

# BusinessJet *interiors* INTERNATIONAL

APRIL 2015

THE INTERNATIONAL REVIEW OF BUSINESS JET INTERIOR DESIGN AND COMPLETION



# Niki Lauda

GIVES US A TOUR OF HIS NO-HOLDS-BARRED CREATION

 **ALSO IN THIS ISSUE:** BBJ 747-8 **EUROPEAN DESIGNERS** FALCON 8X **EBACE PREVIEW** ACJ330 SUMMIT **SOFT FURNISHINGS**

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"I wanted this special wood – not shiny, and laid out like trees. Everything is absolutely how I wanted"

## 6 wheels up

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EYE-CATCHING DESIGNS FROM OTHER SECTORS, INCLUDING AN AUTOMOTIVE ATELIER'S TAKE ON THE CLASSIC RANGE ROVER

# characterbuilding

Very many cabin designs have been explored in considerable depth over the course of this publication's history, but it is a very rare opportunity to be able to speak to the end user of a private jet in person. Private jets generally live up to their description, but for this issue, Formula 1 legend Niki Lauda generously showed us around his new Global 6000. It is fascinating to see how Lauda's personality has been translated – by a designer he has known for more than 40 years – into an airborne environment in which he can feel at home.

It is most certainly an unconventional interior. This is not a beige and cream cabin with high-gloss veneer. It has pinstripes. It has a matte-finish veneer arranged in an unusual way that was, by F/List's account, an extremely intricate affair to implement. In short, it has bags of character. What's more, the aircraft was delivered in just 11 months. You can take the tour on page 16.

Somewhat longer in gestation is the typical BBJ 747-8 – the completion period alone generally takes 18-24 months. But the aircraft offers the kind of space designers can run riot with – 4,786ft<sup>2</sup> in the main cabin and an extra 393ft<sup>2</sup> if Greenpoint's Aeroloft is installed. With the first of this type completed in December 2014 and several more in the works, we asked completion centers what it is like to work on this aircraft, and the kind of features that are being fitted.

On page 14 you can see another bold design enabled by the BBJ 747-8's giant cabin, which even includes an open mezzanine level. It is another demonstration that despite the many challenges of private aircraft design – which are discussed by designers on page 74 – there is plenty of scope to be imaginative, to be different, and to create cabins with real character.



Izzy Kington, editor



Cover image:  
Niki Lauda on board  
his Global 6000 –  
photo by F/List

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# PINBOARD

THE LATEST DESIGNS, LAUNCHES AND LUXURY GOODS



A meeting room on an ACJ340-500 designed by Plus 33 Design Studio



A green G650 customized by M&R Associates Design

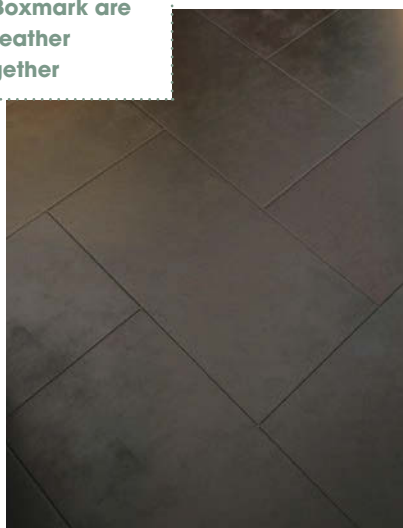


The main majlis area on a head-of-state ACJ340-500 designed by Edese Doret Industrial Design



The lounge area on a business jet concept by Greenpoint Technologies

F/List and Boxmark are launching leather flooring together



Scott Group has created a range of carpets inspired by the Vienna Secession, an art movement of the late 1800s





## LAUNCHES

Lufthansa Technik has designed a solution for VIPs traveling with falcons - the Falcon Master



Carbonartz personalized carbon fiber briefcase; from £11,500 (US\$17,072)

## LUXURY LIVING

Apple Watch with Alexander Amosu 18ct solid gold case and blue ostrich leather strap; £14,750 (US\$21,900)



Josefinas Blue Persian Salt ballet pumps; €3,369 (US\$3,573)

(From top) Khaliq Kallisto, Aella and Hector cushions; £380 (US\$564), £385 (US\$572) and £385 (US\$572) respectively



Lalique for Bentley Blue Crystal limited edition fragrance; £3,500 (US\$5,196)



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## BEST OF THE WEB

A TASTE OF THIS QUARTER'S WEB-EXCLUSIVE CONTENT ON [WWW.BUSINESSJETINTERIORSINTERNATIONAL.COM](http://WWW.BUSINESSJETINTERIORSINTERNATIONAL.COM)



"Bonding and aggregation enable you to take two channels that are normally separate, and merge them into a virtual connection that has the characteristics (including bandwidth) of both combined."

**Ken Bantoft of Satcom Direct**  
demystifies satcom



"We want to work with suppliers who tell us what we need to hear, not necessarily what we want to hear. We need them to commit and meet their promises. We also need them to stand up and share the pain when they don't. We also need them to be innovative to help us provide solutions for customers."

**Russell Coldiron of Spirit Aeronautics** discusses purchasing and material control



"There are three key opportunities for synergy. The first is in improving the passenger experience of the aircraft, where the combination of our cabin systems (such as Venue and Airshow) and our satellite connectivity solutions enable both an office-in-the-sky experience and IFE."

**James Hardie** comments on the acquisition of ARINC by Rockwell Collins



"The team used customer feedback as the basis for the flat-floor, stand-up cabin design. It was also the inspiration for the interactive CMS."

**Chris Hearne of Textron Aviation** provides an inside view of the Citation Latitude program



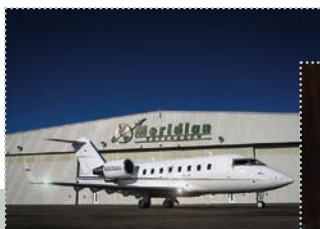
"The seven-passenger layout is the most popular for the G150 and the nine-passenger layout is the most popular on the G280. The top cabin feature customers request is connectivity."

**Rick Trusis** discusses Gulfstream's mid-size programs



"Many in the consumer electronic industry expect to see a large increase in demand for 4K in 2015."

**Bill Baltra of Sky Definition Aero Systems** explains all about 4K screens



### GALLERY

Meridian Air Charter's recently refurbished Bombardier Challenger 605



### VIDEO

The Timeless to Visionary cabin designs by Jet Aviation Basel Design Studio







Who helps ensure Duncan Aviation's  
on-target turntimes?

## Meet Tiffany

Duncan Aviation pairs its customers with project managers to provide a single point of contact regardless of how many shops touch an aircraft during its stay. Project Manager Tiffany Griffin works with schedulers and maintenance, interior, engine and paint shop team members to ensure that her customers are always aware of what's happening with their aircraft.

Just as importantly, Tiffany keeps the various shops in the loop on the progress of the work in order to accommodate tight schedules, making small tweaks as needed to ensure promised aircraft out-dates are met.

In July, Tiffany was part of a team that oversaw 13 aircraft scheduled for maintenance, interior and/or paint work at Duncan Aviation's Battle Creek, Michigan, facility. Every single aircraft delivered on time.

For the rest of the story visit  
[www.DuncanAviation.aero/experience/tiffany.php](http://www.DuncanAviation.aero/experience/tiffany.php).



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## RAS INTERIORS REFURBISHES LEARJET 60 FOR ANTONIO BANDERAS

RAS Interiors, which is based at Biggin Hill Airport in the UK, redelivered this Learjet 60 to film star Antonio Banderas following a complete refurbishment and repaint. The aircraft is being used in South America, the USA and Europe, as well as for transatlantic journeys.

The work was finished 10 weeks after the contract was signed. The aircraft was inducted on April 25, 2014, and redelivered five weeks later.

In the first week, RAS Interiors removed the existing interior. Over the next three weeks, the exterior was stripped and repainted in a new scheme. The fully refurbished and modified interior was fitted in the final week.



All the woodwork was stripped back to the original wood, stained in a darker tone and finished with high-gloss lacquer. The main cabin's lower dado panels, sidewalls and ceiling panels were recolored, and new countertops were fitted in the lavatory and galley. All metalwork in the cabin was re-plated with a brushed stainless finish.



New 100% wool carpet was fitted throughout, with a special backing to reduce noise levels, in combination with cabin shell soundproofing enhancements. A drugget was also installed to protect the carpet.



All the wash lights in the main cabin were replaced with new ones that are designed to give a consistently bright appearance.

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The two cockpit seats were recovered in new leather and sheepskin. Meanwhile, the six main cabin seats were modified to give a cleaner appearance and more comfortable feel. The seatbacks and bases were reshaped with new foams and covered in high-end leather. New seatbelts were also fitted to complement the new color scheme.



## Q&A: ROGER PATRON, BUSINESS DEVELOPMENT MANAGER FOR RAS INTERIORS, UK

### HOW DID YOU SECURE THIS PROJECT?

I secured the work through discussions with Antonio Banderas's chief pilot, Thomas Graham. RAS Interiors, part of the RAS Group, is an EASA-approved company with the capability to refurbish or design and manufacture new cabin interiors. RAS Completions also has a proven track record for exterior paintwork on business jets. We are based in a 30,000ft<sup>2</sup> hangar at Biggin Hill Airport in the UK, with close connections to London.

### WHAT WAS THE CLIENT'S BRIEF?

Mr Banderas purchased the aircraft in 2014. The Learjet 60 was selected for its size and range. He wanted the aircraft interior to look more contemporary than the original, so the main brief was to bring the interior up to date. We proposed new high-end luxurious materials and provided various color and finish samples to help with the selection of the wood veneer.

### WHAT WAS THE MOST CHALLENGING ASPECT OF THIS PROJECT?

It was to create the high-quality finish in a short lead time. This lead time was possible only because we have a highly experienced team in place. The repainting was achieved by a team led by completions director Chris Ransley; the interior was completed by engineering manager Carl Ebdale and his team of highly experienced aircraft engineers; and quality, design and certification functions were overseen by the company's head of design, Kevin Hann. The other challenging aspect was the P static test.

### DO YOU HAVE ANY MORE PROJECTS LINED UP THAT YOU CAN DISCLOSE?

We are currently completing the VIP interior of a Super Puma Helicopter that will be used by a head of state. The team is also in the process of refurbishing the interiors and exteriors of 10 Dassault Falcon 2000EX aircraft for a prestigious European business jet operator. In addition, we are also refurbishing a Bombardier Global Express for a UK MRO.

# COMPLETIONS ROUNDUP

THIS QUARTER'S ANNOUNCEMENTS FROM COMPLETION CENTERS AROUND THE WORLD

## KIRKLAND, WASHINGTON, USA:

Greenpoint Technologies delivered a BBJ 747-8 featuring a VIP interior. The center also merged with its sister companies Odyssey Aerospace and Greenpoint Products and Services.

## PETERBOROUGH,

**CANADA:** Flying Colours Corp refurbished its first Sikorsky S-92 helicopter. See page 58 for details.

## PARIS, FRANCE:

Dassault Falcon Service performed the first C-check on an in-service Falcon 7X, and at the same time, renovated the interior, installed a satcom unit and wi-fi system, and repainted the livery.

**PARIS, FRANCE:** Sabena technics and Honeywell launched a development and certification program for the installation of Honeywell's Ka-band JetWave satcom hardware on a VIP wide-body.

## DALLAS, TEXAS, USA:

Associated Air Center (AAC) signed a green nose-to-tail ACJ320 completion. The aircraft will be equipped with a forward galley, a master bedroom and lavatory, and a main lounge with three areas – a mid-cabin VIP lavatory, an aft staff area and passenger lavatory and an aft custom galley. The ACJ320 is expected to arrive at AAC in August 2015.

## CINCINNATI, OHIO,

**USA:** Field Aviation acquired ARINC Aerospace Systems Engineering and Support (ASES) from Rockwell Collins. ASES provides aircraft modification, integration and maintenance services, as well as logistical and sustainment capabilities.

## BASEL, SWITZERLAND:

Amac Aerospace signed an A320-200 nose-to-tail completion project. The aircraft will be converted from an airliner configuration into a VVIP jet for its Middle Eastern owner. The cabin will include a master bedroom, master lavatory with shower, and an IFE system including AVOD and wireless streaming to portable devices. Amac also signed a BBJ cabin reconfiguration contract with a Middle Eastern customer. Amac will also provide the interior design package for that aircraft. The company also broke ground on a fourth hangar, which will be used mostly for wide-body maintenance.

## BASEL, SWITZERLAND:

Jet Aviation Basel redelivered its 25<sup>th</sup> BBJ with a custom VIP interior and livery designed in-house. The BBJ 1 was completed and certified in nine months. The center was also selected by Boeing Business Jets to complete two BBJ 777-300ERs for a client in Asia, and by a Dassault operator to perform a C-check on a Falcon 7X, in conjunction with a major cabin refurbishment and avionics upgrade. The company also received ISO 14001 and OHSAS 18001 certifications.

## INDIANAPOLIS, INDIANA, USA:

Comlux America signed its first wide-body completion contract and began work on extending its hangar to house wide-bodies. The A330 is scheduled to arrive in September 2015. It will be outfitted with a VIP interior. The center is also to outfit two BBJ Max 8s for the Comlux Group's charter operation.

## SAN ANTONIO, TEXAS, USA:

GDC Technics acquired 100% of PFW Engineering Group, including subsidiaries in the UK, USA and Canada, and the EASA 21J design organization approval. GDC Technics also signed an agreement with Honeywell to bring the Honeywell JetWave satcom system to in-service Boeing and Airbus business and commercial aircraft.

## GENEVA, SWITZERLAND:

Ruag Aviation upgraded a Dassault Falcon 900 for the Royal Malaysian Air Force, under contract with Airod of Malaysia. The project included a major 4C check, the update and overhaul of avionics, and a full renovation of the cabin.

## FORT LAUDERDALE, FLORIDA,

**USA:** Lotus Aviation Group, which offers refurbishment, paint and IFE services, is opening a new hangar and adding 2,400ft<sup>2</sup> of office space.

## HAMBURG,

**GERMANY:** Lufthansa Technik converted an A310 into a Zero-G aircraft for Novespace.

## ERFURT, GERMANY:

Haitec Aircraft Maintenance was granted repair station approval by the FAA.

## SAN ANTONIO, TEXAS,

**USA:** HAECO Private Jet Solutions is partnering with Emteq to offer the eConnect suite of solutions, as well as integration and engineering services.

## ADDISON, TEXAS, USA:

Following its first green BBJ livery project, King Aerospace is now included in Boeing Business Jets' directory.

## OBERPFAFFENHOFEN,

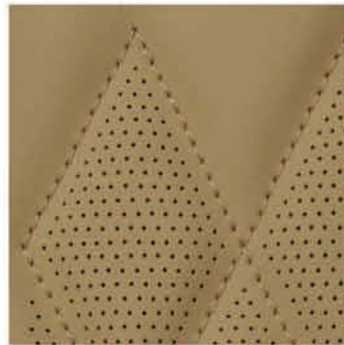
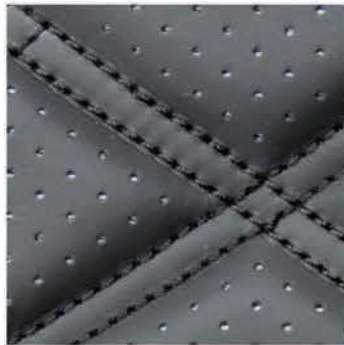
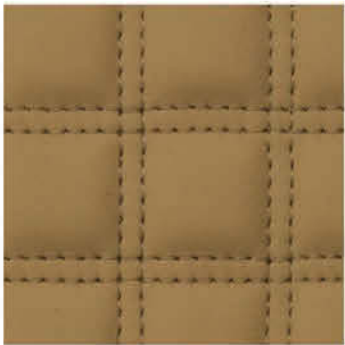
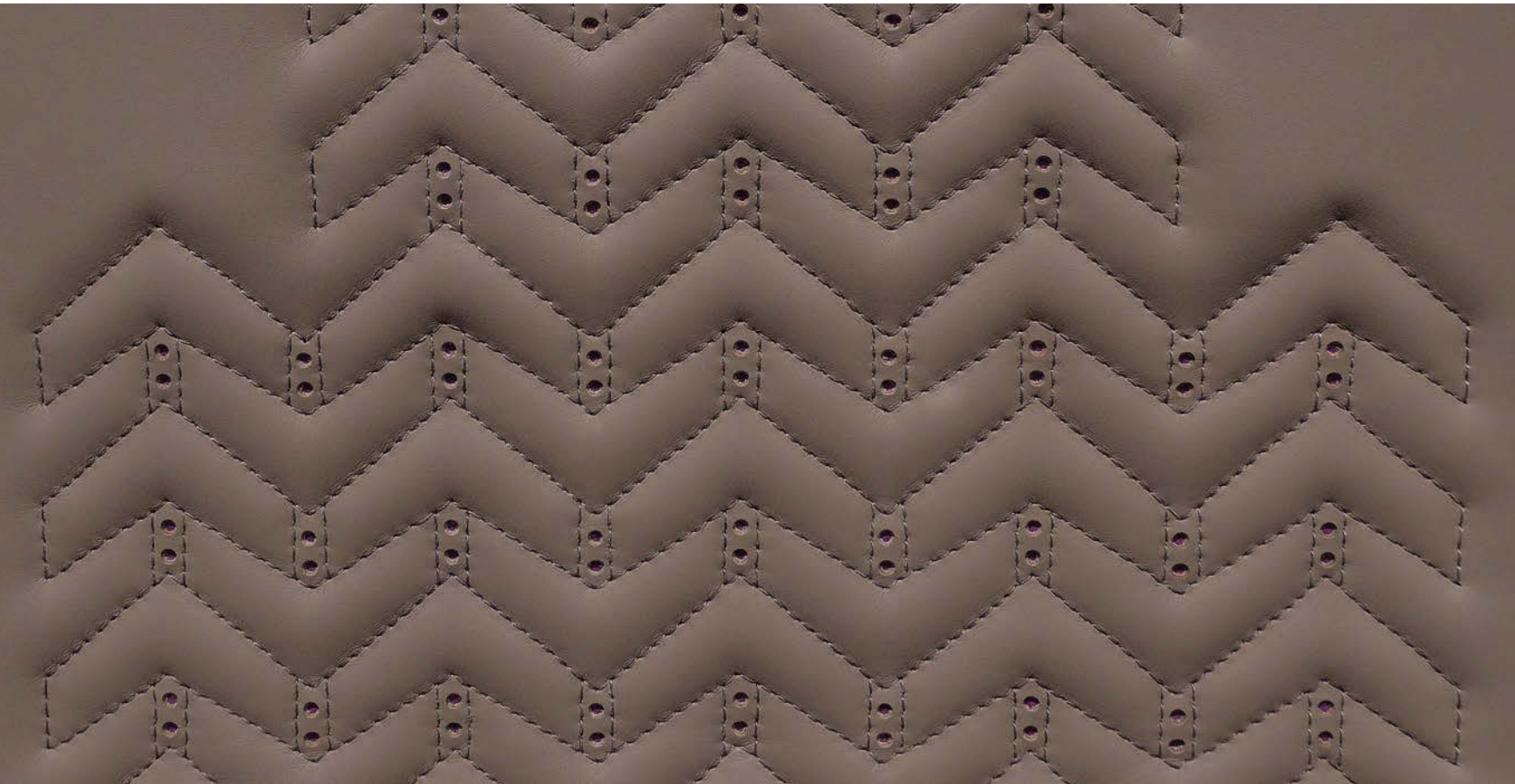
**GERMANY:** 328 Design achieved supplemental design organization approval from the General Civil Aviation Authority of the UAE.

**SINGAPORE:** ST Aerospace announced it had secured new contracts worth \$310m in the fourth quarter of 2014 – for projects ranging from airframe, component and engine maintenance, to VIP completions and engine wash. The VIP completions division secured heavy maintenance contracts for three BBJ 757s.

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# AERISTOCRAFT





# LEVEL BEST

The BBJ 747-800 is a huge aircraft that can even accommodate a partial second deck, as evidenced by Greenpoint Technologies' Aeroloft kit, which yields another 393ft<sup>2</sup>. Jacques Pierrejean of Pierrejean Design Studio wondered how else the space occupied by the Aeroloft could be used.

"One of our private customers was looking for something specific, a more exciting interior offering a huge space on board his future aircraft," he says. "Based on our experience with the BBJ 747-800 and following discussions with Boeing's engineering team, we tried to optimize the volume of the space allocated to the Aeroloft by opening this area into the lounge of the main deck."

Thus the central main lounge was made into an open space taking advantage of the full cross-section of the aircraft, with stairs leading up to a mezzanine entertainment lounge. "The result is really unique and fits perfectly with this type of aircraft," says Pierrejean.

The sense of grandeur is heightened by the huge IFE screens on the upper sidewalls, and the panels that cover the windows. The latter are included to enable passengers to control the amount of light coming in.

The staircase is positioned as per its certified configuration, but the handrail and the stairs have a new design. The mezzanine is in the same location as the Aeroloft would be. The headroom is less than on the main deck.

Pierrejean does not anticipate any major problems with certification. "It's on the way, because we have kept the same configuration, except that the ceiling and the upper bulkhead of the Aeroloft is now opened on the main deck. We will produce a virtual tour to get customer feedback and then launch the official technical feasibility studies with Boeing's engineering team."

## SIDEWALL SCREENS

Four large IFE screens are integrated in the upper sidewall panels on each side of the fuselage. "Most of the time, cabins are reduced by installing the IFE screen on forward and aft bulkheads," says Pierrejean. "We wanted to avoid this."





## GUIDED TOUR

## VIP BEDROOM

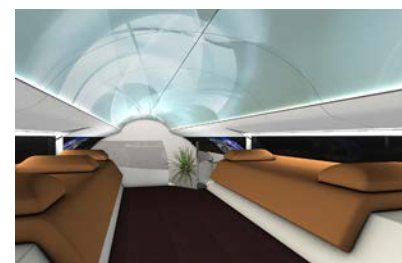
The VIP's bedroom is located at the front of the aircraft. It features a 1.6m bed. There is also convenient access to a communal washroom.

## SPA

The spa, which is close to the VIP bedroom, features a 1m-diameter shower, a steam area for relaxation, a massage table and also some equipment for light exercise.

## ENTERTAINMENT LOUNGE

The mezzanine area has four club seats and two large divans. It is also equipped with a 3D screen. One of the seats interacts with the IFE – it produces movements corresponding to the action to enhance the feeling of immersiveness.



## HIDDEN DOOR

Door three is hidden by a pleated curtain, which was developed especially for the project. It will be open during take-off and landing.

## NATURE

Pierrejean says the décor was inspired by nature, hence the neutral colors, the smooth shapes of the divans, and the Japanese dry garden below the staircase.

## GUEST SUITES

At the aft part of the main deck, just after door three, are five guest bedrooms, each with its own shower room. The beds are 1.4m. As in the VIP bedroom, each of the suites features an individual corner seat with stowage underneath.

## GALLEY

The galley is positioned at the aft of the aircraft, near the crew rest.

## CREW REST

As well as a crew rest, this area at the very aft of the aircraft incorporates a divan and six first-class seats.



## CONTACT:

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# fastmover

Formula 1 legend Niki Lauda shows us around his new Global 6000, which is brimming with unique and personal details

**N**iki Lauda is one of Formula 1's genuine superstars, having won the Drivers' World Championship an incredible three times, racing for both Ferrari and McLaren. Of course, many people in aviation circles will know that the 66-year-old Austrian also has another love in his life – flying. He has founded two airlines – Lauda Air and the low-cost carrier Niki Luftfahrt – and owned a string of personal aircraft including Learjet 60s, two Challenger 300s and a Global 5000.

In February 2015, Lauda picked up his latest jet, a Global 6000. He chose the type because of its range, which is greater than the Global 5000 he owned before, and its speed. The Global 6000 has a range of 6,000 nautical miles at Mach 0.85 (with NBAA IFR reserves, ISA, eight passengers and four crew) – it goes 800 nautical miles further than

the Global 5000. Both aircraft have a top speed of Mach 0.88.

**Global reach** “I’m now completely happy,” comments Lauda. “The 6000 is at the top of the Global family. I’m a commercial pilot, so I know how to fly. I’ve flown 18,000 hours in my life, on all kinds of aircraft – Boeing 777s, Airbuses and so on. Flying is fun; I enjoy it. Being able to go everywhere, more or less, with one stop, makes this, for me, the ideal aircraft. For example, we’re going to Australia soon and I can fly from Vienna, Austria, to Jakarta, Indonesia, which is a 13-hour flight, at Mach 0.85.”

Another reason for choosing the Global 6000 was that Lauda was impressed by the quietness of the cabin. “I hate noise and the Global 6000 has a very quiet interior,” he says. “It’s very important for long flights. Also, the highest cabin altitude is 5,680ft, which is very low.”

1. Niki Lauda stands beside his new Global 6000. The livery is designed to give a hint at what's inside

Photo: F/List

# Custom Interior Products for VVIP Completions



Initial layout of 747-8 Ceiling Panel Assembly at Jormac Aerospace



747-8 Ceiling panel assembly during fit check in full-scale mockup

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Ahead by Design





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## Configuration

The aircraft's configuration equips it well for the long-range flights Lauda will make. For example, there are two divans at the aft, which Lauda will use when he wants to rest. "The divan area is important, because for these long flights, it's always nice to have a nap," he says.

Additionally, there is a crew rest, an extra feature that Lauda didn't have on his Global 5000. "For me, it's important that we always have a cabin attendant with us," says Lauda. "I don't like it if passengers start to make coffee and destroy the galley. So we have a cabin attendant called Barbara, and she can rest there on long flights. It's very important."

The aircraft can accommodate 12 people, although Rausch can't imagine Lauda wanting to fly with more than six. He often flies with his family, including his six-year-old twins.



Photos: F/List

Lauda pilots the aircraft himself, with one co-pilot for flights in Europe and a third pilot for long-haul flights. "I fly it all the time," he says. "I'm chairman of the Mercedes AMG Petronas F1 racing team, so I'm going to all the races all through the season – 20 races – starting in Australia and going all over the world. I use this aircraft for my own business too. I fly about 550 hours a year, only for myself. The aircraft will be busy."

Lauda approaches flying differently to racing. "With driving, there are no rules and no regulations; you can drive over each other. The most important thing is to win," he says. "But flying is the opposite – you have to respect the rules and the limits of the aircraft. There is no room to do crazy things – I never do, because the most important thing is to get from A to B

2. Lauda in the master seat at the front of the cabin

3. The seats were upholstered in Lauda's choice of gray leather

4. The designer managed to balance both thick and thin stripes, in the veneer and soft furnishings respectively

safely. But the Global 6000 is fun to fly, there's no question about it."

Lauda signed for his new Global 6000 in March 2014. The configuration includes a crew rest and galley at the front of the aircraft, a club four and four-place dining area in the middle, and another area with two divans that can be converted into a sleeping area. There is also an aft lavatory.

**A 40-year relationship** Hannes Rausch set about styling the interior to Lauda's tastes. The two met more than 40 years ago, when Rausch was running an advertising agency. "I've done his interior designs, exterior designs, marketing, products, the aircraft for the airlines, and his private jets – every design for 40 years," explains Rausch. "He's my only client for aircraft interiors. We have the same taste; 90%

of the private aircraft interiors I've seen are not for me or Niki."

"He started with Lauda Air, and he did everything, inside and out, down to cabin attendants' uniforms," says Lauda. "He did all my private aircraft. You need to know a lot about rules and regulations and he is very good at it."

The two have traveled together a lot, which means Rausch is well placed to know what Lauda needs from his aircraft. "For years I went to every race with him, because we have a shared understanding, not only about aircraft, but about life," says Rausch. "If someone from the newspapers asks Niki, 'Do you have friends?' he typically says he has none. But if someone asks me, I say, 'He might not have friends, but I do, and he's one of them.'"

This perhaps explains why Lauda gave Rausch no brief, instead trusting

## IFEC equipment

Lauda says internet connectivity is his 'must-have' equipment. "I have Ku-band, which is the quickest; we just tried it coming here," he says. "For me, it's important to always stay in touch and it works perfectly."

The IFE includes Rockwell Collins' 3D Airshow system. "Niki loves it," says Rausch. "Around 10 times in the first flight he said, 'Ah, it's worth it, it's really something.'" In fact, Lauda says the IFE setup "can't be bettered".

There are two monitors in the cabin: one in front of the master seat on the right-hand side, and one in the sleeping room.

him to come up with selections that he would then approve. "He shows me everything beforehand, I say, 'Yes, I like it', and off we go," says Lauda.

One of the most important tasks was to choose new wood veneer. Bombardier was in charge of the cabin installation and livery, but F/List of Thomasberg, Austria (formerly known as list components & furniture), was contracted to produce all the cabinetry. Rausch went with F/List's founder, Franz List, to look at veneers in Salzburg, Austria, and fell in love with an African ebony. "This was a sensation for me," recalls Rausch. "When I first saw it, I said, 'It can't be ebony because it has dark and light stripes.' But it is a special ebony and I love it so much."

**No-nonsense approach** He crossed his fingers that Lauda would love it too. "I started to say, 'Okay, Niki, we now have three possibilities; you in the end can make the solution.' Niki said, 'Stop it, Hannes. Show me the one you already decided on.' We went to the

veneer and I said, 'This is it.' He said, 'Yes? Okay, good.'"

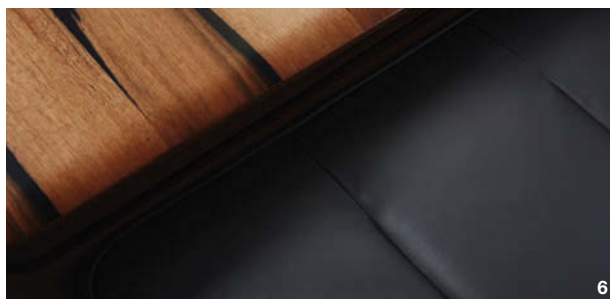
The pair also decided on a matte finish. "I wanted it to be completely different to the prevalent style because wood is a living material," explains Rausch. "I want it to be matte, not shiny; natural, not simulated."

The veneer was a challenging one to implement. "It's the second project that we've done with Niki Lauda – the first was a Challenger 300 five years ago – and he's chosen a type of veneer that is challenging in terms of flammability requirements on both projects," says Johannes Schatzer, director of business development, aftermarket, at F/List. The veneer used on the Challenger 300 was a rare and colorful tulip wood, again with a matte finish. "The African ebony used on the Global 6000 is challenging because it's very oily," says Schatzer. "But as on the Challenger 300 project, engineers from our research and development department found a way to imbue some material into the veneer to fulfill this requirement."

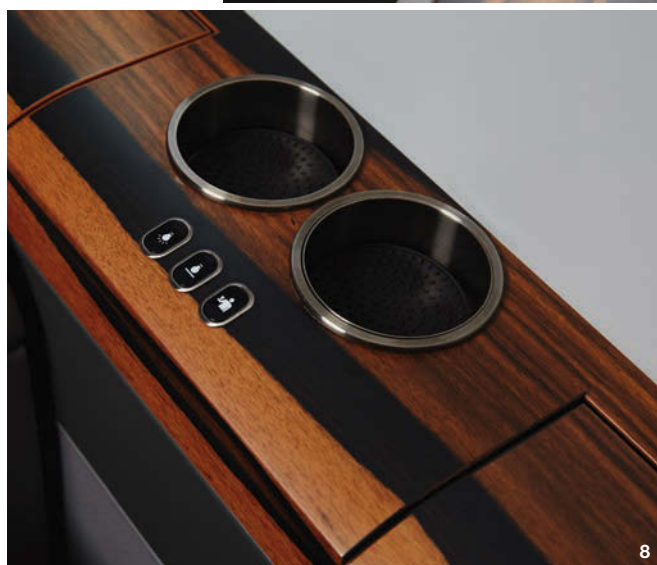
5-8. The veneer is African ebony with a matte finish. Planning the layout was a very intricate task



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Photos: Dominique Lafond-Rodeo



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**11** months from contract to delivery

**12** passenger capacity

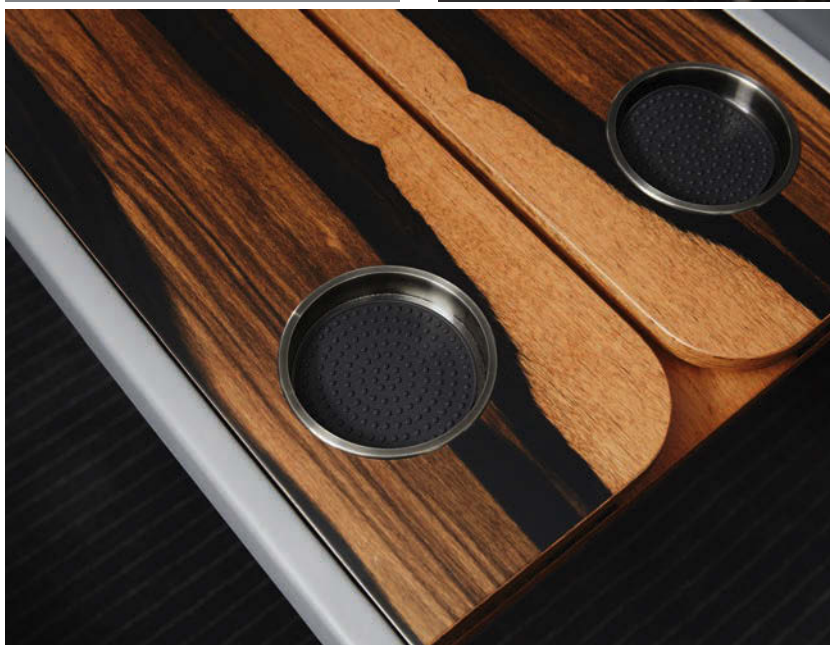
**40+** years Lauda has known his designer



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9-10. The four-place dining setup, which is faced by a long cabinet



Photos: Dominique Lafond-Rodeo

Bombardier sent the existing cabinets to F/List, which removed the old veneer and applied the new surfaces. The work was completed in 11 weeks. “The timescale was definitely a challenge for all of us,” says Schatzer. “We managed it because we have a lot of experience in this kind of work. We also sometimes worked two shifts and over the weekend to minimize the timeframe, which was definitely necessary for this project.”

A particularly challenging part of this project was defining how each piece of veneer would be cut and arranged. Rausch took a very hands-on role in this process. “I placed every line,” he says. “I looked at every piece of wood and where we will place it.”

**Intricate layout** “The veneer layout was absolutely not what is normally done

in the industry,” says Schatzer. “It was very, very complicated. In some areas it’s book-matched – for example in the galley. In some areas the grain is horizontal, in some areas it’s vertical, and on the bulkheads it’s laid like a flower – in some areas we cut a little bit more, in others a little bit less, to get this look. There is no name for how the veneer is laid on the bulkheads; it’s completely unique. That was a decision from the designer. He was in our facility for 2-3 days, working closely with the cabinet maker.”

The result is a triumph. “I wanted this special wood,” says Lauda. “Not shiny, and laid out like trees. Everything is absolutely how I wanted.”

A non-shiny finish was also specified for the stone veneer countertops, which are F/List’s Star Galaxy variety. The company calls the

finish a brushed optic, which means the stone is not highly polished. “It was one of the first projects for which we delivered stone countertops in brushed optic,” says Schatzer. “It’s something special,” comments Rausch. “It’s matte and it’s beautiful.”

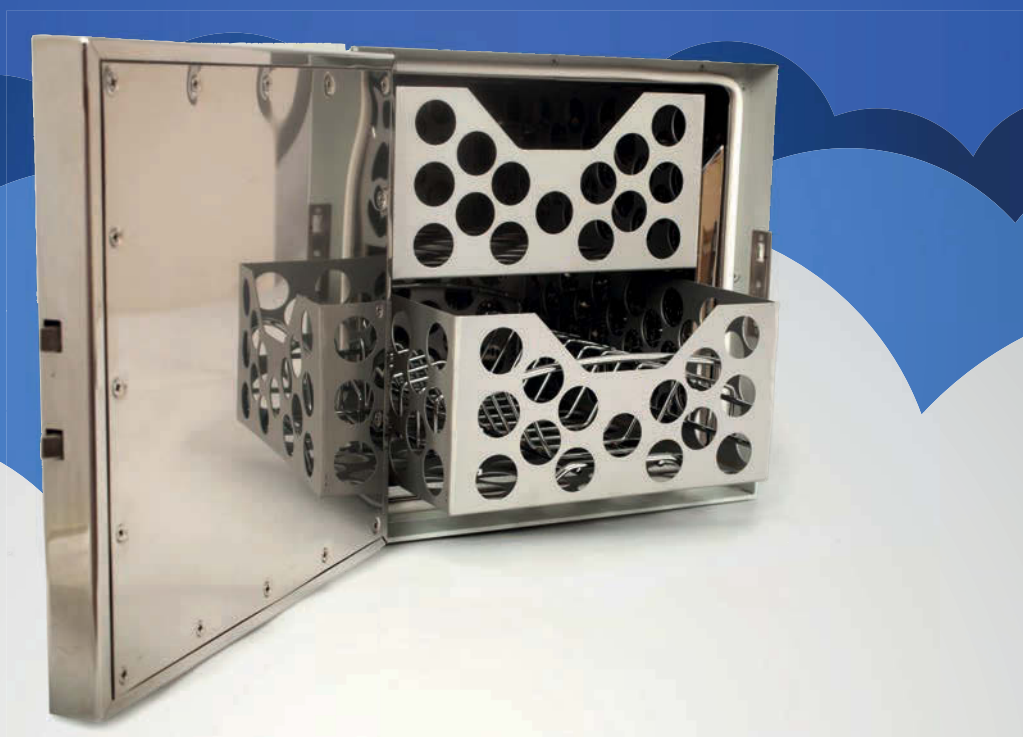
**Pinstripe suits** A defining feature in the cabin is the pinstripe pattern, which is found on the soft materials used for the divans, carpets and parts of the bulkheads. Although these materials match perfectly, each was actually custom-made by different suppliers. Initially, it was thought that some of the suppliers would be unable to do the work in the time allotted, but Lauda and Rausch were persistent, and Bombardier made it happen.

Rausch says the key to the materials’ homogeneity was to provide very clear instructions to the suppliers. For example, the stripes had to be off-

**THERE IS NO NAME FOR HOW THE VENEER IS LAID ON THE BULKHEADS; IT’S COMPLETELY UNIQUE**



# AEROLUX BUN WARMER

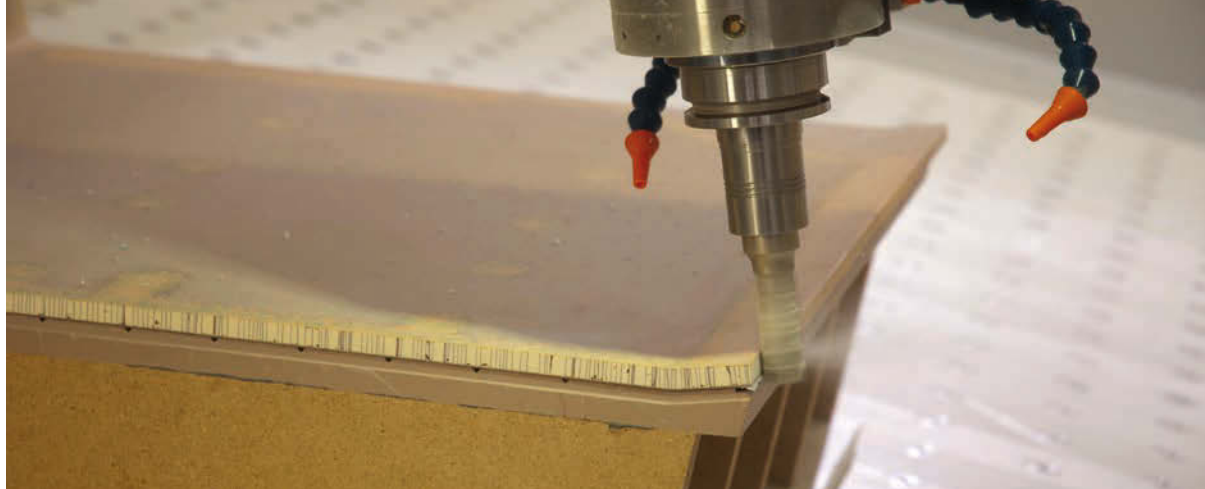


This compact self-contained unit has been designed specifically for warming buns, bread rolls, croissants etc. Insulated to ensure a cool outer face temperature, the door decor trim can be provided to your needs.

The oven incorporates baskets and crumb tray and the baskets can have plate racks inserted for storage.



11-12. F/List's production facility in Austria, where the cabinetry for Lauda's Global 6000 was made



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dislike," he says. "You always need harmony between this, this, this and this. If one part is good and the rest is medium, I don't like it."

"In the end only one thing is important – that Niki likes it," says Rausch. "Actually, I can say he loves it, because he said, 'Whenever we buy another aircraft' – because he's thinking a little bit about the Global 7000 or the Global 8000 – 'I don't need you anymore because the next aircraft will have exactly the same exterior and interior.'" **END**

## F/List's latest product developments

**Werner Kartner, vice president of aircraft interior programs at F/List, reveals some of the company's recent and upcoming developments.**

**Heated flooring:** "We're now in the development phase for a heated solution, mainly for our stone flooring," says Kartner. "It could also be applied later on with our wood flooring, but mainly it's intended for the stone flooring."

**Leather flooring:** This has been developed with leather supplier Boxmark. "They're a very high-quality producer," says Kartner. "And it fits with our line of products. It could be used in combination with our wooden flooring – for example installing the leather flooring around the seats, to create warmth. Nobody else is offering anything like this on the market."

**Fingerprint-resistant glue:** "Fingerprints are a big problem in completions because all the headline and sidewall panels are normally covered with faux leather, and it's attached using some kind of contact glue," explains Kartner. "The slightest touch during installation leaves a fingerprint that needs to be removed later because the quality team will not release the part otherwise. We have developed a very special glue that eliminates this problem."

**Varnish repair system:** "For operators every minute counts, so downtime needs to be minimized," says Kartner. "We have developed a special repair solution for customers who have issues with their cabinetry cracking." The solution was developed with Bombardier, and means affected parts can be repaired on the aircraft, in one day. A special formula, developed in-house, is used to fill the crack. "It tides it over until the next big service, when you can repair the part fully," says Kartner.

white, and not too sharp. "I gave them color samples, specified how wide the stripes should be and in the end they did everything," he says. "It worked in the end. I was a little bit afraid, because if the stripes had been too wide or too close, it wouldn't have worked."

**Personal touches** Rausch says the overall design reflects Lauda's upbringing. "Niki comes from a very traditional and aristocratic family," says Rausch. "He is very polite. His grandfather was the boss of a bank. It's still with him and it's in the aircraft. Although he doesn't care about his clothes or shoes, the moment he sits down in his master chair in his aircraft, that is the real Niki, where he comes from and who he is. It's different to what is around him, but it's him too. A normal guy would not like these lines. His grandfather and his father, they would have had their suits like this for sure. It's his life. The feel of the aircraft is very stylish, polite, masculine, and it's also him."

It is certainly an aircraft absolutely brimming with personality. "It's made for one person," says Rausch. "This aircraft has Niki's character and touch. It's different to all the others. Even Bombardier kept saying it's a completely different design."

Rausch is very happy with the OEM, as it was able to accommodate all his requests. "It's sensational. This Global 6000 was the very first aircraft where we could do everything we wanted. It is unbelievable in the end."

Lauda concurs. "The interior is very important to me," he says. "I want to have my own type of interior and here, Rausch did a perfect job. Bombardier helped a lot, and was flexible, because they had to do a lot of things for us, but in the end, it worked out perfectly. There's nothing I would improve."

An important aspect for Lauda is that there is harmony, both between the exterior and interior designs, and within the interior. "Different things have to function together, so that when you come in, there's nothing you



# AEROLUX

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# atlarge

The first BBJ 747-8s are emerging from completion – with interiors that take advantage of 4,786ft<sup>2</sup> of cabin space

**T**he customer delivery in late December 2014 of the first fully outfitted BBJ 747-8 signaled the entry of a new aircraft type into the VIP wide-body fleet.

The delivery was made by Greenpoint Technologies of Kirkland, Washington, USA. The aircraft was inducted there in January 2013 and the interior was outfitted over the course of 23 months.

Boeing Business Jets has taken nine orders for the four-engine aircraft, the latest and largest member of the Boeing 747 family. Eight have already been delivered to completion centers, and “with interest still high” Boeing expects to pick up a few more orders in 2015. Most of those sold have gone to head-of-state clients.

1. A BBJ 747-8 concept by Associated Air Center



## INSTALLING GREENPOINT'S AEROLOFT GIVES AN EXTRA 393FT<sup>2</sup> TO PLAY WITH



2

One of the BBJ 747-8's biggest selling points is a range of 8,875 nautical miles with 100 passengers. Another is its 4,786ft<sup>2</sup> of deck space – and if that isn't enough, installing Greenpoint's AeroLoft in the space between the upper cabin ceiling and the tail section gives an extra 393ft<sup>2</sup> to play with. The AeroLoft can be used to accommodate eight people in three berthing compartments.

**Lofty ambitions** The AeroLoft can be installed at Greenpoint's facility or shipped in kit form for installation at another completion center. The first kits were installed by Boeing at its plant in Wichita, Kansas, USA. Subsequent kits were sent directly to

centers including Associated Air Center of Dallas, Texas. Greenpoint provides the necessary engineering data to support the installation.

**Elevator going up** Another option for the BBJ 747-8 is an elevator. In fact, two centers offer their own versions. Greenpoint brands its the AeroLift. It can carry up to four passengers, or one wheelchair user and an attendant, between the ground and main deck, eliminating reliance on the traditional ground-based methods of boarding and deplaning," explains Scott Goodey, CEO at Greenpoint.

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### Pillars in the sky

The upper deck of the BBJ 747-8 offers multiple possibilities for cabin interior designers. For example, as part of this concept, SchöninghWulffraat has opened the upper deck up and combined it with the standard lounge area to create a lounge deck.

"It's a space without partition walls or visual boundaries," says Joost Wulffraat, co-founder of SchöninghWulffraat. "A triangle of pillars separate the bar, lounge and dining areas visually, yet all three areas seem to float together in blended shapes, colors and finishes. It's what you might expect in a luxury home rather than in a jet interior."







L-3 Platform Integration of Waco, Texas, USA, also offers an elevator solution. Its system is designed to carry passengers between the ground and main deck, with an intermediate stop at the cargo deck. It is a retrofit system that can be adapted for other wide-body business jets.

While completion centers report fielding inquiries regarding elevators for the BBJ 747-8, at this point no one is disclosing a firm order.

**Health and well-being** Cabin environment seems to be a major consideration for BBJ 747-8 customers, with completion centers reporting everything from cabin noise levels

2. This concept by Associated Air Center includes a large majlis
3. The aft lounge on a BBJ 747-8 concept by Greenpoint
4. Schöningh Wulffraat's BBJ 747-8 lounge deck
- 5-6. Greenpoint's Aeroloft design

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## Q&A: Annika Svore Wicklund, head designer at Greenpoint Technologies in Kirkland, Washington, USA



How did you get into this business?

I give most of the credit to family influences – a great-aunt who was a US Embassy interior designer and lived abroad most of her life, and a grandfather who was an engineer. I have a BA in mathematics and art and went on to study and obtain my National Council for Interior Design Certificate. Also, I love my hometown

of Seattle, Washington. It's a hub of high technology, as well as the extraordinary advancements Boeing offers the industry.

How many completions have you been involved in?

In my 10-plus years at Greenpoint, I've worked on numerous BBJ 737 programs and proposals and in the last few years focused on BBJ 747-8s, the Aeroloft and BBJ 787s. The design team has also supported interiors for smaller business jets, including the cabin of Greenpoint's own corporate charter Learjet.

What is challenging about the work?

We work with clients from all over the world, so one of the most challenging aspects of the design process is embracing each culture and creating an interior that meets their intrinsic passions. Success is in executing on the unsaid. New engineering and manufacturing challenges come with each program, and in a way, we seek them out. It keeps us on the cutting edge of innovation.

What is the most gratifying part of creating an interior?

The final months of the completion as testing begins and the interior becomes real. The best feeling is walking up to the belly of the aircraft when it's nearly completed. The sheer size and complexity of the design integration is phenomenal. At that point, the aircraft assumes its own distinct personality.

How much does an owner's personality influence the cabin?

Each aircraft takes on a persona of its own, chiefly due to the influences of its owner or owners. The degree of that influence often depends on the owner's involvement in the process. If the aircraft is for their personal use, you might write an entire novel about its creation. If it's a corporate interior, a short story might do.

How important is function when designing an interior?

I believe that the purpose of an interior should be the starting point for design, and that the easiest form solution is not typically the best choice. I've seen materials and technologies evolve to give us more options to fit function into different shapes and sizes that are pleasing to the eye.

If not business jet interior design, what other career might you have gone into?

My path out of college was leading me into architecture. But another career possibility would be professional car racing! I love the thrill of speed, tight corners and competition.

7-8. BBJ 747-8  
bedroom concepts  
by Greenpoint

reduced to approximately 56dB (SIL), to a steam bath. The latter is offered by Lufthansa Technik of Hamburg, Germany. The Aircraft Steam Generator (ASG) consists of a steam generator, steam outlet, control panel and refill port. The company describes it as having "a positive effect on circulation, the cardiovascular system and skin". The first steam bath is being installed on one of Lufthansa Technik's BBJ 747-8 completion projects.

**Fresh air** Cabin humidification technology from CTT Systems has also picked up multiple orders for the BBJ 747-8. The company says that relative humidity in an aircraft cabin is typically about 3-5%, but with its Cair technology, relative humidity is boosted to approximately 20%. CTT claims this is not only more comfortable, but also beneficial for those passengers who suffer from respiratory problems.

Cair is based on evaporative cooling technology. It also incorporates CTT's Zonal Drying System to counter





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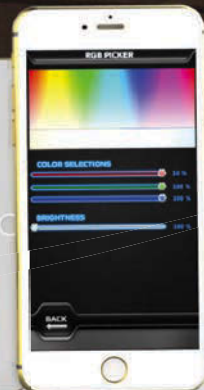
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condensation problems. Associated Air Center is one completion center installing CTT's Cair and Zonal Drying System on a BBJ 747-8. The outfitting process is 70% complete.

**Wish list** Speaking in general terms (within the bounds of non-disclosure agreements), completion centers admit that BBJ 747-8 customers want the very latest and greatest. Must-have items include high-speed internet; wireless IFE with video streaming; ultra-HD IFE; AVOD; multiregion, live satellite television; HD landscape cameras; LED lighting throughout; global cell phone

service; full galley facilities for food preparation; and wet bars. Associated Air Center is installing 3D video monitors in the BBJ 747-8 it is currently completing.

According to Patricio Altuna, vice president of sales at Associated Air Center, the additional space in the BBJ 747-8 has encouraged more "task-specific" individual zones for such purposes as conferences, medical services, gaming and entertainment, guest suites and quiet/rest.

Lufthansa Technik cites demand for larger staterooms and guest rooms and a spacious interior "without hallways or

10

## BBJ 747-8 TIMELINE

### November 2005

Airline version announced

### May 2006

First VIP order

### October 2009

Greenpoint unveils the Aerolift and trademarks the Aeroloft

### February 2013

VIP version announced

### March 2011

First flight

### December 2011

Type certification awarded by the FAA

### March 2012

First green delivery of VIP version

### 2012

A further seven green aircraft delivered to VIP completion centers; first Aeroloft installed

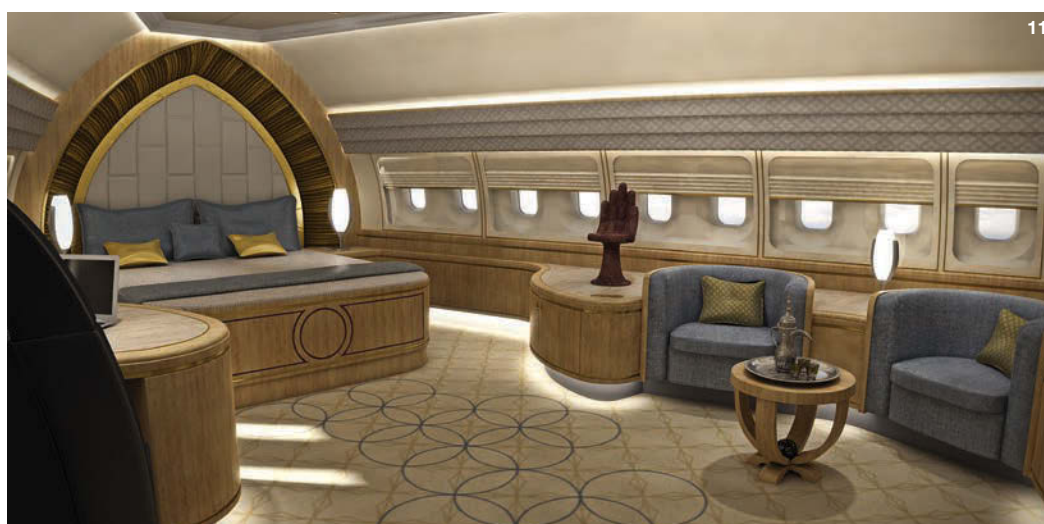
### December 2014

First customer delivery of VIP version

### January 2015

US Air Force announces selection of the aircraft

9-11. Designs by Lufthansa Technik for the BBJ 747-8



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## BOTH THE BBJ 747-8 AND BBJ 787 REQUIRE 18-24 MONTHS FOR COMPLETION

### Missile defense

The new VC-25s for the US Air Force will include missile detection and defense systems.

While L-3 will not cite any particular completion project with such a system, the company does admit to having installed its L-3 Aircraft Threat Countermeasures Solution on a number of aircraft. It is a missile warning system designed to provide exportable anti-missile protection against shoulder-mounted launchers. It can be retrofitted to any business aircraft.

Other missile defense system suppliers include Elbit Systems, Elta Systems, Northrop Grumman and Saab.

service walkways to disturb the impression of space”.

**Air Force One** While very few VIP jet owners wish to be identified, the president of the USA can hardly avoid it, thanks to a very public selection process. The US Air Force announced in late January 2015 that its two current BBJ 747-400 presidential aircraft will probably be replaced by the BBJ 747-8. The presidential aircraft are referred to by the Air Force as VC-25s, and as Air Force One when the president is on board.

The announcement does not represent a final decision to procure the BBJ 747-8, according to Air Force Colonel Amy McCain, manager of the Presidential Aircraft Recapitalization program. “We will need to finalize the overall acquisition strategy and conduct risk-reduction activities with Boeing to inform engineering and manufacturing development contract negotiations that will define the capabilities and cost,” McCain says. She adds that the contract will be awarded only if negotiations result in a fair and

reasonable price. Boeing’s listed price for a green BBJ 747-8 is US\$345.656m.

“The Boeing 747-8 is the only aircraft manufactured in the United States that when fully missionized meets the necessary capabilities established to execute the presidential support mission,” says Air Force Secretary Deborah James.

Greenpoint Technologies completes interiors for many heads of state. “We have a history working with Boeing on many head-of-state interiors and it would be an honor to work on these, given the opportunity,” says a Greenpoint spokesperson.

**Next in line** Three more BBJ 747-8s are due to go into service in early 2015. And as the backlog dwindles, the BBJ 787 is just beginning to arrive at completion centers. With a 14-aircraft order book, the executive/VIP variant of the 787 Dreamliner is expected to keep wide-body centers busy for at least the next three years. Both the BBJ 747-8 and BBJ 787 require 18-24 months for completion, depending on the job’s complexity. **END**



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12-13. A BBJ 747-8 designed by Pierrejean Design Studio for a client from the Middle East



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# longstory

The Dassault Falcon 8X, a stretched version of the Falcon 7X, is already proving popular with customers who want a bit more cabin space to play with

1. The Dassault Falcon 8X's aft cabin






**CABIN STATS**

**Dassault Falcon 8X**

**Cabin width:** 7ft 8in

**Cabin height:** 6ft 2in

**Cabin length:** 42ft 8in

**Seats:** Typically 3 crew + 14 passengers (certified for 19 passengers)

**Range:** 6,450 nautical miles at Mach 0.80 with 8 passengers, 3 crew and NBAA IFR reserves

**Max speed:** Mach 0.90

**Max altitude:** 51,000ft

**Price:** US\$57.5m (2016 price)

In long-range business jet travel, little things can be important. Little things such as an extra hour of range, a few more inches in the galley or the lavatory, and a tad more room to recline that seat. The question is how much these things are worth. On the new Falcon 8X, Dassault is waging that 43in more space in the cabin, and an extra 500 nautical miles of range, commands a premium of around 10%, or US\$5.5m. The 8X is a stretched derivative of the long-range 7X, which costs US\$53.8m. Dassault has sold more than 250 7Xs since 2007. The 8X will cost US\$57.5m at 2016 prices.

The 8X made its first flight on February 6, 2015, and customer deliveries are scheduled to begin in 2016. The OEM is also working on the upcoming 5X, and building a massive addition to its campus in Little Rock, Arkansas, USA, to handle the anticipated flood of completions for the two new aircraft.

Demand for the 8X is largely being driven by customers who fly the 7X – they recognize the value of the long-range jet; they just want more of it, a few more refinements and a little more utility. The 8X is poised to deliver.





The 8X has the same passenger capacity and luggage hold space as the 7X, but offers 7% more cabin space, for a total of 1,765ft<sup>2</sup>. It has four more windows, for a total of 32. The aircraft will also offer 500 nautical miles of additional range, making its maximum range 6,450 nautical miles with eight passengers and three crew members at Mach 0.80. The service ceiling is 51,000ft, but the cabin altitude is only 3,900ft at 41,000ft.

It is the cabin stretch that will have the most impact. When the 8X was announced at EBACE 2014, Dassault Aviation's CEO, Eric Trappier, grandly claimed that it would offer "the highest level of customization of any large-cabin business jet on the market".

**Decisions, decisions** Customers have a choice of 30 basic cabin layouts. They can opt to add the extra space to the galley, increasing its size by up to 25%; they can use it to install a shower in the lav without cutting into passenger cabin space; they can use it to add



2. The aft shower option
3. The 7X's aft shower has been upgraded for the 8X
4. Both electrically assisted and fully electric seats are available
5. The EASy 3 cockpit

### In the driving seat

The 8X has a revamped and restyled cockpit, which incorporates the look and many of the advanced features designed for Dassault's upcoming 5X. These features include EASy 3 digital avionics, based on the Honeywell Primus Epic system, and a new Elbit Systems heads-up display that combines elements of synthetic and enhanced vision for landing in bad weather. The cockpit seats have also been redesigned, one of the aims being to improve comfort.



## CUSTOMERS HAVE A CHOICE OF 30 BASIC LAYOUTS

a convertible crew rest area; or simply to enlarge cabin seating areas.

"The extra length gives us a lot of flexibility in terms of cabin outfitting," says Remi Bachelet, Dassault's director of specification and design. "We can offer three galley layouts, instead of the two for the 7X, and are able to offer a very comfortable cabin entryway with a very large galley and a crew rest area."

Bachelet says the 8X's designers have eliminated what he calls the "corridor effect" in the main entryway by flooding it with more natural light from two additional full-size windows in the galley. Customers opting for the larger galley can install chillers, which could be helpful considering the aircraft is capable of 14-hour flights. Opposite the galley there is room for an optional crew rest area, which has its own window. The design of the crew rest area is new, Bachelet says. It can be converted quickly into a large coat



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closet when required. “The operation to convert the area to offer a bed is a very simple and it brings a lot of comfort for the crew,” adds Bachelet.

Another new option to boost crew comfort in the forward section of the aircraft is an optional vacuum lavatory. An aft vacuum lavatory is standard equipment, as on the 7X.

Bachelet says about 50% of 8X customers have opted for the larger forward galley and new crew rest area so far. Of course some owners want to add the extra space to the main cabin and various layout options enable this. “Some customers select not to have a crew rest compartment and instead want the extra space in the main cabin

and/or in the aft compartment,” comments Bachelet. “With the 8X’s longer cabin, we can install longer sofas in the aft stateroom that convert into a very comfortable bed. In addition, that room can also be equipped with a large pop-up monitor.”

Bachelet stresses that the divans, although larger, remain certified for three passengers for take-off and landing. The size increase was enabled by a new cushion package designed to make these divans more comfortable for lounging and reclining. Bachelet says the aft stateroom is “a big improvement” compared with what is available on the 7X.

**Shower time** The extra space also enables a shower to be added to the aft lavatory area without chopping the cabin down to a two-zone layout, as was required on the 7X. The shower is largely unchanged from the sit-down design on the 7X, but there are a few improvements, Bachelet notes. They include slightly more headroom and an improved heater that warms the mixture of water and forced air faster.



6. The new crew rest area option  
7. The 8X will also have a new HD IFE system



## ABOUT 50% OF 8X CUSTOMERS HAVE OPTED FOR THE LARGER FORWARD GALLEY AND NEW CREW REST AREA

### Upgrades at Little Rock

To support its two upcoming jets, the 5X and 8X, Dassault is investing US\$60m to expand its facility in Little Rock, Arkansas, USA.

“Dassault has been completing Falcons in Little Rock for more than 40 years,” said John Rosanvallon, Dassault Falcon Jet’s president and CEO, at the groundbreaking ceremony in September 2014. “Over that timespan it has built up a wealth of completion know-how and experience that is unrivaled in the industry and is so critical to the quality and reputation of Falcon aircraft.”

An extra 250,000ft<sup>2</sup> of production and completion space is being added; cabinet, upholstery and headliner shops are being refurbished; and other hangars are being upgraded. The expansion should be complete by early 2016.

In 2008, for the 7X, Dassault added 116,000ft<sup>2</sup> to the facility – including production, design and warehouse space, plus four paint bays.



### 8X AND 5X TIMELINE

#### October 2013

Falcon 5X launched

#### May 2014

Falcon 8X launched;  
Falcon 5X’s central  
fuselage joined

#### September 2014

Expansion of 5X and 8X  
completion facility in  
Little Rock, Arkansas,  
USA, begins

#### October 2014

Falcon 8X completes  
ground testing;  
Falcon 5X enters  
ground testing

#### December 2014

Falcon 5X ordered by  
Wallan Aviation

#### February 2015

Falcon 8X makes  
first flight

#### June 2015

Falcon 5X rollout  
expected

#### 2016

Falcon 8X service  
entry expected

#### 2017

Falcon 5X service  
entry expected

The air is used to make the water pressure seem greater. Per flight, there is capacity for three showers of 10 minutes each.

Bachelet thinks that the extra space on the 8X will encourage more customers to opt for the shower. “It’s a big improvement,” he says. “We already have customers thinking about taking that option. We are sure this shower will be quite successful on the 8X.”

Passengers opting for a shower can also easily access hanging clothes in the walk-in baggage hold, which is just aft of the lavatory.



### Performance highlights

An extra fuel tank in the center of its fuselage enables the 8X to achieve a range of 6,450 nautical miles (with eight passengers and three crew members at Mach 0.80) – 500 nautical miles longer than the 7X. The longer legs enable the 8X to fly between city pairs including Paris, France, and Singapore; Lagos, Nigeria, and Chicago, Illinois, USA; Mumbai, India, and Sydney, Australia; Moscow, Russia, and Los Angeles, California, USA; Beijing, China, and Los Angeles; and Hong Kong, China, and London, UK.

Dassault engineers have also found a way to redesign the wing and take 600 lb out of the structure and reduce drag. The new wing still delivers good slow approach speeds – down to 106kts – and a balanced field length of just 6,000ft at maximum take-off weight. Like the 7X, the 8X can stop in ridiculously short distances for an aircraft this size – as little as 2,150ft.

The Pratt & Whitney Canada PW307Ds engines have 6,725 lb of thrust each. They have been tweaked to yield 5% more thrust than on the 7X, while posting better specific fuel consumption and fewer emissions. In fact, Dassault claims the 8X is up to 35% more fuel-efficient than competitive aircraft in its class, with lower direct operating costs thanks in part to fewer mandated inspections.



**Window of opportunity** The lavatory with the shower will also feature a full-size window that can be dimmed electrochromatically. This feature is not carried over to the other cabin windows, which have traditional window shades. But Bachelet says Dassault is still investigating the value in using electrochromatic windows throughout the cabin to provide dimming “like sunglasses”. This would be a complement to the mechanical system because all customers want blacked-out or blocked windows when they are sleeping.

- 8. The largest of the three galley options
- 9. New seats are being supplied by B/E Aerospace

In cooperation with B/E Aerospace, Dassault is developing a new cabin lighting package for the 8X that will enable the lighting color to be adjusted. It is scheduled to premiere on the 7X later in 2015. Bachelet says the new feature is “not like disco lights, but you will be able to fine-tune and separate the lighting temperature”.

Dassault also plans to equip the 8X with new, electrically assisted seats from B/E Aerospace in the main cabin. The seats will still rely on mechanical means for slide, swivel and recline features, but those actions will be controlled by an electric switch as opposed to a mechanical cable connector. The move is intended to improve reliability, eliminating the possibility of cables slipping, breaking and losing tension. The 8X will also be

available with full electric actuating function seats.

Other improvements to the 8X include a new HD IFE system and a new cabin humidification system that can boost humidity by more than 20%.

Bachelet says the 8X largely spawned from feedback provided by 7X customers. He expects a good number of these to upgrade to the new model. “Most of the 8X orders are from long-term Falcon customers who already operate a 7X,” he explains. “They know exactly what they need for their missions.”

For now, the company plans to produce both the 8X and the 7X, as Dassault executives are convinced that not everyone will need the extra capabilities of the 8X. That calculation is a game of inches. **END**





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# Americandream

Major investment by Embraer in a third facility at its hub on Florida's Space Coast is changing the Brazilian OEM's center of gravity

1. A design suite at Embraer's facility in Melbourne, Florida, USA





**W**hen Embraer officially opened its first Embraer Engineering and Technology Center (EETC) on US soil in September 2014, the Brazilian company took another big step into a major market. More than 40% of its fleet is based in North America and the Caribbean, and the OEM says the US could account for 50% of business jet demand over the next decade.

The 75,000ft<sup>2</sup> EETC is the third facility to be built at the site at Melbourne International Airport in Melbourne, Florida. It joins an 80,000ft<sup>2</sup> final assembly and paint facility for Phenom 100E and 300 jets, which opened in 2011, and a 58,000ft<sup>2</sup> customer center that opened in December 2011.

The next additions will support the Legacy 450 and 500 jets. They will include a 137,500ft<sup>2</sup> assembly facility, a 22,500ft<sup>2</sup> paint facility, a 36,000ft<sup>2</sup> completion center and flight preparation facility, and a 40,000ft<sup>2</sup>

delivery center. These new buildings – which will total 236,000ft<sup>2</sup> – should be operational by the fourth quarter of 2016. The Legacy 500 entered service in 2014, and is currently assembled in Brazil. The Legacy 450 is due to enter service in the fourth quarter of 2015.

The Melbourne campus currently employs around 400. The company plans to add a further 600 employees to staff the new Legacy lines, plus another 100 engineers by 2017.

**Why Melbourne?** The choice of Melbourne rather than elsewhere in the USA was largely based on its pool of talent. The area is known as the Space



**75,000ft<sup>2</sup>**

EETC at Melbourne

**80,000ft<sup>2</sup>**

Phenom assembly and paint facility at Melbourne

**58,000ft<sup>2</sup>**

customer center at Melbourne

Coast, as it is home to the Kennedy Space Center and other aerospace operations. NASA's space shuttle program was shelved in July 2011, leaving a lot of highly trained aerospace workers without a job. This gave Embraer plenty of choice when it decided to sow the seeds of what would become its EETC. In September 2012, around 70 engineers began work in a temporary facility at Embraer's campus. Around 200 people should be employed in the formalized EETC by 2017. Other parts of the campus also benefitted – a third of the people initially hired for the Phenom facility were former NASA employees.

The location also puts Embraer closer to key suppliers and other long-time collaborators. California-based BMW DesignWorks USA developed the baseline concepts for the Phenom 100E, Phenom 300, Legacy 450 and Legacy 500 – which Embraer then built upon through extensive interaction with customers. B/E Aerospace, which also has a facility on the Space Coast, developed LED lighting and seats for the Legacy 450 and 500.

**Development exercise** The EETC is equipped with a laboratory for the development and testing of materials and cabin interior components. There are facilities for computational fluid dynamics, finite element modeling, prototyping and 3D computer-aided design. There is also a 3D Virtual Reality Center.

The EETC will work on both product and technology development,

and not just on executive jet interiors. Teams in Brazil and Melbourne have already collaborated on the Legacy 450 and 500 development programs.

The engineers are also supporting individual refurbishment projects. Embraer says being on US soil makes it easier to obtain STCs from the FAA, which are needed to make modifications to an aircraft. For example, a Legacy 600 owner from the USA wanted a wi-fi system, so Embraer's US-based engineers obtained



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5

## Going paperless

In its Phenom assembly hall, Embraer has implemented paperless production. It believes this makes production, customization and aftermarket conversions easier and faster. "Mechanics and engineers don't have to carry around the paperwork," says Beever. "All the updates are done through electronic signatures, which is much more efficient. In the production process, every bit helps. Paperless production drives quality, reduces costs and tightens up schedules."

2. Embraer's campus in Melbourne
- 3-5. Customers come to Melbourne to specify interior finishes for their Phenom, Legacy and Lineage jets

an STC from the FAA for the modification. The company says they did so more quickly than they would have been able to from Brazil. That particular approval was the first Embraer STC submitted directly to the FAA, and surely the first of many. Melbourne is proving to be a hub for planning refurbishments, although the interior fitting is still done in Brazil.

**Customer center** Although the only interiors currently fitted in Melbourne are new Phenoms, the customer center now offers design services for other Embraer models. Design suites for Legacy 600, Legacy 650 and Lineage 1000 opened in July 2012.

Today many more US clients visit the Melbourne complex to specify their interiors than used to go to the OEM's headquarters in São José dos Campos, Brazil. More than 50% of clients who

visit Melbourne are from the USA. From the start, Embraer wanted to make Melbourne a more accessible option for potential customers – a center of gravity. "It's a far better experience for customers to come here and utilize the full facilities than for us to come to them with a suitcase full of materials," says Jay Beever, vice president of interior design and branding at Embraer.

At Melbourne, customers can define configuration, materials, aesthetics, seating, storage, galleys and other onboard equipment, as well as exterior paint. The experience is similar to that in Brazil. The Melbourne showrooms also incorporate mock-ups of the Phenom 100E, Phenom 300 and Legacy 450 models. Customers can see how their interiors could look with different configurations and options, using an iPad app.

## MELBOURNE TIMELINE

### May 2008

Melbourne announced as site for facility

### February 2011

Phenom 100E final assembly facility and paint shop opened

### December 2011

Customer center opens, with design suites for the Phenom 100E and Phenom 300

### July 2012

Design suites for the Legacy 600, Legacy 650 and Lineage 1000 added to the customer center

### September 2012

70 engineers begin work in a temporary Engineering and Technology Center (EETC) facility; Phenom 300 added to assembly line

### September 2014

New EETC opens

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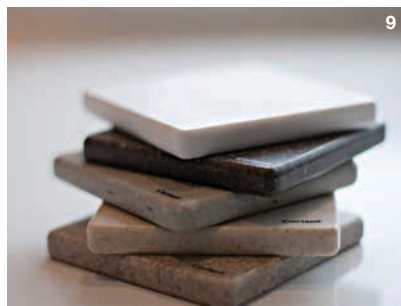
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Embraer says clients are generally prepared to devote considerable time to seeing the project through. Thus the facilities are fully geared up to make their stay pleasurable. The customer center is nearly two-thirds the size of the assembly operation. It offers accommodation, conference rooms, suites and dining rooms for its clients' use. Embraer says most clients visit the center several times during the completion. "We ask them what they want their journey to be like," says Beever. "We work with the customers to understand their mission."

**Aircraft options** The Phenom 300 is configurable with cabinet finishes including wood veneer and laminates. There is a choice of various carpets, while the upper sidewall can be covered in one of several types of Ultraleather. There are also various options for seat leather, the upper

### Belo Horizonte and beyond

The venture in Melbourne is not Embraer's first research and development center to be set up outside its São José dos Campos headquarters. It also has one in Belo Horizonte, Brazil, which opened at the end of 2011. There, around 100 engineers and technicians work on product development – from the initial aeronautical definitions and certifications to support for the serial manufacturing phase.

In addition, Embraer is planning a new EETC in Évora, Portugal, which will research parts and structures constructed from composite materials.



6-9. A huge array of veneers, carpets and other materials are on display

sideledge and lower sidewall. Pleated window shades are an option. As for the exterior scheme, the sky's the limit. The paint laboratory at Melbourne is a key component of the operation and is constantly working on options.

Meanwhile, the Phenom 100E offers 11 color palettes, ranging from Amber and Bronzite to Sunstone and Tiffany. The stowage spaces can be tweaked to suit different functions. Options include a refreshment center and premium seats. The external air stair can be fitted with lights and telescopic tubes if desired.

Of course, the Legacy models offer more customization than the Phenoms, with more options for colors, fabrics, flooring, galleys and other equipment. Embraer says F/List's stone flooring – which is available on all Legacy models and the Lineage 1000E – is particularly appreciated by customers.

With the addition of assembly lines for its newest products, the Legacy 450 and Legacy 500, Embraer expects to see even more customers gravitate to its facility on the Space Coast. **END**



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# fastforward

Under Andrew Muirhead's leadership, a seven-person unit has grown into a 130-strong team with responsibility for all of Lufthansa Technik's 'tangible' product developments – and now it is benefiting from fresh investment

In 1989, an Australian studying electronic engineering at RMIT University and German at the University of Melbourne, was turned down for an internship at Lufthansa Technik in Germany. Determined to go to what he terms “the land of engineering”, that undergraduate changed his subjects (to major in avionics) and wrote to the company again. “They must have liked my persistence, because then they did

give me a six-month internship,” says Andrew Muirhead, who, after quite a roundabout route, came to head up the Original Equipment Innovation division at the company.

That route involved finishing the internship, returning to Oz to complete his degree, traveling the world and working for Andersen Consulting. Muirhead joined Lufthansa Technik's Development Engineering department in 1996. The job involved installing

# innovation @



communication and IFE systems as well as cabin lighting on VIP and commercial aircraft. In 1998, Muirhead launched a little video control center business at the company. The first customer was Lauda Air. "That was my first little entrepreneurial exercise at the company," says Muirhead. "When I was at university, I built computers for other students, and programmed educational software, so I've always had that business streak in me."

**Launching the IFE business** The video control centers didn't get the internal backing they needed to progress, but Muirhead went on to lead the company's charge into the IFE business. "One evening in 2001, we were doing a night shift on an aircraft, trying to get an IFE system working," he recalls. "We were having all sorts of problems with it and I said to my colleague, 'Why don't we start developing this stuff ourselves? We

seem to understand how it works better because we're fixing it all the time – why don't we manufacture it?'"

Eventually the company backed this idea, giving Muirhead and his colleague a small budget and a team of seven. "We were like a start-up inside the large company," he says. "We started in 2003, and we managed to have the unit up and running with €20m (US\$21.5m) in revenue in the space of four years. What started as a tiny idea has turned into a significant piece of business here," says Muirhead.

**New facilities** By 2008, the unit had run out of space, so a new facility was built. "We looked at what processes needed to be closer to each other, and we designed the building accordingly," says Muirhead.

There is a qualification test lab, plus facilities for vibration and shock testing, temperature and humidity testing, highly accelerated lifetime

1. Andrew Muirhead, vice president of Original Equipment Innovation at Lufthansa Technik
2. The division's purpose-built facility

# @work



testing, power input testing, and an electromagnetic interference chamber.

"We've also invested a lot in the development of production and development testing devices," says Muirhead. "We developed automatic test equipment, so that we don't need as much manpower for testing."

**The restructure** Now the unit is staffed by just over 130 people. In 2014 it was restructured as the Original Equipment Innovation division and given responsibility for the development and manufacture of all 'tangible' products at Lufthansa Technik. This means all products outside of the MRO business – whether they are designed for airlines, business jets or VIP operators.

Lufthansa Technik also announced in 2014 that it would invest €200m (US\$214.8m) into research and development over the following four years. Not all of that money is being funneled into Original Equipment Innovation, but Muirhead does say the division is "making good use of that at the moment".

The unit is structured around four business lines: commercial aviation systems, business jet systems, lighting and GuideU escape path marking, and seating and structures. "In commercial systems, we've invested a lot of money into the development of wireless infrastructure to support passengers' devices," reveals Muirhead. "In the business jet sector, we are investing

## Diverging from the status quo

Andrew Muirhead likes to do things differently – and this hasn't always gone down well. "We deal with red tape much less now, but in the early days it was a big challenge, because we were doing things very differently and sometimes the organization didn't understand why," he says.

He recalls the time he bought beanbags for a new brainstorming room. "I didn't want a meeting room table because I wanted to have an informal area where we could brainstorm freely," he says. "Later I got a phone call from the purchasing department telling me that beanbags were not meeting room furniture and asking how I could possibly buy something like that. I said, 'It's not a meeting room. How about you look up the definition of brainstorming room and tell me what sort of furniture you have for that?' They said, 'We don't have a definition for that.' I said, 'I think you need one.' Those are the sorts of traps you have to avoid getting caught up in – doing everything that is expected of you, instead of actually questioning the status quo."

3. Andrew Muirhead promises a lot of new functions for the nice IFE system over the next 12-18 months

4. The unit's facility, built in 2008, features extensive testing facilities



a lot in further developing our nice HD system – we'll bring a lot of new functions to market in the next 12-18 months. With seating and structures our focus is on getting chair through the TSO and out to market, although we have other interesting products in the works too, including a dishwasher for VIP aircraft, and some medical products for patient transport. In the lighting and GuideU space, we have been investing in getting our colored lighting system to market. Our investment at the moment is focused on ensuring the products in those four lines are ahead of the game. However, we are also investing some research and development into the next business





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## Proudest achievements

As well as the creation of the Innovation business unit, the career achievement of which Muirhead is most proud is “sticking a Boeing antenna on an Airbus aircraft” back in 2000. He even canceled his ticket to the Sydney Olympics to achieve it.

“We had a VIP customer who wanted a big Boeing phased array antenna on an ACJ340,” says Muirhead. “There were political and documentation challenges, and it was extremely challenging technically to install, not least because it was a huge antenna that I think weighed 40kg, then we had to get it certified. Also, we built all the hardware on the back of it as well, so it wasn’t just a case of mounting the antenna. It was an incredible project.”

lines. This funding gives us more freedom to move.”

Each of the lines is run as a business in itself, with a dedicated manager, and has responsibility for its own profit and loss. The four lines are supported by shared operations, sales and marketing, finance, risk management, product planning and engineering units.

“There are engineers attached to certain business lines, but by being in a shared engineering unit, it means that they do actually communicate with each other,” says Muirhead. “It used to really frustrate me when our engineers would be working on a problem without realizing that it had already been solved by somebody else in another area, because they weren’t talking to each other.”



5

6



5. Lufthansa Technik and Schott joined forces to develop HelioJet<sup>®</sup>, a color LED lighting system
6. Engineers submit their ideas on specially designed beer mats

**Lean setup** The company structure is designed to be as streamlined as possible. “It’s very easy to become slow if you get caught up in big company processes, so the idea is to keep this as lean as possible so that we can move fast,” says Muirhead. “We’re pretty fast in going from the idea to the finished product, and I think that really has to do with how we set up the unit and the fact that the people who work here are very flexible in their jobs.”

The unit holds about 50% of the patent portfolio at Lufthansa Technik. “The luxury we have here is that there is no shortage of ideas,” says Muirhead. “It’s always very tempting to start 20 projects at once, but you’ve really got to stay focused on what you do well, and what is going to be a success in the

market. You’ve got to force yourself to focus on the things that are still in progress and not get sidetracked by too many innovations.”

**Beer mats** Muirhead makes sure the team stays focused on solving customers’ problems, not producing technology for technology’s sake. He has implemented a system whereby people submit ideas on beer mats. On the ‘What’s the pain?’ side they must write the problem they are trying to solve, and on the ‘What’s to gain?’ side they sketch out their solution and how it is going to make money.

“As you probably know from books and movies, most of the best business ideas are sketched out on a beer mat in a pub or on a napkin in a restaurant,” jokes Muirhead. The idea is to prevent engineers from spending too much time on initial pitches. “We would get frustrated that they would put all this work together and it would get shot down pretty quickly because they hadn’t considered where the customer fits in,” he says.

Muirhead has a beer barrel outside his office, with a mailbox flag on the

side. “When people have a beer mat idea, they throw it in the mailbox and raise the flag, and on a Friday, we empty it out, look at the beer mats and assess them,” he says. “If there is something worth following, we give the employee a small budget to either prototype the idea or conduct some market research on it, then they come back with an initial ‘quick and dirty’ business case. If it makes sense to follow, that’s when we will go and look into the pot. It’s made a big difference to the quality of ideas because the focus is not just on technology, it’s on solving customers’ problems.”

The engineers are encouraged to develop their ideas iteratively. “It’s about lean innovation, so they do a lot of prototyping, trying things out, learning from the results, and then re-prototyping,” says Muirhead.

At the end of the year there is a prize for the best beer mat idea. “The Brain of the Year trophy is a plastic brain that floats inside a glass container with an LED light underneath it,” says Muirhead. “Whoever wins it has that thing on their desk for the next 12 months. It’s pretty disgusting, but it’s got legendary status here now.”

The department’s methods have been influenced by visiting other companies. Muirhead is also now doing a part-time MBA in Innovation. “Now I’m learning the theory after basically doing this stuff for 15 years,” he says. “It’s really interesting looking back at what we’ve done and what other techniques we could apply.”

With so much practical experience of installations and the certification process, Muirhead is well-placed to understand both the challenges facing his team and the technology they are

## Tackling a new market

The company recently entered the seating market, with its chair family. “The biggest challenge is getting through the TSO process,” says Muirhead. “We have the approval to be a TSO holder, and the next step is to get through all the testing. We’re getting pretty close. Technically it’s quite a challenge, particularly because our design is revolutionary. You come across some challenges you weren’t expecting because the devil is always in the detail.”

Lufthansa Technik is working with supplier Dräxlmaier on chair. “We do a lot in-house, but we do sometimes cooperate with other companies to develop new products and for manufacturing,” says Muirhead. “It’s often by looking over the fence to see how problems are solved elsewhere that you find out how to solve them in the aerospace sector. It makes a lot of sense to work with them to optimize this for the industry that we’re in.”

He concedes that as a new player, Lufthansa Technik has something to prove. “The challenge is making the market aware that



this is a product that we stand behind and that we’ll support,” he says. “It will take some time for market awareness to pick up, but that’s like with any new product.”

Muirhead recalls that when Lufthansa Technik first introduced its IFE system, some business jet manufacturers discounted the company as simply an airline, or an MRO. “It took a number of years before the market really accepted us,” he says. “But now, we’ve got a very strong position in that space.”

## THE CHALLENGE IS THAT WE WANT TO MAINTAIN OUR CULTURE

- 7. The chair seat
- 8. Product ideas are developed through extensive prototyping
- 9. A dishwasher for VIP jets is in development

working on. “I’m not sitting here being Mr Theory,” he says. “I’ve actually done a lot of the stuff and I understand enough of the technology that I can really get into a product discussion.”

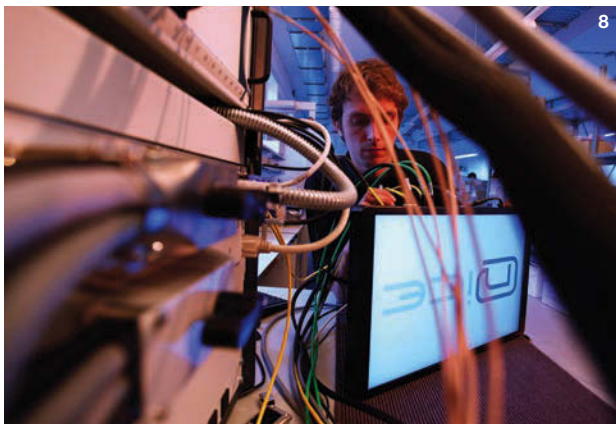
**Managing growth** Muirhead intends to employ 20-30 more people in 2015, and will closely manage how they are integrated. He says managing growth is the most challenging aspect of his job. “We want to grow this business a lot bigger, and we’ve got a good plan to do it,” he says. “The challenge is that we want to maintain our culture. There is a lot of familiarity among our people and if you grow too quickly, you run the risk of losing that.”

Prized traits in new recruits include an area of expertise currently lacking in



the team, entrepreneurial drive, a sense of humor, commitment, the ability to work in a team, and honesty. “With innovation, stuff goes wrong, and the only way to be successful is to bring it out into the open,” says Muirhead.

The company also sees a lot of interns. “I always like to have interns here,” says Muirhead. “They’re green behind the ears, but they bring a lot of fresh ideas.” And that, after all, is the aim of the game. **END**





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Canada's Flying Colours Corp now has a local base from which to serve the booming Asian market – and another interesting arrangement with China's Sparkle Roll Technik





**B**ombardier announced its selection of Flying Colours Corp to support its service center at Seletar Airport in Singapore during the Singapore Airshow in February 2014. Flying Colours Corp began work on the facility's second floor soon after, preparing it to support cabin interior removal and installation work, as well as a wide range of manufacturing and finishing capabilities.

"Flying Colours Corp had been searching for a base or partner in Asia after seeing the potential in that market through its completion deliveries into the region over the previous five years," says Eric Gillespie, executive vice

president of sales and marketing at Flying Colours Corp. "We've had a long relationship with Bombardier and they valued our experience in Asia, so in looking for an interior partner for their new Singapore facility, this combination formed the basis for starting conversations."

"Flying Colours Corp provides the Bombardier Singapore service center with an advantage over our competitors in the Asia-Pacific region, since we're the first facility to provide a comprehensive range of service offerings to our customers in one place," says a Bombardier spokesperson.

The Singapore service center is Flying Colours Corp's third base. As well as its main headquarters in

Peterborough, Ontario, Canada, the company runs a former JetCorp Technical Services facility in St Louis, Missouri, USA, which was acquired in 2009. The Peterborough facility is a Bombardier preferred completion center, an important factor in the airframer's choice of partner.

In Singapore, Flying Colours Corp is offering preliminary inspections, interior removal and installation, repair work, modifications and refurbishment – while Bombardier offers line and heavy maintenance. The upholstery, reinstallation, wood veneer and finishing workshops are now complete and the service center is open for business – indeed Flying Colours Corp has already welcomed its first project.

1. Bombardier's service center at Seletar Airport in Singapore

## COMPANY TIMELINE

### May 1989

Flying Colours Corp established in Peterborough, initially offering aircraft painting and maintenance on small aircraft

### June 2006

The company begins offering completion, engineering and design services for a CRJ conversion program, the CRJ ExecLiner

### March 2009

JetCorp Technical Services of St Louis acquired

### December 2009

First green Challenger 850 delivered

### March 2011

First Challenger 850 delivered to China

### October 2012

Both locations appointed Bombardier authorized service facilities for Learjet and Challenger jets

### October 2013

US\$3.5m expansion at Peterborough begins

### February 2014

Partnership signed with Bombardier for Singapore service center

### October 2014

Joint venture signed with Sparkle Roll Technik

### February 2015

First Sikorsky 92 helicopter refurbished



2-3. Flying Colours Corp's facilities in Peterborough, which are undergoing a US\$3.5m program of expansion

Careful work to gain a full understanding of the local market and business processes has been necessary. "We've been working closely together in our early setup phase and the Bombardier Singapore team has been instrumental in providing us with support as we establish our facility," says Gillespie. "They've pointed us in the right direction in certain instances and that's allowed us to navigate the local networks more efficiently. Overall, our teams have meshed very well and we couldn't be more pleased with the experience thus far."

Bombardier says it has worked closely with Flying Colours Corp "to ensure all business logistics are taken into account". The airframer's spokesperson also explains that the companies have cooperated to ensure regulatory compliance. "Together we've worked to ensure that we have the same certifications from the same authorities." As well as the FAA and EASA, these certification authorities include those for Australia, Bermuda, the Cayman Islands, Hong Kong, Malaysia, the Philippines, Singapore and Taiwan.

Finding the right people to staff the operation has been an extremely important task. After all, the success of a business jet interior fitting business is hugely dependent on being able to

employ and maintain a workforce of talented craftspeople and managers. In Peterborough, Flying Colours Corp works closely with local educational establishments to nurture potential future employees. Similarly, it sees recruiting local people as key to its success in Singapore. For the time being however, a core team of North American personnel has been drafted in, including general manager Paul Dunford. Moving to Singapore after 25 years at Bombardier's global completion center in Montreal, Canada, he brings an understanding of the industry that proved challenging to find.

**Talented individuals** The initial Singapore team therefore comprises a combination of people hired locally and selected technicians transplanted from the North American facilities.

"Our long-term vision is to have a completely local workforce at the Singapore facility," explains Gillespie. "Right now, the skills required to deliver the quality that is expected for Bombardier aircraft are rare, hence our intention to have our own team share their skill-sets with a newly recruited local team."

## The ExecLiner program

Flying Colours Corps' ExecLiner program is based on the Bombardier CRJ200 regional airliner. It offers a multirole, zoned interior, providing mixed accommodation for corporate and VIP passengers for example, or even a mix of seating and medevac. An aft VIP lavatory can be added and typically the aircraft seats 15-18 passengers.

The program also includes an avionics upgrade, and the integration of Flying Colours Corp's auxiliary fuel system, which increases range.





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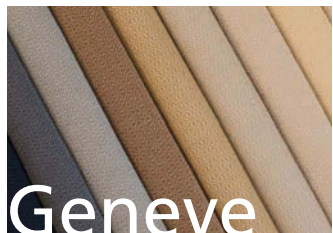
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## DESIGN IN BRIEF

**This is the first Sikorsky S-92 helicopter refurbished by Flying Colours Corp. The work, performed in Peterborough, took about four months. The helicopter was delivered at the end of January 2015.**

**LAYOUT:** The helicopter seats nine passengers. Flying Colours Corp installed forward four-place club and aft five-place club seating, as well as a forward lavatory.

**BLUE AND WHITE:** The interior was designed in-house and is characterized by its bold use of color and various leathers. A key challenge was to make blue crocodile and stingray leathers work next to each other. “We even had to order additional leather so the patterns aligned precisely on each seat and sidewall,” says Eric Gillespie. Blue crocodile leather is used for inserts on the seats, and on the lower sidewalls. The blue stingray leather provides accents on the white leather sidewalls. Flying Colours Corp also installed new cabinetry finished in a new wood veneer with a custom blue high-gloss finish.

**STONE FLOOR:** Granite floors from F/List (formerly List components & furniture) were laid in the entrance area and lavatory. A blue carpet with a white silk pattern is used in the main cabin.



Currently, this involves Singaporean recruits being trained in Peterborough. “On selection, local candidates travel to the Canadian facility for a three-month training session in each technical area,” says Gillespie. “Through on-the-job training and specific aircraft project-led work, it is expected they will become proficient in all elements of the interior skills portfolio we provide.”

**Local support** The Singapore service center’s market focus is on Bombardier aircraft from across the Asia-Pacific region, including those based in China, India, Malaysia, Indonesia and Australia. Bombardier’s spokesperson says the company recognizes how critical it is for business aircraft customers to have support available

4-6. Flying Colours Corp is converting several CRJ200s for Sparkle Roll – the first three will have mixed corporate and VIP interiors

in their own region and thus “continuously explores options to enhance its worldwide maintenance network and provide high-quality services to its customers”.

The agreement with Bombardier also allows Flying Colours Corp to use the facility to support its own past and current completion customers in the region. “This is a very important geographical area for our company,” notes Gillespie. “We’ve already made great strides in Asia through our past

deliveries and this gives us a footprint to continue serving those clients when they want their aircraft refurbished. There are limited facilities in the region capable of refurbishing Challenger, Global or Learjet aircraft to the required standard, so this is a great opportunity to build on our existing relationships and cultivate new ones.”

Gillespie says both the new center and Flying Colours Corp’s close cooperation with Bombardier in a critical region are vital for its future. “It’s extremely important because as the region’s business aircraft market matures, customers are looking to have their interior work completed closer to home,” he



7-8. Flying Colours Corp's facility in St Louis, which it acquired in 2009



says. "Flying aircraft back to North America or Europe for such work is costly and time-consuming. The market has been seeking a local base where this work can be completed at the highest level."

Looking further afield, Gillespie agrees that there is potential for similar operations in other regions, but "each region presents its own challenges and will have to be looked at individually".

**Sparkling conversation** Eight months after the Singapore announcement, in October 2014, Flying Colours Corp unveiled another very interesting partnership in the region – a joint venture with Sparkle Roll Technik (SRT), a business aircraft MRO based in Linyi City, Shangdong province, China. SRT is parented by Sparkle Roll Aviation, and has a sister operation offering charter services. Flying Colours Corp has already begun an extensive program of Bombardier

### Sparkle Roll's CRJs

There have been several iterations of cabin and livery designs as Sparkle Roll learns more about the possibilities Flying Colours Corp offers for CRJ200 conversions.

"The first three aircraft for Sparkle Roll will be finished with mixed-class corporate shuttle and VIP interiors," says Eric Gillespie of Flying Colours Corp. "Then the remaining five CRJs will be a combination of full VIP – similar to our Challenger 850s – and shuttle configurations."

The first three CRJs will be finished in a custom mauve and white paint scheme. Their interiors will feature ebony leather seat upholstery, black trim and rose gold plating.

"The details are evolving as we finalize our partnership, but I can say that we will be doing all of the interior work on their CRJ conversions, starting with the first eight that they've purchased, at our Canadian base," says Gillespie. "The first three are at our facility now, undergoing interior conversion and heavy maintenance inspections. The remaining five are scheduled to arrive in the second quarter of 2015."

**On a roll** Gillespie hopes to continue working with SRT for many years. "It's certainly part of the future," he says. "It gives us a partnership with an established luxury brand and a knowledgeable team in China that caters to the aircraft owner. It continues to develop our inroads to that network within China, which is important for our continued growth."

Even as the finer details of the cooperation with SRT are defined, there are already plans to train local Sparkle Roll technicians. Gillespie is also confident that the close working relationship being established will help the companies collectively "navigate any roadblocks that might arise" as they move forward.

Gillespie also doesn't rule out the possibility of further opportunities for Flying Colours Corp in China. "I do see additional opportunities for our services in China and I think there is potential for new operations in other regions," he says. "Developing these relationships/partnerships takes time and trust on both sides though, so it's difficult to isolate where and when, but I'm optimistic more opportunities will arise." **END**

CRJ200 modification and maintenance work as part of the venture.

The agreement came after a series of discussions between the companies following ABACE 2014. "Sparkle Roll Aviation executives were familiar with Flying Colours Corp's ExecLiner conversions and green Challenger 850 completions, and knew we had experience with the Civil Aviation Administration of China," says Gillespie. "Our understanding of all the certification paperwork, registration processes, STCs and modification knowledge complemented their ambitions to further develop this sector of their aviation business."

Flying Colours Corp's ExecLiner experience placed it particularly well for the SRT work, since the initial agreement covers CRJ200 conversions.

## DEVELOPING THESE RELATIONSHIPS/ PARTNERSHIPS TAKES TIME AND TRUST ON BOTH SIDES



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# dualjewel

The ACJ330 Summit's half-airline, half-VIP cabin is targeted at governments and individuals traveling with a large entourage

The latest cabin concept from Airbus Corporate Jets, the ACJ330 Summit, has a split personality. One half of the wide-body's cabin offers a VIP experience; the other is given over to airline-style business and economy seating. The concept is not necessarily aimed at those on a lower budget (although Airbus Corporate Jets is keen to stress its cost-effectiveness), but at VIPs who want to travel with lots of people.

"This makes sense if you're opting for a wide-body and looking to carry more people, but the extra passengers will not necessarily all be VIPs – they

may be support staff, journalists and other invited guests," says David Velupillai, marketing director at Airbus Corporate Jets.

The ACJ330 is one of Airbus Corporate Jets' top sellers, and is particularly popular with government customers. Velupillai says these customers often use their aircraft to transport a select few – such as heads of state and top ministers – in VIP outfitted cabins, and the rest of the passengers in economy or business





1. The ACJ330 Summit's conference and dining room

2. The VIP bedroom offers heads of state a place to recharge

## IF THE CUSTOMER WANTS TO MODIFY THE LAYOUT IN SOME WAY THAT'S ABSOLUTELY POSSIBLE

accommodation. He adds that private billionaire customers also sometimes want this kind of configuration when they have a large entourage.

**Starting point** The ACJ330 Summit concept places the VIP section at the front of the aircraft. This section features a bedroom with an en-suite bathroom, a private office and a conference/dining room. The middle section of the aircraft houses 21 business seats, and there are 28 economy seats at the rear.

Velupillai is keen to stress that this configuration is not set in stone. "It's a starting point," he says. "If the customer wants to modify the layout in some way that's absolutely possible."

"We can be flexible," agrees Sylvain Mariat, head of Airbus Corporate Jet Centre's (ACJC) creative design studio, which worked with Airbus Corporate Jets on the design. "The door is open for modification and discussion."

The rear half of the aircraft, with its airline-style seating, can be installed on Airbus's assembly line. Velupillai says this will cut cost and time.

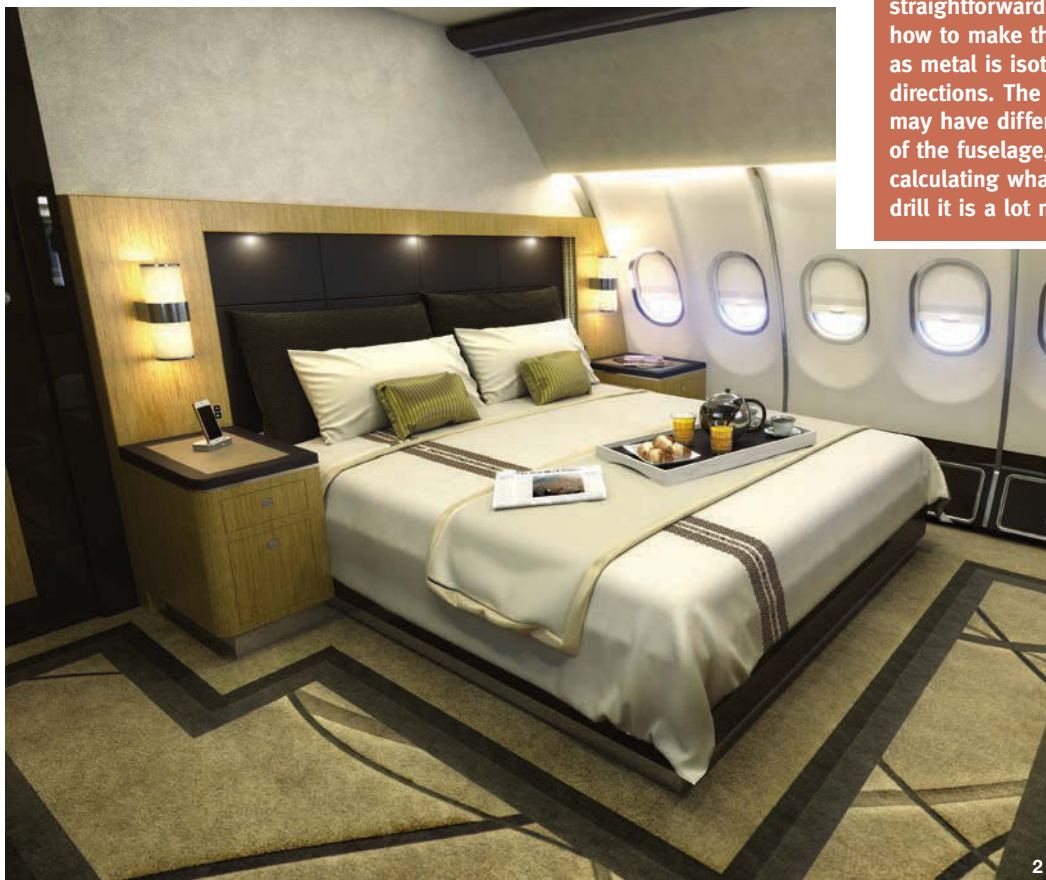
**Who will complete it?** Airbus Corporate Jets has audited and approved seven cabin outfitters for its corporate jets – ACJC of Toulouse, France; Associated Air Center of Dallas, Texas; Comlux America of Indianapolis, Indiana; Lufthansa Technik of Hamburg, Germany; TAECO of Xiamen, China;

### Why the ACJ330?

The ACJ330 is an important product for Airbus Corporate Jets. Together the ACJ330 and its forebear, the ACJ340, account for almost 40 of the 60 VIP and government wide-body aircraft Airbus Corporate Jets has sold. This is also nearly a quarter of the 170 ACJs sold since the mid-1980s, when they became available. There are currently no plans to create a Summit-style cabin for the ACJ340.

So how does Airbus Corporate Jets account for the ACJ330's appeal? "In many ways the ultimate luxury is space, whether you're talking about your home, a hotel room or an aircraft," says David Velupillai, marketing director at Airbus Corporate Jets. "You get that space with a wide-body aircraft that can now fly non-stop to the world. When the A330 was introduced in the early 1990s, it could do transatlantic flights, but it wasn't an Asia-to-Europe aircraft. But as the aircraft evolved in maximum take-off weights from 212 to 242 metric tons and with various airframe improvements along the way, it is now an Asia-to-Europe aircraft. There might be small advantages with the BBJ 787, but the ACJ330 can pretty much do everything a BBJ 787 can do, with the advantage of being available now, for a more cost-effective price and using a technology cabin outfitters are more comfortable with."

Here Velupillai is referring to the A330's traditional metal fuselage. "We're hearing of outfitters working on BBJ 787s, whose carbon fiber fuselages are a bit of a challenge. If you're drilling into a metal fuselage to fix some kind of monument then it's a fairly straightforward thing to do. The cabin outfitters know how to make the calculation for that and get the STC, as metal is isotropic – it's got the same strength in all directions. The trouble with carbon fiber is that you may have different numbers of layers in different parts of the fuselage, oriented in different directions, so calculating what is an acceptable hole and where to drill it is a lot more complicated."



and Jet Aviation and AMAC Aerospace, both of Basel, Switzerland.

Some of these cabin outfitters have wide-body cabin completion experience. For ACJ330 Summit cabin outfitting, Airbus says that all options are still on the table.

"Airbus is the only wide-body aircraft manufacturer that does turnkey cabin outfitting and most governments like a turnkey project," comments Velupillai. "The key thing is that we can help our customers to manage the cabin outfitting."

Velupillai says the ACJ330 could be available with the Summit cabin for less than US\$200m and that completion would take between 24 and 30 months. This new model could therefore be flying by 2017.



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**Back to front** Of course, installing the airline-style cabin at the aft and the VIP one at the front makes obvious sense given the airline-style cabin will be installed first, on the production line. But Airbus Corporate Jets has also found that VIPs on government aircraft like to be at the front of the aircraft. “The head of state or minister in a government aircraft typically wants to be at the front of the aircraft, so they can be the first one off and when

they’re the last ones on they don’t have to walk the length of the cabin in front of everybody before getting to their private area,” says Velupillai. Door two is directly opposite the private office, granting such access.

The concept was designed over five months in 2014. Mariat says the project drew on many years of customer experiences and expectations of the ACJ320 family and wide-body government aircraft in general. Careful

## THE HEAD OF STATE OR MINISTER IN A GOVERNMENT AIRCRAFT TYPICALLY WANTS TO BE AT THE FRONT



### ACJ330 Summit

**Cabin width:** 17ft 4in

**Cabin height:** 7ft 11in

**Cabin length:** 149ft 2in

**Seats:** 2 pilots + 80 passengers

**Range:** 9,000 nautical miles with 80 passengers, NBAA reserves, IFR profile

**High-speed cruise:** Mach 0.86

**Max altitude:** 41,000ft

**Price:** US\$200m

10

A330s are made each month (airline and VIP combined total)

~40

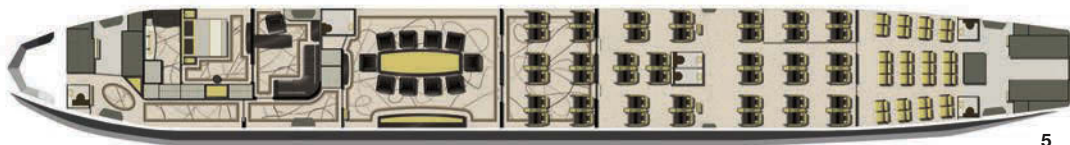
ACJ330s and ACJ340s have been sold

170+

ACJs have been sold in total

2,321ft²

ACJ330 cabin floor area



attention was paid to all areas, not just the VIP zone. “We found solutions to optimize weight at the back,” says Mariat. “With the VIP areas at the front, the design was the result of the many discussions we’ve had with customers. We could have proposed a concept that was very futuristic, but with this aircraft the priorities were ergonomics and functionality.”

**Design flexibility** Research commissioned by Airbus in 2013 found that billionaires want flexibility, privacy, familiarity and tailored experiences. One example of a feature that can be tailored to customers’ tastes on this aircraft is a backlit panel in the private office. “This wood inlay is one of the best new examples of our craft we have achieved,” says Mariat. “We

3. The economy section at the aircraft’s aft
4. The business section
5. The base layout, which can be adapted if required

# LEADERS NEED PROPER REST ALONG THE WAY AND THEY NEED TO BE ABLE TO HAVE MEETINGS



6. The VIP bathroom  
7. The private office features a customizable backlit panel

removed some of the material so that when you switch on the light, you reveal decorative artwork on the wood. And when you switch the light off, you still have the wood itself. It's a detail that creates an atmosphere of peace and elegance. We did something similar on a single-aisle aircraft once, but here the customer can choose the design they want, so in the end the result will be unique. It's this kind of flexibility we are talking about."

Colors and materials can be selected by customers. Aspects that differentiate the VIP section from the airline section include metallic edging on the window surrounds and vertical partitions, plus faux suede on the sidewalls.

Velupillai notes that governments vary greatly in terms of the level of luxury they want on board. "The basic

need to transport people is pretty much the same in most parts of the world," he says. "However, you have some governments that want to do that as functionally as possible and don't worry about how luxurious the furnishings are, so gold-plated taps won't feature."

**Value for taxpayers' money** There is often the factor of how a government is seen to be spending taxpayers' money. "That's always a concern," says Velupillai. "The reality is that the taxpayers probably want it both ways. They want their government to spend the minimum amount of money, but at the same time, expect their head of state to acquit themselves well when they visit another country – and not fall asleep in the soup. If a leader is

## The wide-body market

Airbus has delivered more than 1,500 A330 and A340 aircraft (airline and VIP versions) since the early 1990s. "The largest wide-body market is the Middle East," says Velupillai, "but we are pretty well distributed across the rest of the world as well. We've now overtaken all of the Boeing family of wide-bodies with the A330/A340 program and we're also currently making them at the highest rate of any wide-body program. We make 10 330s a month, so that gives you some idea of their popularity."

negotiating some kind of treaty or summit agreement, citizens want them to do their best for the country. Some citizens would no doubt like their leaders to fly economy but stay up 24 hours on end. But to be at their best, leaders need proper rest along the way and they need to be able to have meetings during the journey with advisers and journalists." **END**





# Innovation Driven by Experience Excellence Driven by Commitment

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# designforum

Ahead of EBACE 2015, VIP aircraft interior designers based in Europe discuss trends and issues affecting their trade today

**WARJA BORGES:** State-of-the-art IFE systems, live TV and equipment to enable passengers to work on board and stay connected to the world are necessary for most customers.

Generally, in terms of design, I have noticed requests for more modern-classic interiors. It is less about opulence and more about timeless elegance and sophisticated details. However, every region has its preferred style. My customers come from all over the world, but the number of inquiries I'm getting from Asia is increasing.

**YVES PICKARDT:** The market is rapidly moving from the USA and the Middle East to Russia, India and China. The further east you go, the more you see a demand for more modern interiors. But we do not really follow trends. Today's trends seem to turn aircraft cabins into luxury cars, sometimes ultra-modern, lacking personality and originality, and absent of coziness. Some interiors look like sci-fi movie sets.



**JOOST WULFFRAAT:** I've seen a trend for lighter shades with less contrast between materials. Jet owners are also opting for simple shapes. They seem to want a rest from all the stimuli of their daily lives on the ground, so they opt for more simplicity in their airborne worlds. They also expect their favorite technologies to follow them into the sky, and their expectations always seem to be just a bit ahead of what the market can deliver at that time.

Another trend is for privacy in the cabin. It used to be common to have divans either facing each other or directed toward a large screen where everyone would watch the same movie. Not anymore. When someone is using an iPad they prefer that no one else can see the screen.

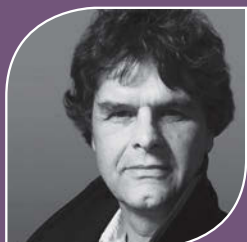
**VINCENT REY:** There is more demand for large jets from Bombardier, Dassault Falcon and Gulfstream, as well as the single-aisle ACJ and BBJ types. Refurbishment projects account for about 60% of our activity at the moment. But whether the aircraft is brand new or not, the customer always wants something unique and extraordinary, matching their desires fully. Our customers are from all over the world, therefore interior styling need to be adapted to each customer's wishes.

**JEAN-PIERRE ALFANO:** Technology that is currently of interest to clients includes wi-fi, GSM cell phone service, satellite TV communications, CMS, HD exterior-mounted cameras, active noise-canceling systems, VIP seats with functions including audio response massage, electronically dimmable windows and 4K OLED monitors. Concerning colors, we have noticed a shift away from beiges and grays toward more contemporary color harmonies based on taupe, silver/gray and pastel blue. Wood and stone flooring are also generating client interest.





**WARJA BORGES**  
Unique Aircraft,  
Munich, Germany



**JOOST WULFFRAAT**  
SchöninghWulffraat,  
Amsterdam, the Netherlands



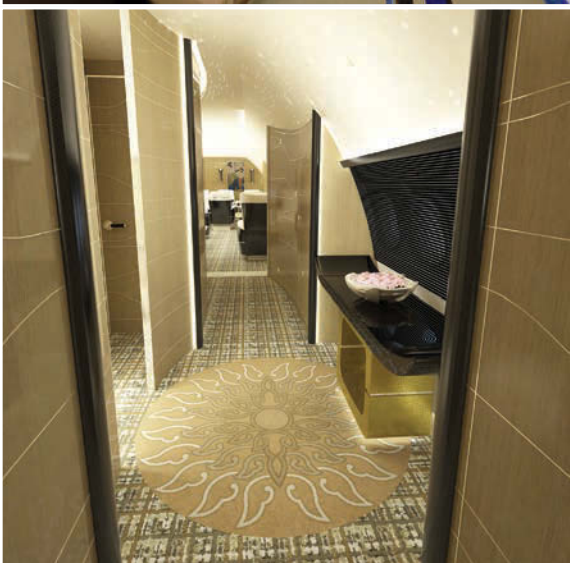
**YVES PICKARDT**  
Pinto Design Agency,  
Paris, France



**JEAN-PIERRE ALFANO**  
AirJet Designs,  
Toulouse, France



**VINCENT REY**  
M&R associates design,  
Geneva, Switzerland



**JOOST WULFFRAAT:** Clients now expect a virtual walk-through. Of course we want our clients to be as involved as possible in the process and to be aware of what the interior will look like before it is built. However, technology has made these early stages very demanding in terms of specificity. Even at this initial stage, the design has to be fully rendered, which takes a long time. Overall, however, the technology vastly improves the efficiency of the build-out process. The time to market is shortening. By using shared technologies and software, designers are part of the engineering process as well.

3D printing is another technological breakthrough and offers us more creative options, because we don't have to rely on tooling to try out shapes and forms.

**JEAN-PIERRE ALFANO:** Clients have a tendency to want technological features seen in the architectural and hospitality industries. So we have to discuss the ideas and determine if the technologies are mature enough, or whether the cost of development and certification is prohibitive considering the budget.

**WARJA BORGES:** Advanced technologies like LED lighting, flatscreens and touch panels are enabling different ways of using the space. New presentation tools, such as a 360° virtual cabin app, are giving the opportunity to show the entire cabin design to the customer at a very early stage. Technology always enables us to progress, but traditional tools are still useful, and in the end, you need to study what is the best solution for each project.

**YVES PICKARDT:** Apart from our recent use of carbon fiber, there is nothing really new in our wide selection of materials. We always remain open to new ideas, stimulated by any number of possibilities – a nice leather bag, a new hotel, an epiphany in the middle of the night. Technology is certainly not a barrier to our freedom of creation – quite the contrary. Though we try to hide or soften anything technological that is in close contact with the passengers, it enriches the cabin.

HOW IS TECHNOLOGY  
AFFECTING YOUR  
WORK? IS IT ALWAYS  
A GOOD THING?

**VINCENT REY:** Weight, sound levels, IFE and internet connectivity are major considerations in the industry, and new technologies in these areas can boost the passengers' enjoyment of the cabin. We look at every new technology to see how we can integrate it into our cabin designs. At M&R associates design, every project is an opportunity to develop a new design and research and/or develop new materials. Based on our experience and access to high-end material vendors throughout the world, we have the right capabilities to fulfill our mission.



## BIOGRAPHY

Warja Borges, Unique Aircraft

Born and raised in Munich, Germany, Borges loves to travel to learn about foreign cultures and history. She is inspired by designs and color combinations from all over the world.

After four years of studying interior architecture and some years of practice creating interiors for residences and offices, Borges got the chance to work with Reiner Heim Aircraft Interior Design, based in Munich. She was a part of that team for 10 years, designing bespoke interiors for various customers and aircraft types.

Five years ago, Borges decided to start her own business as an independent designer, and has since worked with clients and aviation facilities worldwide. The company name arose from a customer representative's comment to Borges that "You were the one who made our aircraft unique."





# Turn your ideas



# into virtual reality.

ACA visualisation of Pierrejean Design Studio's Trendy BBJ 787 concept

## **ACA** Virtual Cabin

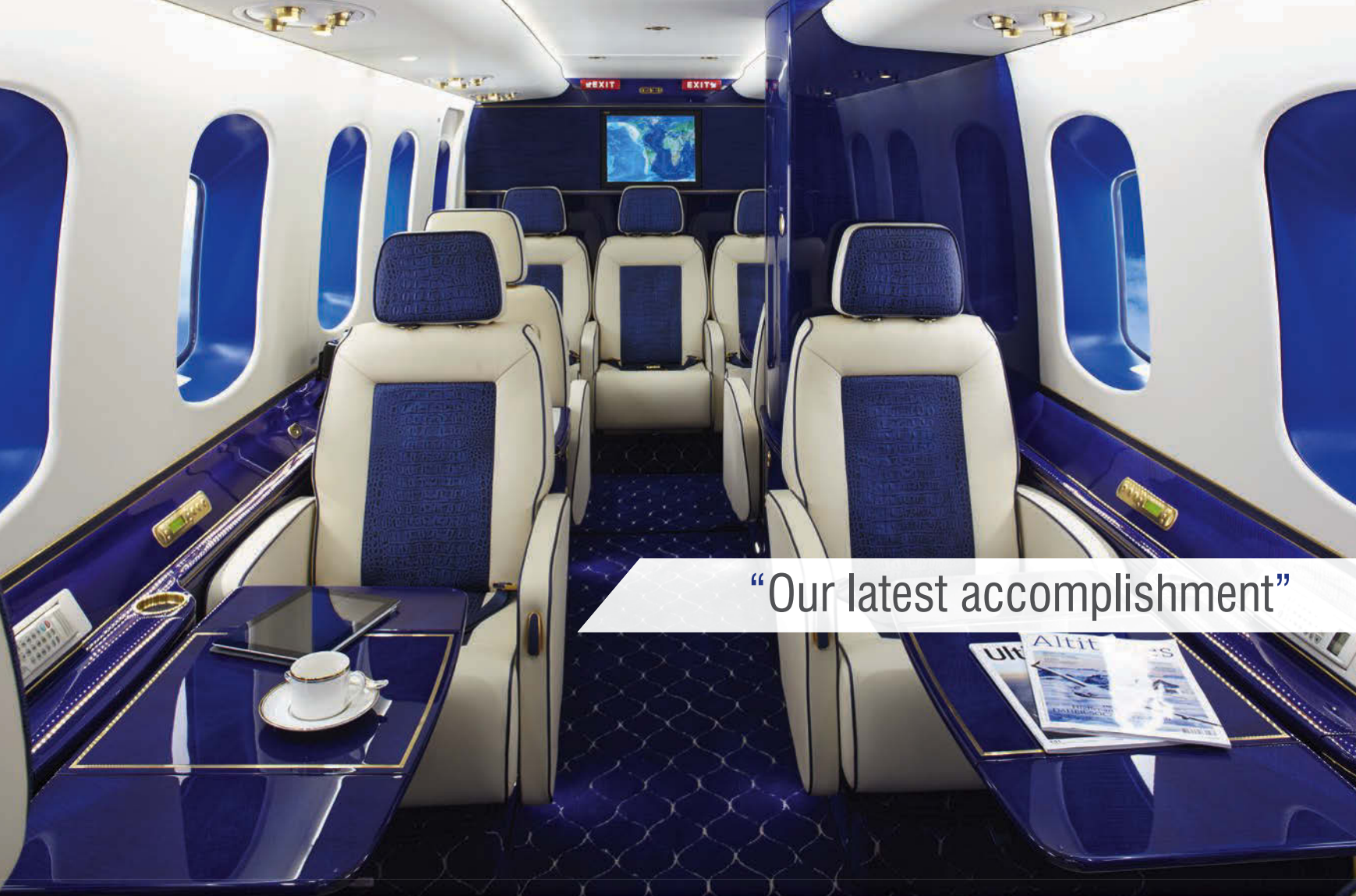
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## BIOGRAPHY

Joost Wulffraat, SchöninghWulffraat

Joost Wulffraat studied industrial design at the Gerrit Rietveld Academie in Amsterdam. After graduating, he went to Milan, Italy, and worked in several studios that designed car interiors for Alfa Romeo and the Fiat/Lancia group.

He went on to design jet interiors and flight decks for Fokker Aircraft, in its Design and Styling Center at Amsterdam Schiphol Airport in the Netherlands. While at Fokker, he met Marcel Schöningh, a design engineer specializing in 3D computer visualization. In 1996 the two founded SchöninghWulffraat, an interior design studio specializing in private jets and luxury yachts, in Amsterdam.

From the earliest design stages, SchöninghWulffraat offers its clients a 3D design approach and complete access to the entire design process. Its designers pride themselves on building jet interiors to perfectly match the client's style. They also incorporate authentic cultural symbolism when appropriate.



**JEAN-PIERRE ALFANO:** I'm really inspired by the SkyView panoramic window that Fokker has developed for the BBJ. We are looking forward to incorporating it as an important design element. It has a big wow factor.

I am also inspired by feng shui, and like to integrate natural elements in design. The five feng shui elements are earth, metal, water, wood and fire. Recently I have been thinking about water; one cool feature I would like to implement is a water wall.

Another great challenge would be to design an airworthy grand piano. One of my clients asked if it would be possible.

**YVES PICKARDT:** We always try to create cabins that are different from those we have designed before, and indeed from anything that has been seen before anywhere. Then, of course, we listen carefully to the customer's wishes. We always seek the best quality, with absolutely no compromise – quality of materials, quality of work, quality in terms of comfort and quality that flies. We create aircraft with soul, with interiors that reflect the owners' personalities and make them feel at home.

**WARJA BORGES:** My passion is for materials, colors and how surfaces feel. My inspiration comes from everywhere, particularly nature, architecture, art and photos. My aim is to stimulate the senses and support well-being on board. I always study the culture of the region my customers come from and reflect it by implementing certain styles or details in the cabin.

WHAT DESIGNS,  
MATERIALS AND  
IDEAS HAVE INSPIRED  
YOU RECENTLY?

**JOOST WULFFRAAT:** Three new technologies have offered inspiration recently – light-transmissive carpeting by Desso and Philips Lighting; 3D architectural display glass by Corning, which converts a glass wall into a touch display; and the SkyView panoramic window by Fokker Services. We have already used the latter two of these innovations in our designs, and we are awaiting certification to be able to implement the Philips/Desso carpet.

All these products highlight a shift in design emphasis for jet interiors. A decade ago, cabin designers were more like interior decorators. A cabin was seen as a space to be filled with loose elements. That mentality was followed by a focus on a more integrated design by industrial designers. With their approach, the feel of materials was sidelined, but this is now coming back into prominence.

**VINCENT REY:** We are inspired generally by architecture, design, cars, watches and fashion. These inspirations inform the creation of general harmony and elegance, material selections, seat and divan design, carpet details, decorative inlays and other aspects.

**JEAN-PIERRE ALFANO:** The main barriers to innovation in our industry are non-recurring costs – the investment you need to make to translate a simple idea into something that is airworthy. One of the reasons it costs so much to innovate is that the regulations are written mainly for commercial aircraft with many passengers. For the average VIP jet with far fewer passengers, the regulations are overkill. If I want to innovate, I have to interact with a certification engineer, who will box me in. The specific needs of private aircraft should be explored at a convention such as EBACE, to see if there could be some regulatory easing.

**VINCENT REY:** Conception and completion time are very often too short and the airworthiness regulations are getting stricter. These are major constraints that we have to cope with on every project. Extending the design conception and project preparation time would give more time for design, engineering, certification, mock-up production and other preparatory work, leading to a more efficient completion.

**WARJA BORGES:** New innovations have to pass through a lot of tests to meet all the certification requirements of the aircraft industry. It is a very time-consuming and expensive process. FAA and EASA regulation is becoming increasingly strict, which limits possibilities.

WHAT ARE THE MAIN  
BARRIERS TO INNOVATION?  
WHAT WOULD YOU CHANGE  
ABOUT THE INDUSTRY IF  
YOU COULD?

**JOOST WULFFRAAT:** The only barriers to innovation are self-imposed. As designers, we simply find a way to implement our design. But we do find ourselves fighting for our designs much more often than we should have to. Technology should be in service to the wishes of our clients. If we return to a design-driven process, then innovation becomes a goal. Innovation leads to better technology and a better design.

The cost of a jet interior is relative. If a client falls in love with a design, cost is less of an issue. A jet is a very personal statement. It's an emotional expression, which means that the feel for the design, and not the cost, should be primary.

**YVES PICKARDT:** One thing we would recommend is to eliminate the need to meet 16g certifications for items such as decorative lamps. These restrictions are useless and make lamps too expensive, because of the engineering involved.



## BIOGRAPHY

Yves Pickardt, Pinto Design Agency

The Pinto Design Agency is owned and operated by Linda Pinto (pictured below left), the sister of the agency's founder, Alberto Pinto. The company has been in business for more than 40 years. It specializes in all fields of luxury design – residences, palaces, hotels, corporate offices, yachts and jets. A staff of more than 90 experts contribute to these projects.

The aircraft interior design department was created 17 years ago and Yves Pickardt has led it since its inception. After years of design studies and experience with prestigious design studios in Italy and France, Pickardt was given the opportunity by Alberto Pinto to work on some of the first BBJs. It was a dream come true.

After the first BBJ, aircraft interior projects came to Pinto regularly from all around the world. "There seems to be a growing preference for ACJ319 and ACJ320 Neo aircraft, whereas 10 years ago BBJ led the market for this category," says Pickardt. "Among smaller jets, Bombardier Globals seem to retain their leadership."





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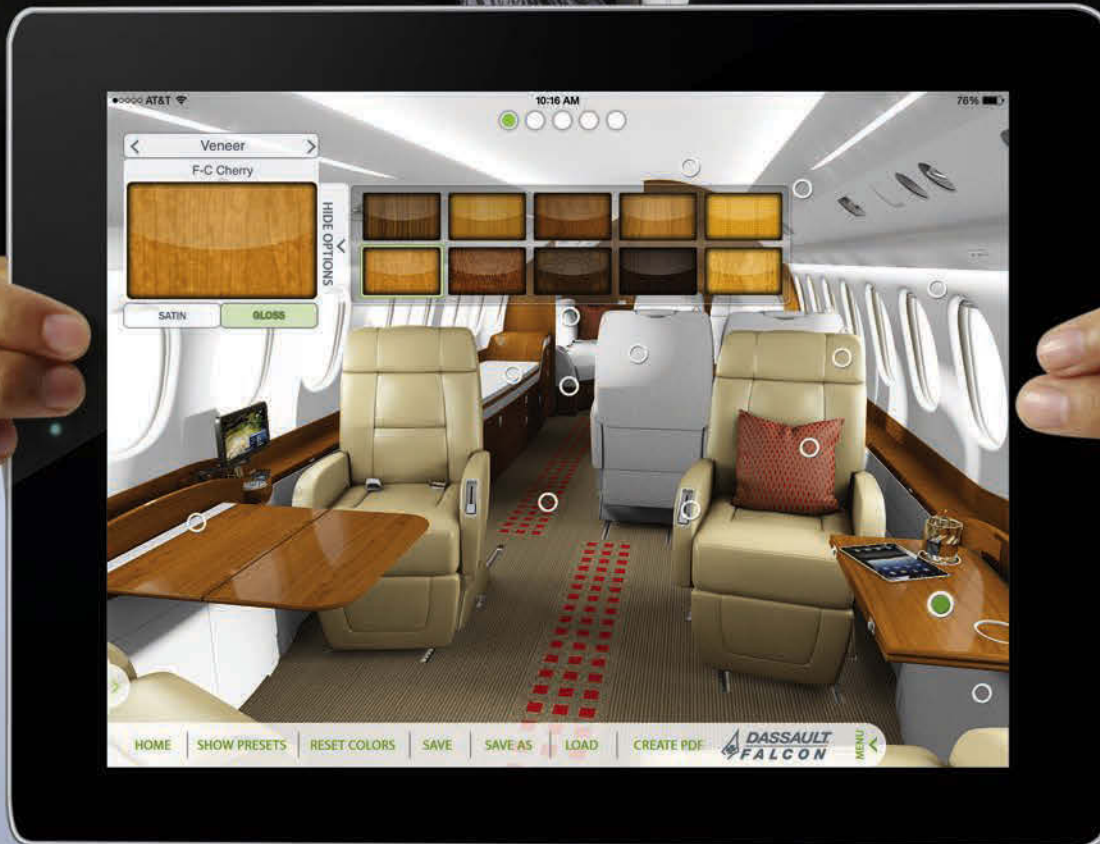
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## BIOGRAPHY

Jean-Pierre Alfano, AirJet Designs

Jean-Pierre Alfano is the founder and creative director of AirJet Designs. The company specializes in corporate, VIP and head-of-state aircraft interior design. The team includes industrial and interior designers, trim and color specialists and 3D artists. As part of the Aero Experts Group, the designers also benefit from the experience of aircraft interior certification engineers working alongside them.

Over the past 15 years, Alfano has worked on various completions – from small and mid-size jets to wide-body Boeing and Airbus aircraft.

Born in France to Italian parents, Alfano spent his childhood in France and Italy, with one foot in each culture. He completed various levels of his education in France, Italy and the USA. He holds a Masters degree in product design and engineering, and is a recognized EASA aircraft cabin certification expert.



**JEAN-PIERRE ALFANO:** People who are not familiar with aircraft constraints often ask: “If money is no limit, why can’t we have a pool in the aircraft, and why can’t I move the furniture around like in my house or yacht?” Part of my role is to explain how certification requirements impact the design. I also make my clients aware of maintenance issues. You need to use materials that are easy to clean and will not break easily, because repairs are particularly expensive in this field.

The challenge is to combine creativity, comfort and aesthetics within the limits of time, budget, airworthiness issues and weight concerns. You need to be creative; clients want something different and custom made. But you also need to consider the budget and timescale. For example, you will have to go with standard seat structures if you want a controlled delivery time.

**YVES PICKARDT:** Our unique remit is to help passengers enjoy their flight in comfort and joy, while knowing that the attention to creative design is unsurpassed and all technological and security measures have been adhered to.

The cost of a completion is unique as well. Aircraft design is priced higher per square meter than yachts and residences. We strive to make the most of every dollar spent, because nothing can be changed once the critical design review has been held. No mistakes are possible. It is a tightrope walk with no net.

**WARJA BORGES:** Designing interiors for VIP aircraft is more challenging than normal interior architecture because of the space limitations, the tube shape and all the regulations and requirements you have to meet. But these challenges are exactly why I love my work and what makes this business so special to me.

WHAT IS UNIQUE  
ABOUT VIP AIRCRAFT  
INTERIOR DESIGN AS  
OPPOSED TO OTHER  
SECTORS YOU HAVE  
WORKED IN?

**JOOST WULFFRAAT:** With a jet cabin, the design alone is not enough. We have to be very specific about materials, otherwise the design will not obtain the necessary airworthiness certification. Our combined 20 years of aviation experience has taught us which materials and features are airworthy. That helps us to stay on time and under budget. Without an in-depth knowledge of cabin safety rules and regulations, a designer simply cannot propose a realistic design.

Designing private jet interiors is a high-end industry. Not only because all the materials must be of the highest quality to obtain certification, but also because clients are demanding. We expect this of course, because a jet is a very personal and big investment.

**VINCENT REY:** VIP aircraft interior design involves a combination of technical aviation knowledge, working with space constraints, design creativity, innovative ideas, elegance, exclusivity, refined details to reflect the personality and lifestyle of the owner and/or users and a focus on the comfort and well-being of passengers.

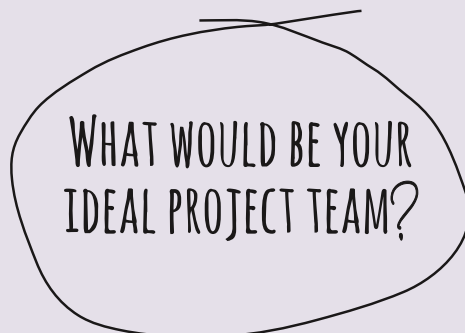
**JOOST WULFFRAAT:** The ideal team includes a stylist for color and trim, designers for integrated form solutions, and a cabin compliance verification engineer, so that there are no last-minute safety or certification issues.

The advantage of using 3D renderings from the very beginning is that it speeds up the process and fosters communication. With detailed renderings, the whole team of designers, engineers and the client can share their input and verify the design details at every stage of production.

In some cases we work with the client's representatives, and they let us know what the client expects. In the end, direct contact with the owner helps us to specify details in the most efficient way. There is no guesswork when the client makes the decisions directly.

Then it is essential that we work closely with the completion center to make the client's vision a physical reality.

**WARJA BORGES:** The ideal project team would be a combination of designers and a flexible engineering team that is willing to work on new solutions. The involvement of a customer representative is an advantage. They can be a direct contact who answers questions quickly, gives directions and makes decisions, which can speed up the project. I like to work very closely with the completion center to supervise and support the work, all the way to the delivery.



**JEAN-PIERRE ALFANO:** We have various types of expertise within the team, including creative design, industrial design, colors and materials, and 3D modeling. The larger group has cabin engineers and certification experts.

One advantage to working with a customer representative is that the client is often not readily available, but the rep is there if we need their input, ensuring the project moves along smoothly. We are happy to work with completion centers when our input is needed, and to ensure the client's wishes are respected.

**YVES PICKARDT:** The ideal team should include a leader with a multicultural background; a professional experienced in designing not only aircraft but also yachts, private residences and hotels; a material specialist; a designer and draftsman; and a 3D illustrator and designer. We also need the skills in house to manufacture light mock-ups in wood or synthetic materials with a 3D printer.

Working closely with the completion center is key to a successful result. It is sometimes appropriate for a customer to have a program manager.

**VINCENT REY:** During the initial design phase, we prefer to work very closely with the customer to capture the general concept exactly, and guide the owner toward their dream. Customer representatives are usually fully complementary, and often every party learns from each other. Design companies should follow their projects at the completion center until the end (including inspection with white gloves) to ensure that the dream becomes reality.

## BIOGRAPHY

Vincent Rey, M&R associates design

M&R associates design was founded by Rey and Florent Magnin (pictured bottom left), two designers with complementary expertise gained over the course of 20 years with major aircraft manufacturers and completion centers. For example, Rey's past employers include DeMaria Design, Jet Aviation Basel and Bombardier. Rey and Magnin were later joined by a third partner, André Nilles (pictured bottom right). He brought more than 25 years of experience with leading business jet and helicopter manufacturers, as well as references from customers based in Europe, the Middle East, Africa, North America and Asia.

Over the years M&R associates design has completed projects for almost every type of VIP aircraft, working on Gulfstream, Bombardier, Dassault, Embraer, Boeing, Airbus, Airbus Helicopter, Agusta and Sikorsky models.

"This makes M&R a unique aerospace design and project management company, specialized in aerospace with major customer references, which is also referenced by both Airbus and Boeing," says Rey.

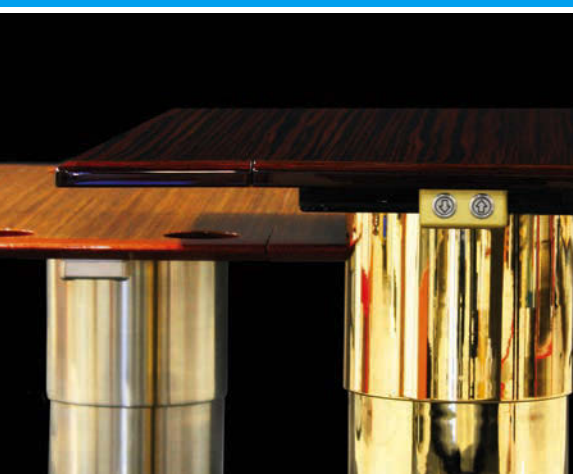






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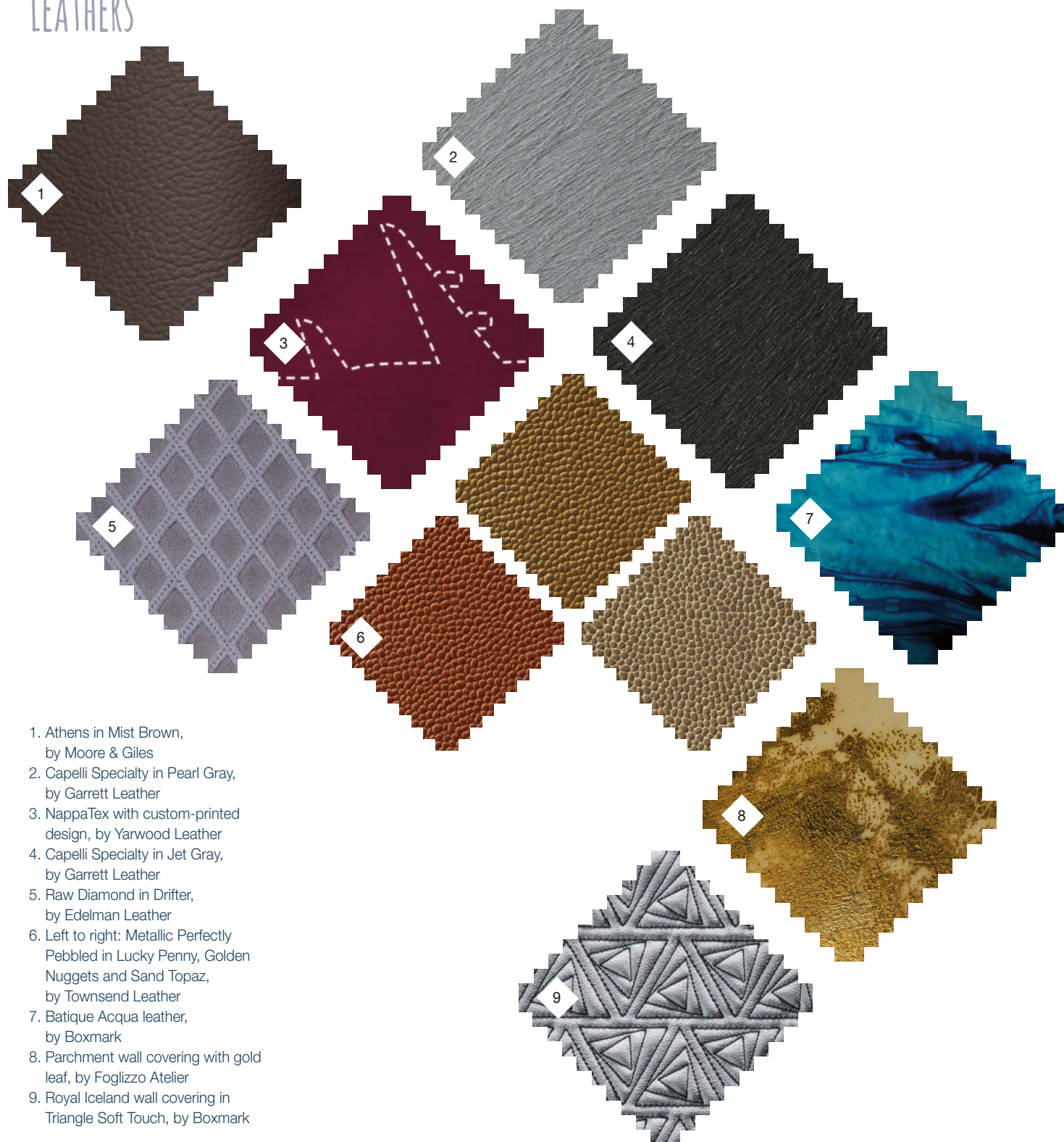
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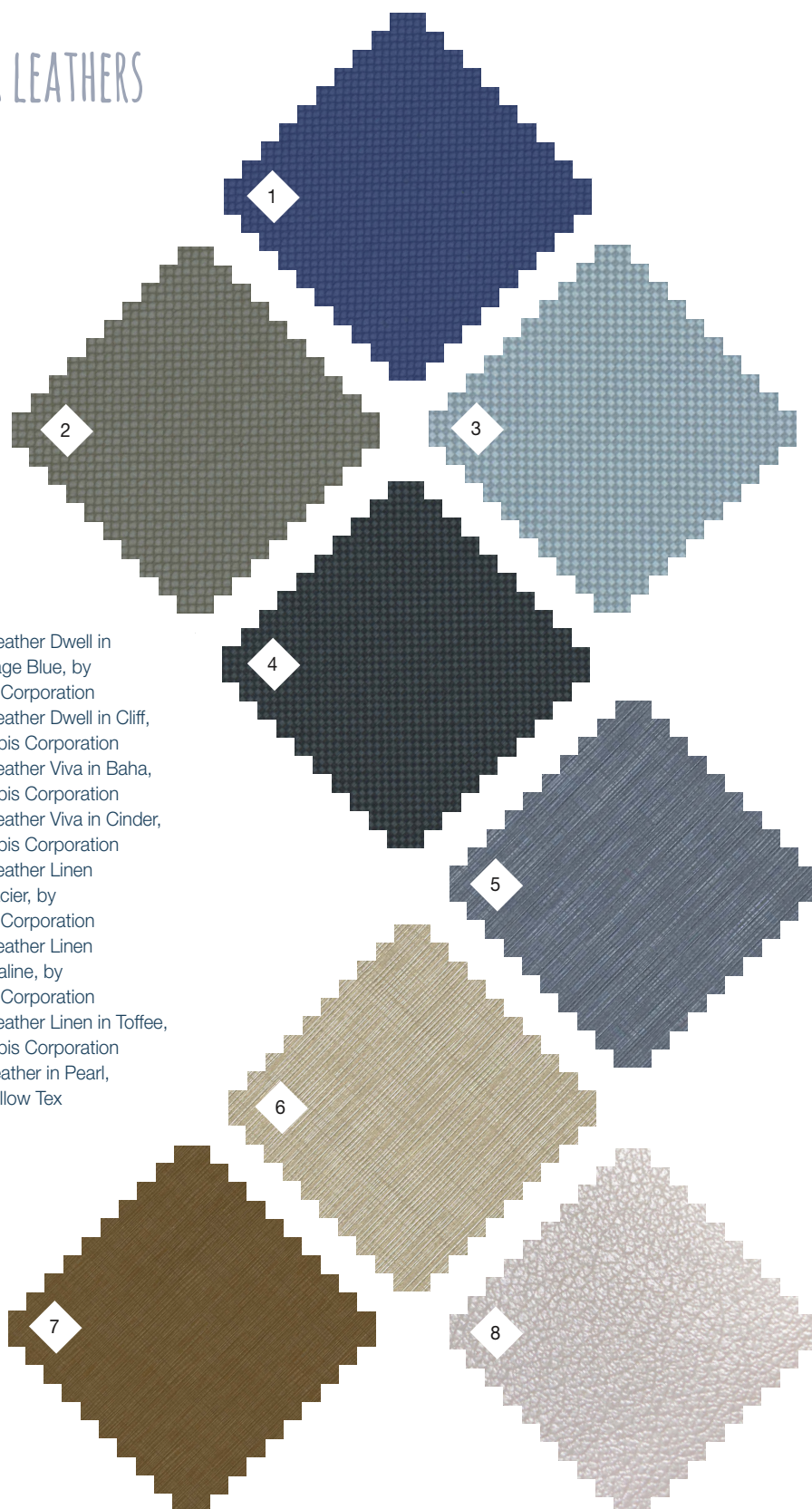
## LEATHERS



1. Athens in Mist Brown,  
by Moore & Giles
2. Capelli Specialty in Pearl Gray,  
by Garrett Leather
3. NappaTex with custom-printed  
design, by Yarwood Leather
4. Capelli Specialty in Jet Gray,  
by Garrett Leather
5. Raw Diamond in Drifter,  
by Edelman Leather
6. Left to right: Metallic Perfectly  
Pebbled in Lucky Penny, Golden  
Nuggets and Sand Topaz,  
by Townsend Leather
7. Batique Acqua leather,  
by Boxmark
8. Parchment wall covering with gold  
leaf, by Foglizzo Atelier
9. Royal Iceland wall covering in  
Triangle Soft Touch, by Boxmark



## FAUX LEATHERS



1. Ultraleather Dwell in Heritage Blue, by Tapis Corporation
2. Ultraleather Dwell in Cliff, by Tapis Corporation
3. Ultraleather Viva in Baha, by Tapis Corporation
4. Ultraleather Viva in Cinder, by Tapis Corporation
5. Ultraleather Linen in Glacier, by Tapis Corporation
6. Ultraleather Linen in Opaline, by Tapis Corporation
7. Ultraleather Linen in Toffee, by Tapis Corporation
8. Izit Leather in Pearl, by Willow Tex



## TREND TALK

**Eric Hewitt**, principal design engineer at Marshall Aviation Services, reveals the materials, colors and stitching techniques that are proving popular

We are seeing a simpler palate coming through, which I believe will continue into 2015. These more neutral and subtle colors produce cleaner, simpler lines in the cabin, emphasizing the craftsmanship.

Leather is still the number-one choice. One thing to bear in mind is that lighter and simpler designs can require more frequent cleaning, because marks and abrasions are more likely to be seen than on more complex, darker hides.

Over the years we have seen demand go from piping to double stitching through to the subtler look offered by single stitching, which is popular now.

I expect to see a surge in demand soon for perforated leathers, which the premium automotive market has used for a number of years.

Smoked tulip woods, dark wood stains and high-gloss finishes (such as a piano finish) are also becoming more popular.

Finally, the use of differentiated carpeting to demarcate zones is resurgent, and engraved decorative plating is also becoming more prevalent, particularly with Middle Eastern clients.

## FABRICS

1. Belina in Beige, by Tisca Tiara
2. Jacquard-woven seat cover fabric in Cream and Gold, by Lantal Textiles
3. Jacquard-woven matelassé curtain fabric in Gray, by Lantal Textiles



## OTHER FLOOR COVERINGS

1. Stone Flooring in Labrador Blue Pearl, by F/List
2. Wood Flooring in Walnut, by F/List
3. Leather Flooring in Xtreme Sumatra, by F/List and Boxmark



## CARPETS

1. Orleans by Scott Group Custom Carpets
2. Harbor Grid by Scott Group Custom Carpets
3. Tisca Forum II MDF 08048 in Sand and Chestnut, by Tisca Tiara
4. Bouvet II by Scott Group Custom Carpets
5. Wool and silk carpet in Off-white, by Lantal Textiles
6. Wool and silk carpet in Cream, by Lantal Textiles





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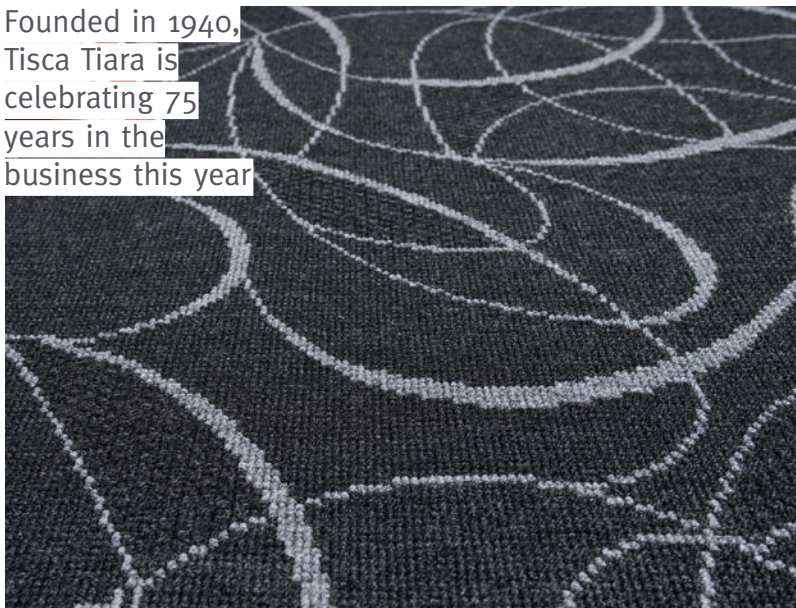
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Founded in 1940, Tisca Tiara is celebrating 75 years in the business this year



## CARPET COLLECTIONS

Tisca Tiara will present its Tisca Scalino carpet collection. The floor covering integrates various weave structures to accentuate elements of the design. The use of 3D effects results in variable light refractions.

The company will also unveil a new collection of carefully harmonized fabrics and carpets for business jets. Tisca Tiara says the new collection reflects the latest global trends in terms of designs, textures, materials and color combinations.

Also on display will be a variety of steam-pleated, ready to install curtains, which the company also produces in-house. As an additional service, Tisca Tiara maintains more than 1,500 curtain fabrics in stock.



## Whinnying formula

Hans Erni, a Swiss painter, designed the color scheme and interior for Pilatus' new PC-12 NG demo aircraft, which will be on

static display. The exterior and interior of the PC-12 NG are decorated with white horses, doves and a depiction of Pegasus, all drawn by Erni.

In addition, a full-scale mock-up of the upcoming PC-24 Super Versatile Jet will be on display at the Pilatus booth.



## Ink resistance

Tapis will show its ink-resistant and antimicrobial Ultraleather Pro. The stain-resistant technology is incorporated into the polyurethane rather than applied as an aftertreatment, which Tapis says means the resistance is permanent.

The company will also display the latest styles and colors it has developed for its Ultraleather collections. The latest offerings include three lively patterns in Linen, Viva and Dwell that go beyond the classic look of leather, with color palettes that offer neutrals as well as some bright, vibrant options. Tapis is also introducing a new collection of woven fabrics, made from natural woven fibers.

## EBACE 2015

This year's EBACE will be held on May 19-21 in Geneva, Switzerland. It will be the 15<sup>th</sup> edition of the event, so the organizers have planned lots of activities to celebrate, including inviting attendees to a sign a wall on the exhibit floor. The exhibition will be held at the Palexpo conference center, with a static display at Geneva International Airport. New features this year include the Innovation Zone, where education sessions will be held; and an exhibition area for unmanned aircraft systems. Read on for a taste of some of the products and services that will be showcased.



**Q&A:** Christopher Mbanefo,  
CEO, Yasava

### What will you exhibit this year?

Aiāna Wave will be unveiled to the public for the first time at EBACE 2015. It is not a seat, a chair or a bed; it's best described as a personal anti-gravitational support system. It enables users to adopt postures previously not possible on an aircraft. Another unique feature is that it truly follows your body – it responds to your movements simply, without the need for electrical actuators. Aiāna Wave will be showcased as part of an evolved Astral Design Series. The Astral Design Series is for large-cabin ultra-long-range corporate jets, and offers totally new cabin layouts, truly tailored to the lifestyle of the user.

### How does the new model build on your previous one?

Aiāna 1 was a full-flat electric seat specifically designed for corporate aviation, and featured wireless controls. This time we wanted to use smart mechanics rather than electronics, and to support all the body positions a person might want or need to adopt during an 18-hour period. We have used gravity as our main design driver. Using gravity while at the same time defying it was a really cool challenge.

### How did the industry respond to your previous designs?

The response to the Astral Design Series was overwhelming and humbling. We received multiple inquiries and requests, including for Aiāna 1, and it was a hard decision not to go for an immediate return on investment. While Aiāna 1 still represents the leading-edge in seat design and technology, we realized we could improve it by extending the Astral Design Series philosophy to the seat, which initially we had not done. We extended the development phase, resulting in the amazing Aiāna Wave. It's all part of what we call 'flight couture'.





Customers can select from multiple seat grouping options for each living area

## G500 AND G600

Gulfstream will highlight the two new aircraft it introduced in October 2014 – the G500 and G600. The cabins are 91in wide and 74in tall and accommodate 19 passengers each, in 27in-wide berthable seats with articulating footrests.

The G500 has three living areas, and the G600 has up to four, as well as an optional crew rest. Both have forward and aft lavatories and include a full-size galley that can be located in either the forward or aft portion of the aircraft. The baggage compartment offers 175ft<sup>3</sup> of storage space.

Other highlights include a cabin altitude of 4,850ft at FL510 and 3,000ft at FL410, along with 100% fresh air. The aircraft feature oval windows measuring 28 x 20.5in, the same size as those on the G650.



## BBJ 787-9 design

Greenpoint Technologies will feature its Azure design for the BBJ 787-9, using a 1/20<sup>th</sup>-scale interior model.

Azure features an open living space with a forward master suite, private office and two aft mini-suites for guests. The central gathering area includes an entertainment lounge and formal dining room, which surrounds a sculpture. Additional features include an aft spa-serenity room for exercise and relaxation.



## Under new management

OHS Aviation Services of Germany will introduce its new chief operating officer, Gregor Bremer. He is focusing on operations and expanding the design organization in compliance with EASA Part 21.

“Our goal is to have OHS’s design organization fully certified for major and minor changes for Part 23 and Part 25 aircraft in the first half of 2015, so we can achieve minor changes and STCs,” says Bremer. “This means we will be able to offer engineering services such as modifications to configurations, IFE and avionics, both on our premises and as a service on customers’ premises.”



## Espresso delivery

Aerolux will be displaying the Nespresso espresso maker. This is the only aircraft espresso maker that is made to use the Nespresso capsule system and performs to Nespresso standards. Aerolux has sold more than 3,000 units as VIP customers demand the same quality espresso in the air as they have at home. The unit is now available in a 28V version for aircraft with this power.

**56**  
aircraft made up the static display at EBACE 2014

## Static display

In March 2015, the show’s organizers confirmed that Bombardier, Cirrus Aircraft, Dassault Falcon, Embraer Executive Jets, Nextant Aerospace, Pilatus Aircraft and Textron Aviation would have aircraft on the static display at Geneva International Airport. The organizers expected the static display to be sold out, with at least 60 aircraft on view, including “dozens of pre-owned aircraft available for potential buyers’ consideration”.

The organizers also said that in the exhibition hall, visitors should be able to see mock-ups of the Bombardier Global 7000, Dassault Falcon 5X, Bell 505 and HondaJet.

## One-stop shop

Zodiac Aerospace will co-exhibit with Greenpoint for the first time at EBACE. Zodiac supplies seats, galleys and galley carts, water and waste systems, oxygen systems, cabin lighting, and IFEC options for business jets.

FLASHBACK

## Big news from EBACE 2014 included

- › The launch of Dassault’s Falcon 8X, featured on page 36
- › The Global 7000 full-scale mock-up unveiled by Bombardier
- › Lufthansa Technik’s entry into the seat market with its adaptable chair family
- › The unveiling of Aerion’s updated vision of supersonic travel – the Aerion AS2
- › The Avanti Evo twin turboprop aircraft launched by Piaggio Aero

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DRM approval means CCC's customers should be able to watch early-window content in the near future

## STUDIO APPROVAL

Custom Control Concepts (CCC) will highlight the fact that its AVOD IFE system now has Hollywood studio approval for early window content – that is, new movies and music recordings that are not yet released on Blu-ray, DVD or CD.

The AVOD system offers HD IFE content, which can be viewed on-demand by each

passenger, on bulkhead monitors, in-seat displays and on wireless devices via an app. CCC is also working on a new version of its mobile app, which it says will leverage the latest advances in mobile technology, and allow the company to integrate its interactive SkyShow moving map system on Apple devices.



## Light foam

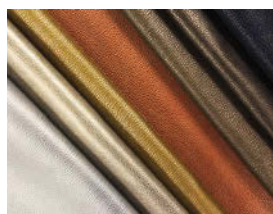
Zotefoams will showcase its Zotek F polyvinylidene fluoride range of foam materials. The company says its manufacturing process produces lightweight (the range

starts at 33kg/m<sup>3</sup>) closed-cell foams that have consistent cell structures, are exceptionally pure, low in odor and exhibit outstanding flame, smoke and toxicity performance, and exceptionally low heat release, meeting FAR 25.853(d).

The foam can be laminated to a wide variety of synthetic or natural materials. It can also be molded with a sealed, textured surface finish, removing the need for lamination.

## Supporting player

328 Support Services, now part of Sierra Nevada Corporation, will showcase its services as the type certificate holder of the Dornier 328, a level 1 design organization and a production organization. The company recently achieved supplemental DOA approval from the general civil aviation authority of the UAE, enabling it to make changes approved for UAE-registered aircraft, from satcom installations to complete conversions.



## Leather launch

Townsend Leather will introduce Metallic Perfectly Pebbled, a collection of seven textured leathers with metal-inspired colors. The leathers are offered in whole cowhides, averaging

55-60ft<sup>2</sup> each. Townsend Leather says they meet all industry standards. The finish is applied by hand, with a resulting variance in design and color.

**~500**  
exhibitors  
participated at  
EBACE 2014



**Q&A:** Peter Landquist,  
vice president of sales and marketing,  
CTT Systems

## What are your plans for EBACE?

As we are now in partnership with B/E Aerospace, we will show our Cair product at their stand. The Cair system is a cabin humidification system that combats the extremely dry air that VIPs are normally exposed to in aircraft cabins. I am looking forward to meeting all our completion center customers, hopefully creating more end-customer contacts, and of course discussing our concept with the business jet manufacturers.

## How popular is your product?

To date, CTT has sold 71 Cair systems, for both narrow- and wide-body VIP aircraft. It has become a well-known product within the VIP market.

## Do you have plans to expand your offering?

We have versions of the system for almost all large VIP aircraft and we are also developing it for the BBJ 787. We are also working on a concept for business jets, like Gulfstream and Bombardier types.

## What's next for humidification technology?

For the large VIP aircraft, we have a very good product, but as always, one can't sit still; one has to improve the system constantly. We have a challenge on our hands developing the system for small business jets because the available space envelope is much smaller than that on a large VIP aircraft.



SkyView windows can be installed in the bedroom and/or the lounge

## WINDOW DISPLAY

Fokker Services will display its SkyView Panoramic Window. The window measures 51in wide, which is slightly larger than three typical window bays. It is 20in high, approximately 30% taller than existing windows. The company believes the window will provide the opportunity to set new standards in VIP aircraft interior designs.

The window will first be available on BBJ 737-series NG aircraft. In addition, Fokker Services is also exploring other platforms with Boeing, such as the BBJ 777 and BBJ 747, and says it will also explore Airbus aircraft market opportunities.



**Q&A:** Fabio Molina,  
business development director, Inairvation

**Roughly a year on from the company's launch, how are things progressing and what are you working on?**

Inairvation offers turnkey, fully integrated interior solutions for executive jets, from the concept all the way through the engineering developments until the manufacture of the complete interior. We were actually founded in response to customers' demands to have an integrated interior delivered from a single source. We are now moving fast toward our first contract announcement. We are currently in contact with several OEMs working on various cabin integration concepts. We are changing details as we move forward and learn, but we are certainly continuing with our original approach.

**What else is in the works?**

We are working with one of our shareholders, Lufthansa Technik, to introduce its chair as the seat we will offer customers. It does not mean that customers will have to go with chair, mainly because most of them have their favorite suppliers, but we truly believe that having such an innovative seat will reinforce our value proposition to customers. We are also investing in research and development, specifically to integrate lighting with wood as much as we can.

**How is the collaborative approach working?**

The shareholders, F/List and Lufthansa Technik, and their preferred partners, Schott and DesignQ, are working very well as a team. Our first cabin project was conducted in a very smooth and efficient way, and received very positive feedback from customers.

**What are you plans for EBACE?**

To unveil our first customer; continue talks with prospective customers; and present chair as a new product in our portfolio.



## Broadened service

ViaSat will highlight the availability of its Exede In The Air inflight Ka-band internet service to general aviation customers.

The solution was initially only available to commercial airlines.

ViaSat is also offering hybrid shipsets designed to roam seamlessly between the company's Ka and Ku networks, to keep flyers connected to the best available service over most of the high-traffic air routes worldwide.



## Water treatment

International Water-Guard (IWG) will highlight its selection by Gulfstream to provide the latest version of the IWG-A6 water treatment device for the new G500

and G600 jets. The potable water treatment devices will be installed as standard fit with a single NPS-A6 on the G450 and G550, and with a dual IWG-A6 on the G650, G500 and G600.

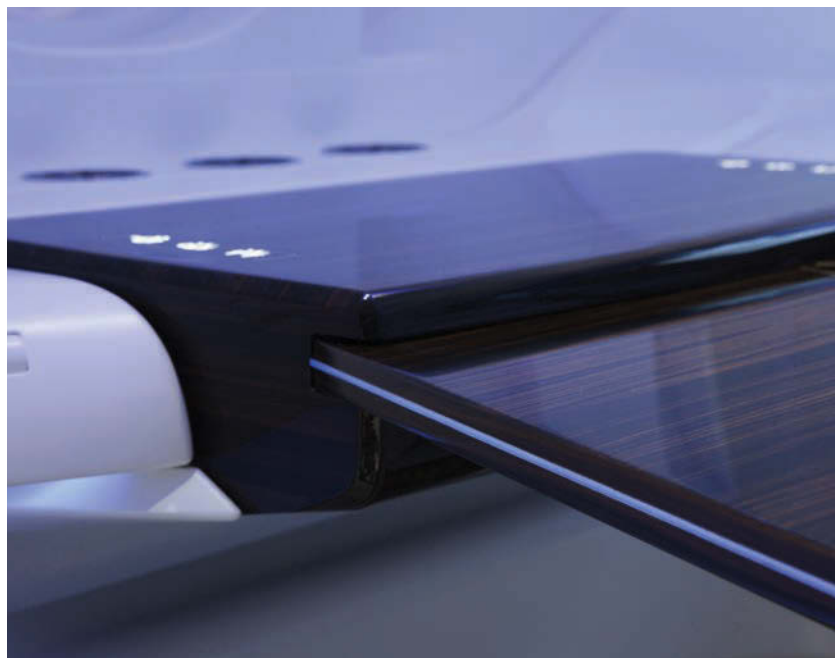


## Fiber provider

PGA Electronic will present lighting products including flexible reading lights, ambient lights and the Bebop'tic fiber optic system. Bebop'tic has a built-in microcontroller and can be customized to a great degree.

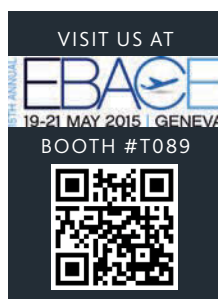
Communication with an external system enables all light sources to be synchronized to create a general ambience for the cabin. Using the Bebop Controller or the autonomous light source, customers can create different ambiances by varying colors and luminous intensity. Bebop'tic can be controlled through any CMS, including PGA's, from a wi-fi-connected iPad. The fiber has been developed to be flexible and small in diameter. PGA says the materials used make the fiber shock-resistant and enable any mounting location.





Industrial design by DesignQ

## When technology meets cabin



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# INAIRVATION

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# ENJOYING YOUR STAY IN GENEVA



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**Q&A:** Alexandra Collins,  
 founder and managing director,  
 Design Investment

## What is it like having such a big trade show in your city?

Design Investment is based in the countryside near Geneva. Having EBACE on our doorstep means having great opportunities to meet with our clients and business partners on a fixed, once-a-year basis, without needing to travel. It is not only the perfect occasion to pick up on previous conversations, get an update on ongoing projects and discuss new developments and trends in the business; the show also offers the opportunity to visit the aircraft on display with our clients. Our studio is only a few minutes' drive from the show and we have the possibility not only to meet with our clients at the show, but also to arrange meetings in our facilities, so we can discuss ongoing projects in a private environment.

## What are your favorite memories from past shows?

Being specialized in both high-end commercial aviation and private/corporate aviation, we realize how much there is to learn and apply from one sector to the other. On several occasions visiting this show, I found inspiration and sometimes even solutions for specific design ideas we had developed in our projects. On one occasion, a client was visiting the show at the same time. We were able to meet with some specialists and come up with a valuable solution for a feature he was very keen on having in his aircraft.

## Do you have any plans for this year's show?

We are currently working on a very high-end blue-sky research project and have been asked to push boundaries in every sense. I hope to be inspired by the show, to see innovative things and to find, in my talks with specialists, some interesting products to support the project.

## ALEXANDRA'S TIPS

### WHAT TO DO

Go to the heart of Geneva's old town, the Place du Bourg-de-Four, and get a feeling for the original town spirit while seated in one of the terraces of the square's cafes. Take the steps up one of St Pierre's Cathedral's two towers for a bird's eye view of the town. Rent a boat and take a ride along the shore to see the town from its most attractive side, the waterfront. You could also go for a stroll in the Quartier des Bains. The art museums and galleries around the Centre d'Art Contemporain Geneve offer a unique accumulation of art exhibitions and cultural events.

### WHERE TO EAT

For the Swiss cheese fondue experience and a relaxed and yet cosmopolitan atmosphere, go to Café du Soleil in Petit-Saconnex. The Auberge du Lion D'Or in Cologny offers an elegant, contemporary and sophisticated dinner with a breathtaking view over the lake and on to Geneva.

### WHERE TO SOCIALIZE

For drinks and socializing before or after dinner, push the secret door of Chez Henri, an oyster bar in the back room of a lively hamburger place in downtown Geneva. When the weather is right, La Terrasse on the Quai du Mont-Blanc, just next to the entrance of the Bain des Paquis, offers a laid-back atmosphere for socializing after a busy work day, and you can even rent a boat there as well.

### WHAT TO BRING HOME

Don't miss out on the opportunity to procure some Princesses from Auer Chocolatier on Rue de Rive. I recommend bringing them back home for your loved ones, but unfortunately it is also very easy to finish the box by yourself!





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# grand opening

A new facility will help SACS Boysen Aerospace to meet market demand for its vast product line-up, which includes fasteners, struts, latches and mechanisms for tables and pocket doors



1

The SACS Boysen Aerospace Group consists of Sacs, located in Rottweil and Binsdorf, Germany; and Boysen, located in Munich and Hamburg, Germany.

SACS specializes in the development and manufacture of fastening and connecting systems, and offers a huge range of products for aircraft. These range from fasteners and turned and milled parts, right through to table and pocket door mechanisms. Boysen's expertise is in distribution. Its facility in Munich deals mainly with metric parts (measured in centimeters), and the one in Hamburg is responsible for imperial parts (measured in inches). Boysen has more than 12,000 different parts in stock and also offers an aircraft-on-ground service.

In 2012, the group opened a plant in Dallas, Texas, USA. This is called SACS Boysen Aerospace US, and is devoted to supporting the US market – in particular the group's helicopter OEM customers, which include Airbus Helicopters.

The plan for 2015 is for SACS to open a new facility in Empfingen, Germany. The groundbreaking in September 2014 was the start of a new and exciting stage for the company. The new facility will have a 5,900m<sup>2</sup> production hall, increasing the group's capacity to mill, turn, stamp, laser and bend sheet metal; assemble parts; and treat surfaces. The site will also host a 2,200m<sup>2</sup> office building, giving more room for the company's sales, logistics, purchasing and quality departments.

One of the big reasons for the expansion is to increase the company's capacity for research and development. The company places a lot of importance on its ability to work together with customers at every point in the development.

"Most of our parts are customized solutions, developed together with our customers," says Karin Marschall, team leader for sales at SACS. "For example, we develop table and door mechanisms for Bombardier and Embraer. For latches and struts we work together with aircraft manufacturers and mostly

are in charge of the development liability. For the Airbus Helicopter NH90 we developed

latches and struts for upper-deck cowling usage. For the A320 we developed an improved latch as well as several hinges."

SACS uses high-strength raw materials such as aluminum, steel and titanium. It uses plastics such as polyethylene, polyamide-imide and polyetherimide, to accord with fire resistance requirements. The company's product designs are influenced by certification requirements; the load that each product will support; technical requirements such as interface points and how much space is available; and in the case of parts that passengers will see, aesthetics.

The company notes increasing demand for parts to be multifunctional. In addition, usability is important, for all parts, to ensure safe and easy handling. SACS says safety is a vital consideration for all its products. Mechanisms are built and tested to be very durable, solid, reliable and easy-to-use. For example, pocket door mechanisms are built with gas springs that close the door automatically. The company believes the feeling of solidity contributes to the passengers' experience in the aircraft.

**SACS Boysen Aerospace** **Reader Inquiry No. 501**

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2

1-2. A business jet table mechanism developed by SACS





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CTT Systems AB is a Swedish technology group active in the aviation industry, specialising in humidity control systems for commercial aircraft. Customers include both aircraft manufacturers and airlines. See [www.ctt.se](http://www.ctt.se)





# visualaid

ACA designed its platform-independent visualization app to help designers communicate their ideas easily, quickly and fully

Communicating interior design choices can be an intricate process. Imagining a variety of furniture, materials and accessories can be challenging, especially when the viewer's orientation within the aircraft and different light situations have to be considered. To support designers and their customers, 3D visualization company ACA has brought together almost 30 years of experience in the aviation business to develop a tool that it says makes this process a lot easier, faster and more cost-efficient.

"Our objective was to develop an app – for use on any tablet, smartphone or computer – to make the experience of an interior design more true to life and interactive than regular 3D renderings and films," says Tobias Malangré, CEO at ACA. The company decided to combine 360° real-time technology and photorealistic 3D images within an interactive environment.

"With the app, it is now easy to navigate through the entire cabin with a full understanding of spatial orientation, and to show different configurations and material proposals," comments Warja Borges of Unique Aircraft. "Our customers love it. They get a much better feel of the design at a very early stage. It is also a great tool for communicating with the completion center

when discussing the realization with the engineering department. Furthermore, we can implement photorealistic 3D movies into the app, so that the functions and contents of the cabin monuments can be explained easily."

Borges also sees time-saving benefits. "Having a better means of communicating with our customers reduces the number of changes up to the critical design review," she says. "Or, changes are made already within the virtual model, right after the preliminary design review."

Alexandra Plank from rohi uses the app to present her company's fabric designs in the context of a complete interior. Meanwhile, Simon Koenig from Jet Aviation Basel Design Studio says the app has been useful for refurbishment projects. "Being able to look at a large variety of combinations of furniture and materials in a virtual environment provides an additional service to our customers and supports the decision-making process," he says.

The app makes use of portable devices' 3D tracking functions, so a tablet or smartphone can be used as a virtual walkthrough camera. Lauren Brocklehurst from Constant Aviation points out that this enables customers and designers to view

the cabin from every angle. "There are no blind spots behind the camera anymore," she says. "Working with the complete interior helps us to identify potentially problematic areas."

The app can be delivered in the universal HTML5 standard so it can run on desktop computers, laptops and mobile devices. "This makes it an excellent tool for presentations in a variety of situations," says Tim Callies of Callies Design. "It also gives the customer the opportunity to take the app home and discuss the design with family and friends."

Another important feature for Callies is the ability to quickly test materials and room configurations under various light situations.

Malangré even believes the app can lower the cost of visualization. "Traditional 3D walkthrough videos require up to 1,800 individually rendered HD images for each minute of the movie," he says. "A 360° real-time app requires far fewer images, saving a lot of rendering time and consequently, costs."

ACA Reader Inquiry No. 502  
To request more details from this advertiser,  
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1. ACA's fully interactive Virtual Cabin app, shown featuring a design by Tim Callies for OHS Aviation Services

# lightfantastic

Modern cabin lighting technologies are enabling designers to create more beautiful, functional and mood-enhancing cabins, explains Custom Control Concepts

The bar for VIP cabin designs has never been so high, contends Eric Johnson of Custom Control Concepts: "Designers are asked to set the stage for some of the world's highest-level meetings, and to impress tech-savvy corporate passengers. Clearly an awareness of cutting-edge cabin technologies is critical to the job."

Cabin lighting has seen many advances over the years. "Lighting products are now capable of doing so much more than simply being switched on and off," says Johnson. "Top designers are using advanced lighting to enhance cabin environments, and are applying light in new and creative ways."

In particular, Johnson says LED technology has opened the door to a wide range of environmental enhancements, including both dramatic and subtle lighting accents.

"In addition, strip lights and can lights now come equipped to deliver extraordinary levels of luminosity with finger-touch precision and regional focus," Johnson says. "Modern lighting control units (LCUs) offer wireless controls that do so much more than enable you to click through a shortlist of white color intensities. They give passengers control over a full RGBW spectrum of lighting colors, with tens of thousands of intensities."

In fact, some new LCU designs offer more than 64,000 intensity settings (also known as steps), creating nearly invisible transitions. "For top VIP cabin designers, transition transparency is a critical component in today's overall cabin presentation," says Johnson.

All these developments are exciting for Johnson because he believes they enable designers to influence the passengers' mood. "Light levels have long been known to have a psychological effect on the passenger and their overall flight experience," he comments. "After all, the majority of information we receive about the world around us comes through our eyes. The intensity of light and the way it is distributed can influence our perception. Designers now have the tools to visually comfort passengers and greatly improve their overall experience of the cabin."



Custom Control Concepts Reader Inquiry No. 503

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1-2. Custom Control Concepts offers many lighting products for VIP and business jets





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Berletex Aero Design is an aerospace design and engineering firm supporting major aerospace companies worldwide. We pride ourselves on providing the engineering support required to offer a complete engineering solution based on our extensive corporate aircraft completion experience. With offices located in Montreal (Canada) and in Europe, our specialty lies in corporate VIP aircraft interior completions.

Using the latest technology in engineering tools (CATIA V5, SolidWorks, AutoCAD), Berletex Aero Design provides a wide range of services so as to ensure a successful completion:

- Monument design
- Mechanical and Avionic Systems design
- Airframe Structural Modifications
- Stress Analysis,
- Certification (T/C, FAA, EASA)
- On-site engineering liaison support

To date, Berletex Aero Design has undertaken and successfully completed numerous interior completion projects on Bombardier Global 5000/6000, Challenger 604/605/850/870, Boeing BBJ/BBJ2, Boeing 747-8i and Airbus A330/340 aircraft.

### Our strengths include:

- Mechanical System Design (Waste, Water, ECS, Oxygen)
- Interior shell design
- Fully integrated monument design/installation
- Structural modifications/installations
- Avionic/Electrical Design
- Cabin Management System (CMS) integration
- Lighting
- Advanced/conceptual design
- Exterior camera systems



**Berletex Aero Design Inc** 3773 Cote-Vertu Boulevard, Suite 475, St-Laurent, Quebec, Canada, H4R 2M3

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# entertainmenttoday

## PGA Electronic outlines its latest and upcoming IFEC and lighting innovations

PGA Electronic, the Astronics Group's French subsidiary, specializes in motion systems, lighting and IFEC/CMS equipment. Its latest innovations include the new Smart Cabin Player app. This enables passengers to access the aircraft's AVOD system, HD media player, USB media player and moving map on all screens in the cabin, as well as their PEDs. HD content can be streamed to multiple iPads simultaneously via wi-fi.

The app can be customized with defined themes. The graphical user interface is also designed to be intuitive, and the app supports many languages. Its default language is English, but all languages are available on demand.

PGA Electronic has also added interactive games to its Full IP IFEC system. The games have been developed with DTI and are compatible with various screens offered by the company. Passengers can play in the cabin using a USB or wireless controller.

PGA Electronic is also offering two new digital rights management (DRM) services. Passengers using the Full IP system can access early window content (films and music recordings that are not yet available on Blu-ray, DVD or CD) in HD. This media can be viewed on demand using the company's system, on all screens installed in the cabin. Thanks to a collaboration with IFP, new content is available every month. PGA Electronic says all the major Hollywood studios have approved its system.

PGA Electronic has also developed a DRM partnership with Interact, a media provider for IFE systems. This alliance makes it possible to offer a legal public use solution for legacy systems, approved by six major Hollywood

studios. Customers can now procure late-window content (blockbuster movies and TV series that have already been released on DVD) for distribution in their aircraft.

All content will be offered in its original language, plus additional languages if available. PGA Electronic says this system is easy to integrate and adjustable to any cabin configuration without hardware upgrades. It can be used to retrofit old IFE systems.

PGA Electronic's most recent lighting development is the Be-Bop'tic fiber optic system, which has an autonomous LED source that can be used without Be-Bop'tic and that can communicate with other cabin systems. Be-Bop'tic allows the customer to define colors, for example, to match different flight phases.

Because the product can communicate with external systems, all light sources in the cabin can be synchronized. It also has a built-in microcontroller. Customized fiber has been developed to be flexible and small in diameter, so it can be integrated into any type of mount. PGA Electronic says the materials used make the fiber shock resistant and suitable for any mounting location.

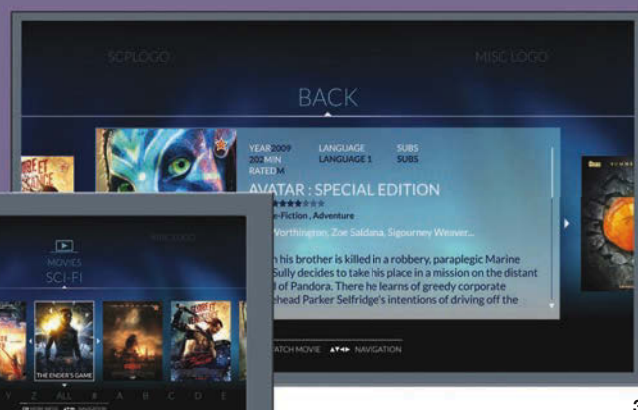
The Be-Bop'tic system can be used to add bright decoration in the cabin, to highlight fixtures such as fixed-shell seats, doors and windows. Using the Be-Bop Controller, the color and intensity can be varied. PGA Electronic says the RGBW technology makes color homogeneity possible throughout the cabin.

It will also be possible to control Be-Bop'tic through any CMS, including PGA Electronic's, accessed on the company's touchscreens or via passengers' own wi-fi connected iPads. Passengers can control the lighting using a color wheel or select from preset color schemes.

### PGA Electronic

### Reader Inquiry No. 504

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1. PGA has launched two new DRM services for IFE provision
2. The Be-Bop'tic system
3. The Smart Cabin Player app works on multiple platforms

# Skylounge

## Cabin Sleep System

In 1997 Cascade Designs pioneered the development of the world's first customised self inflating aircraft cabin mattress to fit all aircraft models under the brand Skylounge™. To date there are in excess of 15,000 units in service.

### About Us:

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Skylounge operates easily. By opening the valves, the mattress will self-inflate in minutes. By closing the valves, the air is trapped inside the foam maintaining structural integrity. An electric pump can be provided as an accessory to assist with inflation and deflation.

### Skylounge Benefits:

- Compatibility - Customised design to fit any aircraft model.
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- Stow ability - Minimal volume when deflated.
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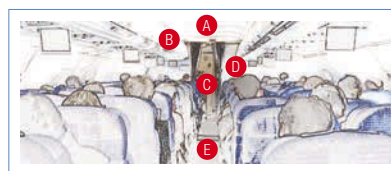
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# crystalclear

MSB Design says demand for its bespoke crystal, china and flatware (CCF) inserts is growing

Over the past year, MSB Design has expanded its client base for its bespoke crystal, china and flatware (CCF) inserts. The number of aircraft types carrying the customized inserts as a line-fit (OEM) option has broadened. At NBAA 2014, it was announced that Embraer will offer these inserts on the Legacy 450 and 500, in addition to the Lineage 1000E family. The company also reports an increasing number of completion centers are installing the inserts as part of both completion and refurbishment projects.

The inserts are designed to hold dinnerware, cut glass, tableware and other valuable yet fragile objects – such as vases, bottles and serving bowls – securely. The inserts are also

designed to meet ergonomic needs and match the interior of the aircraft. As part of the service, MSB Design consults with each client to understand the requirements of the crew and passengers. It can also offer advice on the most suitable cutlery, china and cut glass.

The company says each insert is made of high-density foam that has been certified for aviation use and is lightweight but strong. Fine precision engineering ensures the foam is cut to match the contours of the pieces it will hold, as well as the dimensions of the cabinets and drawers it will be held in. Three pieces of each item are measured and then the average measurement is used to create a close-fitting insert. As well as protecting the items, MSB Design says the close fit drastically reduces the noise made by items rattling.

Customers can select from an existing range of designs, colors and textures to finish the inserts, or they can commission bespoke styles, perhaps to incorporate corporate colors, logos or branding.

“The feedback received from aircraft owners purchasing the CCFs has been very positive; in fact we’ve seen continuous take-up from new individual owners, corporate flight departments and OEMs,” says Shannon Gill, business development director at the company.

MSB Design is based in Montreal, Canada. It is a division of Sogclair Aerospace, an engineering and contracting company based in France. In addition to the CCF inserts, MSB Design also produces a single-pedestal hi-lo conference table and a ready-to-assemble customized cabinet kit. Other products are currently in development.

**MSB Design**

**Reader Inquiry No. 505**

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1-2. CCF inserts made by MSB Design

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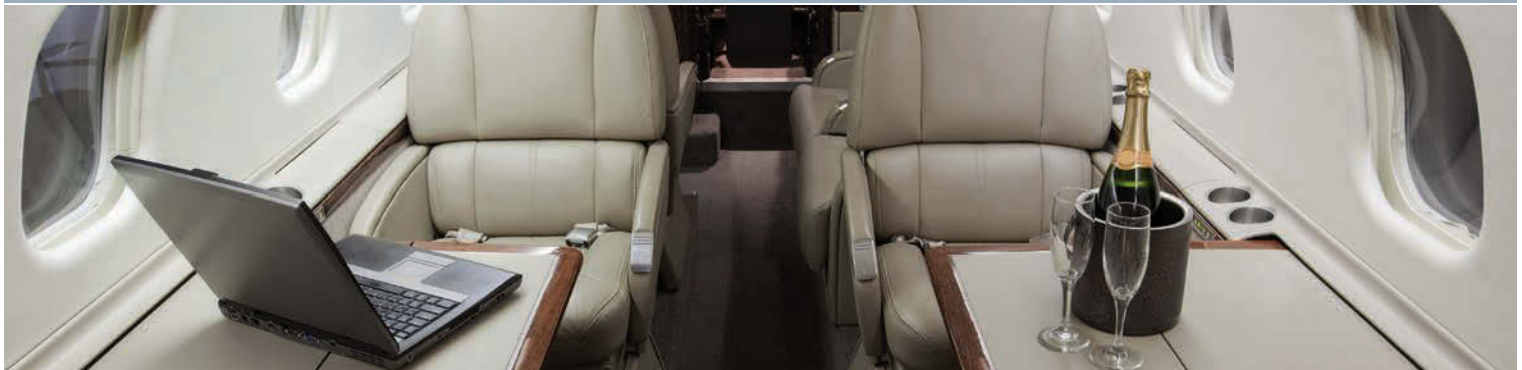
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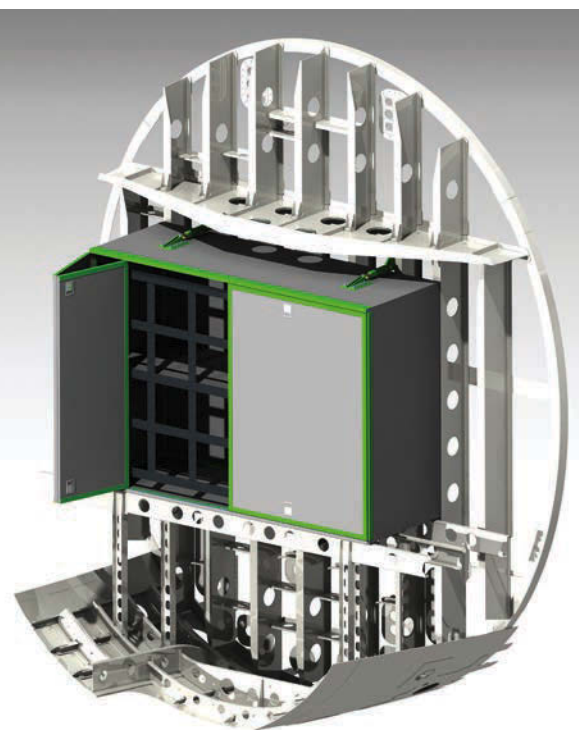
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# better together



Berletex Aero Design recently became a member of the GAL Aerospace Group. Berletex Aero Design is an engineering and design firm based in Montreal, Canada. It has 20 years of completion experience on both narrow- and wide-body VIP aircraft.

With the addition of Berletex, GAL Aerospace can now offer a more complete solution for corporate aircraft interior completions. Its services for Tier 1 aerospace suppliers now range from mechanical and electrical engineering to the manufacture of fully integrated cabinetry, advanced composite components, machined and composite periphery parts, and components for environmental control systems.

Capitalizing on the synergies of both companies, GAL Aerospace recently secured a VIP completion. The project involves engineering and building several fully integrated monuments for a European client. The ability to design and build plug-and-play interiors expands GAL's capabilities, enabling it to offer complete solutions catering to its customers' needs.

GAL Aerospace is also in the process of developing an STC for the design and build of a storage cabinet being installed in the aft equipment bay of a Bombardier Global 5000. Making use of space that is taken up by a fuel tank on the Global 6000 platform, the storage unit can accommodate articles such as mattresses, engine covers and golf clubs. The idea is to free up valuable space in the baggage compartment.

"With engineering offices in Europe, Canada and the USA, Berletex's engineering personnel are strategically positioned near most major aircraft OEMs and completion centers," says Ross Bellingham, president of Berletex Aero Design. "As part of the GAL Aerospace Group, we are in a better position to be reactive and responsive in interacting with our customers and listening to their needs."

**Berletex Aero Design** Reader Inquiry No. 506

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# fighting fear

Aviophobia, also known as fear of flying, or flight anxiety, affects many people around the world. One of the more common methods of addressing it is medication, but Shervin Rezaie, general manager at Aircraft Lighting International, questions whether this is the best approach to take. "Medication is more of a band-aid than a solution," says Rezaie. "And it can result in unpleasant side effects."

So what other solutions are available to ease passengers' tension? While mood lighting may sometimes be looked at as a purely aesthetic addition to a cabin, Rezaie believes it has the potential to create an environment that assists passengers to conquer their aviophobia, or at least offer partial relief from it.

"For evidence of this, one merely needs to examine how mood lighting is used in other high-stress environments," contends Rezaie. "Take, for example, the Phoenix Children's Hospital in Arizona, USA, which incorporated mood lighting in its design to create an immersive escape for patients and families while at the hospital. A children's hospital is a cacophony of stress and anxiety, and if mood lighting can help

alleviate any of the tension there, its application in the aviation industry is a no-brainer."

Rezaie argues that lighting is no longer simply helping people to see, it is now setting the mood. "It can be used to relieve stress and increase productivity," says Rezaie. "Using mood lighting, the business jet community now has the opportunity to cultivate a cabin environment in which our passengers' aviophobia is no longer an issue, and the flight can be redefined as a pleasurable experience."

**Aircraft Lighting International** Reader Inquiry No. 507

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# officeservices



Growing demand for inflight connectivity over the last few years has pushed many developments in terms of the satellite infrastructure and services offered to business jet passengers. Satcom1 specializes in providing aeronautical satcom solutions to VIP, head-of-state and military customers. Its services include system design, implementation, airtime services and cabin billing solutions.

"We have put a tremendous amount of effort into maximizing the quality of the internet services enjoyed by our clients, so that executives and officials can access PDF files and other documents during their flights, and act on them instantly," comments Karina Larsen, co-founder and vice president of partnerships at Satcom1. "Analysis of inflight network usage shows that approximately 85% is internet usage, with some 7% of the time spent on VoIP calls and the remainder taken up by the faxing of documents."

Satcom1 currently provides services for more than 1,500 satcom terminals. "Satcom1 has developed a router software suite called AvioIP, which is able to aggregate Inmarsat channels to provide the user with 1MB broadband connectivity in flight," says Larsen.

The company is planning to release a new version of AvioIP in May 2015. Among other new features, it will include aggregation of more than two SwiftBroadband channels. "This has already been tested," says Larsen. "The system has been proven to deliver up to 1.6MB/s in our lab at Paris-Le Bourget Airport in France." Future versions of the software are expected to also support new services such as Inmarsat JetConneX and Inmarsat HDR.

Satcom1	Reader Inquiry No. 508
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# modernclassic

The Range Rover is made over by a luxury automotive atelier from Italy



The aim with Ares's 600 Supercharged project was to create the ultimate Range Rover, as a demonstration of the company's ability to customize cars for clients. "It's all about how our clients feel inside their car; it should excite them, inspire them and feel like an extension of their personality," says Mihai Panaitescu, head designer at Ares.

The exterior has also been completely remade with carbon fiber. Inside, the car features new asymmetric seats designed in-house for "maximum lightness and superior ergonomics", says Panaitescu. Other highlights include custom Nappa leather, chrome details on the windows, a custom steering wheel featuring precious metal inserts, and panels handcrafted from Mediterranean oak.

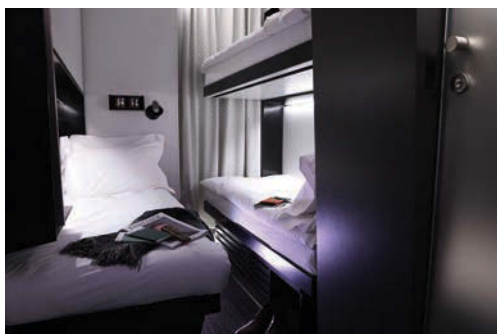
"The way in which we use wood is integral to how we do our interiors," says Panaitescu. "We have always strived to choose wood that isn't used in any other cars and we then apply it in a very unique way. We create our own wood veneer and then an Italian artist paints it by hand to achieve a completely unique look. We also use wood in areas where you wouldn't normally expect to see it, for example on door panels that are usually covered with a textile or leather."



## OTHER EYE-CATCHING DESIGNS FROM VARIOUS INDUSTRIES...



Zebirino marble was used in this residential kitchen in Mayfair, London, UK, designed by Katharine Pooley for a private client. Each slab of marble was hand-picked from specialist Italian quarries.




The Snoozebox portable hotel by Tangerine is a masterclass in compact design. The brief was to create a sophisticated 3.6 x 2 x 2m hotel room that could fold in half for transportation. It had to offer various configurations, with fold-away beds.



The 2016 Mercedes-Maybach Pullman S600 limousine is 21ft long and features traditional face-to-face seating in the back, leather upholstery throughout, and is available with a 3D surround-sound system from Burmester.





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