a step towards a future in which the

airlines no longer directly supply IFE to their passengers. In this model, it is suggested, the traveller would come aboard with a wireless device and use it to consume content already loaded, or to shop for entertainment on the Web via the aircraft's WiFi network and air-to-ground link.

The main difficulty with this scenario is the fact that connectivity is still a scarce commodity and will remain so long after the introduction of broad data pipes like Ka-band. With a typical digital movie adding up to around 1.5Gb per hour of playing time, mass downloading via satellite would strain system capacity and passenger wallets alike.

There's also a service-related objection. The airlines currently go to the trouble and expense of selecting and procuring content so that the customer doesn't have to. There are plenty of travellers who will continue to expect their entertainment served up to them, just like dinner and drinks, pillows, blankets and a lie-flat bed.

In the medium term, then, WiFi IFE is more likely to supplement rather than replace the conventional in-seat provision, delivering paid-for content and advertising to passengers who want to go one better than the standard offer. At the same time, as residual safety concerns die away in the face of mass of incident-free operation, WiFi will cement its place in the connectivity world. ☒

CONTACTS

www.aircell.com; www.lhsystems.com; www.livetv.net; www.onair.aero; www.panasonic.aero; www.row44.com; www.viasat.com

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Air-Eltec and SkyMax

Sky-Tender trolley

Air-Eltec Luftfahrtelktrik and SkyMax presented their updated Sky-Tender – a trolley that produces up to 30 different drinks (such as tea and coffee, fruit juices, soft drinks or mixed drinks from concentrates and water) automatically at the press of a button. Beer and wine can also be offered. Improvements on the model displayed at Hamburg in 2010 include a pop-up unit to house the drinks dispensers, and a touchscreen display that reads a code on each drink container and automatically displays what drinks are loaded, along with how many servings are left.

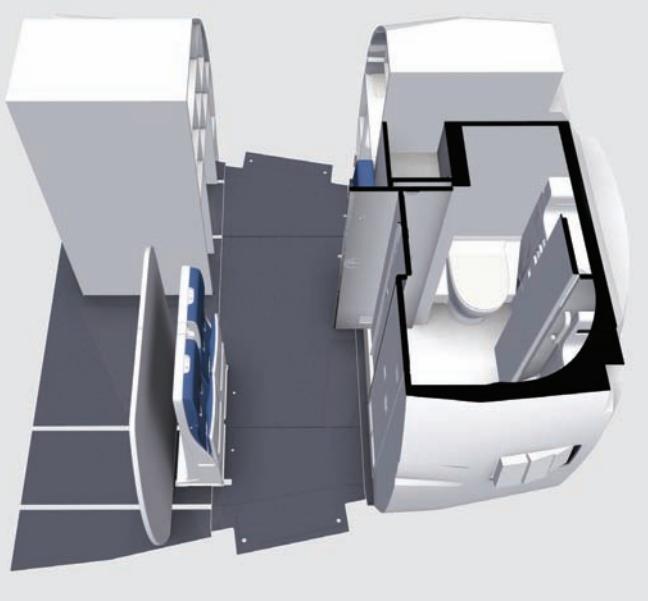
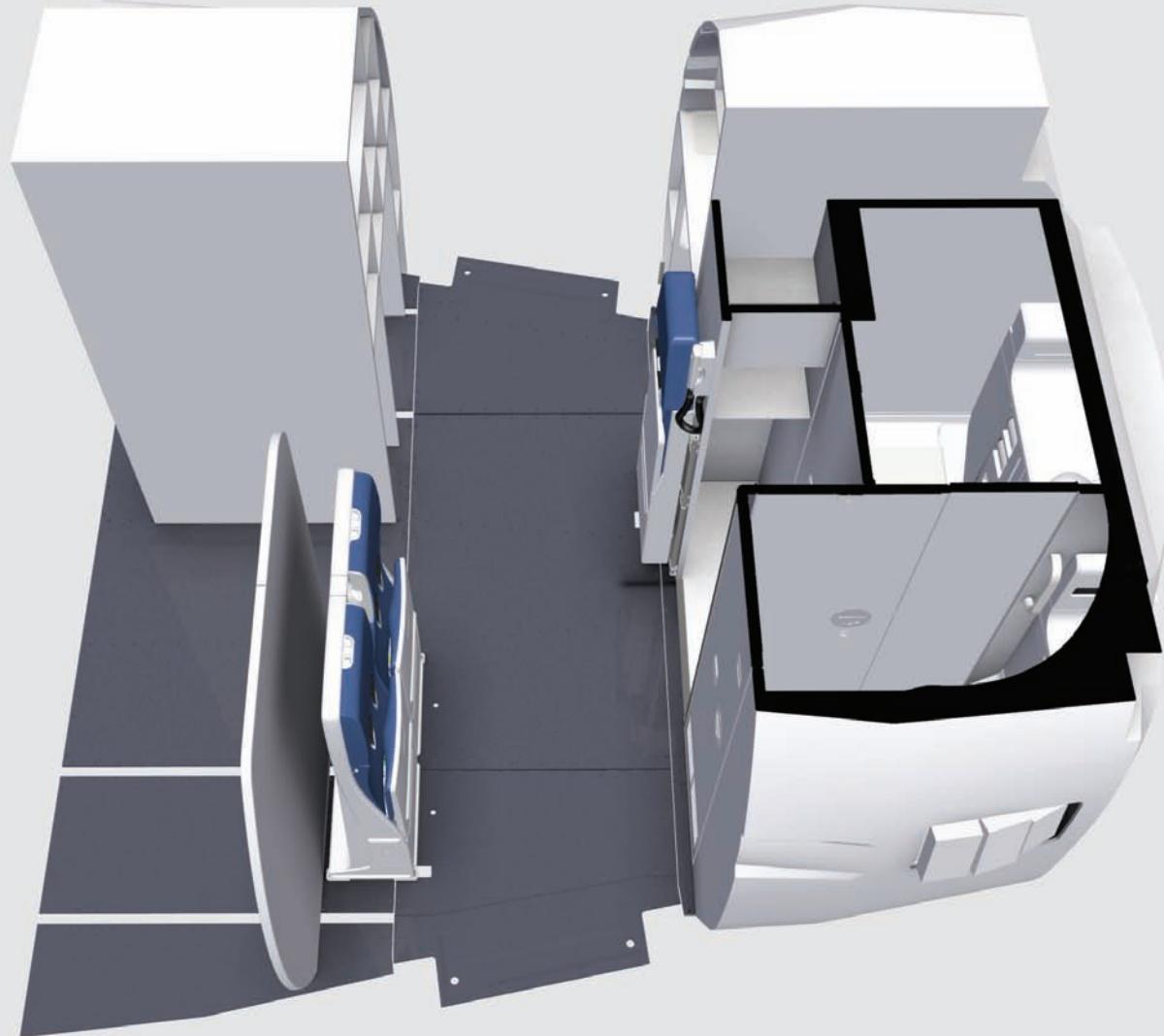
"The Sky-Tender is now ready for the market," says Oliver Kloft, managing director of SkyMax. "From June, tests in the air will start." With the tests, the trolley's creators wants to convince airlines of the benefits and the reliability of the system, which was developed specifically for the aviation industry. The fact that the trolley negates the need to bring bottles, cans, dry ice, hot water dispensers and coffee makers on board is likely to attract airline attention. The trolley is also designed to ease service for crew, and make carbonated drinks taste better – the carbon dioxide is only added when mixing, and so can be adjusted to the lower air pressure in the cabin.

SkyMax offers a customised leasing programme and will take care of service and repair. It has long-term contracts with manufacturers, and so says it can guarantee the continuous supply of concentrates and cartouches.

Based on a standard Atlas trolley, the Sky-Tender weighs 45kg without liquids and 85kg fully loaded. Syrups and drinks are loaded in 830ml bag-in-box containers; one unit can produce more than 220 drinks (180ml per drink).

www.skymax.eu





Space-Flex lavatory

Airbus presented a market research mock-up of a space-saving rear lavatory and galley concept for the A320 family. Called Space-Flex, the concept is designed to make more efficient use of the volume at the rear of the cabin. The result is that two lavatories and a galley can now be accommodated in this space, offering airlines the possibility to install up to three more seats in the cabin and/or to improve seat pitch. One of the Space-Flex lavatories provides full access for persons with reduced mobility through a simple conversion process (pictured, left).

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pivot point

Heath Tecna debuted Project Amber, a new interior upgrade system that enables airlines to retrofit Boeing 737 and 757 aircraft with pivot bins typical of new aircraft types. New components include ceilings, light valances, large pivot bins (replacing shelf bins), support modules, PSUs, sidewalls, close-outs and light fixtures, providing carriers with a cost-effective way to refresh the cabin.

The pivot bin interior fits in standard 80in modules. The width of the bins is alternated (47in and 33in) to fit the maximum number of bags with the minimum amount of wasted space. The pivot bins also feature an electronic latching option, which allows the crew to open all the

overhead bins in preparation for boarding or to lock them shut during aircraft descent – at the touch of a button.

The company also showed a new modular closet, designed to make life easier when operators need to reconfigure an aircraft's layout. Xpand closets can now be adjusted longitudinally in minutes. Depending on the style of closet chosen, this is accomplished by using components such as folding panels, folding shelves, modular sized shelves, tambour doors, tambour shelves and telescoping coat rods. Using these adaptable components, Xpand closets can be designed to adjust to one particular length, or may be sized in 2in increments.

ECO-01 NG seating

ZIM Flugsitz almost tripled the size of its stand compared with 2010 – reflecting its growing stature in the seating industry. Its customer list now includes Thai Airways, airberlin, air transat, Luxair and Mahan Air.

The company displayed its revised ECO-01 NG economy-class family for short-, medium- and long-haul flights, updated with new styling, many customisable features and additional weight savings. The ECO-01 product range uses advanced materials such as carbon fibre to cut weight to just 26.7kg (58.9 lb) per standard triple. The seat can be installed at 28in minimum pitch with widths ranging from 15.3–18.5in, and recline from 6–9in. The modular design makes it adaptable to all narrow- and wide-body aircraft, and is designed to cut lead times and simplify customisation.

ZIM also unveiled a new business-class seat (BC-01), which is due to be delivered to the launch customer in the first quarter of 2012.

www.zim-flugsitz.de

ZIM Flugsitz GmbH



Aura IFE system

This new seat-centric IFE system secured a handshake agreement with a launch customer (announcement pending) at the show. The key feature of the system is that computer processing power and memory is stored in the seat units – not head-end servers.

Aura's stand at Hamburg featured a cabin mock-up fitted with 10 economy-class seats featuring the first 10.1in touchscreen solution (the company plans to offer screens from 7-22in).

The mock-up showed all four of the components that comprise the system – a 3.5kg avionics controller, which replaces servers; a crew and maintenance interface unit (CMIU); 'intelligent' power and data units, which are mounted under a group of seats; and the seat client units – the touchscreens and passenger controls.

Intelligent Avionics has aimed to engineer out points of failure, for example by building a triple-redundant, interwoven power system to the seats that it says would enable entertainment even if two of three seat-power units failed. If a seat unit does fail, it can be swapped by cabin crew in flight.



The company says it has also invested heavily in creating fast, efficient and fully automated content update processes that replenish hundreds of seat units per aircraft, safely and accurately in about an hour for a typical monthly refresh.

The system is designed for any aircraft – from a single-aisle, low-cost carrier to a long-haul wide-body to a private jet. Aura copes with media content ranging from movies to HD games. Functions for carry-on devices like recharging a phone or playing user content come as standard. Aura is also compatible with other airline systems such as broadcast flight maps, legacy video and satcoms to open up the internet, social networking applications and shopping.

The company is working with Dell for the PC motherboard and key components; Microsoft for the Windows Embedded 7 operating system; and Teledyne Controls. It is also championing transparency by publishing its system and component weight, component reliability (MTBF) data and benchmark pricing.

www.aurainflight.com



KAL duty-free shop

AIM Aviation caused a stir by unveiling a duty-free shop developed with Korean Air (KAL) for the airline's A380. The fully staffed duty-free shop will be positioned at the back of the main cabin. Passengers will be able to browse the products (cosmetics, fragrances, alcohol and accessories) on display and pay for them in the shop. The shop will be able to display up to 64 individual items, on magnetic shelves. Magnets are glued to the bottom of display items to stop them moving around.

www.aim-aviation.com

ul-tra [uhl-truh] *adj.*

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Thales

TopSeries Avant IFE system

Thales unveiled the complete architecture of its new TopSeries IFE system, TopSeries Avant (pictured above). The company says it combines the strengths of earlier generation systems with advanced technologies such as high-definition video, solid-state hard drives and faster processors. The new seat-centric solution was recently chosen by an undisclosed airline for installation on its future A350 aircraft. Thales is working closely with Airbus to have Avant offerable on all other Airbus platforms.

Avant embraces the Android operating system and incorporates the Touch Passenger Media Unit, which won a 2011 Crystal Cabin Award. Thales is opening an app portal to take advantage of the growing number of Android-based applications so airlines can review and select capabilities already tested and integrated into the new system.

"We are in high gear now with our new generation system. The market will see Thales manoeuvre into new market segments and deliver new innovation for the latest aircraft types," said Alan Pellegrini, managing director for Thales' IFE activities.

www.thales-ifc.com

resin d'être

Sabic Innovative Plastics added to its Extem UH family of amorphous thermoplastic polyimide (TPI) resins. The new grade features unprecedented heat resistance and offers new design possibilities by providing exceptional dimensional stability for thin-wall moulding.

The company says that Extem resins are inherently flame retardant without the use of halogenated additives that can pose environmental risks and raise regulatory compliance issues.

eX3 IFE system

Panasonic revealed the latest addition to its X Series IFEC portfolio – eX3 (pictured below). It says eX3 will feature elegant industrial design, seamless integration, capacitive touch, proximity sensors, great viewing angles, touchscreen handsets and next-generation processors. It will be able to offer broadband connectivity and GSM services, high definition, high levels of personalisation, onboard social networking, an immersive interactive based on the Android operating system, thousands of applications and video games for every passenger. Premium passengers will enjoy large HD and even 3D displays, productivity tools such as video conferencing and a "home theatre entertainment experience".

eX3 is also designed to minimise an airline's major cost drivers. Panasonic continues to invest heavily in advanced media strategies aimed at reducing content costs and shortening the traditional media cycle from 45 to 15 days, and even real-time with broadband. The company says the system features Android, solid-state disc drives, fewer components, improved BITE accuracy and real-time system monitoring through connectivity, making it more reliable than earlier Panasonic solutions. It also has a simplified, lighter architecture.

www.panasonic.aero

Panasonic



vox populi

Peryphon, an Israeli defence equipment supplier, raised a few eyebrows with a new onboard GSM system for voice and data services in flight, delivered via a Ku-band satellite broadband link. Peryphon says the system complies with aviation and telecoms regulatory requirements, with inflight calls and SMS messages to cost less than current international roaming rates. Costs will be charged directly by each mobile operator to the passenger's account.

crystalclear

The winners of the 2011 Crystal Cabin Awards

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Industrial Design/Interior Concept

Recaro's BL3520 economy-class seat was designed with three key characteristics in mind: lower weight, optimised living space and better comfort. Recaro has reduced the weight of each seat place to under 11kg – 3kg less than the previous seat model. Thus, it says the BL3520 helps to reduce fuel consumption and CO₂ emissions, as well as lower costs for airlines. A slimmer backrest design and a high literature pocket improve living space for the passenger, even at 28in pitch. Recaro made use of the latest scientific research to further enhance seating comfort and ergonomics.



Greener Cabin Health and Safety

The Non-Touch Waste Flap (NTWF), developed by Elektro-Metall Export with Schueschke Solid Surface, improves hygiene by ensuring passengers and crew no longer have to touch the flap of the washroom waste bin to dispose of paper towels after drying their hands. The NTWF's sensor reacts to a passenger's hand only, ignoring stray light or other disturbances. The NTWF is failsafe in the event of mechanical or electronic failure, and can also be retrofitted easily in a plug-and-play manner. It has been tested for more than two million cycles.



University

Arigonomic is a short-haul economy cabin concept developed by the Munich University of Applied Sciences with the help of EADS Innovation Works. The concept pays particular attention to ergonomics – the seat shape is based on the latest orthopaedic research, supporting specific areas of the back,

rather than the whole surface. An integrated high-tech gel within each seat can be stimulated by electric impulses, switching from a compressed state to a soft state depending on flight mode and passenger preference.



Entertainment and Communication

The IMS Company's RAVE embedded IFE system has just two parts: a system control unit (SCU), and a self-contained, fully autonomous seat display unit (SDU) at every seat. The key to RAVE's simple system architecture is that every SDU stores all the content and functionality in each seat, making it independent of the SCU, which is responsible for the background loading of the next month's content set and the aircraft interface. The current month's content set is at the passenger's disposal, playing from one solid-state SD card, and the next month's content set is loaded to a separate SD card. The system is designed to eliminate not only the single-point-of-failure scenario, but also unnecessary LRUs, excess weight and complexity, as well as reducing the installation footprint. Each seat display mounts into a display docking station, enabling crew to replace malfunctioning units, even during flight. IMS says RAVE is functionally competitive with today's traditional systems, offering users a brilliant HD touchscreen, and terabytes of content storage.



Judges' Commendation

Thales' Touch Passenger Media Unit (TouchPMU) is a menu-driven 3.8in touchscreen device based on the Android operating system. It is designed as a multitasking complement to the in-seat IFEC system and works in two ways. As an extension of the Thales IFEC system, passengers can view most system capabilities on the handheld device, enabling conveniences such as watching a movie on the seatback display while playing a game on the TouchPMU. As a standalone media access device, the product stores a wide range of applications locally, independently of the Thales IFEC system, and can host applications found in the Google Marketplace.



Passenger Comfort

The SkyCouch product, developed and produced by Recaro for Air New Zealand, is a trio of three economy seats that together create a flexible space. The legrest can be raised to 60° as well as horizontal to enable passengers to stretch out and relax or sleep, or for children to use as a play area. The foot net gently cradles the feet without hard pressure points, and is self-stowing, enabling travellers to stow bags under the seat when the net is not in use. The SkyCouch also features a stuffed and stitched underlay, helping to create an even surface for a good night's rest.



Material and Components

Lufthansa Technik's coloured floor path marking light for galleys has a reduced height of 2.3mm so that it lies almost flush with non-textile floors. The non-electrical light was tested vigorously to prepare it for the challenging galley environment; it now withstands all kinds of mechanical loads, fluids and temperature changes. The company says that easy installation and low running costs ensure savings for operators, and 100% failure-proof operation guarantees passenger safety in the event of an emergency.

CONTACT

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Bulletin Board

PRODUCTS SERVICES



doubledebut

Chameleon Products, known for its decorative film and covering technologies (as pictured on Emirates' A380 bar, top right), has launched a new product campaign – Way Up, Weight Down. This is part of the company's aggressive strategy to develop a number of new weight-saving products that complement its existing products and services for the aviation sector.

The first product, a new material that can be applied to bulkheads using glue, will be launched in early June 2011. The company says the as yet unnamed product will pass all vertical burn and smoke and toxicity testing. "It will allow any image or design to be applied to a covering as light as paper, and will enable airlines to have a huge array of designs and images on any monument," says Trevor Whetter, managing director at the company.

In July 2011, a second product will be launched, also following smoke and toxicity testing. "In effect, the product will completely remove all foam requirements on aircraft seating and will reduce the weight of every passenger place by over a third," says Whetter.

Whetter believes the new products will benefit the industry. "With the price of fuel always on its way up, I really see the future of new products centred around this business plan whereby everyone benefits and the product effectively pays for itself," he says. "We just need to tweak the

products a little, think of a suitable name and then launch. This is what Chameleon Products is all about – constantly looking for innovations and producing changes."

The company's product portfolio also includes ADP and Visionairy, both launched in 2010. ADP enables any image, pattern or effect to be applied onto aviation-approved plastics such as ABS, polycarbonate, PMMA and PSSU. The product can then be vacuum formed into any 2D or 3D item, with applications including seat parts, bulkhead coverings and sidewall panels.

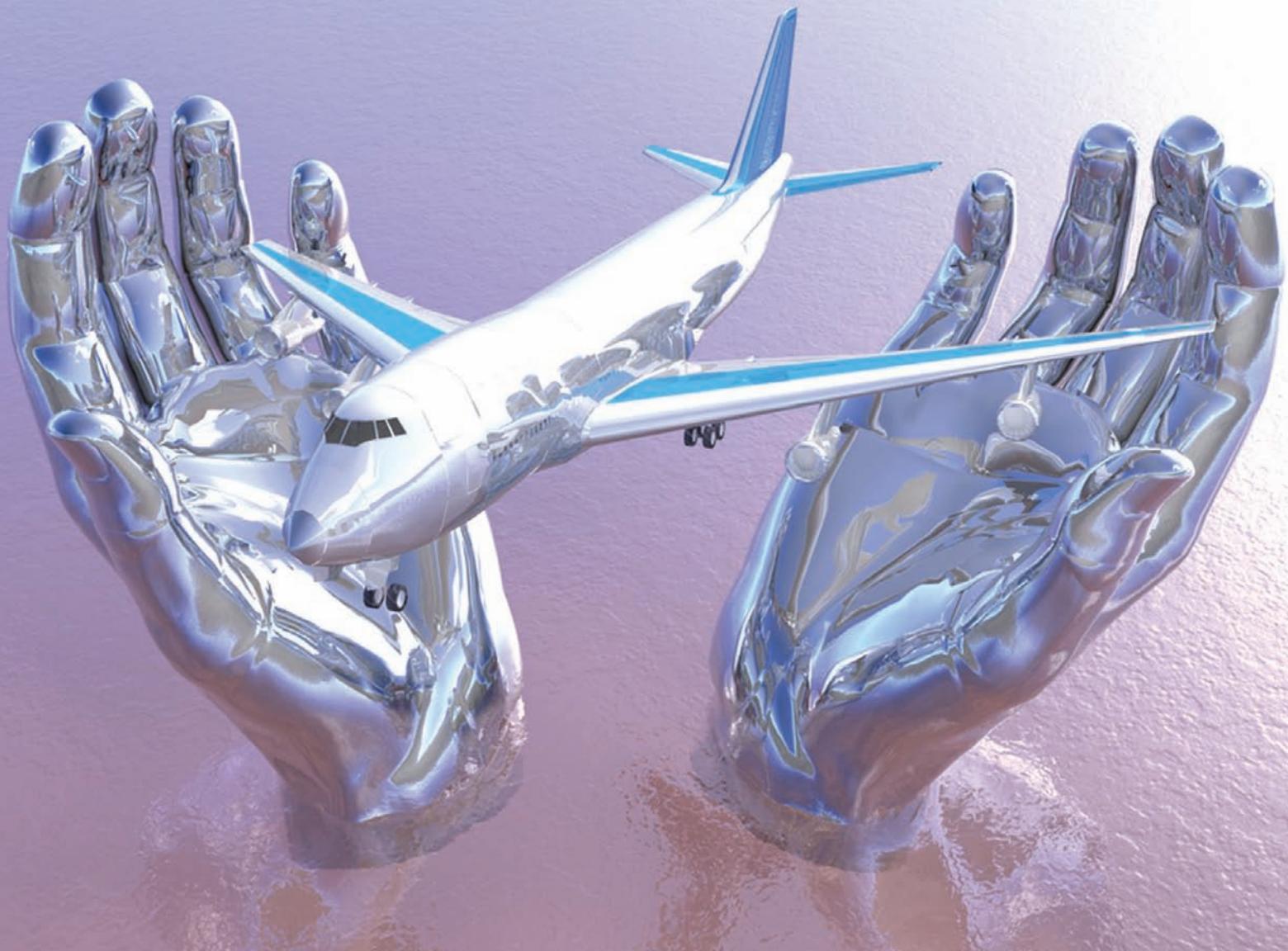
"ADP enables organisations to send us their own material in flat sheets and we can apply any of our decorative patterns or any customised design onto it," says Whetter. "If the material is already an approved aircraft material then after our decoration technology is applied it has a good chance of complying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

Meanwhile, Visionairy enables airlines to use 3D images in their cabins. The process applies a vast range of images onto substrates, creating 3D scenes that can then be attached to aircraft bulkheads or other areas. Visionairy images can be created in sizes up to 1 x 2m. "The technology allows us to create images of anything," says Whetter. "Once we have created the image, we can recreate it many times over quickly."

Two new products will soon boost Chameleon's portfolio of decorative film and coverings

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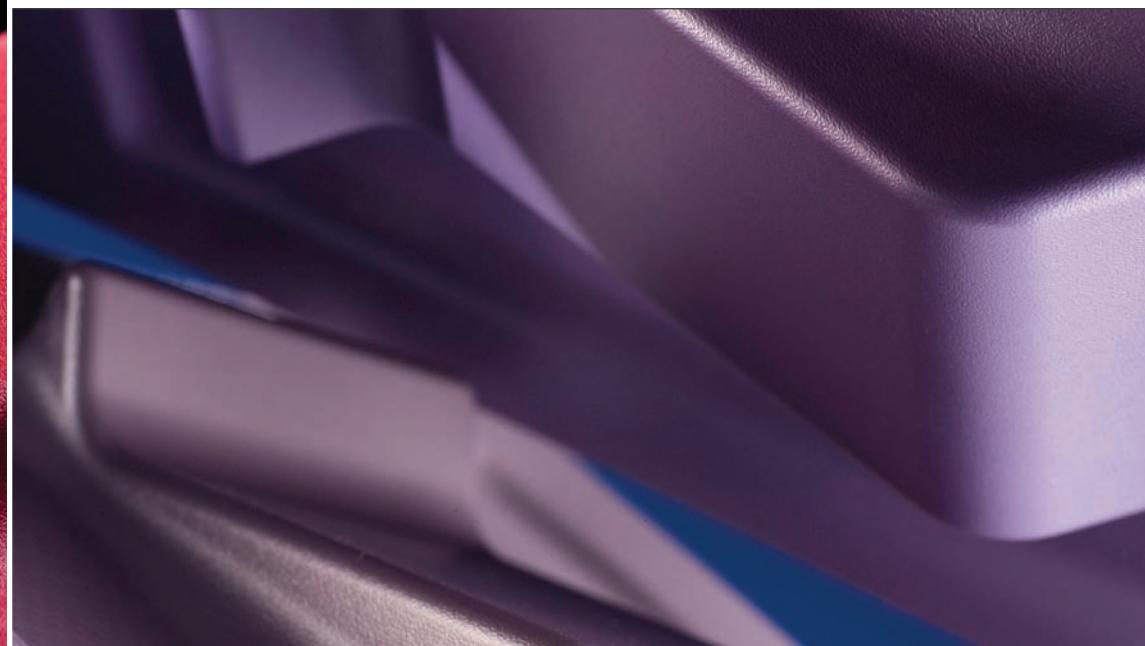
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Colour plays a vital part in setting tone, so Kydex aims to match any hue a designer can envisage

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Reader Enquiry No. 502

huefinder

Colours are more than a mere reflection of light; they reflect people's state of mind, feelings and personalities. By tapping into those associations, aircraft interior designers can help set a mood for passengers from the moment they board. Colour can also be used to embody and enhance the brand of the airline throughout the cabin.

Kydex is dedicated to helping bring designers' visions to life. The desired ambiance might be the prestige of platinum for a premier business carrier; the serenity of flecked seashells, golden sands and glimmers of sunlight for an island airline; or a notion as simple as 'blue skies ahead'. It is no coincidence that colour and tone are synonyms – colour can be used to set tone.

But it can be a tricky thing to pin down – much influenced by movement, shape and lighting. That is why Kydex has transitioned from presenting flat colour chips of its thermoplastic sheet to three-dimensional, thermoformed pieces as product samples. "Parts that have undergone the thermoforming process showcase the varied properties of the final product. Colours, glosses, effects, embossing and pearlescent finishes come to life. The designer can see the subtle interplay of shapes and shadows, of curves and angles," says Ronn Cort, international business manager at Kydex. "The most intricate details of colour and light can make or break a design. So it's essential to designers to see exactly what they will get."

Typically, Kydex can meet a colour-matching request in hours, freeing designers to pursue their plans with confidence.

There are names, numerical codes and call outs for colour in the design industry. But Kydex says that in essence, colour is experiential. Designers may be inspired by anything from the translucent blue of a butterfly to the muted gold tones of weathered brass and even a sunburst orange Chevy HHR (as in one recent case), but find it challenging to replicate that in compliant materials. Kydex has worked with some of the most prominent names in the commercial airline and aircraft interior design industries for decades to meet that challenge. Close collaboration is at the core of its mission.

The Kydex Design Lab has created thousands of custom colours, and works continuously to coordinate new colour palettes. The company presented a collection of 28 colours at the recent Aircraft Interior Expo in Hamburg, Germany, held in April 2011. The Kydex 6503 collection was the product of collaboration with designer David Scott. Scott began as a sceptical potential client, challenging the company to match his vision of a dreamy, cloud-like environment in fully compliant materials. "Needless to say, Scott was impressed with the company's rigorous quality standards, processes and finished product," says Cort.

Kydex is committed to pushing the envelope of colour in airline cabins. "Airline passengers have grown more sophisticated in their tastes," says Cort. "Designers want brave, contemporary colours to fulfil these desires and demands. Like David Scott, they are finding their match with design-forward companies such as Kydex that understand their world and realise their visions."

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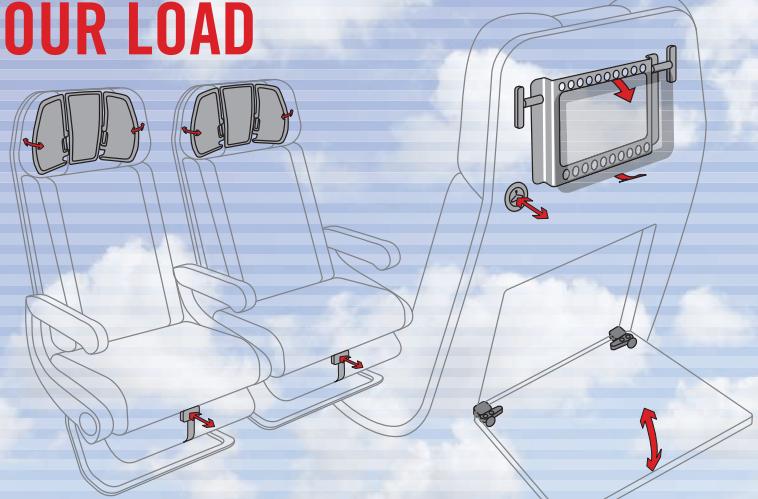
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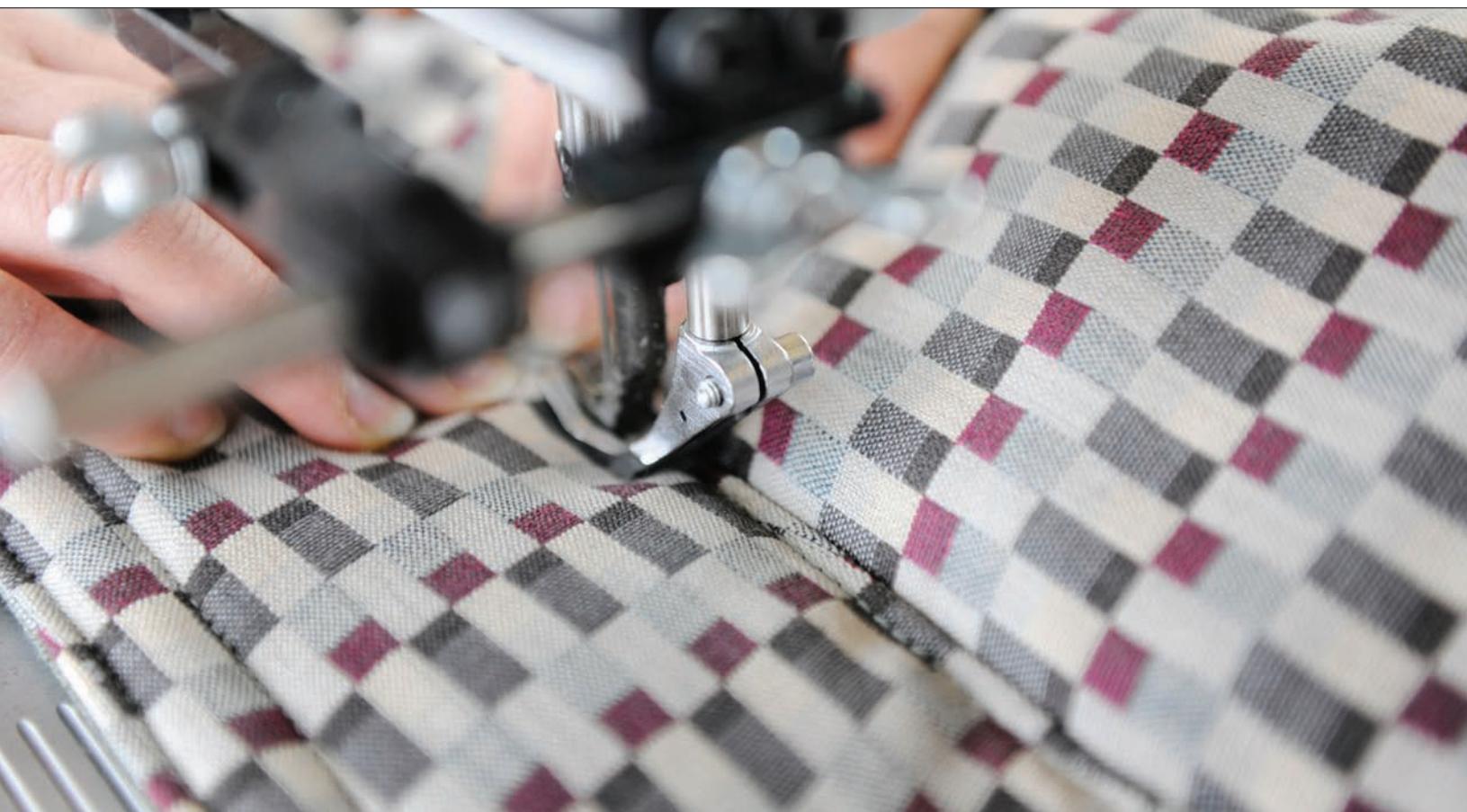
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Reader Enquiry No. 503

time travel

Cabin interiors are created in complex projects involving many parties and processes. Lantal's all-in-one solutions are designed to cut the airline's process management and handling costs while streamlining the project.

"Using fit-and-fly seat covers instead of yardage; ready-to-lay carpet parts instead of standard rolls; and ready-to-hang pleated curtains instead of bolts of fabric simplifies the work of aircraft interior coordinators, designers, engineers and purchasing managers," says Urs Rickenbacher, CEO at Lantal.

Recently Lantal achieved a milestone in its transformation from a semi-finished products manufacturer to a systems provider – when the European Aviation Safety Agency (EASA) granted it Design Organization Approval (DOA) status.

The DOA status allows Lantal to collaborate with airlines and completion centres more closely in projects involving OEM cabin interiors as well as the refurbishment of existing aircraft. Lantal is authorised to develop, test and certify modifications to aircraft cabin components. The scope of the work as applied for by EASA relates to ready-made parts such as curtains, pre-cut carpets and cut-and-sewn seat covers, as well

as minor aircraft interior changes associated with such products.

The company's in-house engineering services cover the design and development of the complex low-pressure Pneumatic Comfort System, as well as seat covers, curtain systems and textile floor covering parts. The company can also manage the approval of minor and major changes to aircraft interiors.

The DOA follows a Production Organisation Approval (POA) granted in 2005 by the Swiss Federal Office of Civil Aviation (FOCA). Lantal can therefore provide an EASA Form One with each delivery of ready-made parts.

"With its new DOA status, Lantal has become an even more attractive partner for all-in-one solutions and real single-source convenience," says Peter Kämpfer, executive vice president for markets at the company. "At the same time, we remain focused on cost-effectiveness, product suitability for aviation and the wellbeing of travellers. Lantal's seat cover fabrics, curtains, carpets, leathers, fit-and-fly products, design counsel, laboratory services and the Pneumatic Comfort System fully address the needs of the civil aviation community."

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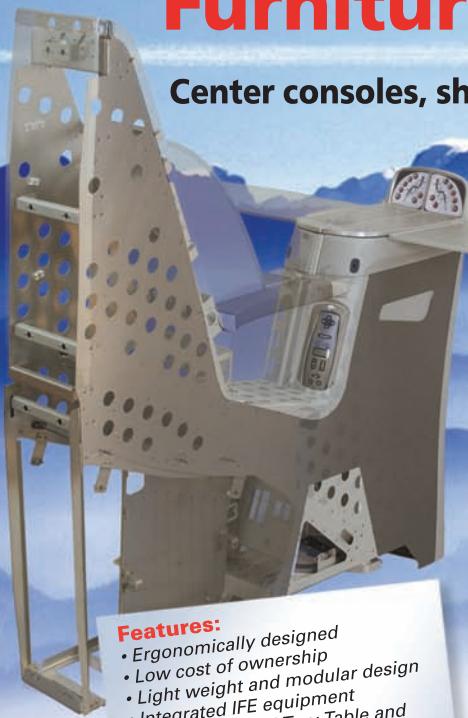
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Many airlines are going down the galley retrofit route to expand the life of their aircraft

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Reader Enquiry No. 504



fresh start

Market analysis conducted by Driessen-Zodiac Aerospace indicates that there is a trend for airlines to extend the life of existing aircraft by modifying cabins with newer products while they await the next generation of aircraft models to modernise their fleets.

Galley replacement is a part of this trend. "The opportunities in this competitive galley retrofit market require a four-point approach – weight reduction, functionality, aesthetics and fleet commonality," says Abraham Sarraf, sales and marketing director at the company.

In response to the market's demand for retrofit solutions that also help to cut weight, Driessen-Zodiac Aerospace has developed a new line of galleys with a reduced weight of 10-15% compared to its previous generation. This reduction was accomplished by using fewer fasteners and lighter materials and by shaving weight from components such as plumbing and electrical systems.

By working closely with various customers, the company also addressed the functionality of the galley with respect to food handling, ergonomics, customisation, ease of operation, maintenance and catering access.

As cabin interiors have become more and more sophisticated, the designers paid special attention to the appearance of the galleys. They used the latest technology in areas such as panel pressing, CNC milled parts and latching mechanisms.

Many airlines operate a varied fleet of leased and owned aircraft that feature different galleys. Driessen-Zodiac Aerospace says that by replacing the galleys with one standard, these airlines can control their operating costs (by reducing weight) and simplify catering and maintenance procedures.

The company is also working with airlines and MROs on a new product called Total Care Service (TCS). TCS enables the airline and MRO to work with Driessen-Zodiac Aerospace's technicians to take a proactive approach prior to heavy maintenance checks. The technician performs a pre-check inspection of the galleys during an overnight stay about two to three weeks prior to the scheduled maintenance check. From this inspection the airline and MRO can be made aware of what parts will be replaced during the heavy check. The idea is to enable the MRO to complete on time and get the aircraft back in revenue service with its galleys looking like new.

Driessen-Zodiac Aerospace specialises in single-aisle Boeing 737-NG and A320 galleys, as well as galley equipment and air cargo equipment. The company has been part of Zodiac Aerospace since 2008. Zodiac Aerospace is a stock-listed multinational company with 80 production sites around the world and more than 20,000 dedicated employees. The group incorporates expertise in cabin interiors, aircraft systems, aerosafety and technology.

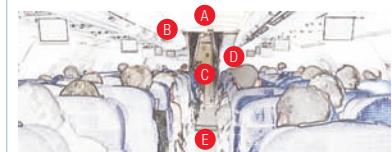
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A design by Loher Raumexklusiv and Loher Engineering proves that galleys can be beautiful as well as functional

haute cuisine

One of the highlights of the Aircraft Interiors Expo 2011 was the impressive appearance of Loher Raumexklusiv in conjunction with Loher Engineering. With a new VVIP lounge galley concept, integrated in a mock-up A340 fuselage specially made for the expo, Loher Raumexklusiv proved that galleys in the VVIP segment do not have to be restricted to serving functionality alone – they can be a creative design highlight of any VVIP interior.

The design goal behind the art deco-style galley and bar was “understated luxury”. This was pursued through the combination of a subtle lighting concept with precious materials such as Onyx Fantastico, high-gloss Macassar veneer, gold dust and mother of pearl.

The company has not neglected functionality and ergonomics in the pursuit of a stylish finish. The galley is designed to enable culinary delicacies to be freshly prepared to the highest standards. Ultramodern functional elements such as a teppanyaki grill and induction cookers have been incorporated. After use, the cooker and the extractor hood can be concealed by the sliding red onyx marble worktop. Specially made pull-out cooling units were built in under the bar top. Professional kitchen appliances have been integrated in the multifunctional back wall, subtly fitting in with the overall homogenous design. A coffee machine, microwave and induction oven vanish when necessary behind flexible glass light panels finished in an onyx look, while an extractor hood has been added next to the cooker.

Loher Raumexklusiv – run today by Alfred Loher and his sons Alfred Loher Junior and Roland Loher – was founded back in 1931 and specialises in creating individual, high-end interior fittings and one-off pieces of furniture. The company has over 75 years' experience in developing and manufacturing exclusive interiors and furnishings for villas, boardrooms, yachts and private aircraft, and prides itself on its dedication to quality. Managed now by the third generation of the founding family, the enterprise has continually developed into a forward-looking and internationally oriented firm of craftsmen, with a workforce of about 215 employees.

In April 2006, the company was licensed by the German FAA as a manufacturing firm for aircraft interiors under Part 21 Main section A Section G for C1/C2 Ratings, and can therefore operate in the market as an independent supplier. In December 2007, Loher Raumexklusiv obtained authorisation as an approved maintenance company under Part 145. The company is currently pursuing certification under DIN EN 9100 (Aerospace series – Quality Management).

Loher Engineering was set up in 2009 and certified as a development company by EASA under Part 21, Main section A, Section J, enabling the company to offer expertise from a single source, even with complex projects.

Currently the company is planning another production site [40,000m² in size] specifically for its aviation and yacht divisions. Completion is scheduled for 2013.

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JUNE 2011



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A new joint venture is set to impact the global aircraft seating market

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Reader Enquiry No. 506



joining forces

A term sheet has been signed by Aerospace Life-Support Industries and United Seating Technologies to establish Jiahang United Seating Technologies (JUST). United Seating Technologies brings together a design partner (Bertone) boasting a century of experience (beginning with seats for the automobile industry) and an engineering and manufacturing partner (Optimares) with ultramodern capabilities.

The joint venture hopes to become a global player in aircraft interiors, by producing a full line of seats. It plans to introduce nine models to begin with, covering economy, premium economy, business and first class for existing aircraft types and new-generation aircraft.

Its first product is the economy class X-Light, pictured. Combining aluminium and carbon composite technology, the seat weighs 6kg per passenger place. The company also intends to apply this technology to its premium economy, business and first-class seats.

The joint venture came about as the result of assessments made independently by all the parties. Each perceived an increasing demand for all types of aircraft interiors for the foreseeable future. The discussions accelerated after reviewing the 2010 Boeing estimate of new aircraft to be delivered over the next 20 years. The 30,900 deliveries projected would generate approximately six million passenger places for line fit. Meanwhile, industry indices for refurbishment indicate that as many as 16 million passenger places will be required for new aircraft alone. JUST calculated that this combined with the refurbishment of aircraft currently in service, places the demand for new seating at over 20 million over the next 20 years.

The joint venture decided that the Aviation Industry Corporation of China's (AVIC) facility in Xiangyang, China, was an ideal manufacturing location. The Aerospace Life-Support subsidiary has vast experience in building fighter aircraft ejector seats, helicopter seats and the like for the military. Located in one of China's most modern manufacturing parks, all of the equipment was in place and capacity expansion was not an issue.

The facility boasts advanced equipment for metal cutting, numerically and computer controlled boring, lathing and milling centres and welding robots. In addition, capabilities such as fabricating and sewing seat covers, die forging, heat and surface treatment, casting, organic moulding, vacuum plating and composite material forming and coating are in place. The only component missing was a stylish design with wide appeal.

Fortunately, architect Franco Carretto, head of Bertone's transportation design unit, was on hand. Carretto has previously worked for Giugiaro Design, where his designs included mass transport vehicles for Chinese, Finnish, Italian, Portuguese and Spanish companies. In aviation he has provided his expertise for major airlines including Singapore Airlines and Qantas, and for aircraft manufacturers such as Airbus for its flagship, the A380.

So with a €100 million (£87.1 million/US\$140.3 million) commitment, the capabilities necessary to engineer technologically advanced aircraft seats, world-class equipment, new facilities in a modern manufacturing park, a trained labour force, a leading design organisation and an experienced technical and commercial team in place, the joint venture is now ready for business.

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testassured

Established in 1985, Magnus Power manufactures frequency converters ranging from a 1kW bench unit up to a 150kW floor standing unit, typically with 400Hz, 60Hz or variable frequency outputs. The company boasts ISO9001 certification and says that all its products are CE approved. These products have been sold in more than 25 countries, and the company is constantly looking to develop its distributor network – initially throughout Europe, but eventually worldwide.

Magnus Power's products are used by a number of major companies in the aerospace and aviation industries for applications such as testing aircraft seating, galley systems, instrumentation and aircraft ground power. The company is often involved in designing bespoke products for clients, and says that its long-standing expertise in the frequency converter market enables it to offer cost-effective solutions.

Magnus Power says that it has a power source suitable for testing any aircraft seat or item of galley or lighting equipment. If the customer cannot find the power source they need from the standard equipment range, then Magnus Power encourages them to ask, as it is always looking at developing new products.

The company's standard products include the LF1-400, a 400Hz single-phase output with a maximum power output of 1kW. This product weighs 9kg and measures 440mm x 370mm x 98mm. Another popular product is the LF3-400, a single-phase input with three-phase output at 400Hz. The unit's total power is 3kW.

Both of these products have fixed outputs but if the client needs to be able to vary the output voltage and frequency, the company recommends its LP3 (three-phase output) or LP1 (single phase) converters. The LF and LP ranges are available from stock.



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finelines

Rollon is a single-source supplier for linear rails, with a comprehensive portfolio of nine product families. From the numerous varieties of roller guides, telescopic rails or profile rails, many industry sectors choose the linear solution according to their specific demands. For the interior equipment of aircraft or trains, telescopic rails and lightweight drawer slides are ideally suited to move tables, adjustable seats or foot- and armrests. Smooth movement and low noise are important in this area.

Various linear movements are also incorporated in airport equipment. For example, Rollon says that arrival and departure schedule screens need easy access for maintenance when they are moved forward, often on roller-bearing guides; the gates themselves or control cabinets in the terminals are often mobile rather than stationary; and doors or movable stairs also require linear movement, as well as high resistance against weather conditions.

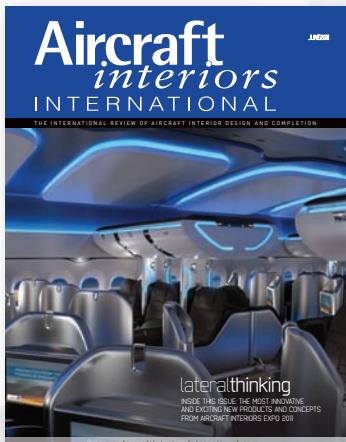
Rollon also has much to offer in the assembly of aircraft. Its linear guides can ensure the precise positioning of tools and robotic axes. In these applications, high loads and precision play a major role.

The demands of the aerospace industry (limited space, comfort and security) have led to many requests for customer-specific solutions. Rollon's entire range can be adapted for individual applications, for example with customised strokes, bearings or surface treatments. This flexibility is supported by knowledge of how the products will be applied, and an international network of sales representatives.



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blingyourhook

Passenger comfort and convenience are major considerations for aircraft designers, and Southco believes that aesthetics have become every bit as important as functionality in improving the passenger experience. To that end, it has endeavoured to bring a series of innovative and lightweight products to the aircraft interior market that are not only practical and easy to use, but also boast a clean and stylish look.

One of these products is its MP-Coat Hook for aircraft seating, which provides a flush look and features a robust pop-out hook in multiple finishes and shapes to match virtually any décor. This flush-mounted point latch consists of a plastic housing and cover and offers a choice of round, oval or square flanges. It is available in various finishes, including bright chrome, satin chrome or brass with hook and flange in matching or complementary finishes.

An indented contour on each hook provides a convenient grip. Operation is designed to be as easy as possible – the passenger presses the button to release the hook, then pushes the hook flush again to store. Southco says the MP-Coat Hook is easily installed through a single hole, accommodating a range of panel thickness from 2–25.4mm (0.1–1in). The company believes that the product's polished look and metal actuation knob help to bring a solid feel of quality to the cabin, creating a positive impression.

Southco is a leading global provider of engineered access solutions including latches, locks, captive fasteners, hinges, handles and other accessories for applications in the automotive, aerospace, mass transit, off-highway/construction, networking, telecommunications, computer, RV/caravan, marine, industrial machinery and HVAC industries. The company is strongly focused on customised engineering solutions and global support for its customers.



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kerryreeves

Want to know more about key industry individuals, but haven't got the time to search for their Facebook profile or LinkedIn page? This issue's 'FaceSpacer' is **Kerry Reeves**, Air New Zealand's manager of aircraft programmes, who picked up a Crystal Cabin Award for the carrier's Skycouch at this year's Aircraft Interiors Expo in Hamburg.

01

HOW AND WHEN DID YOU FIRST GET INTO THE AIRLINE BUSINESS?

I have been involved in the airline business and aviation for more than 30 years, most of that time in a technical role. I've worked in engineering and maintenance, aircraft leasing management and new fleet introductions, including configuration design and airline service readiness. The airline industry is very infectious – few of us leave once we've had a taste of it.

02

WHAT WAS YOUR IMPRESSION OF THE INTERIORS INDUSTRY BEFORE EMBARKING ON AIR NEW ZEALAND'S NEW LONG-HAUL PRODUCT PROGRAMME?

It has suffered from a very traditional approach that has not changed in the last 20 years. In many ways this has been driven by the ever-increasing regulatory requirements and the hurdles of risk and cost facing an industry that does not make good financial returns.

03

AND NOW, AFTER INTRODUCING THE NEW SKYCOUCH AND SPACESHAT?

I see incremental changes on their way but no real step change in product. Many of the innovations seen at the Aircraft Interiors Expo never make it through the certification and regulatory environment and on to an operating aircraft. Suppliers have to be bold to attempt something new but with the current shortage of seat manufacturing capacity in the industry there is little incentive for this to occur. With the recent demise of a number of key seat suppliers, this part of the industry is particularly at risk of not meeting future aircraft orders.

04

WHAT RESEARCH DID YOU CARRY OUT AS PART OF THE PROGRAMME?

We focused on understanding our customers' needs and developed segmentation based on the experience that different traveller types wish to have. These traveller types were given *Simpsons* characters to provide the design teams with an easy way to understand passengers' personas. Interestingly the different traveller types on board a long-haul flight are fairly evenly balanced in all classes, so the challenge was to create experiences that delivered to those needs within the affordability that each traveller has.

05

WHICH CHARACTER ARE YOU?

I am very much a Mr Burns character when I am flying on business. I prefer to be in control of my experience, have my



own space to zone out in and not be disturbed by others around me. Also I value having easy access to personal storage as I like having my stuff within easy reach.

06

SHOULD MORE AIRLINES MAKE THE EFFORT TO DESIGN THEIR OWN SEATS?

Designing seats is a major undertaking however I think more airlines should think of the seat designs that deliver the customer experience for their market. A lot of airlines do this for the first and business cabins but ignore the premium economy and economy areas.

07

EXPLAIN HOW YOU PLAN TO LICENCE SKYCOUCH AND SPACESHAT TO OTHER AIRLINES?

The licensing model remains flexible depending on the methodology that suits the airline: it can be by seat place; by aircraft; or more generalised, including additional value in the approved operational procedures and commercialisation processes. We believe the business model that is the most attractive is one that licenses an aircraft or route to use the product, which would also include the ability to add value through the selling model capability. This may also allow – through the protection of patents and restricted licensing – an airline to have its own restricted routes for the product, in the same way that Air NZ may choose to not provide the product to its direct competitors. The price is purely dependant on the products' ability to provide value in the particular network.

08

HOW COMPLICATED WAS THE REVENUE MODELLING FOR SKYCOUCH AND SPACESHAT?

As the real value is not in the hardware of the seat but in the commercial selling model of the proposition to the passenger there is some element of complexity in realising this. We had to be creative to find simple ways of selling space as a proposition – not just a seat.

09

JUST HOW MANY AWARDS HAVE YOU WON NOW?

We have certainly attracted and won many awards and it has been hugely rewarding for the team to receive recognition through these. Some the more recent ones have been UK *Design Week* magazine's 2011 award for best furniture design (Skycouch); a *Wallpaper* design award for best air style (Spaceseat); a Red Dot 2011 product design award win (Spaceseat) and honourable mention (Skycouch); and a Crystal Cabin Award win (Skycouch) and shortlisting (Spaceseat) in the passenger comfort category.

10

NEW ZEALANDERS ARE KNOWN FOR THEIR PIONEERING SPIRIT – WHICH NEW ZELANDER INSPIRES YOU THE MOST?

I have always been inspired by John Britten who was a brilliant Kiwi designer. He designed his own motorcycle using very innovative ideas and went on to win many races against the big factories. I'm a very keen motorcyclist myself and have raced competitively in the past. I find it very refreshing and like living a little on the edge.

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