

BusinessJet *interiors* INTERNATIONAL

OCTOBER 2015

THE INTERNATIONAL REVIEW OF BUSINESS JET INTERIOR DESIGN AND COMPLETION



Flexjet refresh

WITH ITS EYES ON THE VERY TOP OF THE FRACTIONAL MARKET, FLEXJET IS MAKING BIG INVESTMENTS IN NEW AND IMPROVED INTERIORS THAT DARE TO BE DIFFERENT



ALSO IN THIS ISSUE: DC-6 RESTORATION **LIGHTWEIGHTING** CUSTOM ACJ319 **SLEEP** AW609 **AIRLINE CABINS** NBAA PREVIEW **STONE**

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Above & Beyond



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"I have carte blanche to replace and renew interiors as required; we consider aesthetics to be paramount"

8 wheels up

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Photo courtesy of Greenpoint Technologies

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TRUE EXCELLENCE BEGINS BEYOND THE SURFACE

THIS IS THE PRINCIPLE BY WHICH F/LIST DEVELOPS AND MANUFACTURES
CABIN INTERIORS FOR BUSINESS & PRIVATE JETS, CABIN REFURBISHMENTS & RETROFITS
AS WELL AS CUSTOMIZED VVIP INTERIORS FOR NARROW & WIDE-BODY AIRCRAFT,
MEGA YACHTS AND LUXURY HOMES.

F/LIST

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EYE-CATCHING DESIGNS FROM OTHER SECTORS, INCLUDING A SUB-AQUATIC RESTAURANT

freshstart

The funky cabin on the cover – complete with zebra-print leather – is one of several distinctive interiors Flexjet has created to help it target the higher echelons of the fractional market.

The company has a varied fleet – a mix of Bombardier, Gulfstream and Embraer aircraft ranging from super-light to ultra-long-range models. Rather than applying a uniform design, Flexjet has created a variety of schemes to suit the differing tastes, but consistently high expectations, of its target market. There are warm-looking cabins full of earthy browns and gold, and masculine designs realized in gray. Turn to page 30 to discover some of the unusual details. There is even an Art Deco scheme, particularly evident in the aircraft's marquetry and carpet.

The latter isn't the only interior featured in this issue to recognizably take its cues from the past. On page 22 you can read about Cloudmaster's quest to restore a 1958 DC-6 to service. The plan is to offer it for shared ownership. Key to the project is a new cabin designed by Bannenberg & Rowell, which manages to reflect the aircraft's heritage – referencing *Mad Men* and Sean Connery's Bond along the way – while also equipping it to meet modern passengers' requirements.

Other highlights in this issue include a look at how seats, divans and beds are being designed to help passengers get a refreshing sleep (page 54) and what can be done to minimize weight without impacting aesthetics (page 38). There's also a bumper preview of NBAA 2015 (page 87), which is crammed full of news from exhibitors and comment from North American OEMs. It looks set to be a lively show, full of fresh new ideas.



Izzy Kington, editor



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Flexjet

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PINBOARD



A BBJ 747-8 concept by Greenpoint's design team



An ACJ320 completed by Comlux America with a design by Comlux Creatives and Inflight Cabin Solutions



Windspeed Technologies' SkyDeck, a semi-external viewing platform



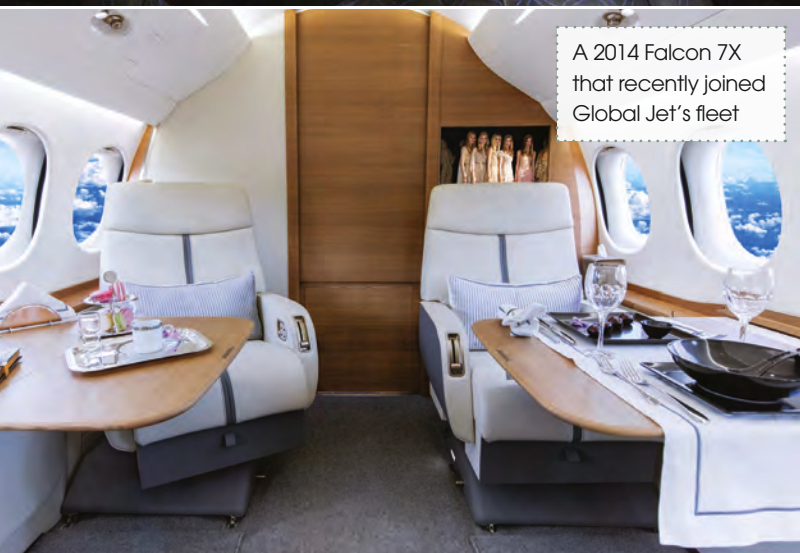
Dassault Systèmes' Passenger Experience, which uses 3D visualization and interactive content to transform engineering data into visual 3D design, marketing and sales applications



American Hornback, a range of hand-tipped faux alligator leathers from Edelman



A Challenger 300 designed and refurbished by Constant Aviation



A 2014 Falcon 7X that recently joined Global Jet's fleet



In conjunction with Kevin Glancy and Jonathan Fawcett, On Air Dining is now offering amenities including dinnerware and linen

LUXURY LIVING



Bespoke Beverages KL Diamond coffee; £8,500 (US\$13,112) per 250g



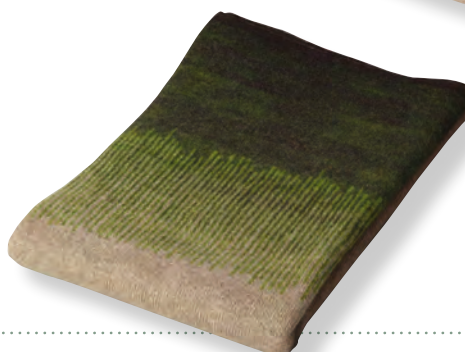
James Virgo Artwork Bronze Bow Tie, available from Debut Contemporary; £200 (US\$309)



Recchiuti Platinum Collection box of chocolates; US\$168



Oyuna Etra cashmere bedspread in taupe with beige; £1,599 (US\$2,599)



Oyuna Borda cashmere throw in taupe and green; £579 (US\$899)

LAUNCHES

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BEST OF THE WEB

A TASTE OF THIS QUARTER'S WEB-EXCLUSIVE CONTENT ON BUSINESSJETINTERIORSINTERNATIONAL.COM



"Aircraft owners are moving away from the warm beige hues and moving toward more contemporary, masculine, cooler tones, such as taupes and grays. This allows them to add pops of color throughout the aircraft. We're seeing a lot more attention to the small details, like changing the stitch pattern or adding a welt cord to mirror the look of today's luxury cars."

Veta Traxler, West Star Aviation's new paint and interior designer, discusses trends in private aircraft interior design



"A couple of years ago, you couldn't imagine real-time rendering being used in any other field than gaming, with a pretty unrealistic view. In contrast, nowadays you are able to see impressive realistic outputs rendered in real time, within an immersive environment using comfortable and appealing reality goggles."

Max Pardo, co-founder and managing director of LightBox, considers the evolution of 3D visualization technologies



"The aim was to create the next exciting experiential in-flight entertainment for VIP aircraft owners and the airline industry. It is a system designed to provide an exhilarating view of the aircraft's external environment while in flight, from a safe semi-external location."

Shakil Hussain, president of Windspeed Technologies, explains all about his invention, SkyDeck



"We start with a physical model or display and blend it with animated and still digital content. All these elements are carefully choreographed to become an engaging interactive presentation."

Tom Toomey, business development director at PacMin, explains how the aircraft model-builder is harnessing 3D projection technology

GALLERY

A Global Express that has joined Vertis Aviation's South African portfolio





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GLOBAL EXPRESS REFURBISHED BY CONSTANT AVIATION

Constant Aviation finished the refurbishment of this Global Express in March 2015. The project was completed in six months.

The interior layout was completely redesigned to offer three main zones – for business, dining and entertaining. There are 12 traditional passenger seats, plus two additional seats integrated in the dining area's credenza, and a new crew rest area.

In addition new IFEC, CMS and avionics equipment was installed.

All soft goods were replaced with high-end materials, in line with the New York loft theme.



The cabin's 12 seats were redesigned to be more comfortable. Constant Aviation replaced the foam and reupholstered the seats in nubuck.



The IFEC upgrades include a Honeywell AIS 2000 satellite TV system and Honeywell Ovation Select CMS. With the aim of providing a seamless internet solution covering both domestic and international travel, Constant Aviation installed the Gogo and SwiftBroadband systems, gaining certification for dual routers.



Constant Aviation modified the window surrounds to make the openings larger, the aim being to make the actual window seem larger and to funnel in more sunlight.

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Garrett Leather supplied the nubuck used on the majority of the seats, while Townsend Leather supplied leather for inserts on the club-four seats in the dining area. Custom Plywood supplied bird's eye maple veneer, which Constant Aviation stained. Scott Group Custom Carpets supplied a handmade carpet incorporating silk. The custom dyed zebra material used on the kitzers was supplied by Edleman Leather.



Q&A: LAUREN BROCKLEHURST, INTERIOR DESIGNER, CONSTANT AVIATION

WHAT WAS THE BRIEF FOR THE AIRCRAFT?

The new owner wanted to refresh the look of the interior, and decided on a New York loft look. The Global Express typically flies on missions more than four hours long, and also makes a lot of international trips. The cabin interior design was rooted in the fact that the customer wanted to offer similar comforts as passengers have at home.

WHAT MODIFICATIONS WERE MADE?

The customer requested that a section of the cabin was dedicated to entertainment, providing a theater feel. We installed a three-place divan along with a VIP seat arranged around a 42in screen that offers DirectTV and Blu-ray connectivity. We also incorporated a newly designed ottoman underneath the TV.

The customer also wanted a family atmosphere where passengers could sit and dine together. To accomplish this, we designed and created two additional seats in the dining area. These are the kitzers, which are stored within the newly designed credenza. This means the dining area can seat six.

Other changes included modifying the lav vanity and the galley, and redesigning the cabin seats.

WHAT WAS THE MOST CHALLENGING PART?

All projects of this magnitude have challenges. For us, the challenge is not in the execution but in the design and planning. It is extremely important that we design an interior that the customer will be ecstatic about. To accomplish that, we need to learn a lot about the customer, their expectations and vision. We spend a lot of time going over what is important to them in terms of interior equipment, and making sure we understand their vision. We provide numerous renderings to help hone the design and layout. This is one of the most important steps in redesigning an interior and turning the customer's dreams into reality.

ARE NEW-TO-MARKET MATERIALS INCORPORATED?

The window panels are a new-to-market material. They are made from an Ultrasuede material from Tapis that is then sent to Kalogridis Deconel. Kalogridis applies the foam backing and adds the motion pattern to the Ultrasuede. It is a highly detailed piece. The plating was another interesting design. Signature Plating can create a satin appearance that gives a very rich look.

WHAT OTHER PROJECTS DO YOU HAVE LINED UP?

We are working on the complete interior redesign of a Global, our third such project, and are also in the final stages of redesigning a Gulfstream V interior.

COMPLETIONS ROUNDUP

THIS QUARTER'S ANNOUNCEMENTS FROM COMPLETION CENTERS AROUND THE WORLD

MOSES LAKE, WASHINGTON, USA:

Greenpoint Technologies inducted its second BBJ 787 for interior completion. The company was also contracted to complete a BBJ 777-200LR and installed Ku-band antenna provisions on a BBJ 787-8.

WATERFORD, MICHIGAN, USA:

Pentastar Aviation received FAA STCs for the installation of the Satcom Direct Router on Gulfstream G350, G450, G500 and G550 aircraft.

JOHANNESBURG, SOUTH AFRICA:

ExecuJet refurbished the interior and exterior of a Beechcraft King Air B200 for the South African Air Force.

HAMBURG, GERMANY:

The Lufthansa Technik Group accepted 157 young people onto traditional or dual-study training programs. The company also installed split scimitar winglets on a BBJ.

CAHOKIA, ILLINOIS, USA:

Jet Aviation St. Louis signed an agreement to certify and install the SmartSky 4G LTE-based internet system on the Global Express platform. It also received parts manufacturer approval from the FAA and is performing maintenance on three Embraer Lineage jets.

INDIANAPOLIS, INDIANA, USA:

Comlux America completed an ACJ320 designed by Comlux Creatives in partnership with InFlight Cabin Solutions, the customer's design representative. The company also appointed Philippe Karam as chief procurement officer and Johannes Seeger as head of MRO programs.

BASEL, SWITZERLAND:

AMAC Aerospace completed its first BBJ 747-8i, following a two-year downtime. AMAC Aerospace also refurbished an ACJ319, adding new IFE, satcom systems and storage, and performing heavy base maintenance; completed a C check, cabin rectifications and avionics and satcom upgrades on another ACJ319; performed a C check and cabin modifications on an ACJ330-200; and reconfigured the cabin of a BBJ 3. It also signed for a BBJ 737-700 refurbishment and heavy base maintenance and cabin modifications on a BBJ 777-200.

BERLIN, GERMANY:

LBAS and OHS expanded their cooperation to offer a comprehensive maintenance and refurbishment program, including engineering.

GRAND JUNCTION, COLORADO, USA:

West Star Aviation welcomed a new paint and interior designer, Veta Traxler, and a new manager, Chad Adams, for its Bombardier Global program.

DALLAS, TEXAS, USA:

Associated Air Center (AAC) signed a green ACJ320 completion contract with a Middle East customer. The aircraft will be outfitted with CMS and the JetWave Ka-band satcom system. AAC also obtained 145 repair station certification from ANAC, and FAA STCs for controller-pilot datalink communication (CPDLC) systems on a BBJ 757-200 and a BBJ 737-300.

CLEVELAND, OHIO, USA:

Constant Aviation completed its 30th 96-month inspection of an Embraer Legacy 600. The company also opened a Center of Excellence for Beechjets.

WICHITA, KANSAS, USA:

Air Capital Interiors received an FAA repair station certificate.

BASEL, SWITZERLAND:

Jet Aviation Basel signed contracts to install Rockwell Collins' Pro Line 21 upgrade on a Dassault Falcon 2000 and a Falcon 2000EX. The company also received maintenance approvals for Dassault Falcon aircraft from authorities in Gabon and Namibia and received EASA Part 145 approval for the BBJ 787.

AMSTERDAM, THE NETHERLANDS:

JetSupport added Dassault Falcon 900EX type approval to its maintenance capabilities.

TULSA, OKLAHOMA, USA:

Thomas Kuhn has become president and CEO of Lufthansa BizJet International.

DUBAI, UAE: ExecuJet's Dubai repair station was awarded FAA certification, having demonstrated compliance under FAR 145.

ZURICH, SWITZERLAND:

Jeremy Remacha was appointed as SR Technics' interim CEO.

COLUMBUS, OHIO, USA:

Spirit Aeronautics expanded its FAA-approved capabilities list with additional airframe ratings.

SINGAPORE: Jet Aviation Singapore began its first Bombardier Global Express 8C inspection, in conjunction with an interior refurbishment.

ERFURT, GERMANY:

HAITEC Aircraft Maintenance was granted approval to perform Part 145 base and line maintenance on G650 aircraft.

BORDEAUX, FRANCE:

Pascal Jallier became vice president of Sabena technics' VIP completion programs.

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CLUB RULES

A new breed of luxury hotels in London, Savile Row elegance and business clubs provided the inspiration for this concept for BBJ or ACJ narrow-body aircraft. Mayfair was developed by Andrew Winch Designs and unveiled at ABACE 2015. Jim Dixon, head of aviation at the company, says the aim was to create an “arresting” and “youthful” aesthetic.

The club influence is clear, as there is a big emphasis on social interaction in the cabin. There is a table that can be used for games, a bar and a cinema area that Dixon says is ideal for karaoke. Including the crew rest, the aircraft features 19 seats that are certifiable for taxi, take-off and landing; 10 of these provide berthing.

There is a lot of visual contrast in the cabin. Light and dark areas help to define the space, and the curving shapes of the divans and seats are offset by the linear patterns that are used throughout.

Finishes include high-gloss dark veneers, golden onyx, Qing upholstery (see *Colors*, right) and satin almond gold fixtures – but these are all customizable. A key aim on this project was to offer customers the benefits of a pre-prepared design, while enabling them to personalize the aircraft’s materials and detailing. There are also aspects of the layout that could be modified if requested – for example, the master bedroom and bathroom are interchangeable.

“One of the key advantages of Project Mayfair is that it will offer clients their own design, but also a reduction in the cost to buy, engineer and design, and a short turnaround time from purchase of a green aircraft,” says Andrew Winch, founder of Andrew Winch Designs.

Winch says particularly challenging issues have been ironed out. “We’re hoping to get a client to build it as the design is very feasible and the materials are adaptable,” he says.

LINES

A linear pattern is repeated on the carpet, ceiling panels, tables, seatbacks and the livery, giving the aircraft a cohesive theme.

COLORS

The designers used a light turquoise color that is called Qing in Chinese culture, and is associated with nature and renewal, implying vitality. Color is used to divide the aircraft into zones without using bulkheads.



GUIDED TOUR

GALLEY

The galley is equipped with an open induction hob and extendable work surface. Opposite is a crew rest area with a berthing seat. The crew rest can be closed off for privacy. There is also stowage for large items of luggage.

DINING AREA

A large circular dining table is surrounded by a semi-circular divan and three single seats. The table folds to form a games table. There is also a fixed 42in monitor and stowage for dinnerware in this area.



LOUNGE

A social lounge is created by positioning two divans (one L-shaped) and a single seat around a hi-lo extending table.

BAR

The bar area is visually defined as a separate area by its more intimate (less bright) lighting. The bar is spot-lit by a 'skylight' above.

GUEST BATHROOM

This has a central position for optimized access. Opposite is a luggage closet.

CINEMA LOUNGE

A U-shaped divan opposite a hi-lo 42in TV creates a cinema space. The space also has two single seats and a fold-out table, so it can be used as an office or lounge. Further to this flexibility, the divan can be made into a double berth, creating a guest bedroom.

MASTER SUITE

As well as a double bed, the master bedroom is equipped with a private desk and dressing table, wardrobe and fixed 42in TV. The adjoining master bedroom features a large shower.

CONTACT:

www.andrew-winch-designs.co.uk

GOLDEN ONYX

The bar's countertop features golden onyx, illuminated from beneath to create the main focal point in the aircraft. Andrew Winch Designs says the color could be adapted if required.



workingwith STONE

A cabin designer and an artisan discuss how to get the most out of this beautiful natural material, without incurring a weight penalty



THE ARTISAN

Bernhard Steinbauer,
director of production
management for stone, F/List



THE DESIGNER

Jacques Pierrejean,
design office manager,
Pierrejean Design Studio



THE ARTISAN: BERNHARD STEINBAUER, DIRECTOR OF PRODUCTION MANAGEMENT FOR STONE, F/LIST

WHAT STONE PRODUCTS DO YOU OFFER?

Our stone flooring can be used throughout the cabin, including wet areas, and can incorporate inlays such as marquetry and logos. We also offer stone veneer, which can be used for countertops in galley and lavatory areas, wet areas including lavatories and showers, tabletops and credenza tops, partition walls, armrest plates, handrails, inlays and other applications.

WHAT TYPES OF STONE ARE SUITABLE FOR USE?

It depends on the application, but most types of stone can be used. However, the stone needs to be qualified to meet the project's requirements, especially in terms of slipperiness, flammability and suitability for curved applications. In general, granite and some marbles are the most suitable; other types of stone require more attention. We source our raw material from around the world, through a dedicated and qualified stone supplier who, after years of working with us, knows the high standards we demand from the raw material.

WHAT PROCESSES DO YOU GO THROUGH TO PREPARE STONE FOR INSTALLATION?

It all depends on finding the right stone that pleases the customer. Depending on the final product, the first step for stone flooring is a live-sample stone catalog with HD pictures of various types of stone. The customer can choose from this catalog or request a second catalog focusing purely on a specific stone type. The catalog shows the exact stone slabs reserved for the project.

Real stone is a natural product and even within the same type, veins, slight variations of color and inclusions (material trapped inside the stone) are possible from one slab to the next. The live sample pictures can also be visualized with the contour of the floor layout, so we can show the customer the final appearance even before production has started.

The next step is to transform the stone into ultra-thin layers, depending on the project requirements. In general this is standard stonemason work in conjunction with special engineering to meet aircraft qualification requirements.

Our craftspeople use classic tooling, together with CNC and waterjet technology. Finally, we offer polished, brushed, honed and sandblasted finishes – which are achieved with special tooling – or high-gloss varnished surfaces. These surface finishes can also be combined with inlay work or mosaics.

HOW ARE YOUR PRODUCTS INSTALLED?

F/List's goal is always to provide a plug-and-play solution. The final installation is usually not in our scope of work, but we can provide on-site supervisory support, on customer request.

WHAT IS CHALLENGING ABOUT STONE?

Stone is not as predictable as artificial surfaces; its formation took millions of years and every stone has its peculiarities. A lot of time and research is necessary for every customer request. Our long-term experience helps, but you can never generalize from one stone type to another.

HOW DID YOU GET INTO THIS ROLE?

I joined F/List as a cabinet maker in 2005. Eight years later, and as a master craftsman, I wanted to try something different and broaden my skills. A position in the stone department became vacant and I took the opportunity to learn about this great material. This was around the time that the program graduated from pure research and development into real projects. Now I lead a whole production unit. We produce and deliver more than 40 stone floors a year, and just as many other projects, including stone countertops, stone inlays, mother-of-pearl inlays and shower panels.

WHAT DO YOU LOVE ABOUT WORKING WITH STONE?

I love seeing what beautiful things Mother Nature is able to produce and finding out how each stone reacts to different treatments. As we are committed to fulfilling all our customers' wishes and no stone is like another, everyone in the team is required to learn, research and develop new solutions constantly. It makes me proud that we have been able to satisfy customers on more than 150 stone flooring projects so far.

1. A slab is inspected for quality
2. Waterjet cutting
3. Stone polishing
4. Finished parts for a stone veneer countertop



1



2



3



4



THE DESIGNER: JACQUES PIERREJEAN, DESIGN OFFICE MANAGER, PIERREJEAN DESIGN STUDIO

IS STONE GROWING IN POPULARITY FOR VIP JETS?

Many of our customers – across all cultures – are extremely fond of this material. It feels luxurious – even more so in an aircraft interior, where it is unusual because of its apparent weight.

HOW HAVE YOU USED IT IN YOUR DESIGNS?

We used to use marble only on furniture. For example, for the countertop of the lounge bar on Emirates' A380 we used a beautiful stone cut very thinly and integrated illumination on the back. Then we extended the use of stone to floor coverings, for example on an ACJ340. On one of our latest projects, a BBJ 747-8, we applied stone on furniture, walls and bulkheads.

WHAT IS CHALLENGING ABOUT USING STONE?

With the support of specialists, who are now able to cut the stone very thinly, using stone on an aircraft is not as challenging as it was a few years ago. The challenge is to find the right aesthetic balance in your material selection. Each material will highlight the others, and combined they should offer an original aesthetic that is sophisticated and trendy. If we want to use stone, we take the time to create a palette of complementary materials such as metal, leather, wood or even, as on our latest realization, cashmere.

SHOULD STONE BE A FOCAL POINT OR BLEND IN?

How you use stone will depend on the aircraft; it will be not the same for a business jet as for a narrow- or wide-body aircraft. On some projects it makes sense to apply stone as a focal point, but we usually prefer to use it as an accent. The concept has to be balanced.

WHAT DO YOU FIND ATTRACTIVE ABOUT STONE?

All natural materials are very attractive to me. Stone comes from the ground and there are deep psychological feelings and cultural connotations attached to it. It is a strong material, and is available in an extremely large variety of beautiful colors and amazing patterns. It is hard to imagine all the choices we have. Each piece of stone is unique and could be considered a piece of art in its own right.

IF YOU WERE DESIGNING YOUR OWN JET, WOULD YOU USE STONE?

I like the contrast between cool and warm materials, so I would be interested in looking for some special, exclusive stone with an unusual sophisticated pattern and beautiful mixed colors. This, combined with soft, warm materials, would create a unique atmosphere on board.

5-7. Concepts incorporating stone, designed by Pierrejean Design Studio



5



6



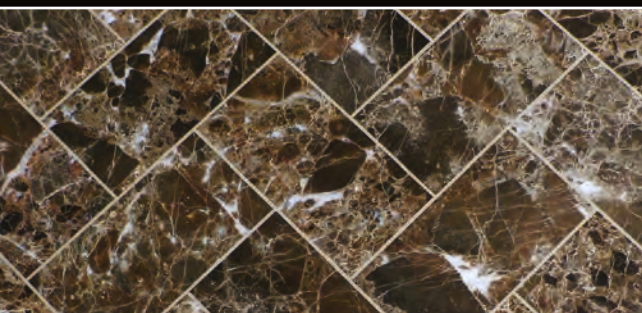
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Photo courtesy of Dassault Falcon Jet.



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pastglories

A Douglas DC-6 is being rebuilt and offered for shared ownership, with a modern/retro cabin designed by yacht specialist Bannenberg & Rowell

In 2008, a DC-6 built in 1958 landed at the Goodwood Revival. The vintage car race meeting is held every year at the Goodwood Circuit in the UK, and includes a static display of historic aircraft.

“By a considerable margin the largest aircraft ever to land at that famous grass aerodrome, the DC-6 drew an appreciative crowd and several inquiries about VIP charter,” says Julian Firth, director at Cloudmaster, a company founded to transform the DC-6 for VIP service. “It occurred to us that a full restoration for exclusive passenger service was the perfect continuation of the aircraft’s extraordinary career. Our founder had

commissioned the DC-6’s first rebuild when he returned her to the UK from Yemen in 1987. In addition, I have a lot of experience operating the type, having overseen the introduction into service of the only other DC-6 operated privately and restored to a similarly high standard.”

The pair teamed up with the chief engineer on that other DC-6 project, and Cloudmaster was founded.

Sympathetic restoration The aircraft will undergo a comprehensive restoration, and a new cabin has been designed. Cloudmaster chose Bannenberg & Rowell, a company particularly well known for its work on yacht interiors, to design the cabin. The

1. The 1958 DC-6 will be fully restored





Service history

The DC-6 that Cloudmaster is rebuilding was ordered by Canada's Maritime Central Airways, in 1958. Completed in June 1958, it was bought just three months later by British independent carrier Eagle Airways and started operations in 1959 as G-APSA.

After a successful career with Eagle, later British Eagle, G-APSA was sold to Saudi Arabian Airlines and then Yemenia. Returned to the UK in 1987 and restored by Instone Air Line, it then flew under commercial charter until 2004. In later years it performed in films and at airshows, first in the livery of KLM then, in its 50th year, returning to its British Eagle livery of 1960. G-APSA passed to Cloudmaster in 2012.



brief was to create something contemporary yet evocative – offering the comfort, entertainment and connectivity demanded in the VIP jet sector – but remaining true to the era of classic piston airliners.

“We admired Bannenberg & Rowell's work on the refurbishment of Donald Campbell's 1938 yacht Blue Bird, and on several highly individual contemporary projects,” says Firth.

“When Julian and his team first approached us they referenced what we'd done for our rebuild of Blue Bird,” says Dickie Bannenberg, company leader at Bannenberg & Rowell. “They liked the way we had rebuilt the yacht's interior and kept the spirit of the original era, but nevertheless, achieved a thoroughly modern interior. We have applied the same philosophy to Cloudmaster.”

Vintage enthusiasts There was considerable enthusiasm in the design agency's London offices. “For a studio of car and aircraft petrolheads,

anything designed in 1958 is going to cause a lot of raised pulses,” says Bannenberg. “But I hope we resisted the temptation to just dive into the period and produce either a re-creation or an obvious pastiche. We would be mad, though, not to reference the era in our new design, so there are some judicious nods toward the look and feel of the *Mad Men* vibe, and Sean Connery's poise and tailoring.”

“The real heyday for this aircraft was the early 1960s, with Eagle Airways and its successors,” says Firth. “This was a period of tremendous social change and exceptional style. We

WE RESISTED THE TEMPTATION TO PRODUCE EITHER A RE-CREATION OR AN OBVIOUS PASTICHE

2. Passengers entering the aircraft will come straight into a reception/bar area
3. The VIP cabin, which has a bunking divan

wanted a northern European, even British, vibe, and chose a modernist ethic exemplified by the early Bond films, Danish furniture design and Scandinavian architecture. We think they've captured the mood exactly.”

Seventh decade Firth is keen to point out that the DC-6 is capable of delivering passengers to New York in time for a show having breakfasted in London. This capability aside, there must be challenges in converting an aircraft soon to enter its seventh decade of service. “There are considerable challenges in conducting a restoration at this level, but we understand what's required and have the experience to achieve it,” says Firth. “The aircraft is of great assistance, because it's such a good design in the first place, while all the basic materials remain in production, the supply of spares is secure, and the design is still supported by the manufacturer, now Boeing.”

“The beauty of the aircraft is its scale and heritage,” says Bannenberg.

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DESIGN IN BRIEF

Under commission from Tara Getty, Bannenberg & Rowell designed a spectacular interior for Blue Bird, a 1938 motor yacht originally built for Malcolm Campbell. The vessel subsequently provided inspiration for the Cloudmaster DC-6.

LAYOUT: The rebuild was not planned as a restoration, little of the original 1938 fit remaining. Instead the emphasis was on creating an optimized interior “with a sophisticated and fresh reinterpretation of 1930s and 1940s design language”, says Dickie Bannenberg. “It had to work for a family with two young children who, while conscious of the yacht’s heritage, were not hung up about its correctness.”

NEUTRAL PALETTE: A limited selection of veneers, based on American Black Walnut and accented with Macassar Ebony and Zebrano, forms the cornerstone of the yacht’s interior palette. Colorful fabrics were avoided so that the upholstery might work with the vessel’s architectural detail and color scheme to complement the owner’s art collection.

DETAILS: As well as custom nickel metalwork, Bannenberg says details include “door handles recast from original 1930s Belgian molds and Bannenberg-designed picture lights and bathroom light fittings”.



“There is certainly no compromise.” For the cabin design, the major challenge was the shape of the space. “However, the discipline of working within a given structural envelope and associated mechanical and electrical services is very similar to yachts,” says Bannenberg. “Unlike Blue Bird, comprehensive ‘as-built’ drawings exist for the DC-6, although we took the precaution of sending two of the team to survey the stripped-out aircraft and take measurements to double-check frame locations and windows in particular. We went through many layout iterations with Julian to achieve the best balance of seating – both in terms of grouping and function: having a meeting, dining, chilling or sleeping.”

Cabin configuration The layout has been designed for optimum comfort and utility on missions ranging from a short VIP excursion to a transatlantic corporate charter. The private VIP cabin, which includes a bunking divan for two people, is immediately aft of the flight deck. Following this is a conference area with club four and club two seating. Aft of this is a sleeper lounge, again with club four and club

4. The conference area, which immediately follows the VIP cabin

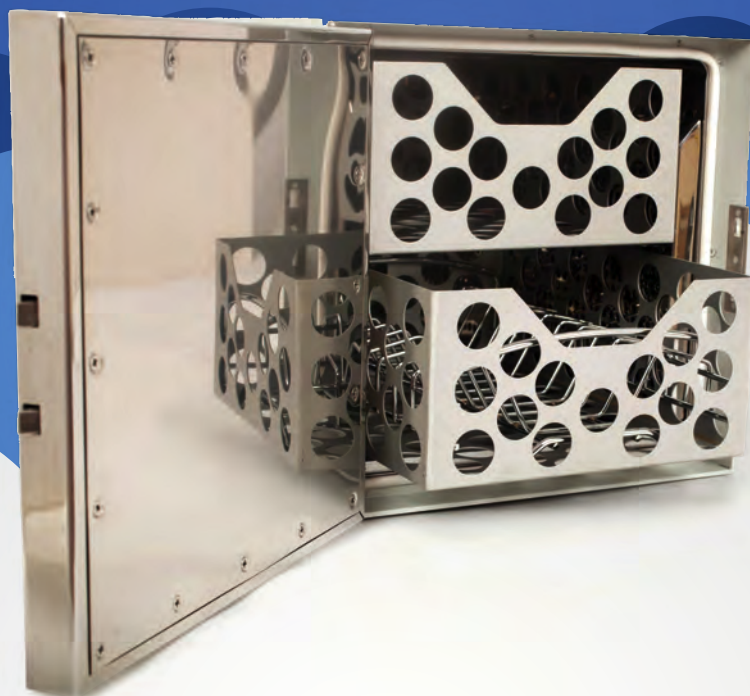
two seating, all of which recline to lie flat. Following this is an entertainment lounge with a club four and another bunking divan for two; the central reception and bar, where passengers will embark and disembark the aircraft; a lounge with club seating for four; a galley equipped with microwave and convection ovens, plus a coffee maker; and a washroom including shower.

The aircraft’s capacity is 28 seated passengers, or 13 sleeping ones.

Suppliers can’t be identified at this stage, but Bannenberg reveals a little of what’s expected of the interior equipment. “Seat design is something we have paid particular attention to, but the guts of it will be an established and approved unit,” he says. “We made a deliberate decision to treat windows



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5. The aircraft has 28 passenger seats

SEAN CONNERY'S TAILORING FROM THE EARLY BOND FILMS PROVIDED COLOR AND TEXTURE INSPIRATION



Cloudmaster DC-6

Cabin width: 9ft 11in

Cabin height: 6ft 12in

Cabin length: 69ft

Seats: 6 crew + 28 passengers

Range: 3,600 nautical miles at 240kts with IFR reserves

High-speed cruise: 260kts

Max altitude: 20,000ft

Price: Approximately US\$4.21m per share, US\$33.68m for the whole aircraft

in pairs visually. We also devised a graphic based on the aircraft's silhouette, for use on the bulkhead storage unit, while Sean Connery's elegant tailoring from the early Bond films provided color and texture inspiration for the interior palette."

IFEC equipment will include a flight information and conference system, digital audio and HD video equipment, LCD screens, a wireless local area network, power outlets and a satcom system. Passengers will be able to control aspects such as lighting and window shades through tablets.

Shared experience The aircraft will be completed in the UK and offered for shared ownership. According to Firth, the scheme is neither timeshare nor fractional ownership as generally

understood. "Use of the aircraft is expressed in days rather than hours, facilitating longer cruises over several days without restricting the aircraft's utility for shorter trips," he says. "Cloudmaster believes there are advantages to shared ownership – maximizing aircraft use while minimizing costs to the individual, and in addition, the companionship of a highly exclusive group of like-minded individuals. We created a convenient system of utilization and operational management so that the individual owner is likely to experience similar access whether he holds one share or several. And the aircraft will also be available for charter, offering the opportunity to offset some of the costs of ownership."

History repeating The Cloudmaster DC-6 will offer a combination of history and modern equipment. Will it remain a one-off? "We are already considering our next project," reveals Firth. "Another DC-6 would be possible, but there are also other interesting aircraft requiring attention. We wouldn't rule out a Cloudmaster interpretation of a modern type." **END**



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With the aim of targeting the very top of the fractional market, Flexjet is making big investments in new and improved interiors





When fractional private jet provider Flexjet changed hands from Bombardier to Directional Aviation Capital (DAC) in 2013, its new owner had distinct ideas of what to do with the company. DAC already owned another fractional company,

Flight Options, which was positioned in the market as the value provider, and for the most part remains so today, with older aircraft and a stronger emphasis on affordability. DAC's chairman, Kenn Ricci, wanted to position Flexjet at the very top of the market – as a truly premium brand.

To achieve this, massive investment has been made in new aircraft. Indeed,

1. A Global Express LXI in the Deco scheme

2. The Walnut LXi design for the G450 features a high-gloss black walnut veneer on the sidewalls
3. A Learjet 75LXi with Graystone interior

a US\$5.2bn order for up to 245 new Bombardier Challenger and Learjet aircraft – a firm order for 85 aircraft and options for another 160 – was announced at the time of the acquisition. Then in October 2014, Flexjet placed its first-ever order with Gulfstream, for up to 50 aircraft – a mix of G450, G500 and G650 types.

Customized interiors It is adding aircraft fast – and by the end of 2015, the fleet should approach 100 aircraft. Flexjet worked with both OEMs to craft customized interiors for these Bombardier Learjet 75s, Bombardier Challenger 350s and Gulfstream G450s. The interiors are branded as the LXi cabin collection. Flexjet also fitted the interiors on several of its current aircraft, to test out the concepts. Its

WE DECIDED TO RECONFIGURE THE LEARJET 45s FROM EIGHT TO SIX SEATS



Red Label

The LXi interiors will be the most important selling point of Red Label, an upscale service Flexjet plans to roll out later in 2015.

Red Label customers will have access to LXi aircraft that will only be used for fractional operations, with no more than 10 owners per aircraft, and which will fly a limited number of hours per year, with dedicated crew.

All Red Label aircraft will have LXi interiors, but not all LXi aircraft will be used for Red Label.

Christopher Bero, vice president of global marketing at Flexjet, says Red Label customers will also have access to premium perks including exclusive events, VIP lounges, luxury ground transportation and custom catering. “Our tagline is ‘You won’t just be flown, you’ll be moved’,” says Bero. “We’re looking at what the luxury owners at the top of the fractional chain really want.”



sister company, Constant Aviation, carried out the refurbishments.

Light refreshment The LXi development began with the Learjet 75. “The problem with all light jets is that there is this quest to have as many seats as possible,” says Ric Michaels, director of product development for OneSky, the umbrella entity for Flexjet, Flight Options, Sentient jet cards and Skyjet Charter. “Our Learjet 40s and Learjet 45s are wonderful aircraft – fast, well-equipped and high-performance – but they always seem just a little bit crowded, especially when every seat is taken. And then you run into baggage limitations and typically also range payload limitations. With full seats you can’t necessarily take full fuel, so it is always a compromise when the cabin is taken to its maximum seating capacity. We decided to reconfigure the Learjet

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4. A Global Express LXi with the Manhattan design, which is intended to resemble a New York City apartment
5. The Graystone LXi interior for the Learjet 75 features a distressed leather with a suede feel to it

4

FLEET IN NUMBERS

4

super-light types – Bombardier Learjet 40XR, Learjet 45LXi and Learjet 75LXi; and Embraer Phenom 300

3

mid-size and super-mid-size types – Bombardier Challenger 300 and Challenger 350 LXi; and Embraer Legacy 450

3

large types – Bombardier Challenger 604 and 605; and Gulfstream G450

3

ultra-long-range types – Gulfstream G500 and G650; and Bombardier Global Express

45s from eight to six seats. In doing so a unique platform was created, engineered by Bombardier/Learjet and type certificated for our use as the Learjet 75LXi.”

Denuding the Learjet 75 of two seats in the main cabin produces more than a foot of additional legroom for the front two seats and another 6in of legroom in the club-four single seat arrangement behind. “We’ve also really opened up the aircraft’s useful load,” says Michaels. “It rarely has an issue with full fuel and full seats and we’ve really opened up the space.”

There is a sliding pocket door to separate the entryway, cockpit and galley from the main cabin – intended

to enhance passenger privacy and lower cabin noise. The forward two seats are fitted with leg rests and a recline function. Immediately in front of them are two Blu-ray-equipped monitors fitted to the forward bulkhead. In addition, there are HD monitors at each seat position. The aircraft is equipped with a version of Lufthansa’s nice CMS/IFE system, plus high-speed internet and a wireless telephone interface.

The cabin itself has a whole new look. “Learjet designed a new sidewall panel for us and a new window reveal that has some contours that make the sidewall much more appealing,” says Michaels. There is also a new siderail and a new LED lighting system. To accommodate a larger starboard galley, the front closet was moved port-side. The galley is equipped with a single-serve coffee/espresso machine.

Soft focus For the soft goods there are three variations. Graystone features rich grays against a dark walnut veneer; Tuscany has an ostrich-embossed leather in a reddish brown, offset by a satin eucalyptus veneer; and Loredo is a lighter brown and tan scheme.

All of the new interiors feature a distressed leather that has a slight feel of suede to it. The seats’ French seam is outlined with a heavier, contrasting baseball stitch. Other ‘surprise and



5

delight’ features include eel skin treatments and paisley leathers. “You can add a lot of interest without making the interior look bright green or bright blue,” says Michaels. “We shouldn’t be that far out of the box.”

Test aircraft Flexjet tested the Learjet 75 interior concept by installing it first on existing late-model Learjet 45s – which have the same cabin cross-section as the Learjet 75 – at a cost of almost US\$1m per aircraft. “It was expensive and it took a lot of time and effort, but at the end we knew we had a winner,” says Michaels. “The Learjet 45s are indistinguishable from the Learjet 75s unless you know about the different avionics.” The company plans to continue to expand its Learjet fleet.

Family affair The LXi concept is being migrated to various Flexjet aircraft. For the Embraer Phenom 300s, there are two new interior themes – Cognac and Essex. Cognac features a warm gold with trim and accent veneer close in tone to mahogany, while the Essex seats feature gray leather with a cream-colored insert.

Flexjet has 35 super-mid-size Bombardier Challenger 300/350s in its fleet. All of these are configured with eight seats in a double-club layout, and have the optional larger galley with a single-serving coffee maker. For the

newer Challenger 350 aircraft, Flexjet came up with three cabin interior concepts – Thunderbird, Deco and Cognac – which are installed at the factory by Bombardier.

Cognac on the Challenger differs from that on the Phenom, says Michaels. “We use a red gum veneer in the Challenger version of Cognac,” he says. “It has a deep grain and looks spectacular with brown and gold and overall creates a very warm interior.”

Thunderbird is a bolder look that Michaels characterizes as “manly”, with high-gloss gray veneer, charcoal leather seats and deep oiled pewter plating. “If you like the interior of a BMW, you will like Thunderbird,” he says.

Young and pretty Flexjet is retrofitting its newer Challenger 300s with similar interiors called Lightning, Van Gogh and Carbon. Interestingly, Flexjet is only retrofitting the newer Challenger

300s. “It may sound counter-intuitive,” says Michaels, “but we are stressing our brand with new aircraft that are less than five years old. We want our newer aircraft to look brand new; it doesn’t make sense to refurbish an older aircraft at the end of its life.”

On the new Gulfstream G450s now joining the Flexjet fleet, the company went with different seat colors in each zone and added two more single seats opposite the mid-cabin divan to create a 16-seat layout, giving the big jet more utility and creating larger passenger grouping areas, including six seats around the dining/conference table in the aft of the cabin.

Flexjet has also considered how to keep its interiors fresh. It plans to replace fabric inserts and carpets more often than before. “I have carte blanche to replace and renew interiors as required,” says Michaels. “We consider aesthetics to be paramount.” **END**

I HAVE CARTE BLANCHE TO REPLACE AND RENEW INTERIORS

6. A Challenger 350 LXi outfitted in the Deco design scheme



Magic carpet

Carpeting plays a big role in all the new LXi designs. They all feature multilevel carved carpeting with lots of texture. “We use custom geometric carpeting,” says Michaels. “We think the carpeting needs to be clever; it’s a very important design element.”

The company orders an extra set of carpet with each aircraft and plans to replace it at least every two years.

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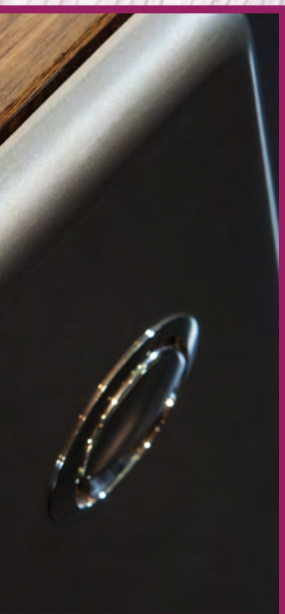


weightyissue

Companies across the industry have developed many ways to reduce weight in VIP aircraft cabins

One of the challenges in business and VIP aircraft cabin design is to keep weight down without compromising comfort. Operators want a low cabin weight so that the aircraft can take off with a maximum fuel and passenger/crew load.

“Making a long-distance trip without having to refuel also saves time,” says Michael Reichenecker, an aircraft interior architect at Lufthansa Technik. “In addition, VIP customers often belong to the global corporate



elite and the need to operate in an environmentally friendly, energy-efficient way does not stop when it comes to private transportation.”

Christian Schirlin, project manager at AMAC Aerospace, notes that for wide-body operators, range and payload are rarely concerns, but lightweight cabin architecture remains important. “There are center of gravity concerns that drive weight – the need to avoid concentrating too much mass in one area,” he says. “On a recent BBJ 747-8i completion we used lightweight techniques in certain areas where the

aircraft’s structure was not designed to support high loads. The customer needed to store weighty items in a particular area, so we reduced weight locally in that cabinet.”

Rethinking the classics Achieving a lightweight cabin is a challenge that can be met through careful design, new materials and technologies, and rethinking traditional techniques.

Hermann Furlinger, vice president of VVIP interior projects at F/List and CEO at Hilitech, says honeycomb has become the industry standard

lightweight material for cabinetry and other structures. Decorative surfaces including paint, veneer and carbon fiber can be applied on top. However, he believes there is still more weight to be saved. “F/List has developed a special process whereby raw-face veneer is applied directly onto the honeycomb substrate, instead of using the traditional three-ply veneer method. Also, a high proportion of the weight in a final cabinet originates from the use of potting compound – and we’ve developed a weight-saving potting process.”

1-5. Methods to cut weight include the use of new cabinetry techniques, composite materials and wireless IFE systems



F/List is also involved in creating some entirely new technologies. “Our subsidiary Hilitech specializes in developing lightweight aviation components in carbon fiber and other substrates,” says Förlinger. “It has a mold-based manufacturing process using a new material to create finished composite components without manually reworking them with filler. This enables us to create 3D shapes with less weight and more design possibilities. We also have innovative products like the F/List stone veneer and various flooring systems in wood, stone, leather and carbon fiber, developed with weight-saving as their most important goal.”

With new materials have come modern production techniques, some with foundations in traditional cabinet making, others highly evolved.

“Materials and methods have been modified for aircraft use and have little in common with the cabinetmaking craftsmanship that F/List started with in the early 1960s,” says Förlinger. “To satisfy our quality demands and the regulatory requirements of the aircraft industry, all production methods, including cutting, bonding and varnishing, have been refined and adapted, while materials like adhesives, flame retardants and varnishes have been modified.”

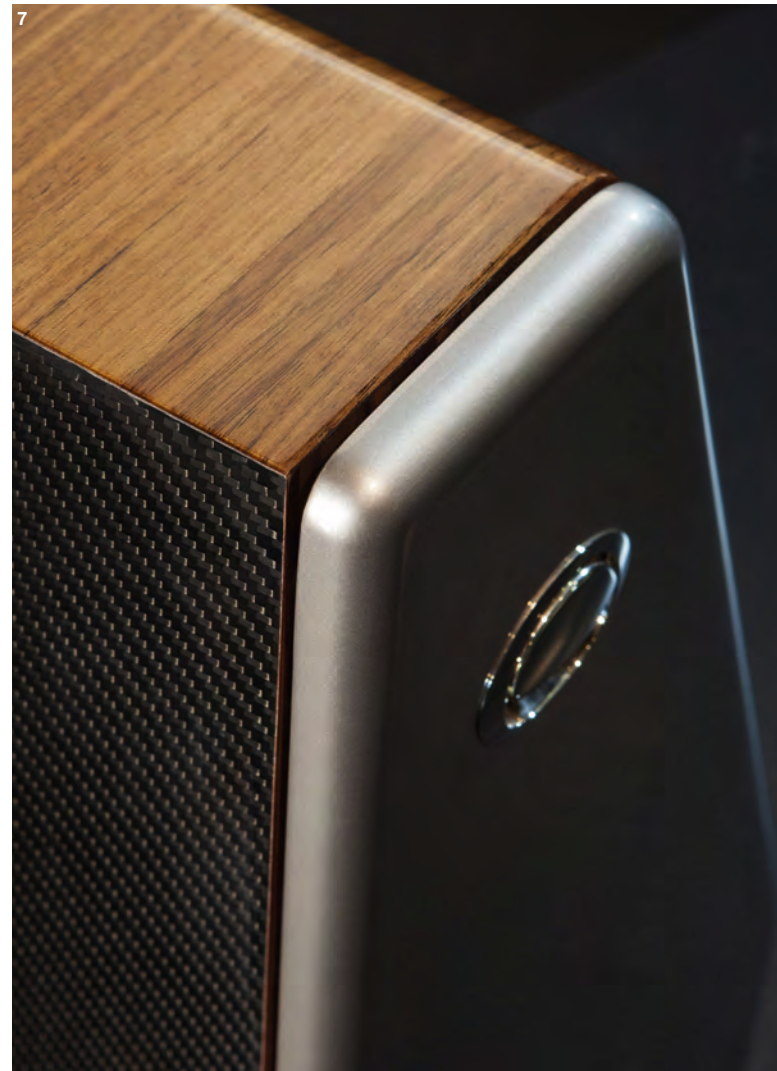
Carbon fiber Lufthansa Technik’s Reichenacker says carbon fiber is “the material of the future”, albeit one with challenges attached. “Carbon fiber definitely calls for new processing methods,” he says. “Working on any carbon parts demands careful attention. For example, since carbon

drill chips and carbon fiber dust are hazardous to the lungs, special vacuum procedures have to be considered.”

However, carbon fiber also offers advantages beyond a light weight. “In terms of structural rigidity, carbon fiber can surpass metals,” says Reichenacker. “Condensation is less of an issue as well. Pure carbon surfaces are definitely delicate, but can be coated with paint or veneer if so required.”

Christian Schirlin says AMAC Aerospace has faced the challenge of cabin weight becoming a threat to

CARBON FIBER CALLS FOR NEW PROCESSING METHODS



Seat savings?

Slimline structures and lightweight materials are making an important contribution to reducing weight in airliner seating, but are they applicable to business and VIP aircraft? “Lower density foam and lightweight synthetic leather may replace traditional materials, but cost increase will be more of a challenge when introducing lightweight materials into seat structural components, because of the lower volumes in the VIP seating market,” comments Pete Perera, vice president and general manager at Aero Seating Technologies. “The use of carbon fiber and other lightweight materials in the primary seat structure may also pose certification risks for dynamic testing.”

Airline seats are increasingly optimized to retain comfort while weight (and the space required for each seat) is reduced. Considering business aircraft applications, Perera says, “I believe it’s a possibility that requires further investigation to determine what the trade-offs would be.”

- 6. A 3D part made by Hilitech from composite material
- 7. Hilitech parts can be finished in various luxurious materials

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8



9

Lightweight BBJ 1 concept

In 2013 Lufthansa Technik debuted a lightweight BBJ 1 concept. Radically different in appearance from traditional VIP cabins, the somewhat minimalist design relies on lightweight materials and careful load distribution across the cabin floor. The latter is intended to contain the aircraft's center of gravity within a limited range, reducing the need for trimming and maximizing fuel efficiency.

In designing the cabin, Michael Reichenecker says his goal was to enable a maximum range of 6,100 nautical miles. This requires all nine auxiliary fuel tanks and reduces the payload available for the cabin, eight passengers and their luggage to a maximum of 12,500 lb. For optimal flight efficiency he positioned the heaviest monuments – including the galley – aft, their position influencing the overall floorplan.

He also looked to derive as much function as possible from cabin elements so that, for example, some surfaces and structures double up as lighting installations. Carbon fiber seats developed by Lufthansa Technik and the Pierrejean Design Studio are intended to reduce weight without compromising comfort. The same material is used in the wall panels, which mask the aircraft's structure and cover its soundproofing material, but without an inner panel. A spine along the aircraft's ceiling is designed to reduce structural weight, providing an attachment point for wall and lining components, while room dividing elements double as storage units.

range, and has approached the problem without recourse to lightweight materials. "We begin decreasing the number of inserts and the number of pins, testing each time we take one away," he says. "We test until they break, which helps us to define a borderline. Normally, a cabinet might have perhaps 20% strength in reserve, which means you can reduce weight by making it 20% less strong, but then you perhaps have to test on a cabinet-

8-9. A lightweight, long-range BBJ 1 concept by Lufthansa Technik
10-11. AMAC prefers to reduce weight in cabinetry through the way it is put together, rather than the materials used

by-cabinet basis. If you're building a series of similar cabinets you can build them to the lowest weight standard."

3D printing Through its precise application of material, 3D printing can potentially offer benefits in the manufacture of lightweight components. But Lufthansa Technik's Reichenecker says the technology is relatively immature. "It basically enables infinitely complex forms, but

at the moment it's limited by the maximum printer size," he says.

Furlinger says the technique is not a big focus at F/List at the moment. "The quality is not good enough for visible parts and substructure components are too expensive to manufacture," he says. "Furthermore, there are only a few types of plastic available that meet the flammability requirements, and the size of parts you can create are too small for furniture components. Nevertheless, we are testing and we will see what the next developments bring."

Flammability regulations are a challenge for all materials. Production techniques and materials are modified to meet the requirements and typically, as at AMAC Aerospace and F/List, completion/cabinetry centers maintain flammability testing laboratories.

Schirlin says that AMAC Aerospace's lab is always busy, testing materials on a case-by-case basis. "We aren't doing serial work here," he says. "In the commercial world materials might be qualified in batches of five or 10 shipsets, but we're a completion center



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THE MOST BEAUTIFUL, FLAWLESS SURFACES CAN BE APPLIED TO LIGHTWEIGHT SUBSTRUCTURES

and have a one-shot requirement. But we already use 3D printing, creating lightweight parts suitable for aircraft use and replacing components that might otherwise be in heavier material, such as resin, for example.”

Aesthetic imperative While materials have become lighter, there has been no tolerance for reduced aesthetic quality. “The most beautiful, flawless surfaces can be applied to lightweight substructures,” comments Furlinger. “Finishes like real stone, wood veneer, leather, mother of pearl and metal, or even inlays and mosaics, are possible. Many complex designs are realizable, although there are limits owing to technical issues and/or requirements and regulations.”

Surface materials are chosen for their type, but typically also for their quality within that type. Wood veneer

might be chosen for a particular grain, and a center completing a VVIP cabin typically sources enough wood from a particular tree to finish the cabin and have stock for subsequent repairs or additional features. The same is true of lightweight carbon fiber finishes. “We go to the carbon fiber factories and select the grain and roll,” says Schirlin. “We also look at the color, because some batches are more gray and others are closer to black.”

There are other weight savings to be had beyond the use of lighter materials. In some cases, technological improvement has delivered a weight saving almost as a bonus. For example, a wireless connectivity system saves on traditional cabling. There is no single source of weight reduction in the majority of cabins, but the result of cabin-wide techniques can produce startling results. **END**

Long-range ACJ319

In May 2015, Airbus Corporate Jet Centre (ACJC) delivered a new ACJ319 for an Asian customer. Weight was a big factor in the design, as the aircraft had to be capable of flying 19 passengers from Northern Asia to Los Angeles, USA.

The aircraft includes a crew rest area, double office and lounge, dining area and VIP bedroom with en-suite bathroom and shower.

ACJC says it achieved a cabin that is 10% lighter than contracted, largely through the use of “new composite-based cabinetry, such as carbon fiber tables for the dining area”.



13

12



12-13. ACJC saved weight on this ACJ319 through composite-based cabinetry and wireless IFE

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thelongrun

K5-Aviation and 28 East designed Vertis Aviation's new ACJ319 to be beautiful, to stay that way, and to deliver an exceptional range

In April 2015, a third ACJ319 joined Vertis Aviation's charter fleet. Its cabin is the result of close cooperation between aircraft management company K5-Aviation, program manager 28 East (a joint venture between K5 and Vertis) and cabin outfitter Fokker.

28 East was responsible for purchasing the green ACJ from Airbus and managing its subsequent completion. But its involvement even extended to the design, as Luca

Madone, a partner at 28 East, and Erik Scheidt, director at K5, decided to design the cabin between them. The overarching aim was to create a beautiful and lightweight cabin, within a tight timeframe.

"None of us has a design background as such, but we all have an aviation background," says Madone. "We also had support from Erik's wife Tanja, who has a very good eye for design. We chose not to work with a designer because the completion had to

be ready in a very short timescale and it needed to be very light. Also, we are always very much involved in the selection of suppliers and materials, so we decided to do it all ourselves. That doesn't mean we'd always decide to do it that way, but for this particular project it was right."

Flexible interior Scheidt and Madone worked together every day for a year to design their perfect cabin, usually via telephone and email.



1. The ACJ319's third compartment, a lounge featuring a berthable divan



Beauty that endures

All the materials and finishes have been chosen carefully, bearing in mind the aircraft's charter mission. "The interior color scheme is very light in general, but we chose a carpet with a degree of darkness so that it is less sensitive to stains," says Luca Madone of 28 East. "The leather has been specially impregnated to give it maximum resistance to stains, within the limits of flammability requirements."

All the aircraft's leather is from Foglizzo, while Tisca Tiara supplied the hand-tufted carpet and divan fabrics.

THE AIRCRAFT IS IDEAL FOR ROYAL FAMILIES, HEADS OF STATE, OTHER VIPs AND CORPORATE FLYERS

At the front of the aircraft is a flexible space made up from two compartments that have been opened up to operate as one area. Scheidt and Madone were initially unsure how the space would look. "But it's amazing; it makes the cabin seem much more spacious, and the compartments can still be separated by a large curtain for maximum flexibility," says Madone.

The area is used primarily for dining, but can be turned into a sleeping area for 12. "All the seats become lie-flat beds and remain fully accessible," says Madone. "The tables can also be removed and the space used as a lounge area. Finally, there is the option to remove the tables and move all the seats into a forward-looking arrangement similar to first class. This is an interesting choice for corporate flying."

The third compartment features a lounge with four single seats, a divan and two removable ottomans. "The divan can be transformed into a 220 x 200cm bed," says Madone. "The bed is certified for take-off and landing, so the compartment can be prepared as a full bedroom before departure if desired."

Compartment four features a second lounge and a cinema room. "A 55in LCD screen is mounted opposite the corner divan, on the largest partition wall in the aircraft," says Madone. "The corner divan turns into a bed that can be rotated slightly for access from both

sides. It's a 180 x 200cm king-size bed and is also certified for take-off and landing." Aft of this compartment is an en-suite shower room.

Sleeping arrangements The flexibility of the aircraft means that it sleeps the same number of passengers as it seats – 19. Madone is very pleased with the modularity. "You can have the aircraft in full VVIP fit in lounge configuration, or with two bedrooms," he says. "The configuration also offers proper table dining for 12 passengers, or corporate seating for 12. So the aircraft is ideal for various groups – royal families traveling with an entourage, heads of state, other VIPs and corporate flyers."

The IFE, CMS and connectivity system was supplied by Alster Aero. Scheidt designed the installation. "It's

2. The carpet, supplied by Tisca Tiara
3. Foglizzo provided all the leather
4. Functions including lighting can be controlled via CMS
5. Onyx adds to the VIP look
6. There is a shower room at the very aft of the aircraft



LAN-based," he says. "This makes it extremely lightweight and means that no cabin space is wasted with servers or computers, because it's all in the aircraft's electronic compartment."

As well as wi-fi, there are multiregion DVD players and AVOD. The whole system is HDMI. Views from two cameras – one on the tailfin and one on the belly of the aircraft – can be viewed on any screen in the cabin.

The CMS controls all the expected features, including window shades and the B/E Aerospace cabin lighting, but also the power outlets, humidification system and additional heaters. There is a central operator's panel, but there are no local switch panels, which Scheidt describes as "ugly panels you typically see in seats". Instead, every seat features a personal touchscreen.



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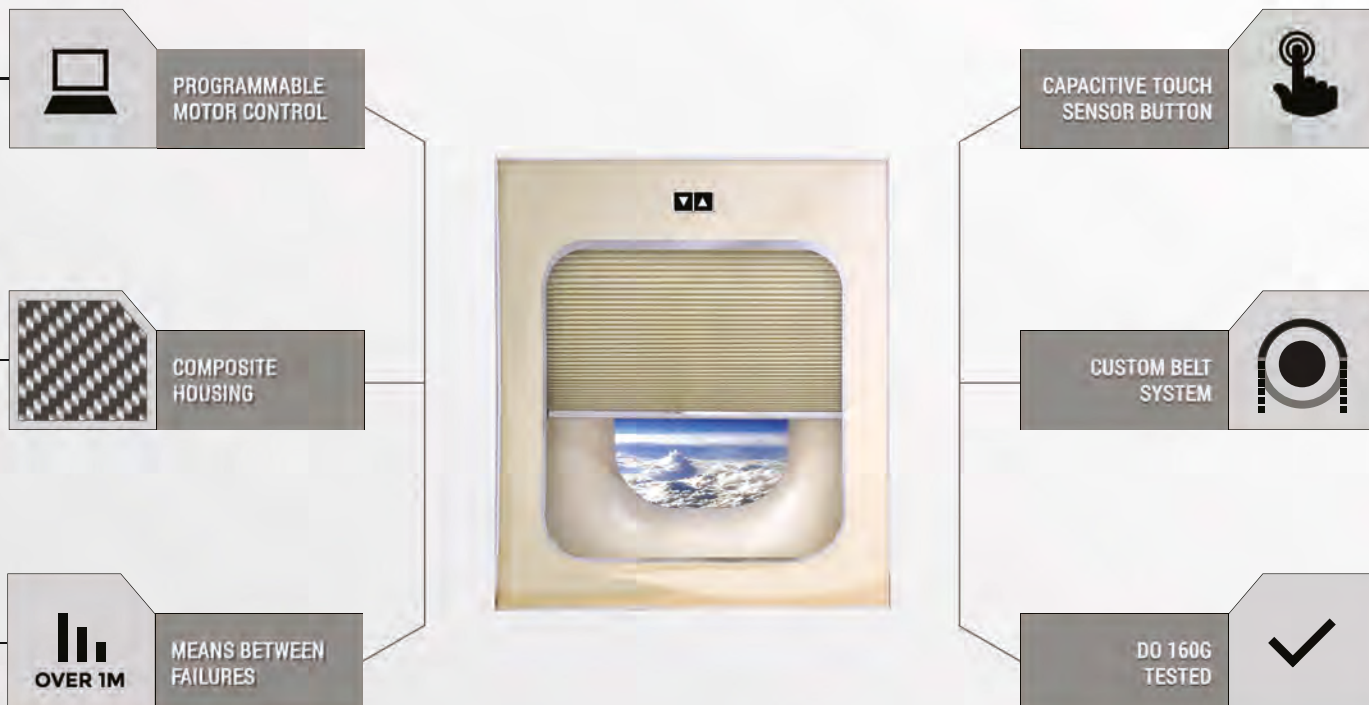
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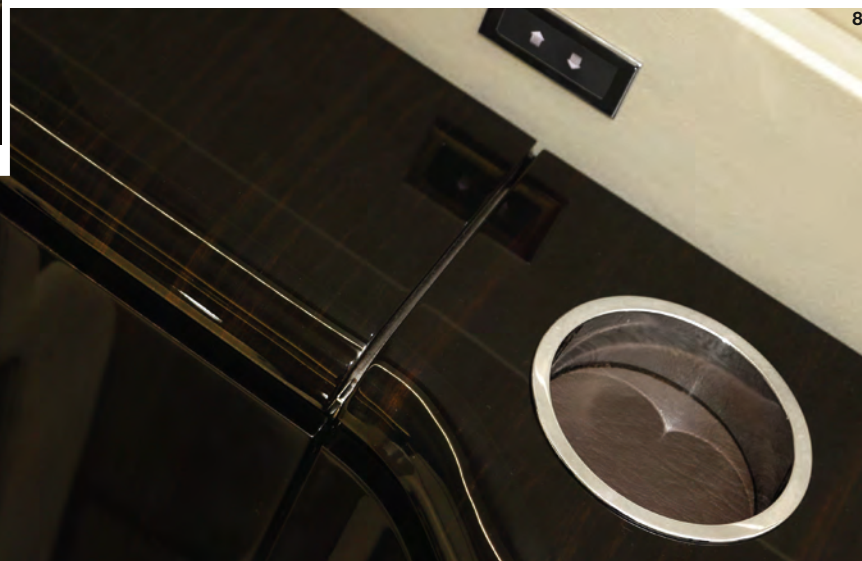
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7



8



9



4

main interior
compartments

19

seats

5

auxiliary tanks

5,500

nautical mile
range

12

months in
completion

49dB

sound level in
the bedrooms

“Passengers can use these to control features including lights, window shades, and AVOD,” says Scheidt. “Or they can control the system via their smartphones and tablets. We have a web application, like a website, on an onboard web server. Passengers don’t need to download an app, they just dial into the website and control everything from there. We also have six iPhones on board, one in each compartment, for cabin control and also for satellite communication, by voice, over the wireless LAN.”

The completion Fokker was chosen to bring the vision to reality, having worked with K5 on an earlier completion. “Erik had already built a relationship with them,” says Madone. “We chose them again because we are familiar with them and know the quality of their work is outstanding.”

The aircraft was delivered from the Airbus facility in Hamburg, Germany, to Fokker’s facility in Woensdrecht, Netherlands. But this was not the end

7-9. Neutral colors and luxurious finishes were chosen to cater for a range of VIP charter passengers

of K5’s and 28 East’s involvement. “We provided a complete package to Fokker and we were also involved in the engineering,” says Scheidt.

This was 28 East’s first project as the completion manager. “The whole team worked perfectly together,” says Johan van Dorst, sales director at Fokker. “28 East’s management visited us regularly, and we had really good support from K5, and several meetings with them.”

Fokker began by installing the seat tracks and additional rails for cabinets, and other hardpoints for attaching the interior. Then the electrical cabling and other equipment was installed. “Also at this early stage, the air-conditioning was adjusted with the introduction of mufflers and other measures, because

Unusual bed

Johan van Dorst of Fokker says that the bed in compartment four, which unfolds from an L-shaped divan, is unusual. “Normally a bed is positioned alongside the cabin wall, but this bed hinges at one corner along the centerline of the cabin,” he says. “Closed up as a bed, it can be repositioned so that it can be approached from either side.”

a very low noise level was required,” says van Dorst.

Lightweighting Achieving a low weight was a driving factor. “We needed a lightweight cabin to maximize range,” says Madone. “If the cabin exceeds a certain weight on the ACJ319 you have to remove an auxiliary tank, but we wanted to operate without restrictions, using all five. It’s an ultra-long-range ACJ – we’ve flown 5,500 nautical miles with passengers.”

An important contribution to the cabin’s low weight was made through the way the honeycomb cabinetry panels are joined. “We improved on how existing technologies are used,” says Madone.

The edges of abutting panels were cut at an angle and then a portion of honeycomb was removed to leave an overlap of ‘skin’. This is folded across the join and bonded. “This eliminates the need for almost all of the potting compound traditionally used where panels join,” says van Dorst.

In a traditional ACJ completion of this standard, van Dorst says the cabin weighs 7-7.5 metric tons. “In this aircraft we brought that down to a little over 6 metric tons,” he says. “We also



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- 10. The fourth compartment features a 55in LED screen and a divan that transforms into a king-size bed
- 11. Finishing touches include accessories from Dior
- 12. The first two sections of the aircraft were opened up to enable greater flexibility

did it through a number of other techniques, including carefully measuring sound frequencies and applying soundproofing only where it was required.”

Special attention was also paid to ensuring maintenance staff can access cabin systems easily.

The aircraft was in Fokker’s hangar for a little over 12 months, with 20 to 25 engineers involved over a 6- to 7-month period for essential design and engineering work prior to monument

installation. Subsequently, around 20 people worked on the cabin itself.

Customer satisfaction Asked if he’s pleased with the aircraft, Scheidt is effusive. “I’m extremely satisfied and in some areas it’s even better than expected,” he says. “Even my wife is happy with the design! We were a little unsure about two things we’d had installed, but when we saw them on the last day of the completion they looked fantastic.”

Madone confirms that in addition to the opening up of compartments one and two, they had had doubts about the woven nabuk leather on the sidewalls. “It was difficult to imagine on the color board, but in reality it looks absolutely stunning,” he says.

“Whenever you put such an aircraft into service, you have a big day when you do the first long flight,” says Scheidt. “Normally you do a few short flights to make sure everything works as expected beforehand, but with this aircraft we entered into service with a 13-hour flight. I flew it myself and I was sitting in the cockpit waiting for at least one cabin issue, but there were none, and the passengers tested it extensively, using the shower, the AVOD and all the touchscreens.”

Passenger feedback indicates the sleeping arrangements are particularly appreciated. “The bedrooms go 100% dark, we have the cabin humidification system, it’s extremely quiet – 49dB in the bedrooms – and the beds are very comfortable,” says Madone. “Already, two customers have said they slept for eight hours and had never done that before on an aircraft.” **END**

CUSTOMERS HAVE SAID THEY SLEPT FOR EIGHT HOURS



12



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1. The stateroom
on the Embraer
Lineage 1000E



rest assured

Owners of every size of aircraft are demanding solutions to enable them to sleep on board – from fully flat seats to inflatable solutions, private pods, berthing divans and high-tech beds

Whatever the size of the aircraft, the VIP interior industry has a solution to enable customers to sleep on board.

On some jets and for some passengers, the solution is to incorporate seats that recline to 180° for a fully flat surface.

For example, PAC Seating Systems' lie-flat seats are fully motorized and have an articulating seat pan that moves to the same height as the seatback when reclined to a berthing position. The leg rest also extends and adjusts automatically to the same level.

Gulfstream's G650 features fully flat berthing seats by RCO Engineering.

The electrically articulated seats have a power function that controls the backrest, leg rest and lumbar support. They also incorporate heat and massage features. "One request we got over and over again was for a single push-button to convert from a 16g-compliant upright seat for taxi, take-off and landing, to a fully flat berth for sleeping," says William Gay, director of customer completions at Gulfstream.

Completion and refurbishment provider Elliott Aviation has also noted the importance of sleep to owners of business jets of all sizes. "There are a lot of small aircraft owners out there who make multiple stops on a business trip and appreciate a two- or three-

Cocoon pods

There is also a focus in the industry to provide customers with more privacy as they sleep. Associated Air Center has developed a sleeping pod for the BBJ 747-8 currently undergoing completion at its facility. “In a similar manner to pods in commercial super-first class, our pod includes a full-size surround that provides both elegance and privacy,” explains Rafael Tapia, lead designer at Associated Air Center.

Likewise, the Cabana mini-suite by Edése Doret Industrial Design is a berth that can measure up to 60 x 76in. Recent installations include a BBJ 757, on which two Cabanas were installed, and a BBJ 747, on which four Cabanas were included. “The Cabana is often selected for use by children, providing a small bedroom in which they may sleep, play video games or watch television,” says Edése Doret, president of the company.

hour nap on the non-stop flight home,” says Adam Doyle, paint and interior sales manager at Elliott Aviation.

While fully flat is one answer to the request for comfort, another is customized foam stacking. “The use of different densities of foam in a seat that converts to a fully flat berth has more impact on comfort than anything I can think of,” says Andrew Perl, director at PAC. “It allows us to customize to individual preferences.”

Inflatable beds Other solutions include drop-down armrests that provide a wider sleeping surface, custom-cut foam toppers and inflatable beds such as the JetBed. “We’ve had pretty good experiences with the JetBed,” says Doyle of Elliott Aviation. “The package

is relatively small and light, and it’s easily adjustable to allow the passenger to control the firmness.”

JetBed has sold more than 1,000 of its products and emphasizes the ability to customize. “We’ve even designed beds that are 80 x 110in to fit around dinettes, and beds for divans,” says Gary Bostick, president at JetBed.

THERE ARE A LOT OF SMALL AIRCRAFT OWNERS OUT THERE WHO APPRECIATE A TWO- OR THREE-HOUR NAP ON THE FLIGHT HOME



2



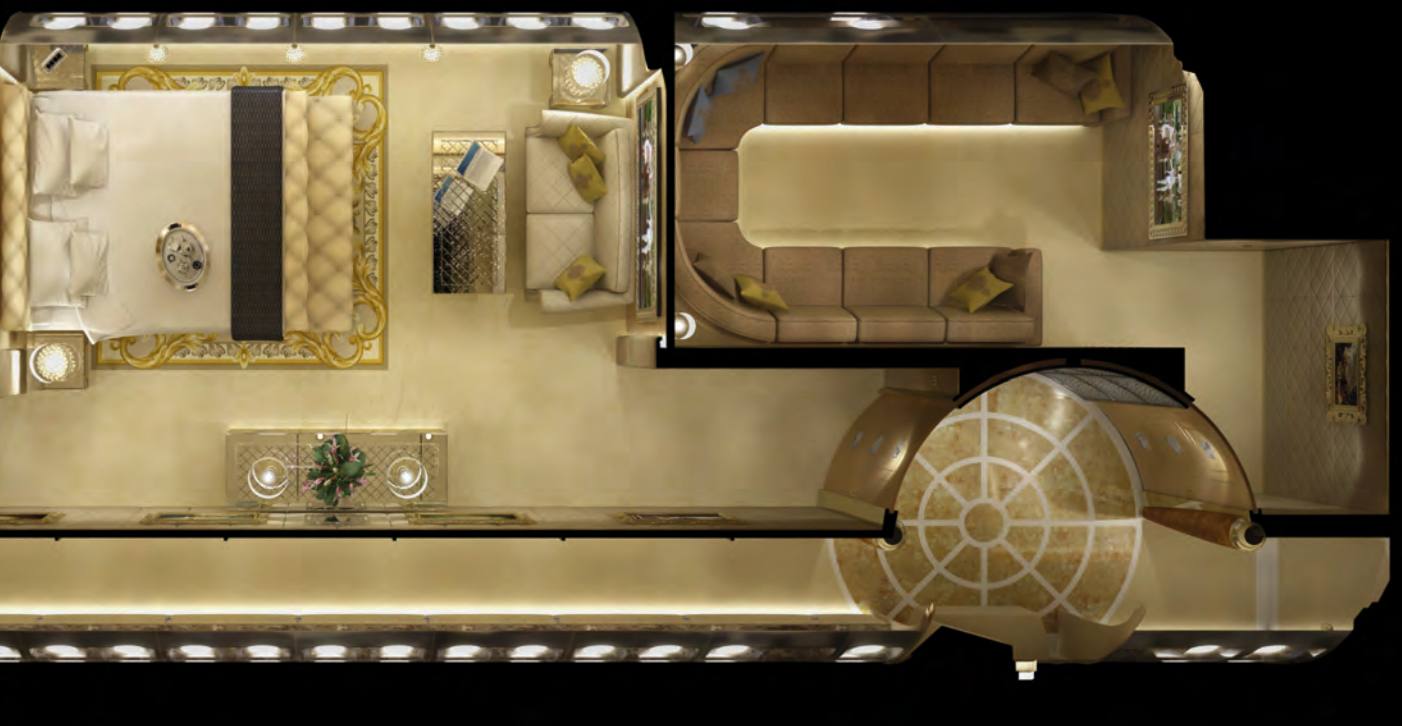
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“We’ve created beds for just about every business aircraft out there, from a Pilatus PC-12 to a BBJ 737.”

Cascade Designs is another major provider of inflatable beds for aircraft. The company says its Skylounge product can be customized to fit any aircraft model. The underside is contoured to match the top surface of the user’s preferred seat, the flat top provides the sleeping surface. Cascade also makes lumbar supports and the Jetrest seat base cushion, both of which



2. The main bedroom in a concept by Edése Doret
3. A guest bedroom on the same Edése Doret cabin design
4. Two Aiana Wave seats berthed side by side within Yasava's Astral Design Series cabin for the Global 6000
5. This bed, inspired by a Tempur-Pedic model, was created by Associated Air Center for a BBJ 787 project



Upcycled beds

While many aircraft beds take their cues from consumer offerings on the ground, it's not all one-way traffic. MotoArt is just one company to upcycle a vintage aircraft part for consumer furniture aimed at aviation enthusiasts.

MotoArt has 150 product lines made from vintage aircraft parts, including four styles of beds. In the case of the bed pictured above, the company's designers used a Boeing 747 engine nacelle. This was cut in half to create foot and headboards for a king or California king-size mattress. The look is completed with LED lighting underneath.

mold to the body of the occupant by use of a push-button valve.

Natural body position Not everyone is sold on the fully flat approach. The Aiana Wave from Yasava Solutions is instead influenced by a NASA development – a berth for astronauts in zero gravity. “In space or underwater, the relaxed body assumes a natural body position, between full extension



and contraction,” says Christopher Mbanefo, CEO of Yasava Solutions. “Today’s typical fully flat surface is akin to sleeping on a gym mat. Full flat is not a definition of comfort.”

Mbanefo also says Aiana Wave positions the occupant in such a way that the vertical distance between the heart and the brain is reduced. “This results in a 30% reduction in heart effort, facilitating blood and oxygen flow,” he says. “One positive effect of this positioning is a dramatic reduction in the chances of developing deep vein thrombosis on long flights.”

Aiana Wave was unveiled at EBACE in May 2015, where it won six letters of intent. Yasava Solutions is also developing a double Aiana Wave configuration with a pod, and a more luxurious version called the Aiana

Suite, which would incorporate the Aiana Wave seat and a separate bed.

Divine divans Then there are divans, which commonly feature a berthing capability. PAC has built them to meet 16g requirements as forward-, aft-, and side-facing models for three, four and five passengers.

Meanwhile, the G650’s sleeping compartment has two side-facing divans that can meet in the center of the cabin, creating a bed with optional storage drawers beneath. Gulfstream has also installed fixed beds all the way up to queen size in the compartment, completing the space with vanities and entertainment centers.

Articulating beds When it comes to beds, various things can be done to



Stateroom luxuries

There is more to a bedroom than the bed alone. For its Lineage 1000E, Embraer has developed a stateroom intended to support long trips and make passengers feel at home. At the heart of this is a queen-size bed that is angled to be in balance with the aircraft's attitude, but there is also an assortment of other amenities typically associated with a bedroom.

These include a walk-in wardrobe, a full-height mirror and a 32in flatscreen that can be integrated with video devices including Apple TV and gaming systems, as well as the JetMap option.

Passengers don't have to get out of bed to use the phone, which is within reach of the bed, or to control the lights, window shades and IFE, which are all controllable using a CMS app on their mobile device.

No luxury bedroom would be complete without an en-suite, and on the Lineage 1000E, stateroom passengers can opt for an aft lavatory with a shower large enough for more than one person. Water drains off all sides of the shower floor, which provides a flat floor and enables water drainage at all angles of flight. The shower provides up to 40 minutes of running water.

- 6-7. The stateroom on the Embraer Lineage 1000E leads on to an en-suite with shower
- 8. JBRND's self-leveling bed
- 9. Seats in the berthing position on the Embraer Legacy 500

optimize comfort. Jeff Bonner Research & Development (JBRND) is developing a self-leveling bed, which adjusts automatically to the aircraft's inflight angle of attack, which can be nearly 4°. The firm has delivered eight beds so far and is at work on four more.

Self-adjusting bed The company is now working on a bed with sensors that will not only level itself to match the angle of attack, but also the angle of bank when the aircraft is turning.


It is also transforming an existing bed with sliding drawers so that it lifts from the bottom to expose fixed storage bins.

Getting airworthiness approval for new or modified products such as these takes time. "The certification time for some new products is as much as five weeks and may cost up to US\$10,000 a week," says Jeff Bonner,

president at JBRND. "It takes careful analysis to determine the budget allocation and the time required."

Rafael Tapia, lead designer at Associated Air Center, says that overall, the industry is trying very hard to give customers the same comfort in their aircraft as they have on the ground. As well as seat pods, the BBJ 747-8 the center is currently working on will feature a special bed inspired by popular manufacturer Tempur-Pedic. "I met with the customer and we went to a local retailer. I then asked our vendor to incorporate all the same features, including massage," says Tapia. "Throughout my career in the interior design business, we've always tried to match the look, feel and comforts of the customer's home." **END**





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1. A mock-up of the AW609 tiltrotor in VIP configuration

pioneerspirit

With its AW609 civil tiltrotor, AgustaWestland aims to combine the range, speed and cabin of a fixed-wing aircraft with a helicopter's ability to take off and land vertically

AgustaWestland is deep in the development of what it hopes will be a disruptive technology – a civil tiltrotor called the AW609. The company says its tiltrotor will be able to take off and land vertically, and yet cruise along twice as fast and for twice as far as a typical helicopter. The AW609 will travel at about the same speed as a turboprop (around 275kts), for 500 nautical miles with standard tanks, passengers and fuel reserves, at an altitude of 25,000ft.

AgustaWestland sees potential for its craft in applications ranging from offshore oil and gas transportation to search and rescue, medevac, law enforcement, homeland security and corporate/private passenger transport.

A comparatively larger tiltrotor, the 60,407 lb Bell-Boeing V-22 Osprey, made its first flight in 1989 and has been in operational service for the US military since 2007. The current version seats as many as 32 soldiers, can sling outsized cargo, be configured as a gunship, and fly up to 1,000 nautical miles without refueling.

In the 1990s, Bell and Boeing formed a partnership to develop a civil tiltrotor together. Boeing later left the project, and Bell proceeded to form a new partnership with AgustaWestland, to develop what was then designated the BA609.

The prototype flew in 2003 and remains part of a test fleet. This test fleet also includes a second aircraft in Italy, and is scheduled to grow to four aircraft by 2016.

THE AW609'S INTERIOR CABIN DIMENSIONS FALL SQUARELY INTO THE LIGHT JET CATEGORY

In association with the FAA, Bell and AgustaWestland began the heavy work required to develop the regulatory framework for an entirely new classification of aircraft – powered lift – and write an entirely new section of the Federal Aviation Regulations (FARs) – Part 29 – to govern it.

After AgustaWestland bought the 609 program outright from Bell in 2011, the company moved the program from the Bell XworX facility in Arlington, Texas, to its own hangar across the field. It then began to re-evaluate the program, aiming to optimize the airframe and systems and wring costs from the supply chain. In 2013, AgustaWestland agreed on and defined the certification basis for this classification of aircraft with the FAA.

Fleets of Philadelphia In 2015, the company announced it was moving flight testing and development for the aircraft to its plant in Philadelphia, Pennsylvania. That facility provides supply chain sourcing, engineering and product support for the company. It already assembles the AW119 and AW139 helicopters and will soon begin



production of the new AW169. Earlier in 2015, the fuselage for AW609 test aircraft four arrived in Philadelphia and that aircraft will be assembled and based there. Philadelphia will be the first final assembly line for the AW609, but AgustaWestland also expects to assemble this type in Vergiate, Italy, at a later date.

The decision to develop the program in the USA stemmed from a variety of factors, including the origin of its regulatory basis, the capabilities and capacity of the Philadelphia plant, and proximity to key suppliers,



AgustaWestland AW609

Cabin width: 4ft 10in

Cabin height: 5ft

Cabin length: 13ft 5in

Seats: 2 crew + 9 passengers

Range: 500 nautical miles with standard tanks, passengers and reserves

Maximum speed: 275kts

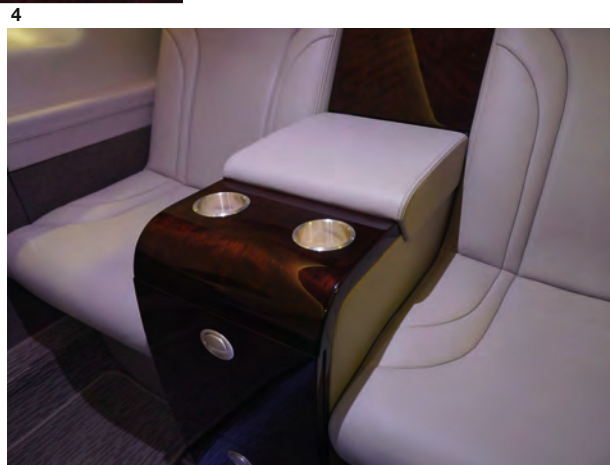
Maximum altitude: 25,000ft

Price: Not yet announced

2. The VIP version will have a cabin wi-fi system
- 3-4. Customers can choose soft goods and other finishes

including Pratt & Whitney for the engines and Rockwell Collins for the touchscreen avionics. AgustaWestland also anticipates that prime demand for the new aircraft will come from North America, including the offshore oil and medevac markets.

Multi-talented An ambition to provide a cabin that could serve a wide variety of missions led to a partial redesign of the aircraft, which will be evident on test aircraft three and four. The main cabin door has been redesigned to be



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THE SEATS MUST CONFORM TO HELICOPTER CRASH STANDARDS



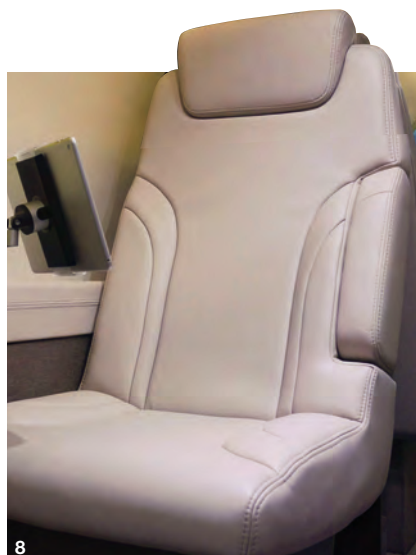
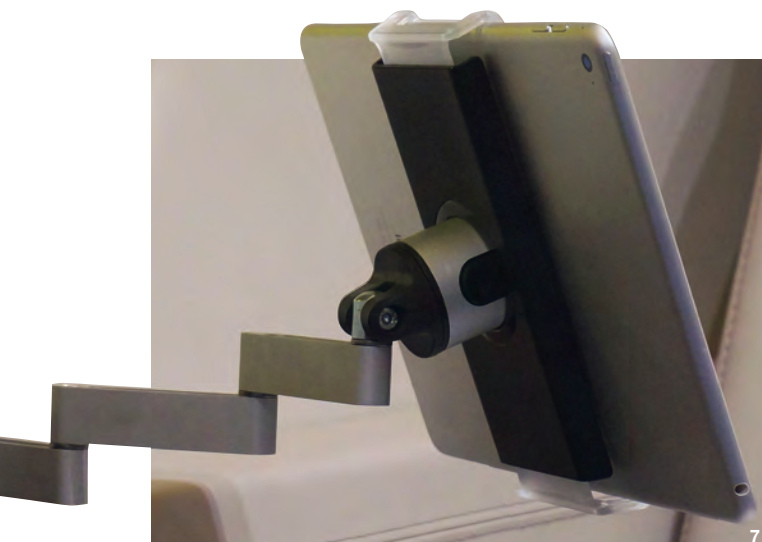
5. The center console could be used to store tablets
6. Customers will be able to add personal touches to the cabin
- 7-8. Passengers will use tablets to view the IFE, so tablet mounts will be incorporated

a wider (35in) two-piece clamshell with an integrated step, harking back to the Learjet 30 series, which were popular medevac aircraft. The AW609's interior cabin dimensions fall squarely into the light jet category. The cabin is 13ft 5in long, 4ft 10in wide and 5ft tall – up 6in from the original cabin height.

While AW609's program manager, Clive Scott, says that developing the interior for offshore energy operators is AgustaWestland's first priority, concepts for the executive and VIP cabins are coming together. Decisions have been – or are about to be – made on a variety of components, including onboard wi-fi, the environmental control system and seating.

The seats have to conform to helicopter crash standards, yet provide functionality, comfort and styling on a par with those found in corporate jets. Scott stressed AgustaWestland's long experience with corporate and VIP interiors developed for its helicopters. He says VIP layouts could have a small forward refreshment area followed by a club-four grouping, followed by a belted lav, if requested. The corporate layout will have six smaller seats.

Healthy competition To get the ball rolling on the details for these interiors, AgustaWestland, in cooperation with *Interni* magazine, is sponsoring a design competition. It has attracted a diverse



AW609 TIMELINE

1989

The Bell-Boeing V-22 Osprey makes its first flight

1995

Bell and Boeing embark on civil tiltrotor design

1998

Boeing exits project, Bell partners with AgustaWestland

2003

The BA609 prototype flies for the first time

November 2011

AgustaWestland buys out Bell's share in the BA609 project

2013

AgustaWestland and FAA finalize FAR Part 29 to regulate powered lift aircraft

2015

Flight testing and development move to Philadelphia, Pennsylvania, USA

April 2015

The AW609 cabin design competition launched

October 2015

Winner of cabin design competition set to be announced

2017

Target for FAA certification

2018

Target for first customer deliveries

9. The VIP version could have a forward refreshment center



group of entrants including Jozeph Forakis of the USA, Setsu & Shinobu Ito of Japan, Ricardo Bello Dias of Brazil, Delineo – Giampaolo Allocco of Italy, Matteo De Pretis of Italy and Marc Poulain of France.

The winner will be announced in October 2015. Explaining its approach, AgustaWestland says the competition emphasizes its “desire to innovate and develop new cabin interior concepts that will benefit future customers, drawing on ideas beyond the usual interior design players and leading fashion design houses”.

Noise and space Cabin interior noise is a key consideration in the AW609’s development. “We have tried to maximize expectations,” says Manuela Barbarossa, head of the VVIP/corporate segment at AgustaWestland. The company is looking at a variety of technologies to enable passengers to engage in conversation comfortably. The company also wants to create a more open appearance and feeling, so it is considering realizing the main cabin seats with retractable armrests.

AgustaWestland is also paying considerable attention to the aircraft’s

AW169 Stream design

The AW609 is not the first of AgustaWestland’s aircraft to be involved in a design competition. In 2014, the AW169, a new light intermediate twin-engine helicopter, underwent the same process, as a starting point for the development of its VIP interior.

Both competitions invited entrants from all design sectors. The winner of the AW169 competition was Lanzavecchia+Wai of Italy and Singapore. Its Stream design includes 4-5 cocoon seats, which passengers can pivot to face the windows or other passengers. The seats are fitted with power points and have pockets to stow small items.

The cabin also features a wardrobe, a concealed IFE screen and a ring-shaped LED light feature. Using an AgustaWestland app, passengers can control the mood lighting, as well as the IFE, window shades and temperature, and access flight information.

Lanzavecchia+Wai also designed the graphics for the app and an exterior paint scheme for the VIP AW169. The helicopter achieved EASA certification in July 2015.

10. IFEC has been identified as a development priority

IFEC systems as it is estimated the AW609 will be called on to fly lengthier missions than those of a typical helicopter flight. “Our customers will expect to be entertained,” notes Barbarossa. “We want a high level of quality and comfort.”

Personal tastes Customers will be able to personalize their AW609s with the fabrics and finishes of their choice, but monument positions will be limited. AgustaWestland is developing several standard color palettes for the interior, and also expects the design competition to yield some innovative color/fabric combinations and seat and sidewall styles.

AgustaWestland is not expected to announce a price for the AW609 until the end of 2015, but the cost for one in VIP configuration is expected to be in line with a well-equipped super-medium helicopter – around US\$24m. As of September 2015, there were almost 60 customers for the AW609.

Around 100 people are currently supporting the AW609 program in Philadelphia, with additional manpower in Texas and Italy. AgustaWestland is targeting FAA certification for the aircraft in 2017 and hopes to begin making customer deliveries in 2018 – after which time the world of business aviation may never be the same again. **END**

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1. The new first class cabin for Swiss's B777 aircraft, a design by PriestmanGoode

PriestmanGoode



commercial gains

With commercial airlines in a constant battle to differentiate their service from that of their rivals, business aviation operators may want to keep an eye on the latest developments



2

Super first class

Even while some airlines are cutting back on their first class product, others are pushing the limits of new aircraft to offer their top flyers a unique onboard experience. To fit its new Reimagined First concept, Etihad Airways had Boeing change the front cabin of its Boeing 787 Dreamliner, removing overhead bins to install First Suites, private cabins separated by a single aisle. “Commercial super first class suites are now becoming more complete environments, in some cases moving away from a bed-in-a-box, toward mini hotel rooms with more open cabin architecture,” says Anthony Harcup of Acumen Design Associates.

Some commercial airlines have brought the standard of their premium cabins to levels that compete with the VIP jet market. What factors are at play as VIP style crosses over to the commercial space?

“For a long time in commercial aviation we have followed a very linear path of evolution in the cabin, which has revolved around increasingly bigger products, particularly in premium, with more and more leg space,” says Adam White, director at Factorydesign. “What we’ve seen, in the past years with airlines including Etihad, Air France and Singapore, is a more innovative use of space. Now it’s real estate, rather than simply the size of the seat, that you buy. I think that was always understood in the private jet market, but we’re now seeing it in commercial aviation. That crossover is a very big moment for first class.”

White says there is a constant drive to innovate in the commercial sector. “We have spent many years trying to be cleverer than the next person,” he says. “There is huge demand to embody the latest technology, to give one airline an advantage over another.”

Certification He also contends that the VIP jet market affords certain freedoms that are either unavailable to or

2. An Airbus concept for a first class cabin on the A350
3. The bar area on Qatar Airways’ A380, designed by PriestmanGoode



3



4

4. The first class cabin on American Airlines’ A321 fleet

impractical in a commercial setting. “The big difference is that certification and testing are more stringent in the commercial sector than in the VIP market,” says White. “There are things we’re unable to do for commercial aviation, that we can do for VIP jets.”

“Both airline and VIP installations have to be developed by an approved design organization, and have to be certified per STC if the installation is not certified by the OEM,” says Juergen Repenning, director of engineering, operations and quality for Lufthansa

Technik’s Original Equipment Innovation division. “To certify a new cabin, whether it is for commercial or private use, requires compliance with all applicable Part 25 requirements (for large aircraft), as identified in the certification program. For private-use aircraft, there is room to negotiate some special interpretations for airworthiness requirements. The STC applicant can negotiate a certification review item with the EASA or an issue paper with the FAA.”

Luxurious materials Anthony Harcup, associate at Acumen Design Associates, says designers of VIP interiors for fewer than 20 passengers have a distinct advantage in giving cabin finishes a luxurious feel. “The VIP market can choose from a more varied palette of materials, because of the more relaxed flammability requirements compared with the commercial sector,” he says.

Harcup also says the VIP industry benefits greatly from the input of



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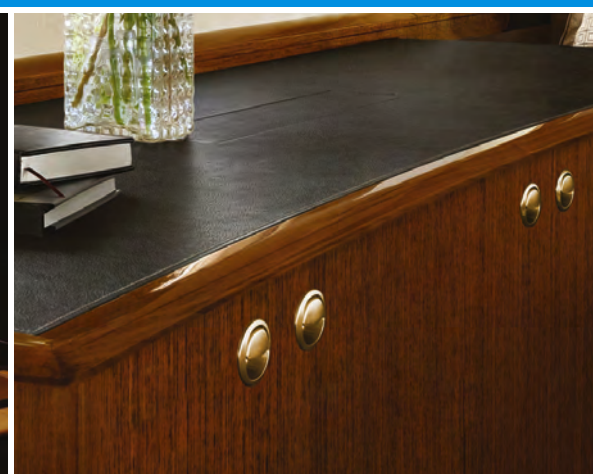
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Photos: Etihad

5-6. The Residence, on board Etihad's new A380s, is a private suite with a bedroom, bathroom and lounge

specialized craftspeople. "Much of the highly skilled cabinetry work comes from smaller suppliers who rarely work in the commercial sector," he says. "Often this means that the detailing on tables, cabinetry, fixtures and fittings is more highly finished in a VIP jet. Table mechanisms and the like are often smoother and more reliable in VIP jets as the customization is more tightly controlled by the OEM and therefore more firmly locked down."

White points out that commercial aviation is also limited by the realities of daily operations. "Maintenance requirements put a particular limit on what you can do," he says. "VIP aircraft are used much less frequently, so you can use materials that are much more glamorous and luxurious."

However, Harcup believes that whether flying commercial or on a private jet, the more affluent flyers expect that a VIP product should be worthy of its label. "Passengers expect a certain level of sophistication from the interiors that they fly, and will subconsciously compare the level of detailing and facilities provided to the high-end automotive, marine and hospitality environments that they interact with every day," he says. "So whether commercial or VIP charter, the benchmarks are similarly high."

Number-crunching In the end, the greatest difference between commercial and VIP aircraft design is the passenger numbers involved. "The requirement to seat more passengers with privacy

drives the need for individual, local enclosures that house all the amenities required in flight, such as IFE, fully flat seats and bag stowage," says Harcup. "In a VIP jet, these amenities are often provided in different zones; there are separate areas to sleep, dine, socialize or relax. This produces an entirely different design brief with respect to cabin layout and detail design."

White says competition for high-revenue flyers has forced airlines into a frenzy of design, each trying to leapfrog over the last best product. "It's getting to a point where you may be able to get a better product in an airline cabin than on a private jet," he contends. "Etihad's The Residence is a tempting alternative to a smaller private jet."

The Residence Harcup similarly describes The Residence product as "the first real commercial alternative to private jet travel". It is a 125ft² suite of three rooms – a bedroom, lounge and bathroom – at the front of the upper deck of each of Etihad's new A380s.

"The business case was built on the premise that there is an overlap of

Airlines turning to VIP jets

Lufthansa is one of a couple of airlines that now offers a private jet service. It books the aircraft for VIPs either as an on-demand solution or as a complement to its commercial long-haul service, through a partnership with NetJets.

Martin Riecken, Lufthansa's director of corporate communications for Europe, says adding a VIP jet option helps lure high-revenue flyers to the airline.

"It's a segment that is relatively small, but we saw that we were able to attract passengers from other airlines to Lufthansa," he says. "They are attracted by the seamless experience of combining jet service with first class on a regular basis."

Lufthansa encourages this crossover and customer retention by offering discounts on combined commercial/private jet bookings, and frequent flier mile rewards when customers use the private jet service. "We see it as a natural extension of the first class product," says Riecken.

Likewise, Delta Airlines uses its Delta Private Jets service to reward loyalty and differentiate its brand from competitors. "We're not attempting to fly away from the airline, but to complement the product Delta provides," explains David Sneed, executive vice president and chief operating officer at Delta Private Jets. "Our team is very excited about the program. Folks are interested in it, and it gives customers the feel not only of this program, but of our unique service."

Other airlines, including Emirates and Korean Air, have also incorporated private jet service into their product mix, giving affluent and corporate passengers another reason to stay loyal to their brand.

THE SPACE IS SO CLEVERLY DESIGNED THAT IT RETAINS ITS PRIVATE AND HIGH-QUALITY LOOK AND FEEL



7



8

customers, even at the large cabin jet end of the scale, and that if the issues of space, exclusivity and personal service could be addressed, that there would be a market," says Harcup.

The Residence is staffed by onboard chefs and butlers. But the service is not without limitations.

Service proposition "The fundamental difference is that the private jet service revolves around you," says Mark Wilson, NetJet's COO for Europe. "You run to your schedule, not the airline's schedule. Of course, both airlines and private jet operators want to make the onboard experience as wonderful as possible, whether that's in first class or what we're doing with our Signature Series brand at NetJets. But, whatever you do, if the traveler is beholden to the schedule of an airline, it's a very different proposition to them being



9

7-9. British Airways' new first class cabin for its B787-9s

Great things come in small packages

British Airways recently introduced a high-tech luxury first class option on its Boeing 787-9 Dreamliner, designed in collaboration with Forpeope.

Abigail Comber, head of customer at British Airways, says that bringing this new cabin to the Boeing 787-9 posed a challenge. "It's smaller than the other first class cabins, with just eight seats, and yet the final result offers great comfort and even more storage space," she says. "The space is so cleverly designed that it retains its private and high-quality look and feel, which our customers quite rightly expect from us."

Domestic bliss

On routes linking the East and West Coast of the USA, American Airlines' first class offering goes beyond what you might expect. These cabins feature pod seats that recline into fully flat beds. First class travelers also benefit from power outlets and a work/dining table.

The decision is in line with the American Airlines' stated product design strategy, to produce a hospitality experience on board that gives passengers what they need to work, rest and play. The company aims to provide a flying experience that Alice Liu, managing director of onboard products for American Airlines, describes as "life uninterrupted". "In the past the aircraft looked like an aircraft," she says. "Why? You spend so much time there – it's your living room, dining room, bedroom, study. It should be like home."

able to go exactly when and where they want to go."

Airline travel also means sharing an aircraft with strangers. "On a private jet, all that time when you are long-haul flying is productive, if you wish it to be, rather than dead time when you can't talk because you don't know who's in the next cabin," says Wilson.

Still, Harcup believes business jet interior designers should be more innovative. "It would be refreshing to see a more adventurous approach to cabin layout and zoning in VIP jet interiors, driven by the OEMs," says Harcup. "Lufthansa Technik and Mercedes-Benz recently worked on a visionary concept interior. This is a great example of how, hopefully, the VIP industry will move forward." **END**

What do aircraft operators want from their interiors? Customization. Who can make most any goal and budget a reality with creative solutions? Duncan Aviation.

Meet Lori

An aircraft designer from Duncan Aviation's Battle Creek, Michigan, location, says every business aircraft operates differently, challenging her to come up with unique solutions daily.

"The key to developing the best solution is interviewing the customers to uncover their main priorities," says Lori. "Some customers come in with exactly what they want, but after looking at the aircraft and considering its use, I usually see something they haven't considered." That's the type of knowledge that only comes with nearly a decade of experience.

Lori says her team can accommodate most requests, but they like as much lead time as possible to minimize the aircraft's downtime. Duncan Aviation's team members can order parts and complete the engineering, as well as most designs, before the aircraft inputs, making the process smoother for everyone.

"Even something small, like ordering parts for new china inserts can require a few weeks, so operators are always happier in the end if they plan ahead," says Lori.

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designforum

In the run-up to NBAA 2015, North American VIP aircraft interior designers share their inspirations, challenges and trend observations

JAY ROBINSON: We've also been working on yachts, and that has cross-pollinated with our ideas about aircraft interiors. Maritime interiors have such a fantastic connection to the environment, and particularly to natural light. We've been inspired to create VIP aircraft configurations that are more open, that allow areas within the airframe to share light and space. I'd be pleased to see material advancements that continue to open up possibilities for translucency and sunlight within aircraft.

EDÉSE DORET: For the past two years we have been inspired to use carbon fiber, jet glass, metal composite and new products from Techno Aerospace. Like all designers we have our own philosophy and style, which we adapt to the client and project.

WHAT HAS INSPIRED
YOU RECENTLY?

NIKKI GLEDHILL: I am increasingly interested in automotive design. The streamlined aesthetic and materials of luxury automobiles can be translated into aircraft interiors quite effortlessly. Many clients can easily describe their style, taste and desired technology by divulging the car they drive.

JIM MURPHY: Currently, we are involved with a project that addresses cultural elements in design. This opportunity has allowed us to understand how materials and color combinations are applied in different cultures. The result is a celebration of cultural differences and a fresh way of blending design elements. Implementing this exercise will enable aircraft manufacturers to better appreciate the eclectic diversity of colors, materials, textures and other design elements they can incorporate for clients across the globe.



NIKKI GLEDHILL
CEO, MBG
International Design,
Spring Branch, Texas



JAY ROBINSON
designer,
Infusion Design,
Bonner Springs, Kansas



EDÉSE DORET,
president, Edése Doret
Industrial Design,
New York City



JIM MURPHY
director of design,
Point Innovation,
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BIOGRAPHY

Nikki Gledhill, CEO,
MBG International Design

Nikki Gledhill founded MBG International Design in 2009, having previously worked for five years as a senior interior designer at a cabin design and modification center. Her degree, in interior design, was earned at the University of Texas at San Antonio.

MBG serves the luxury aircraft and yacht interior sectors. It will work on any airframe, although Airbus and Boeing types are its specialty. Pictured is a wide-body aircraft completed in 2014.

As well as design, the company offers project management. MBG staff can stay at the completions center or make visits to ensure the client's vision is upheld.



Photos: Jim Wilson/AAC



JIM MURPHY: Certification is certainly a factor. Using approved materials and components from the beginning of the design process enables the client to see a more realistic picture of the final design. Our designs are client-driven; the aim is to create an interior experience that addresses their overall desires in every detail. We also always strive to be innovative, to offer design solutions that provide unique results for each project we work on.

WHAT FACTORS
AFFECT YOUR DESIGNS
FOR VIP AND
BUSINESS JETS?

NIKKI GLEDHILL: Designs are always client-driven. Every client uses their aircraft in a different way. Their input regarding what is a must-have and what is a nice-to-have is always the starting point for design.

EDÉSE DORET: The customer, certification requirements and the limitations of the modification center impact our designs.

JAY ROBINSON: On a practical level, we address the critical issues – mission, weight, balance and range. It's our task to consider these matters so that the customer can focus on the look and feel of the aircraft. We understand how important it is to find the proper solutions. It's not the same as designing an apartment – the client can't just move the divan across the room later if they change their mind about it.

A VIP aircraft interior is an interesting problem because it is both architecture and transportation, so it has to provide the luxury and character of a residential space while offering the practical affordances of an automobile. Perhaps the closest equivalent would be a custom private car from the golden age of rail travel. A frequent passenger should immediately feel at home upon boarding, and new passengers should be able to orient themselves easily, discovering the conveniences and luxuries that a well-designed interior offers. Accomplishing those goals takes a lot of planning. Fundamentally, we want to create a space that is comfortable, inviting and humane.

JAY ROBINSON: Highly personalized aircraft really stand out as special, as VIP interiors are often fairly conservative. Lately, though, we've seen the needle moving toward a more transitional or contemporary look as customers seek something particular and personal. Of course, customers often come to us because they want something out of the ordinary, so that may influence my perception. Palettes are moving toward the cooler end, and grays and lighter tones are popular, often with exciting pops of color. I'm seeing more contrast in interiors, giving them a more graphic quality. We're often finding that alternatives to wood veneer are desirable, although considered placement of natural materials will always help to warm and soften these environments. We enjoy the juxtaposition of the high-tech – aluminum and glass and jet engines – with the tactile elements of a nicely appointed interior.

JIM MURPHY: Right now, everyone wants to be able to connect their personal electronics to the flight environment. From my experience, every client has different desires, so whatever those desires are, the goal is to create a unique and personalized interior experience.

WHAT'S POPULAR AT THE MOMENT?

EDÉSE DORET: For the past three to four years, BBJ 787 and BBJ 747-8 aircraft have been popular with heads of state and other VIP customers. Recently we have been working on a few ACJ340-500s and BBJs. Currently we are working on two ACJ340s and five BBJs – including a BBJ777 and two BBJ747s. In terms of technology, Live TV, Ka-band connectivity, 4K display monitors and IFE are popular.

NIKKI GLEDHILL: I have had numerous inquiries concerning BBJ 747, BBJ 777 and ACJ330 aircraft. Those three airframes are the subject of around four out of every five inquiries I receive. In terms of interior equipment, wi-fi, iPad connections, large HD TVs and customized lighting effects are always requested.



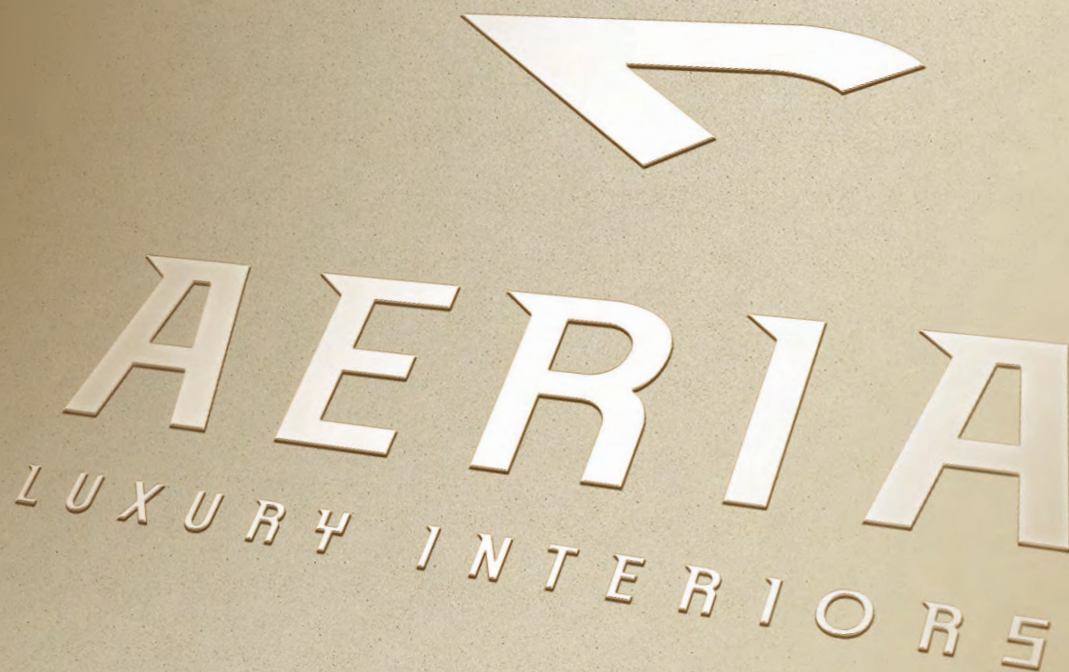
BIOGRAPHY

Jay Robinson, designer,
Infusion Design

Jay Robinson is a designer at Infusion Design, a creative team specializing in transportation and industrial design. He previously worked for Bombardier and founded Robinson Design before merging with long-time collaborator Infusion.

Infusion was founded in 1997, by design professionals from within aerospace and other design disciplines. The agency's roots are in VIP and corporate aircraft interior design, but from this base it has expanded into many other areas, including the marine and mass transportation markets, as well as into designing retail products and visual communications including graphics and websites.





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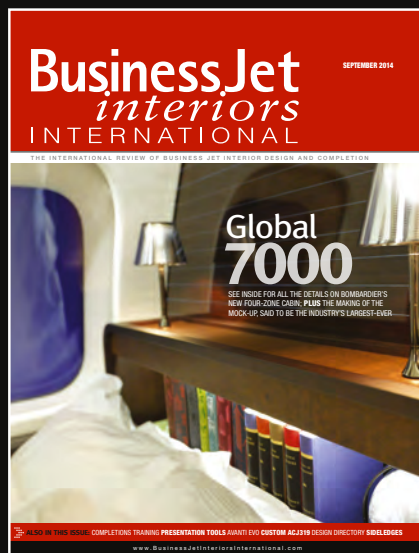
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BIOGRAPHY

Edése Doret, president,
Edése Doret Industrial Design

Edése Doret graduated from Pratt Institute, a college in New York City that has a strong focus on interior design and architecture. Soon after, in 1991, Doret founded his industrial design studio, staying in the city.

Although its core specialties are now aircraft and yacht interior design, the firm actually started out designing consumer products and corporate and retail spaces, and has created designs ranging from trains and motorbikes to a VIP suite for a stadium, consumer products and furniture. The company also undertakes residential and commercial architecture and graphic and digital designs.



JAY ROBINSON: The greatest improvements to our workflow – easier communication, data sharing and research – are enabled by the internet. Design is a largely visual discipline, and the ease with which we can communicate concepts improves the whole collaborative process. It's also very helpful to be able to source exotic products and materials with relative ease. 3D rendering technology is also incredibly useful to help our customers and collaborators envision the final product.

Inside the cabin, the ubiquity of tablets and similar entertainment devices has been a real boon. It used to be that each area had to accommodate built-in monitors, and sightlines were vital. This made for some real configuration challenges. The flexibility that personal entertainment offers means that we can better design spaces that are centered around the people that inhabit them, optimizing environments for conversation, relaxation or work.

JIM MURPHY: Technology does help us, but not as much as having a talented team of creative designers. Working together on a multitude of products helps us stay focused on being creative. Many minds are better than one. In terms of technology in the cabin, we want to take virtual reality back to reality. The idea is not to increase our dependence on technology, but to use it to reconnect at a personal level. One way we are utilizing this theory is to design aircraft interiors where controls are placed with careful thought as to how the user interfaces with the corresponding features. Offering a direct connection to that interface and allowing technology to supplement the interaction instead of replacing it, brings reality back to the man/machine interface.

NIKKI GLEDHILL: Technology is definitely a big topic of discussion when getting into the design details. As technology changes, so do the requirements of the clients. For suppliers, keeping up with the demand and providing up-to-date equipment when the aircraft is delivered to the client is a huge challenge. This is especially hard with the larger airframes, where systems can be defined 12-18 months prior to delivery to the client.

IS TECHNOLOGY
HELPING YOU IN
YOUR WORK?

EDÉSE DORET: Over the past 10 years, technology has played a big part in our design process, client presentations and marketing. We used to use an agency to assist in producing photorealistic renderings and animations from supplied CAD drawings and sketches. Over time, we found pre-visualization was helpful for analyzing the interior space and testing trim and finish definition. For cost and scheduling reasons we decided to employ our own pre-visualization artist and invested in software and hardware to create photorealistic renderings and animations. In parallel, our clients have demanded more and more realism from the renderings, and modification centers have come to rely on photorealistic renderings in the modification process.

As far as technology in the cabin goes, we are working with partner suppliers to create new products for our clients that will make their interiors as distinct as possible. The typical items high on our clients' list include larger monitors, wi-fi and Live TV. With a polycarbonate manufacturer, we are exploring a new technology for monitors, the aim being to make a new leap in the use of monitors and touchscreen panels.

JIM MURPHY: I would like more designers to understand the innovations vendors are offering in the marketplace. We see some really nice concepts out there, but they lack realism because they don't use real components. It's nice to push the limits – sometimes that's where innovation comes from – but when it comes to building the real thing, you need to be sensitive to certain limitations to make the design truly great. For example, there are requirements that a seat must meet to gain certification. When a designer is selling a concept to a client they need to be very aware of these requirements, so the design is not jeopardized when it comes to building it.

NIKKI GLEDHILL: I would like sales teams to recommend that their clients discuss their ideas and requirements with designers before buying an aircraft. Owners often don't realize the constraints of the interior until after the purchase.

WHAT WOULD YOU
LIKE TO CHANGE ABOUT
THE INDUSTRY?

EDÉSE DORET: I would change the timescales involved. We are not afraid of failure, but of time. There is never enough time.

JAY ROBINSON: I'd like our industry to be more nimble. Certification concerns and issues around return on investment have often kept aviation solutions a step behind the state-of-the-art that is available in customers' homes. That's a source of frustration for everybody involved.



BIOGRAPHY

Jim Murphy, director of design, Point Innovation

Jim Murphy's 18 years in the aviation industry have included supporting roles at a handful of completion centers around the world. He joined Point Innovation as director of design in 2014, to lead a team of designers in creating innovation not just in the aviation field, but other product areas as well.

Murphy focuses on working with vendors, project personnel and craftspeople from the beginning all the way through each project, which he says is the key to ensuring his designs are translated from concept to reality. His designs have been realized on a multitude of private aircraft.





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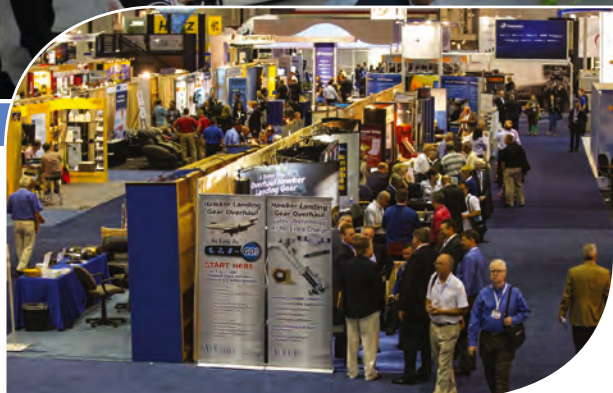
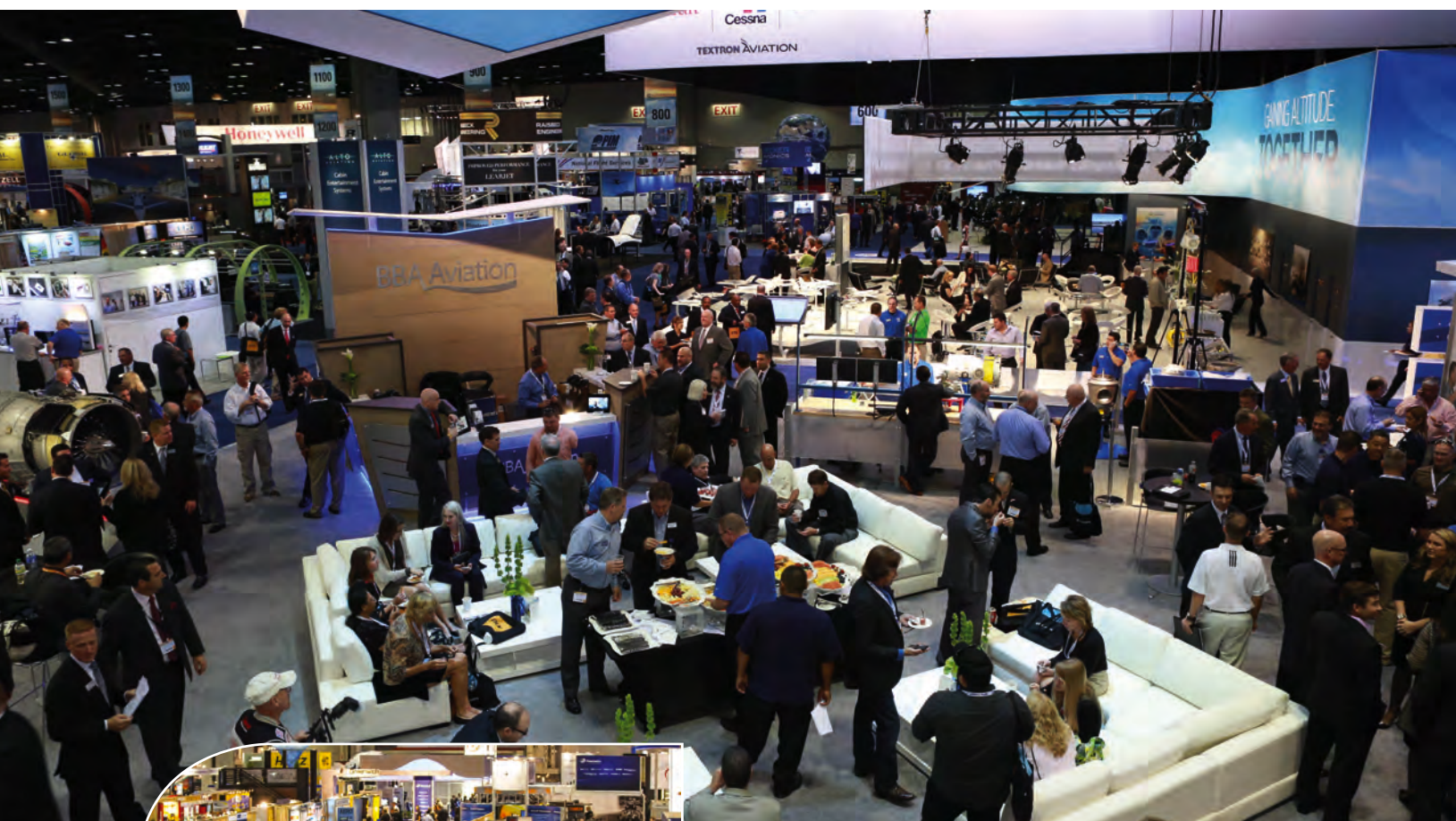
ipad/monitor stowage

electric wireless controls

vertical lift/ cushion tilt

NBAA 2015

EXPO PREVIEW



Photos: NBAA



This year, NBAA's annual Business Aviation Convention & Exhibition will be held on November 17-19 in Las Vegas, Nevada, USA. Around 26,000 people are expected to attend the show, which will feature more than 1,100 exhibitors and two static displays of aircraft.

To give you a head start, *Business Jet Interiors International* has found out some of the key interior innovations set to be displayed. These include satellite communication systems, beds, dimmable windows, soundproofing, IFEC, new leather and carpet collections, and much more – all detailed from page 94.

In addition, on page 88, representatives of three of North America's business aircraft OEMs – Bombardier, Gulfstream and Textron Aviation – give their insights into what customers want, how they responded to these expectations in their most recent product developments, and areas of interest in terms of new materials and technologies.

Finally, on page 104, we wrap things up with a handy guide to some of Las Vegas's many unmissable experiences.



BRAD NOLEN
director of marketing and business
development, Bombardier



CHRISTI TANNAHILL
senior vice president of turboprop
aircraft and interior design,
Texttron Aviation



TRAY CROW
director of interior design,
Gulfstream

1. Bombardier's Challenger 350 cabin
2. Cessna's Citation Latitude
3. Gulfstream's G600 mock-up

stateofplay

Ahead of NBAA 2015, three North American OEMs – Bombardier, Gulfstream and Textron – discuss customer demand, materials and technological tools

All the customer requests noted by Bombardier, Gulfstream and Textron stem from one common desire – to replicate the many comforts and technologies of home in the air.

“Our customers value space, comfort and connectivity,” says Brad Nolen, director of marketing and business development at Bombardier. “Many need to travel often and want it to feel just like home, with all its comforts and conveniences – including entertainment and the ability to sit and sleep comfortably. The seat developed for the Challenger 650 introduces an adjustable headrest and a larger seat pan to provide more space and comfort. We even offer a standing shower option on our Global aircraft.”

Nolen also notes increasing demand for high-speed connectivity: “We’re responding by offering Ka-band internet on the Global family, which will enable new capabilities, including video-conferencing and streaming HD video content from the web.”

Christi Tannahill, senior vice president of turboprop aircraft and interior design at Textron Aviation, also notes the desire for connectivity.

“Customers want high-speed data and voice service, and to be able to control cabin functions using their phones,” she says. “A side effect of this is that customers need a well-planned storage space for their PEDs and other items – and for this to be within convenient reach throughout the trip.”

Textron’s focus on its recent development programs has been on optimizing overall cabin comfort – including cabin dimensions, legroom, and seat comfort – and offering modular configuration flexibility. The company is also receiving more requests for optional equipment including coffee makers, espresso machines and microwave ovens.

“In addition, we’re seeing increased demand for ambient and architectural lighting,” says Tannahill. “The lighting design was a key part of the Citation Latitude’s development. As well as its practical uses, lighting can create a soothing ambiance, particularly on night flights.”

For Tray Crow, director of interior design at Gulfstream, the key to meeting customers’ needs is to build in flexibility. “Most customers are seeking a multifunctional space that supports working, dining and resting in different



areas,” he says. “Ensuring that the interior supports multiple mission types is also vital.”

Crow says the key objective on Gulfstream’s latest interior projects was to “create dynamic interiors with innovative lighting, creative storage solutions, and architecture that is built with customers’ productivity in mind”.

Natural materials In terms of materials, Crow says high-quality natural ones prevail consistently. Gulfstream is developing wood and stone flooring options for its galleys and lavatories. Crow says these new options will offer “elegant and maintenance-friendly flooring solutions”.

Bombardier’s Nolen agrees that natural materials including wood, stone and leather remain the popular choice. “However, we are working with these in novel ways,” he says. “On the Global 5000 and Global 6000, we can laser cut wood veneer into any pattern, such as herringbone or starburst, and apply it to a table or a door.”

Nolen also thinks materials used in homes, cars, yachts, hotels and other applications are gaining ground in business aviation. “With the Global 7000, we made creative use of lacquer and metal accents, inspired by the automotive industry, and we’ve seen strong interest in those,” he says.

Durability and beauty Many of Textron’s customers require cabinetry finishes and soft goods that are highly durable, while still offering a luxurious texture. Tannahill would like to see advancements in topical treatments for fiber protection, to prolong material life without altering its color or texture.

Similarly, Crow would like Gulfstream suppliers to develop new flame treatments that don’t impact the appearance or feel of materials. “There is also opportunity for innovation with new trim details to enrich upholstery styling,” says Crow.

Beyond natural materials, Tannahill of Textron says composite veneers are gaining acceptance, due to their

Dining development

Brad Nolen says that Bombardier has worked hard to elevate the onboard dining experience to the next level on the Global 7000.

The galley itself was built taking the feedback of several focus groups into account. “We worked with our suppliers to introduce home-like features, including a steam oven and an electric kettle,” says Nolen. Bombardier now offers wood or stone flooring for the galley, partly to make cleaning easier.

“We also designed a dining table that extends to comfortably accommodate six people, while allowing the flight attendant to serve a meal without hassle,” says Nolen.

4. In response to feedback, Bombardier incorporated personal touchscreen monitors on the Learjet 75
5. The G600 offers four cabin zones, providing flexibility in function
6. Cessna developed a new cross-section for the Latitude, to create a taller and wider flat-floor cabin

“consistent results in grain pattern and stain absorption”. With real wood veneers, she says, being able to wrap them around complex surfaces has game-changing potential.

Nolen is enthusiastic about the possibility of replacing hardwood edging on cabinetry with very thin laminates or veneers applied over hard foam substrates. “The cabinets actually look more like solid wood, but a lot of weight is saved,” he says.

Tools of the trade Technological developments are also changing the process of designing new aircraft interiors. Nolen says the advancement of rapid prototyping and 3D printing

ENSURING THAT THE INTERIOR SUPPORTS MULTIPLE MISSION TYPES IS ALSO VITAL





Broaden your horizons

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7. Bombardier's new seat for the Challenger 650 has a larger seat pan and an adjustable headrest

has been particularly beneficial. "When designing a handle or control lever, for example, we can often go from concept sketch to 3D to a full-scale mock-up component within a day," he says. "This enables the design team to finalize ergonomics, form and manufacturability with much more speed and precision. It enables us to flush out problems long before production parts are manufactured."

Crow says modeling engineering data in 3D in the initial stages of development enables Gulfstream to perfect the design prior to building it. "This data also drives all of the tools we utilize in the specification process, including our rendering and cabin configuration applications."

Tannahill believes 3D rendering is a useful starting point for customization. "We provide photorealistic images of design collections created by our interior design specialists," she says. "Customers still expect to touch and feel the proposed materials prior to final selection, but starting from images

does make the process a little less daunting for them. In around 70% of cases, the collections are accepted with minimal changes. The remaining 30% of aircraft are completely customized."

For the Global 7000, Bombardier introduced an iPad app that allows customers to pick and mix cabin components to form a floorplan. Then, as on any Bombardier aircraft, once the floorplan is set, designers go through options, materials and finishes with the customer. These selections are sent to an in-house rendering farm, which generates high-resolution renderings, giving the customer an opportunity to modify the design.

"The next generation of tools will be based on video game engines and will allow customers to visualize their material selections in real time, with a high degree of fidelity – perhaps using virtual reality goggles," says Nolen. "This will enable customers to make corrections even more quickly and easily, and will mean everyone knows exactly how the aircraft will look."



8

Show and tell Despite the usefulness of these technologies, Bombardier, Gulfstream and Textron all agree that showrooms and mock-ups are still needed. "Interior showrooms continue to be immensely popular as they allow the customer to experience materials and textures, and also the space in a full-scale mock-up," says Tannahill of Textron. "It is exciting for customers to see material and color combinations come together, guided by a designer."

"A real material sample lets customers truly experience how colors behave in natural light," says Nolen of Bombardier. He says the full-scale

The North American market

According to Bombardier, Gulfstream and Textron, activity in the North American market is currently very positive. Christi Tannahill of Textron says it is the "largest and strongest market for our products".

Meanwhile, Tray Crow says Gulfstream is "seeing good activity in this region". More than two-thirds of Gulfstream operators in North America are corporations, 20% are private individuals and a small percentage are charter companies.

"As the birthplace of business aviation, North America remains the largest and most mature market for business aircraft," says Brad Nolen of Bombardier. One of the company's biggest customers is fractional operator NetJets. Charter companies and corporate firms form the largest segment of Bombardier's customer demographics in the region. "In North America, private aviation is clearly a proven value-generating tool for successful businesses," says Nolen.

All three OEMs are keen to stress that each customer has a unique style, which they want to see reflected in the aircraft interior. However, they do note some trends in the region. "Two-tone seats, creams contrasted with deep brown or black, and carbon fiber accents are popular," says Tannahill. "Overall the trend is for a modern and clean design."

"Most of our North American customers tend to lean toward classic styles, light-colored burl veneers and neutral leathers," says Nolen.



9

- 8. Cessna paid close attention to accent lighting on the Citation Latitude
- 9. Lie-flat, 27in seats with articulating footrests were developed for Gulfstream's G600

mock-up created for the Global 7000 has become an invaluable tool for showcasing the product, and Bombardier has proceeded in a similar fashion with the Challenger 650.

"Our showrooms are an essential element in the process of defining interiors with our customers and they remain popular," says Crow. "Meanwhile, the G600 mock-up has been an outstanding tool to collect feedback from customers. We are focused on exceeding our customers' expectations in terms of comfort and ease of operation, so it's vital to incorporate their feedback. **END**

NBAA 2015

Three satellites ensure global coverage for Inmarsat's Jet ConneX connectivity service



KA-BAND CONNECTIVITY

The imminent introduction of its Jet ConneX inflight wireless connectivity service, later in 2015, will be the talk of Inmarsat's stand. The company says Jet ConneX will deliver high-quality, consistent and reliable broadband during flights, enabling passengers to check their emails, browse the internet or corporate intranet, conduct video conferences, transfer files, send and receive faxes, and make telephone calls. It could also enable real-time TV and TV-on-demand.

The company stepped closer to commencing Jet ConneX services in August 2015, when the third satellite in its Global Xpress constellation was launched. A fourth satellite is currently

in production. Initial hardware and satellite network flight tests have also been completed with Honeywell Aviation, the exclusive provider of Jet ConneX terminals that will connect private jets to Global Xpress satellites.

The tests included streaming online videos and live radio, holding conference calls and downloading files. In addition to demonstrating a connection between Honeywell Aviation's JetWave hardware and Inmarsat's Global Xpress satellites, Inmarsat says the tests validated Jet ConneX's ability to deliver high-speed, reliable wi-fi connectivity over land and water. The Global Xpress network operates in Ka-band.

**NEW
FOR 2015**



Q&A:

Steve Jourdenais
president, Advent Aerospace

What is your focus this year?

We will show some new structural hardware components, specifically a carbon fiber tie-rod and a multipurpose panel latch. In addition, Advent will showcase the new management methodologies that are bringing its two companies, Jormac Aerospace and Cabin Innovations, closer together. Capitalizing on the synergies between the companies will add tremendous value to the market.

What is your latest product innovation?

Our new carbon fiber tie-rods will offer the structural performance of conventional steel tie-rods, while weighing the same or less than an equivalent aluminum tie-rod, and considerably less than an equivalent steel tie-rod. We're committed to research and development to advance the industry and set us apart from our competition.

How are you expanding your capabilities?

We've added vacuum-assisted resin transfer molding (VARTM) technology for our fiberglass mold manufacturing and are adding advanced resin transfer molding (RTM) technology for our carbon fiber structural component fabrication. VARTM has resulted in lower-cost tooling, while RTM will allow us to fabricate structural components that are more compatible with advanced airframes such as the B787 and A350.

What trends are influencing your business?

The consolidation of core competencies between Jormac Aerospace and Cabin Innovations is one of the ways Advent is addressing the higher urgency to be as cost-competitive as possible without sacrificing advanced engineering capabilities and customer service.

1,100
exhibitors attended
NBAA 2014



Shades and beds

In window shade news, JBRND has certified and delivered its first BBJ 787 Electric SyncDrive window shades.

These shades are each single cassettes that mount behind the sidewall and feature two shades, a sheer and a blackout. The proprietary SyncDrive motors are USB-programmable, designed to keep every shade lined up perfectly throughout the cabin.

JBRND will also highlight a new bed platform that can be made narrow for a twin bed or larger for a king-size bed. It can be mounted into any size aircraft and in any location throughout the cabin. "It is built as a catch-all bed," says Matt Bonner, vice president at JBRND. "We got tired of designing numerous slightly different beds so we developed one that can be easily adaptable to any aircraft with very minimal mounting changes." The new bed features strategically placed actuators and allows space for drawers, hidden storage and even speakers around the perimeter. JBRND currently has four king-size and full beds in production.



Noise-reducing headset

The A20 noise-reduction headset from Bose has been updated with Bluetooth audio, customizable audio prioritization, flexible power with auto-on capability (for

select headset variants), and a coil cord cable for helicopter pilots. Bose says sophisticated electronics combine with microphones inside and outside the earcup to sense and react to cockpit noise – instant by instant – creating a more precise noise cancellation signal. A driver designed for higher output levels reproduces this signal, optimizing noise reduction without the need to calibrate/recalibrate. For passive noise reduction, the headset's proprietary ear cushion technology and earcup are designed to block more noise from entering the earcup – allowing more room for the ears.



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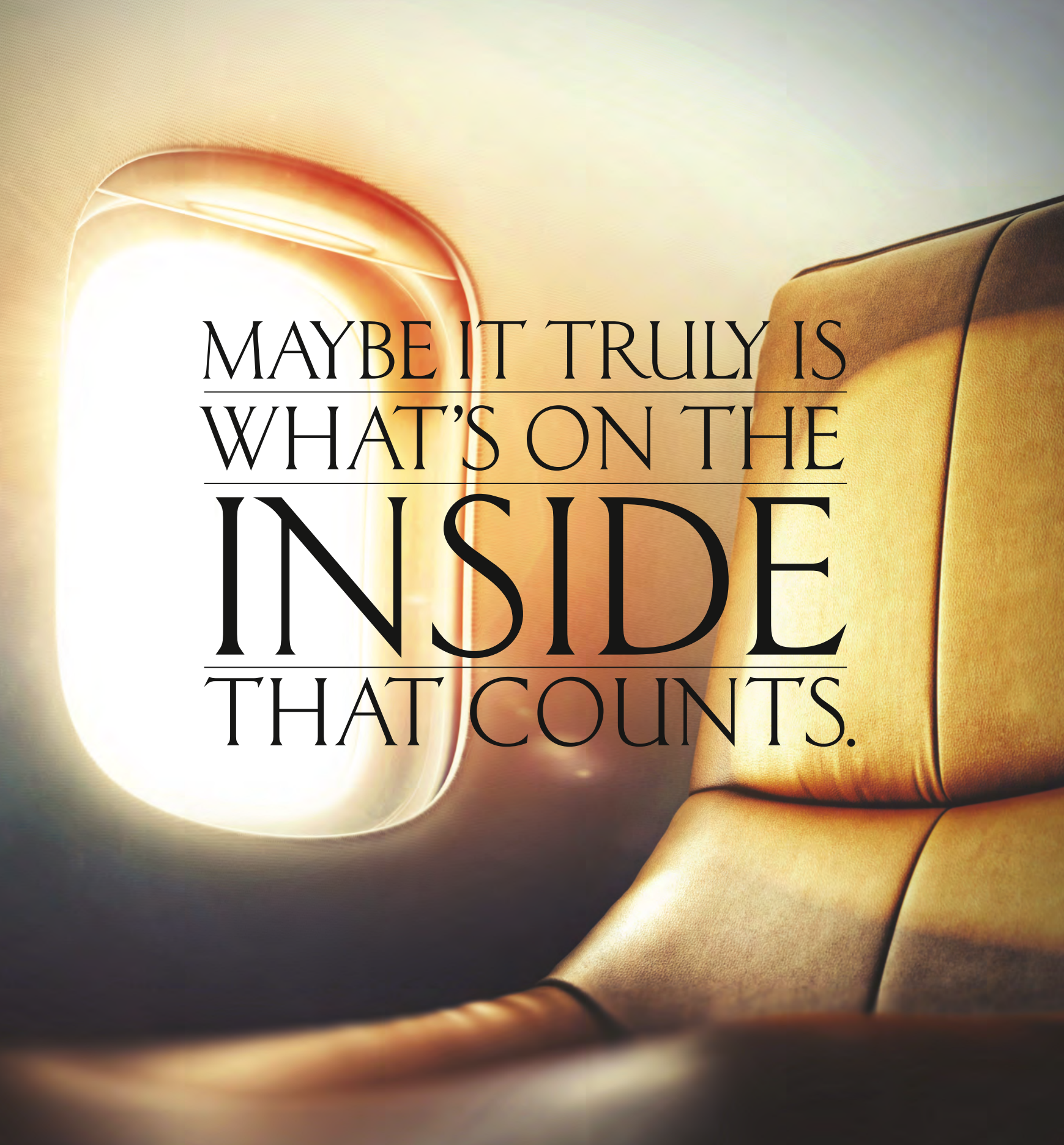


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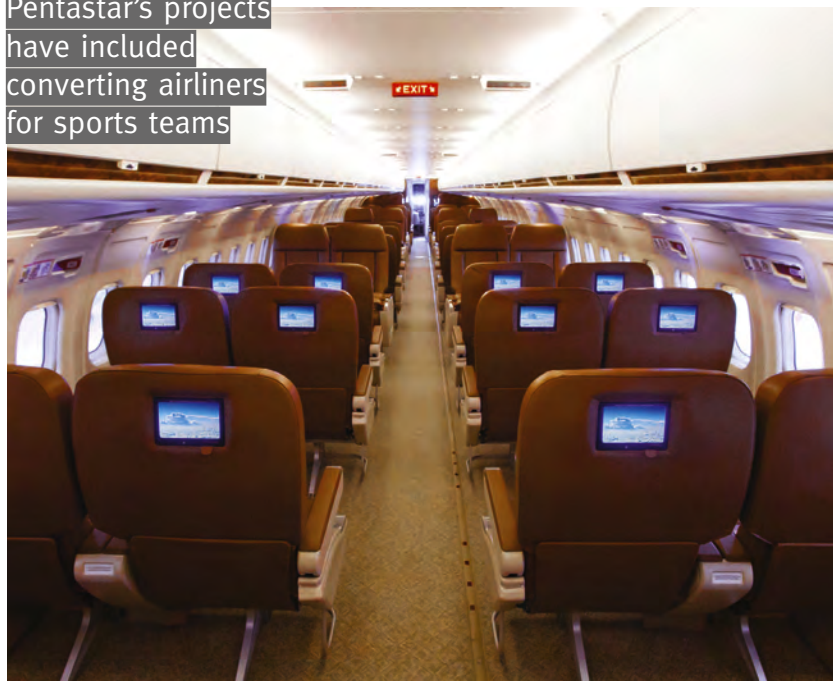
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Pentastar's projects
have included
converting airliners
for sports teams



INTERIOR DESIGN

Having recently celebrated the official opening of its new aircraft interior design studio, Pentastar Aviation of Waterford, Michigan, USA, comes to NBAA to convey the studio's focus on innovation, attention to detail, engineering, craftsmanship and synergy with its other services.

"Although we're a boutique shop, we do big things on aircraft large or small, such as the recent full design and completion of a GV, which included a shower," says Gordon Ross, Pentastar's director of aircraft interiors.

The company's work has included converting airliners into luxury aircraft for professional sports teams. "We worked one-on-one with everyone: coaching staff, athletes and trainers to make sure the design ergonomics were covered, as well as the flight crews to make sure there were adequate storage and cooking mechanisms to feed the teams and store food at the right temperatures," says Ross.

A recent project saw the company create a lift mechanism for a 42in TV monitor stowed in a credenza. "Our solution works remarkably well and exemplifies our commitment to bring unparalleled distinction in design," says Ross.



Tankless water heater

Following its first shipment earlier in 2015 for installation by Associated Air Center on a BBJ 787, IWG's new T-Series tankless water heater can be seen at the show. The T-Series is designed to

support showers and galley complexes, producing hot water on demand from a lightweight, small package.

More than
100
aircraft were
displayed at
NBAA 2014



Q&A:
Jason Rechberg
vice president, Actron



Solar protection

One of the solar protection systems to be presented by Vision Systems is a motorized

shade for two windows. The company says it features a silent fluid motion and advanced motorization with brake, manual unlocking and anti-jamming devices. The solution's foamed casing is intended to keep weight down.

Other solutions on display will include a dimmable sun visor that has an integrated rechargeable battery; a dimmable cabin partition; and a dimmable window that can be controlled by using hand gestures.



Business jets

Announcements ranging from aircraft milestones to technology enhancements will be made by Bombardier at the show. In fact, the

OEM promises a host of announcements and surprises. In terms of its display, Bombardier will showcase a large range of products, including its full-scale mock-up of the Global 7000.

Bombardier says NBAA is a way for it to promote its wide portfolio of business aircraft – from the Learjet 75 to the Challenger and Global families – to the surrounding regions.

What do you plan to show at NBAA this year?

Customers often complain about the left-to-right sway of drawers when fully extended. Our new undermount slide acts as a third member that can be mounted underneath the drawer. It features our patent-pending diamond glides – plastic glides that keep each of the track members engaged with one another over longer areas of the slide. This creates a very robust feel in all directions, even in the extended condition.

We will also debut a patented adjustable wire strike with a slim and stronger design. The mounting hole pattern is central, to allow customers to retrofit current strikers. Our adjustable wire strikes eliminate fascia damage. The wire will remain locked in position and not loosen over time. In addition, the wire striker features adjustable drawer stops.

We will also showcase an array of new latch designs. Over the years, the industry standard has been pretty bland, consisting mostly of rectangular and oval shapes. We have developed a new trapezoidal series that is gaining in popularity. This style is not only ergonomic, but also very attractive.

How are you meeting demand?

We recently doubled our office space and expanded our manufacturing capabilities. Our engineering department has doubled this past year and we now offer even more load and cycle testing capabilities, due to our test lab expansion. We have also created a research and development department that consists of dedicated mills for rapid prototyping.

NBAA 2015

Skandia's soundproofing kit for the BBJ 787-8 is engineered to be easy to install



SOUNDPROOFING KIT

A pre-cut and engineered acoustics kit developed for soundproofing the BBJ 787-8 will be showcased by Skandia. The installation is custom-kitted and includes fuselage skin damping, trim panel and cabinetry damping, flooring and carpet and environmental control system mufflers. The fuselage skin damping materials have been developed in conjunction with Boeing, with the BBJ 787's composite fuselage in mind. These materials are exclusively available through Skandia.

Skandia, which has ISO 17025-accredited flammability testing laboratories, says the materials in the kit meet all applicable flammability requirements and testing. The soundproofing systems are engineered and packaged to provide the quickest,

most efficient installation possible, with pre-cut and part-numbered components. The materials are packaged so that they can be placed directly into the exact location where they are to be installed.

The kit provides acoustical carpet pad in 48in-wide rolls that can be rolled out, cut to length and installed in accordance with established shop procedures. Also of note is the proprietary 48in-wide composite overframe blanket that comes with attached fasteners.

Skandia believes it is important to treat the entire aircraft to maximize the sound reduction in the most sensitive locations. Skandia also provides engineering support on-site to facilitate and assist at each phase of the installation.



CMS and IFE

Highlights of Rockwell Collins' display will include the Venue HD CMS/IFE system, as well as its smart cabin eRouter offering.

Earlier in 2015, Rockwell Collins announced a new smart eRouter as part of its ARINCDirect flight support services portfolio. The eRouter manages onboard networks including Ka, Ku, L-band, ATG and GSM within the cabin, and provides flight crews with access to ARINCDirect service offerings including Follow Me GSM over wi-fi, media content, international trip planning, and weather.

Meanwhile, Rockwell Collins says Venue continues to gain traction in the market. In May 2015, Dassault announced it will equip its new Falcon 5X and Falcon 8X with a Venue-based CMS and IFE solution, continuing the long relationship between the aircraft maker and system provider.

IFE and CMS

On a 55in flatscreen, Astronics PGA Avionics will demonstrate its Smart Cabin Player application, enabling visitors to enjoy a variety of media from its complete IP system, including movies, games and music from AVOD, an HD media player or a USB media player, as well as a new moving map. Through a recent alliance with Betria Systems, the developer of FlightPath 3D and software solutions, PGA now offers a 3D HD interactive moving map experience that enables passengers to control their map interface.

Astronics PGA's IP system is now flying on a BBJ 747-8. The company's IFE technologies on board include full HD screens, touchscreens, audio/video sources and passenger control units.

Also on display at NBAA will be the Be-Bop'tic fiber-optic lighting system. RGBW technology was used to provide color homogeneity throughout the cabin. The lighting is intended to highlight features including seats, doors, windows and walls. It offers variable color and luminous intensities and enables many display scenarios.

NBAA is the
5th
largest trade
show in
the USA

Graphic: Anikel



Streaming update

Passengers have been able to stream AVOD content wirelessly from a server to their PED for years. Now Innovative

Advantage has updated its AVDS backbone system to enable other IFE sources – cameras, maps, auxiliary ports, etc – to be streamed wirelessly to iOS and Android devices. It says this functionality can be added to virtually any aircraft, and even integrated with existing IFE equipment. The company says AVDS uses advanced hardware encoding and encryption, along with an industry standard DRM mechanism, to allow IFE inputs to be viewed on carry-on devices.

BBJ 787-9 capabilities

A 1/20th scale model will be used to display Greenpoint Technologies' Azure interior for the BBJ 787-9. Greenpoint recently inducted its second BBJ 787-8 for completion. "The BBJ 787 is a sophisticated, spacious aircraft that will accommodate all of the needs of a head-of-state, private executive or large family. It offers the comfort of your home or office," says Greenpoint's design director Annika Svore-Wicklund, who led the interior design in collaboration with Lancaster Design Group. Greenpoint will exhibit next to its parent company, Zodiac Aerospace.

Wireless access points

The nMAP2 wireless access point highlighted by VT Miltope is designed to optimize wireless performance in the aircraft. "The nMAP2 provides the latest IEEE 802.11ac technology in an airborne certified package," says Robert Guidetti, vice president of commercial products at VT Miltope. "Packed with capability, the nMAP2 has the intelligence to evaluate what wi-fi devices are turned on and how best to connect them to the aircraft network." Patented software automatically load balances multiple client devices, selects channels and bands, and manages RF power levels.

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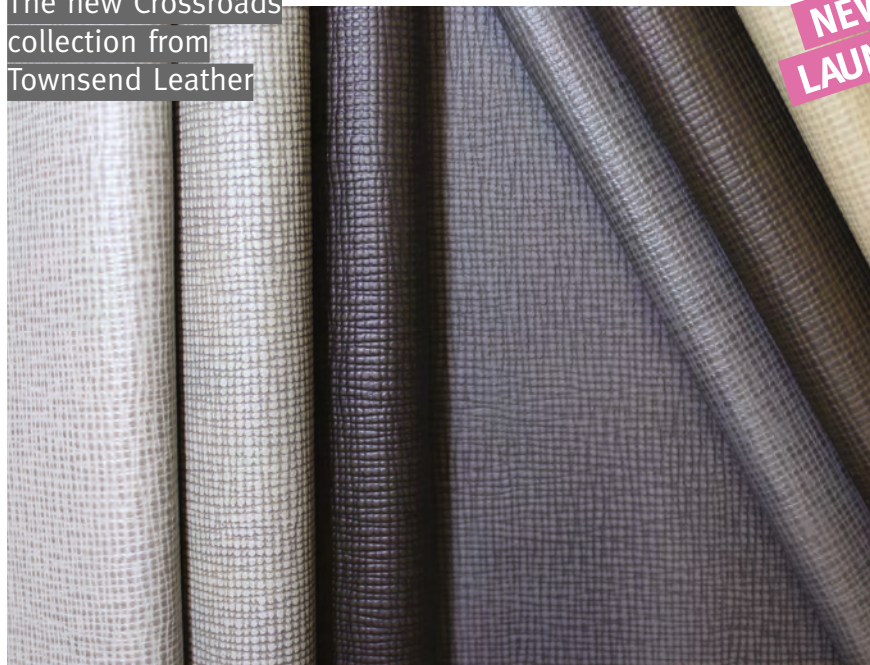
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The new Crossroads collection from Townsend Leather



TEXTURED LEATHERS

A new collection of textured leathers, shown in two finishes – Crossroads Tipped and Crossroads Handiwork – will be on display at Townsend Leather's booth.

Each of the leathers highlights the embossed texture differently, creating two unique looks that can be used separately or together in coordinating applications.

Townsend reveals this small-scaled, embossed woven texture has been very popular for upholstery applications and it is now offering this on leather in five colorways for each technique. As always, the company promises custom colors are also available in these new leathers, with a nominal upcharge and minimal extension of lead times. Townsend says the aniline-dyed hides meet all industry standards and offer great cutting yield on 55-60ft² cowhides. The leathers are all produced at Townsend's facility in New York State, USA.



Interior completion

Nine VIP interiors have now been completed at Comlux America in Indianapolis, Indiana, USA. The ninth cabin was installed on an

ACJ320 for a private customer. Among the expertise Comlux America will highlight at the show is its design ability, which was utilized on this project. Sister company Comlux Creatives led the design under the direction of Lauri Church and in partnership with Fiona Riddle of Inflight Cabin Solutions, the customer's design representative.

New leather collection

After careful research and development, Garrett Leather has created a new collection for aviation customers, Flight, which it will preview at the show. Flight is a European full-grain leather that its maker says has an exceptionally soft feel and smooth appearance. The company says that in addition to meeting standard FAR requirements, Flight is being produced to pass the 60-second vertical burn test, without requiring additional treatment. Technicians in Italy are currently in the process of creating the first dye-lots of the new colors. Flight should be in stock and available for immediate shipment by the end of 2015.

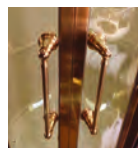


Noise reduction

The solutions to be shown on Lord Corporation's exhibit are all designed to make business aircraft quieter, by reducing vibrations. The offering includes engine mount technologies, interior

isolators and equipment mounts for hydraulic pumps, air-conditioning systems and galley refrigerators. Lord also offers inertial sensing solutions such as satellite antenna pointing.

There will be
2
static displays
at NBAA 2015



Decorative plating

Fifteen years ago, Signature Plating embarked on a journey to become the top decorative plater in the industry. The company now provides more than 100 standard finishes and

the ability to color-match any finish. Within the last nine months, the company has worked on multiple large green-cabin projects, including a BBJ 747-8, three BBJs, two ACJs, and a BBJ 787 that is near completion. Full refurbishment projects have included a BBJ 747-4, Gulfstreams, Falcon jets and Bombardier Learjets. There have also been many partial refurbishment projects.

"Our customer base has grown by more than 100% in the past three years, catapulting us toward our objective," says Frank McKnight, CFO and co-owner of Signature Plating. "Rest assured we will not rest on our laurels, but continue to strive in all areas, to exceed our clients' expectations."

McKnight and fellow co-owner Larry Donoho, along with vice president Paul Sahanek and director of business development Christopher Donoho, will welcome visitors to the stand.

Cabin completion

Completion and conversion capabilities – from rotary refurbishment to special-mission design engineering through to internal and external completions of green aircraft, maintenance under Beechcraft and Bombardier ASF agreements, and nose-to-tail conversions of pre-owned aircraft – will be highlighted by Flying Colours Corporation. For the first time, the team will be talking up its capabilities for implementing automatic dependent surveillance (ADS)-B OUT in Bombardier Challenger 604 and 605 airframes. Flying Colours expects to have the accreditation validated by both Transport Canada and EASA following FAA approval later in 2015.

NBAA 2015

Scott Group's City Grid and Aquila with silk handmade carpets

SHOW
LAUNCH

CARPET COLLECTIONS

Those looking for carpet inspiration should head to Scott Group Custom Carpets' stand, where the company will launch its latest VIP aviation collections, including handmade carpets and a hybrid machine and hand-overtufted collection.

The collections are made up of a range of classic textures and elegant patterns, complemented by distinctive artistic and large-scale patterns, which Scott Group designed with wide-body aircraft and customized layouts in mind. Using a palette of updated neutrals, Scott Group designers looked to fashion for pattern inspiration, taking cues from the refined tweed textures, bold geometric patterns and unexpected details found on the runways.

City Grid and Aquila with silk, both part of the new handmade collection, share a palette of cool gray tones accented by deep indigo blue, bringing a bold look to simple and classic designs. The carpets are all custom designed and handmade in Grand Rapids, Michigan, USA, using New Zealand wool and Mulberry silks.



Q&A:
Karina Bergström Larsen
co-founder and vice president
of partnerships, Satcom1

More than
26,000
people attended
NBAA 2014

What will you showcase at NBAA?

Satcom1 provides airtime, satcom and network design services, as well as router software. This year, our focus is Honeywell's upcoming Ka-band service JetConneX, based on Inmarsat's Global Xpress technology. This will provide high-speed internet globally – a huge milestone. We will also focus on the new Exede In The Air service by ViaSat, and a new router – the PGA platform by Astronics PGA – which is loaded with AvioIP, supporting all existing Inmarsat technologies and ViaSat Ku-band, as well as the upcoming Ka-band. On top of that, the PGA platform features IFE services.

What are the latest improvements to your offering?

In May 2015, Satcom1 introduced Satcom1.TV, an IPTV-based solution ideal for VVIP aircraft operating globally. Satcom1.TV can be delivered to aircraft equipped with aggregated two-channel Inmarsat SwiftBroadband systems, but the perfect satcom carriers are the upcoming Ka-band solutions, including Honeywell's JX MCS-8000 series or ViaSat's new Ku-Ka system, GAT-5320. Satcom1.TV is already in operation on four ACJs. Satcom1.TV offers a choice of more than 600 satellite TV channels, which are received seamlessly within the global Inmarsat or ViaSat coverage area. This solution brings live TV to new levels, by eliminating TV-only antennas and terminal hardware, ultimately reducing weight, drag and costs.

Satcom1 will also present another router, again with the new version of AvioIP software, supporting the latest Inmarsat Ka-band technologies, which makes it the first router in our portfolio supporting the Inmarsat JetConneX Ka-band service.



AV control

Interior designers seeking audio and video controls designed to provide the best audio experience with minimum invasion or modifications should speak to the Alto

Aviation team. One of its highlighted ranges is the Alto Acapella line of passenger audio and video controls. Alto will also demonstrate new features for its Alto nVELOP digital surround sound system, and the latest developments in digital audio, including its full line of audio systems. Alto Sound will be demonstrated in three aircraft mock-ups representing large, medium and small cabins.



Repair station

On July 1, 2015, Air Capital Interiors received its FAA repair station certificate, for the maintenance, repair and

refurbishment of aircraft interior panels, cabinets, seats, floor coverings and interior-related components. It will highlight this milestone at the show. "Now our work can go straight to the aircraft," says Rodney Wilson, president at Air Capital Interiors.

Air Capital Interiors has performed interior repairs – ranging from simple component refinishing to complete interior refurbishment/replacement – on 35 aircraft models since its inception in late 2013.

Pedestal table

A new single-pedestal table with infinite locking heights will be demonstrated on MSB Design's booth. The company provides monuments for a wide range of cabins, either as kits or assembled.

MSB will also showcase its individually designed crystal, china and flatware (CCF) inserts. The company has developed a solid network of wide-body customers for the CCF in the last year, and will be meeting with OEMs, completion centers, clients and design companies to provide details of its capabilities in this sector.

LUXURY REDEFINED

Visit us at NBAA Booth #N936 to learn what makes us fly
and we'll give you a free airplane (ok, it's just a sheet of paper, but it's pretty cool)



WHITE OAK
CUSTOM CARPET



Featuring finely crafted carpets from White Oak .

Aircraft Interior Products is a CAP Family Brand, CAP Carpet, Inc., Since 1967

As kids, the quality of paper we selected and the accuracy of our folds defined perfection in aviation. Today, that concept remains the same. It takes great quality and craftsmanship to make the perfect interior.

Aircraft Interior Products, through our vertically integrated affiliate **White Oak Custom Carpet**, now offers the very best and most diverse, luxury handmade custom carpets in the aviation market. Now that many of our finest handmade luxury carpets include Mohair, we believe we have achieved that perfection!



Aircraft Interior Products

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NBAA 2015 ■■■

WHERE TO START IN LAS VEGAS



wellcome/shutterstock.com



Q&A: Rita Carrillo,
general manager, Signature LAS

Can you share your best memories of past shows?

In 1998 McCarran International Airport, where our FBO is based, hosted a record number of aircraft for NBAA – 700. Runways and taxiways had to be closed to provide parking space for them.

What is it like having NBAA come to your city?

I have been fortunate to participate in every NBAA held in Las Vegas over the past 30 years. It's exciting to see the newest advances in aviation, and also to reconnect with aviation companies that we otherwise might not have the opportunity to see. I'm also proud that Las Vegas is one of the few cities able to accommodate such a large trade show.

What are you looking forward to at this year's show?

I am looking forward to attendance growth as well as seeing aviation advances unveiled. We are delighted that because of the date change we get to work in cooler temperatures! Additionally we have worked closely with the airport authority to mitigate potential departure delays. The procedure we have developed is currently in test mode and feedback so far has been positive.

RITA'S TIPS

WHAT TO DO

Hoover Dam, Red Rock, Mount Charleston and Valley of Fire are well worth a visit if you are an outdoors enthusiast.

WHERE TO EAT

Most of the big hotels have a star chef restaurant. For example, at Caesars Palace there's Gordon Ramsay Steak, and at the Venetian there is Restaurant Guy Savoy, which has been awarded two Michelin stars. Also at the Venetian is Delmonico Steakhouse, an Emeril Lagasse restaurant. Lagasse also has restaurants at the MGM Grand (Emeril's New Orleans Fish House) and the Palazzo (Table 10 and Lagasse's Stadium).

WHERE TO SOCIALIZE

There's so much nightlife in this city. The most famous nightclubs are Drai's at the Cromwell Boutique Hotel and Casino, Hakkasan at the MGM Grand and Tao at the Venetian.

WHERE TO SHOP

Popular shopping spots include the Fashion Show Mall, the Forum Shops at Caesars Palace and the Grand Canal Shoppes at the Venetian.

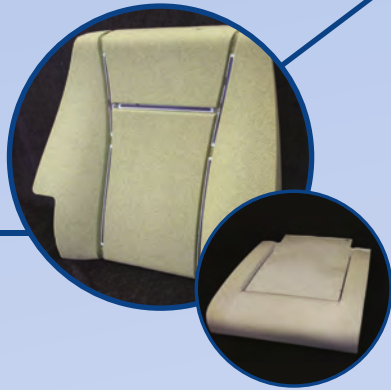
Comfort is a system

Comfort = Support + Flexibility

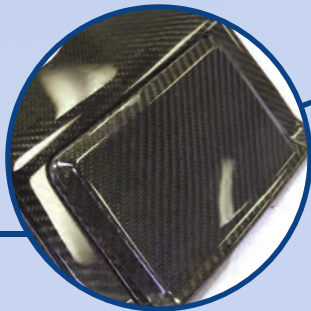
The unique RCO Comfort Mat © suspension system allows for quick changes in cushion firmness without the need to change foam and upholstery.

RCO seat systems incorporate the latest in composites technology for weight savings.

Cushion foam
CNC milled or
poured to shape



Composite trim
panels and
structural parts



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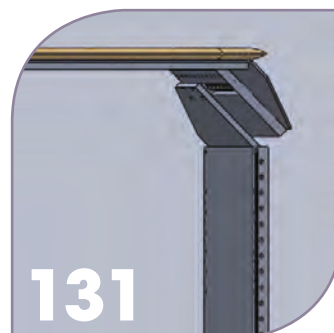
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www.nbaa.org/2015/interiors

starquality

Following the launch of the Ascot, Athens and Apollo leather collections at NBAA 2014, at this year's show Moore & Giles will debut Orion

1-2. Orion, the latest leather from Moore & Giles

The latest collection of aviation leather from Moore & Giles is made from southern German hides and will be available in 65 standard colors. The Orion collection will be launched at NBAA 2015, to be held in Las Vegas, Nevada, on November 17-19. The aniline-dyed leather has a naturally milled grain and is completed with a breathable protective finish. It is 1.0-1.2mm thick and weighs 2.0-2.75oz/ft². The average hide size is 50-60ft².

Moore & Giles also offers three other leathers – Ascot, Athens and Apollo – which are available in more than 80 stock colors. These collections were introduced at NBAA 2014, and the company says they have proved popular. Additionally, a custom program makes full-grain leather available in any color.

"There has been a slight shift away from hues of beige and gray," says Matt Buckley,

senior vice president of sales at Moore & Giles. "In addition to comfort, aesthetic appeal and colorful design, younger jet travelers crave exclusivity. Designers and completion centers both want something fresh, something new and creatively forward leaning."

As well as supplying traditional leather, Moore & Giles also has the ability to add metallic and matte transfer patterns to suede. It offers more than 40 base colors, and says the result still meets aviation testing requirements.

"Our goal is to offer an assortment of neutrals along with colors, textures and designs that give a touch of added luxury," says Chad Evans, director of aviation at Moore & Giles. "Many of our more fashion-forward leathers can be treated to meet aviation technical specifications – a key differentiator since aviation designers are beginning to diversify their portfolios and infuse aircraft interiors with more innovative elements of design."

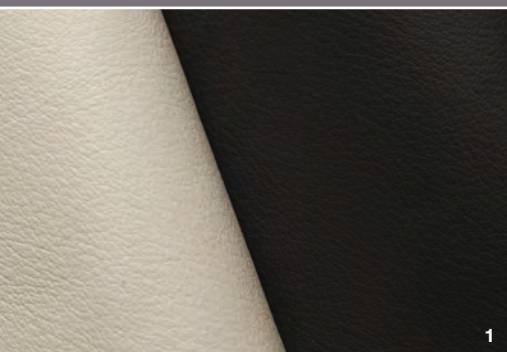
Moore & Giles aims to be a design resource, to inspire through color and texture. Its main facility houses more than 6,000 aviation-specific hides. The company is also committed to providing high and consistent quality – while still offering quick turnaround times. Along with a customer-service care team dedicated to the aviation industry, the company has a quality-management system in place. This system focuses on meeting customer expectations and aviation requirements. In addition, Moore & Giles is AS9120 compliant.

Moore & Giles

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1



2

modern comforts

To develop textiles that offer beauty and performance, Tapis blends traditional crafts with modern technologies

Various luxury automotive brands have chosen Ultrasuede by Tapis for seating applications over the years. Now the company believes this design trend is crossing over into the aviation market. Recently, Ultrasuede was selected as the primary seating material on the new Dassault Falcon 5X mock-up.

The Falcon 5X mock-up has been on an extensive tour, during which it was a challenge to keep the interior clean and looking fresh, according to Tina Gricius, senior aircraft interior designer at Dassault Falcon Jet. A year of heavy traffic had made a visible difference to the natural suede product originally used for the passenger seats. "We replaced the seats with Tapis Ultrasuede and got the look of the natural product with the durability of a manufactured one," says Gricius.

Dassault Falcon Jet is now refurbishing the 5X mock-up in a new colorway for NBAA 2015 and is again using Tapis Ultrasuede for the passenger seat upholstery. "It has proved its performance in every way – look, feel, quality and resilience," says Gricius. "We are using Tapis products not only for the seats, but throughout the entire mock-up."

Gricius was also impressed by the company behind the product. "We can always count on Tapis for excellent customer service and product guidance to provide our customers with the best solution for their Falcon aircraft," she says. "I would go as far as to say they set the benchmark for customer support."

Made of recycled polyester, Ultrasuede is a non-woven material that Tapis describes as pliable, stain-resistant, machine-washable and spot-cleanable.

"The exclusive technology used to produce Ultrasuede enables its lightweight construction, easy cleaning and maintenance, and superior durability," says Jason Estes, director of sales at Tapis. "It's also a safe and environmental choice, partly because of its low weight, partly because it contains no animal products, and also because its stain resistance eliminates the need to use potentially toxic care products."

Tapis conducts extensive research and development, based on feedback from its customers. One recent result of this approach is Ultraleather Pro, the next generation of the Ultraleather product. An ink- and stain-resistant treatment is incorporated into the protective surface layer of Ultraleather Pro, designed to safeguard it against ballpoint pens, food and beverage spills, the transfer of denim dye, and other mishaps. "Offering the highest level of protection and cleanability, this top-quality construction, inclusive of polycarbonate resins, also ensures lasting performance," says Estes.

Tapis also has a new collection of woven fabrics. Pure silk, mercerized cotton and fine linen are mixed with performance-driven fibers for fabrics designed to deliver the woven beauty, specification and opulence demanded by the luxury aircraft market. The Tapis Woven Collection



includes 10 textiles, which are available in a wide range of colors and textures. They are intended to coordinate seamlessly with one another and with other Tapis products, and also to provide differentiation from other luxury jet interiors.

Tapis

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1. Ultraleather Pro
2. Ultrasuede on the Dassault Falcon 5X mock-up
3. The Tapis Woven Collection





Elegant, durable,
easy-to-maintain
fabric for business
aviation seating.

ultrasuede®

Lightweight, durable and inherently stain resistant, Ultrasuede® is the ideal choice for luxury seating applications.

*"Ultrasuede® has proven its performance in every way -
look, feel, quality and resilience."*

- Tina Gricius, Senior Aircraft Interior Designer, Dassault Falcon Jet

ETAPIS

IN EVERYTHING THAT FLIES

humanfactors

Seat comfort depends on numerous factors, not least the body shape and preferences of the occupant

1-2. The Robostand can be used to measure the form and firmness of a customer's favorite seat, enabling it to be replicated



1

One request that unites all of RCO's seat development projects – whether for a complete OEM business jet program or a single VIP aircraft – is comfort. However, creating a comfortable seat is not a simple task, especially given the variation in occupant body shapes and personal preferences. "It is very difficult to make one seat comfortable for everyone," says Norm Starr, general manager at RCO Aerospace Products. "The starting point is to look to accommodate a certain percentile in terms of occupant size, but even that may not accommodate the body size and shape of the actual occupant."

Dimensions that seat designers have to consider include the height of the cushion from the floor, to ensure the typical occupant's feet will reach the floor; and the height of the armrests, to ensure the typical occupant's arm isn't either too low to rest comfortably on the armrest or isn't being pushed up by it.

Another challenge is that people tend to sit differently – some sit more erect, some slouch and others have a neutral posture. "The seat needs to be designed either for a specific individual – which is often the case in high-end business jets – or must be adjustable to cover a wide range of postures," says Starr.

An additional factor to consider is how the seat will actually be used. "There are often conflicting requirements," says Starr. "For example, there is often a request for the seat to be comfortable for sitting yet also provide a flat surface for sleeping – even though, for the majority of time, occupants use a seat for sitting, not sleeping. The seat should be designed to be as comfortable as possible for the primary use (sitting) and have other features such as mattresses for sleeping."

The upholstery is also an important consideration. "Not all leathers are ideal for a seat – some have a slippery surface that may not hold the occupant," says Starr. "On the other hand, suede-like surfaces may hold the occupant too firmly, not enabling the subtle adjustments people want to make over the course of a flight, so the end user should consider upholstery carefully. If active cooling is required, a more porous fabric or a mini-perforated leather covering should be used."

Last but not least, there is the matter of how firm to make the seat. "Softness does not necessarily equal comfort," says Starr. "If the body is not adequately supported, it will not be comfortable for long periods."

RCO offers Comfort Mats, which are placed between the seat cushion and the seat frame, enabling the user to change the firmness of the seat without the need for new foam pads or re-trimming. "The changeover can be accomplished in around 10 minutes per seat, without the seat needing to be taken off the aircraft," says Starr.

For the ultimate customization, the company can also develop a seat that replicates the customer's favorite, perhaps from their home, office or car. "The Robostand measures the contours and firmness of the seat, and we then replicate these attributes to create a unique seat for the customer's aircraft."



2

RCO Aerospace Products

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Ultraleather® Pro

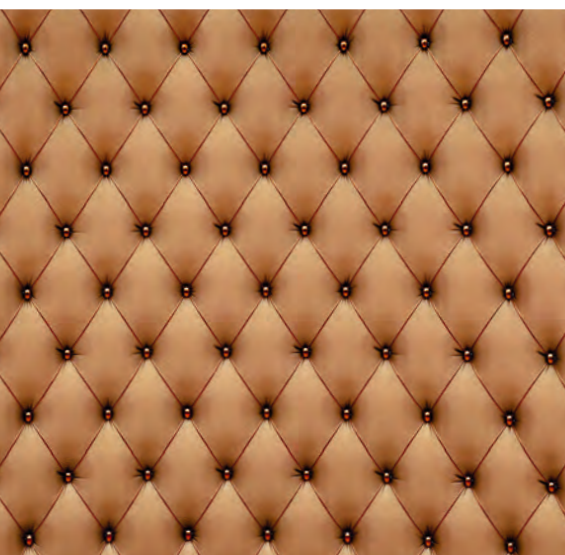
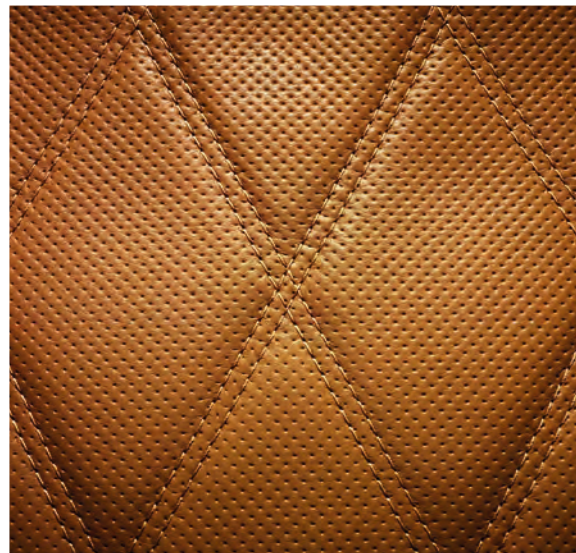
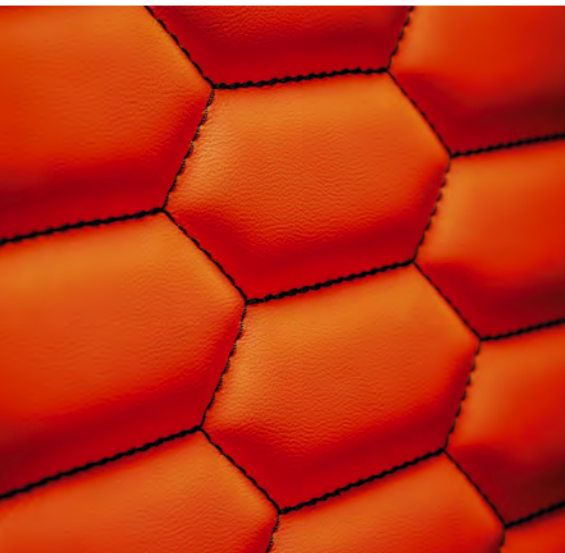
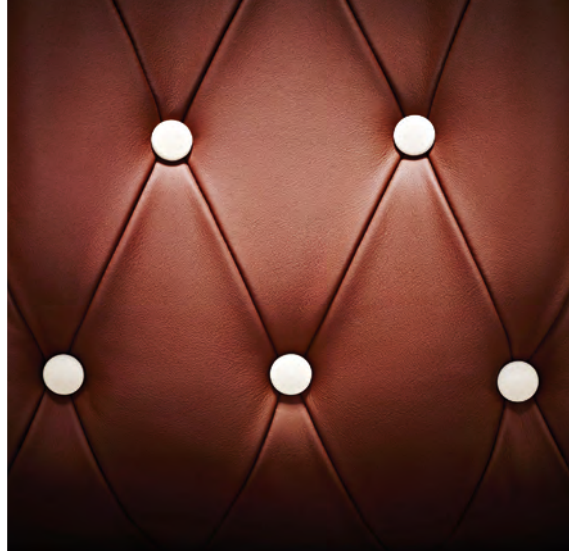
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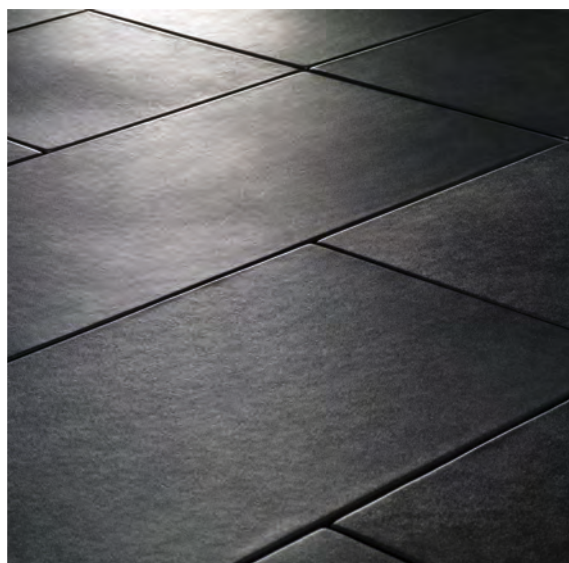
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hide and tweak

As well as investing in the development of new leather innovations, Boxmark is concentrating on customization

1. F/List Leather Flooring
2. Xtreme leather can be used for seat upholstery, as well as wall panels
3. Boxmark's customization options extend to personalized embroidery

Materials used in aircraft have to be hard-wearing and comfortable. Boxmark's leather products are designed to meet both these needs, while conforming to industry standards and helping to create an exclusive ambience.

The company's latest innovation, developed with F/List, is leather flooring for VIP and business aircraft. "By combining our expertise, we generated an outstanding innovation that will create a unique, elegant and sophisticated environment on board the aircraft," says Marjan Trobis, managing director of Boxmark Slovenia.

F/List Leather Flooring is installed in tiles, and is available in a wide range of colors and sizes. "It meets all applicable certification requirements, including for flammability and slip resistance," says Trobis. "A very stringent qualification program ensures that F/List Leather Flooring exceeds the most demanding customer expectations. In addition, the material improves with age, and does not suffer from wear and tear. It develops a rich texture that looks beautifully lived in, greatly enriching the style and charisma of the aircraft cabin."

Another of Boxmark's products is Xtreme, designed to be a hard-wearing and hygienic solution that is easy to care for. "Xtreme meets the highest quality standards and has certificates that prove excellent resistance to

mold, bacteria, disinfectants, dirt, chlorinated and sea water, oil and alcohol," says Trobis.

"It is also highly resistant to stretching, tearing, abrasions and breaking, even at sub-zero temperatures, and is flame retardant. All our flame-retardant leathers not only meet the high requirements concerning flames, smoke and toxicity, but also use eco-friendly flame inhibitors for this purpose."

With its Production Organization Approval, which was granted in 2013, Boxmark is a certified producer for the aeronautics industry. The company supplies both leather hides and leather-covered components for commercial, business and VIP aircraft.

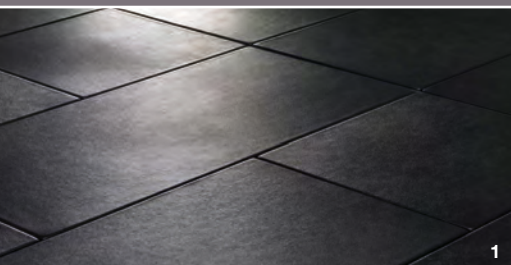
Boxmark also prides itself on its ability to customize its products and services to meet the needs of each customer. "We offer almost infinite possibilities for the visual design of the materials," says Trobis.

The company refines leather and fabrics in different ways upon request – punching, embossing, perforating, printing, embroidering and lasering according to customers' wishes. For example, customers can specify all types of seams. "Even functional demands concerning ergonomics and special performance characteristics are taken into account," says Trobis. "We also focus on using top-quality, aviation-compliant materials – not only for the cover, but also the substructure and upholstery materials, as well as the cotton used for embroidery. It all goes to ensure that the customers receive the best quality."

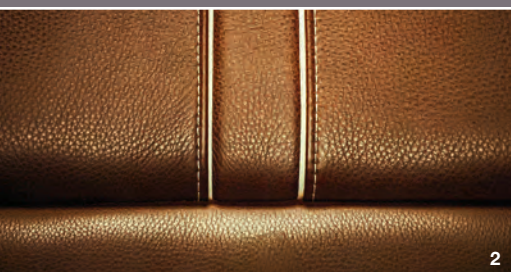
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1



2



3

soundadvice

More than 2,000 aircraft fly with audio systems custom-built by Alto Aviation

The founders of Alto Aviation, Don Hamilton and Steve Scarlata, began their careers at Bose, tuning audio systems for new-production cars. Believing that their experience and passion for audiophile-level sound quality could make a difference in the business aviation industry, they started to manufacture and distribute cabin audio systems for Gulfstream. These became standard equipment for the company. Now Alto Aviation's sound systems fly on more than 2,000 aircraft.

The company's equipment is offered as standard on aircraft types including the Gulfstream G650, G450 Elite, G550 Elite and G280; Dassault Falcon 7X, Falcon 900 and Falcon 2000; Embraer Lineage 1000, Legacy 650, Legacy 600, Legacy 500 and Legacy 450; Cessna Citation X, Citation Sovereign and Citation Latitude; and Sikorsky S-92 and S-76. The company is also working under non-disclosure agreement with other major OEMs, to integrate its products as standard equipment across many aircraft platforms.

Alto's audio systems are offered as an integral part of Honeywell's Ovation and Rockwell Collins' Venue CMS solutions. The company's equipment has also been chosen for many retrofit projects on business aircraft small to large. "We focus on easy, retrofit-friendly installations," says Scarlata. "Our custom acoustical tuning provides each customer with the highest level of sound performance."

The systems are specifically designed for business aircraft, not only in terms of

acoustics, but also to meet the need for space- and weight-saving solutions. The equipment includes loudspeakers, amplifiers, subwoofers, surround systems, passenger interface controls, page/chime systems and standalone systems that do not require IFE or CMS support.

Quality is a huge focus. "All of our employees are fully committed to our mission statement – to wow all of our clients by delivering a superior custom sound, providing outstanding customer support and continuously pursuing product innovation," says Scarlata.

Alto's headquarters in Sterling, Massachusetts, houses its business administration, manufacturing and distribution operations. Offices in Jupiter, Florida, are home to the research and development lab, as well as engineering, marketing and media relations departments. Alto also has engineering representation in Little Rock, Arkansas; Seattle, Washington; and Stuttgart, Germany. A network of audio system engineers and customer representatives are always available to serve clients anywhere in the world. Representatives will also be on hand at NBAA 2015 – to be held in Las Vegas, Nevada, on November 17-19 – to talk visitors through the company's latest developments in cabin audio systems.

Alto Aviation Reader Inquiry No. 505

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1. Alto's ASP-612 speaker
2. The company's latest Acapella VIP keypad
3. Alto offers a full range of audio equipment designed for aircraft



The best seat in the house is flying above your house.



ALTO Aviation is the premier supplier of high-end custom cabin entertainment systems for business aviation.

Our products are offered as standard equipment on most major OEM aircraft.

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With more than 2,000 sound systems flying the skies, ALTO remains the unrivaled leader in premium cabin entertainment systems.

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MEET US AT NBAA 2015 BOOTH #N4907

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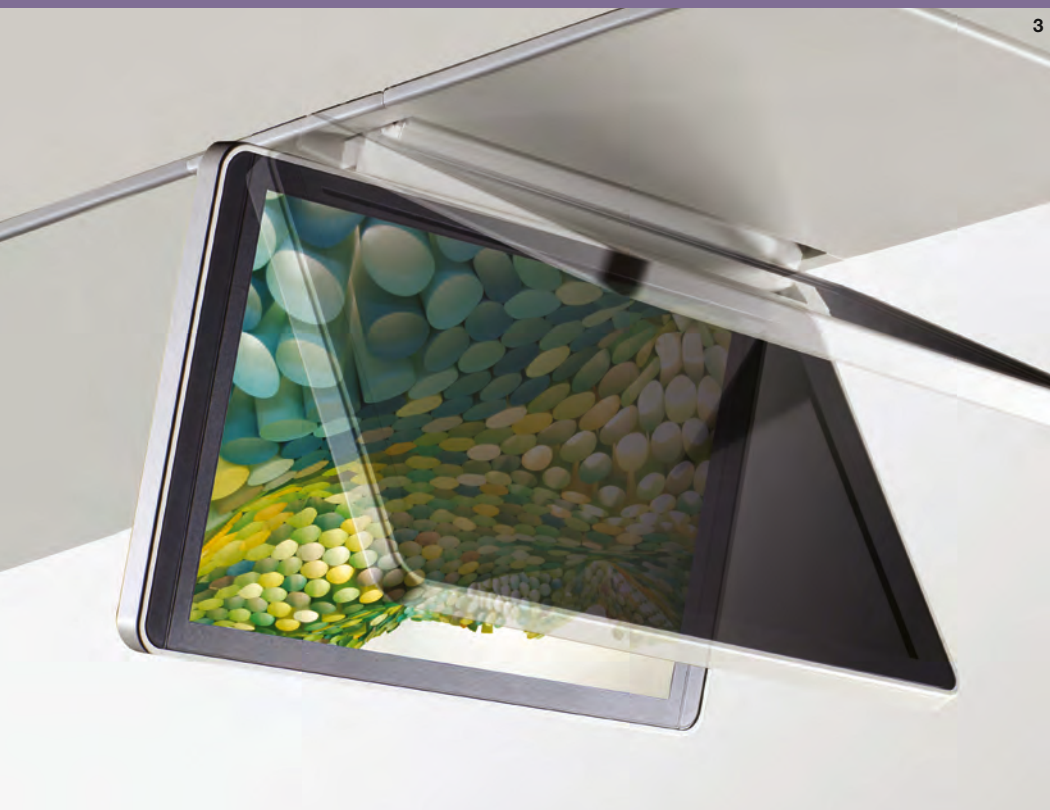
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backto retracts

Retractable overhead monitors are coming back, says Aircraft Cabin Systems

1-3. ACS's retractable HD LCD monitor



Since monitor supplier Aircraft Cabin Systems (ACS) entered the aerospace industry in 1999, there have been numerous developments in video and display technologies on board – from standard definition all the way to ultra-high definition (UHD) displays with HDMI and HDSI video interfaces.

Alongside this, the personal handheld device industry has blossomed. “Handheld devices have changed the playing field,” says Rick Routly, regional sales director at ACS. “More and more PEDs are making their way onto aircraft, aided by more robust qualified wireless access points. One result of this trend is a move away from seatback and armrest IFE monitors, as passengers already have a screen close by. However, there is still a focus on offering passengers as much choice as possible, and this is why we believe retractable HD LCD monitors, installed in overhead applications, are coming back into vogue.”

On business jets and other VIP aircraft, ACS reports that its retractable HD LCD monitors are being used as additional video sources, alongside other modes of IFE – typically handheld devices carried by passengers. “We’re seeing renewed interest for retractable HD LCD monitors in the narrow-body business/charter aircraft market,” says Routly.

ACS believes retractable monitors also offer many maintenance advantages. “The reliability

of our retractable monitors is second to none. Units deliver over 150,000 operational cycles in the lab – and counting,” says Routly. “With these retractable monitors, we’ve minimized the number of moving parts, and there are no springs or clutches. A simple threaded dowel mechanism (which enables the retraction) is teamed with microprocessors, capacitors and high-resolution LED-backlit HD LCD modules – all working in unison to deliver the best entertainment quality, year after year. In addition, retractable monitors involve less installation time and training than seatback IFE.”

Routly also says retractable monitors need less wiring than seatback IFE. “This translates to reduced weight and better fuel efficiency,” he says. “Plus, passengers will regain the space taken up by electronics boxes at their feet.”

ACS’s retractable HD LCD monitors currently support the entire Airbus A319, A320 and A321 family, and the company has orders for Boeing 737 aircraft. ACS is in the bid/proposal stage for several airline fleets, involving both Airbus and Boeing narrow-body families. Its retractable HD LCD monitor is also installed on several ACJ320s, and is scheduled for installation on a BBJ 737 that will be outfitted in mid-2016.

“We’re in a unique position with a talented team, the right focus, the background and the infrastructure in place to continue to improve this technology,” says Routly. “For example, we are looking at wireless control for retractable monitors. Sometimes the past offers solutions to enhance the future.”

Aircraft Cabin Systems

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instant feedback

The latest version of LightBox's visualization software enables users to walk around a cabin, play with the design and see the result instantly

1. A rendering exported from CBox
2. CBox enables users to visualize various cabin configurations in real time

The aim of delivering higher and higher quality has always been a driving force at LightBox, the visualization arm of CorbisGlobal. To begin with, the company created renderings for clients before moving to animations. Later, in 2010, it decided to invest in developing "a whole new product, one that could change the paradigm of visualization", says Max Pardo, co-founder and managing director of LightBox. "Thanks to new modeling technology and state-of-the-art rendering engines we have also managed to make the solution run without the need for expensive hardware."

The aim behind this new software product, CBox, was to offer users a more realistic experience than that offered by renderings and animations. CBox acts as a visual aid for designers and salespeople, enabling them to visualize the space, work on the design and see the results instantly.

"CBox was designed to be intuitive and simple to use," says Martin Amengual, founder and CEO of CorbisGlobal, and co-founder of LightBox. "It has plenty of features, but our user-experience specialists were also careful to keep the interface simple and easy to use."

The 2016 version of CBox is available in three applications – one for installation on desktop

computers, one that can be installed on a mobile device such as a smartphone or tablet, and one that is accessed through a website.

CBox Desktop enables users to navigate a cabin freely, as if they were walking around it. "Once you get a real sense of the space, you can start playing around with materials, layouts, lighting schemes, materials and decorative objects to develop the design," says Pardo. "It's the simplest idea you can imagine – enabling people to visualize the impact of their design changes, instantly."

The mobile and web applications are optimized for their respective platforms. CBox mobile is available for Apple iOS and Android devices. "It's a fast and powerful tool that enables salespeople to create presentations on the spot, perhaps during a meeting, on a flight or at a show," says Amengual.

Renderings, specification information and material/color boards and options can be exported from the application.

"CBox enables designers and clients to visualize and understand cabin designs in a way that was not possible before, thus reducing design time, the endless rounds of going back and forth, missed expectations and frustrations," says Pardo.

The wide range of services offered by LightBox has attracted clients including Embraer, GDC Technics, Aeria Luxury Interiors, Comlux the Aviation Group and New United Goderich. LightBox reports it is also expanding into the architectural, automobile and boating industries.

CorbisGlobal is an architectural, engineering, visualization and software design and development company with a presence in Los Angeles, USA; Cordoba and Buenos Aires, Argentina; and Perth, Australia.



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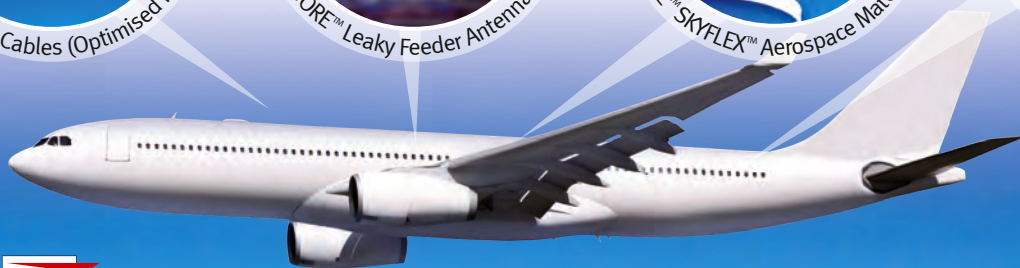
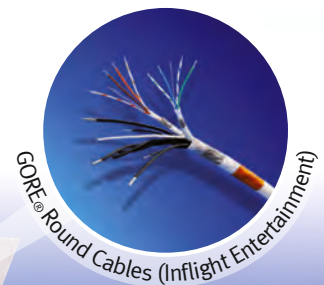


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finishing touches

Maison Lipari offers everything from dining essentials to kitchenware, linen, gifts and decorative accessories

What really makes a space feel alive and welcoming, believes Maison Lipari, are the final touches and accessories. The company offers a huge range for aircraft, including china, crystal, flatware, serving and décor accessories, linens and throws.

The company was established in Montreal, Canada, more than 40 years ago, specializing in the supply of luxury tableware. In 2001, it established a corporate division to service special projects for private jets, yachts, estates, boardrooms, recognition programs, hotels and restaurants. "We noticed that the private aviation industry required special attention and care when selecting dining amenities," says Patrizia Lipari, director at Maison Lipari.

The company has provided the finishing touches for aircraft, including Airbus, Boeing, Bombardier, Dassault, Embraer and Gulfstream types. "We're Bombardier's preferred supplier for china, crystal, flatware (CCF) and accessories, and have worked on jets ranging from mid-size business aircraft to wide-body VIP jets," says Lipari. "Given this experience, our team understands what dining equipment is needed for onboard entertainment and what types of crystal and dishes fit in the various galleys."

The company offers various approaches. It can take the lead on projects, referring to renderings and color schemes to furnish the whole cabin, or it can work collaboratively with the client and their designer to offer a more personal experience.

"Our job is to ensure that no detail is overlooked," says Lipari. "Our team takes every project to heart, and creates long-lasting relationships with our clients."

The company also does its utmost to bring new ideas to the table. "We attend all the most fashion-forward trade and

purchasing shows, to stay on top of trends for home décor, linens and tabletop items," says Lipari. "But the pieces we propose are also timeless and functional."

The company's catalog includes pieces from more than 150 manufacturers, including Christofle, Hermès, Saint-Louis, Baccarat, Frette, Pratesi, Loro Piana and Swarovski. Should clients request a specific collection or brand beyond this selection, the company will endeavor to source and procure it, from anywhere around the world.

Maison Lipari can also suggest and manage the creation of bespoke pieces. "Working with the best artisans and manufacturers, we create unique designs for anything from tabletop items to bed linens, to truly reflect the customer's personal style," says Lipari. "Customers often want something exclusive, not only because it enhances their dining table, bathroom or bed, but also because it leaves a lasting impression on their guests. Custom pieces differentiate an aircraft."

Maison Lipari prides itself on efficiency. "Our service is fast and cost-competitive," says Lipari. "Our custom projects can take as little as three months to complete, and we stock full sets of CCF and linens, which can be dispatched immediately – perfect for last-minute solutions."

The company delivers to anywhere in the world, and will take care of all export, customs declaration and tax paperwork. The company also keeps records of all purchases to enable quick reordering if breakages or losses should occur in service.

Maison Lipari

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1. Chagall Ambience dinnerware by Bernardaud
2. Robbe & Berking Belvedere silverware
3. Pratesi Gatsby linen
4. Saint-Louis glasses, Puiforcat china and flatware, a Christofle candelabra and Pratesi linen

going green

Building on a steady stream of maintenance projects, Aeria Luxury Interiors is on the cusp of delivering its first green completion

1-2. A BBJ concept by Aeria's in-house design department

The VIP division of VT San Antonio Aerospace, Aeria Luxury Interiors, was established in 2011, and has established a strong customer base for maintenance and refurbishment projects. Indeed, in 2015, Aeria has increased its maintenance workload by 20%, and it now has a steady stream of projects moving through its 100,000ft² hangar in San Antonio, Texas, USA.

Next up is a BBJ 737-700, which is scheduled to arrive in October 2015 for a maintenance check. The work will involve multiple checks, along with service bulletins and airworthiness directives. The aircraft is scheduled for redelivery to the customer – a new one to Aeria – in November 2015.

In addition to its maintenance and refurbishment projects, Aeria is also working on its first green completion, a BBJ, which is scheduled for delivery to the customer in the fourth quarter of 2015. "This is a milestone project for our company," says Ron Soret, Aeria's vice president and general manager of completions. "We have set our standards very high for our first completion and aspire to exceed our customer's expectations."

Aeria's in-house design team created the BBJ's custom paint scheme and its interior, which features a lounge, a conference room and a stateroom. Interior equipment will include CMS, mood lighting, a humidification system and a sound-dampening package.

November 2015 will be a busy month for the company as it is also exhibiting at both the Dubai Airshow in Dubai, UAE, on November 8-12, and at NBAA 2015 in Las Vegas, USA, on November 17-19.

Along with operations, sales and marketing staff, the majority of the company's design department will be on hand to meet delegates at NBAA. The design team is led by Ken Harvey, who joined Aeria earlier in 2015. Harvey has many years of experience in VIP aviation, and the company reports he is fitting in as the perfect complement to its experienced management team.

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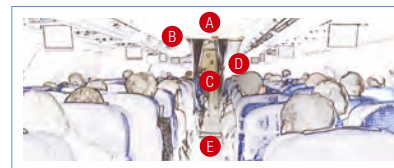
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clearsight

3D visualization has applications in the design, manufacturing and marketing of aircraft

1. Designers can use 3D visualization to try out configurations, materials and finishes
2. Virtual reality can be used to visualize how passengers will interact with the cabin



"Cabin personalization is an effective tool for business jet OEMs and completion centers to differentiate themselves and build customer loyalty," says Isaac Benzaquen, aerospace and defense solution experience director at Dassault Systèmes. The company offers 3D visualization software that can be used during the cabin customization process. It enables aircraft buyers to experience the aesthetic and practical implications of their choices in real-time.

High-end 3D visualization enables OEMs and completion centers to generate realistic, virtual models of cabin interiors without the need for physical prototypes. Within this immersive environment, customers can view multiple interior variations and options, and evaluate their choices. "This leads to more informed and precise decision making and the confidence that they will be happy with the final product, since they have already seen it virtually," says Benzaquen. "There is a strong competitive advantage to be had in matching passenger expectations with the final product."

3D visualization tools that integrate engineering data can also be used by business aircraft manufacturers to gain a better understanding of how passengers will use and experience a product.

"Manufacturers using 3D visualization benefit in two ways," says Benzaquen. "It provides an opportunity to stand out among competitors and facilitates lower costs during development as they can use virtual mock-ups based on actual design data from the earliest design concept through to the physical build."

Teams can work in parallel, use 3D sketching in the concept phase, and validate designs with 3D visualization. "This speeds up the production process and creates collaborative synergies with different stakeholders," says Benzaquen.

Perceived quality can be evaluated, as well as ergonomics and human and machine interaction. "Manufacturers and completion centers realize measurable savings in time and cost, and a boost in quality," says Benzaquen. "In addition, scalability and sustainability are achieved through the automation of engineering, manufacturing and certification processes."

3D visualization can also be a boon to marketing departments. "By using original CAD data, the quality of marketing materials is greatly enhanced while the time taken to produce visual aids is reduced," says Benzaquen.

Content can be created without spending money capturing the physical product. Using highly realistic 3D visualizations, marketers can also visually target customers based on demographics, and develop personalized marketing material.

"The implementation of high-end 3D visualization across the aircraft design, engineering and marketing processes, coupled with the seamless flow of data through the product development cycle, represents a marked improvement on previous interior cabin design and promotion approaches," says Benzaquen. "The result is a rewarding, fulfilling and consistent experience."

Dassault Systèmes

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syberspace

SyberJet turned to OmnAvia Interiors to provide soft goods and other finish materials for the cockpit of the SJ30i

When SyberJet's president, Chuck Taylor, and general manager, Mark Fairchild, began the development of the new flight deck for the SyberJet SJ30i, they envisioned something radically different from a typical cockpit. The core objective was to build a performance-centered cockpit akin to the sleek designs featured in high-end sports cars. "Honestly, we were inspired by the Ferrari 458 Spider," says Fairchild.

SyberJet enlisted the services of renowned Italian automotive designer Jason Castriota to bring the concept to fruition. Castriota has been involved in many prestigious projects, including the Ferrari 599 GTB Fiorano, the Maserati Gran Turismo, and the Pininfarina Rolls-Royce Hyperion. He is known for his emphasis on performance and ergonomics, and was retained by SyberJet to ensure that the SJ30i's interior will be distinctive.

"My team was extremely excited and honored to work with SyberJet on further evolving this amazing aircraft," says Castriota. "We have a shared passion for speed, performance and quality and our collaborative efforts reflect that. Given that many of the SJ30i's owners are pilots themselves, we snatched the opportunity to create a supercar-like environment in the cockpit, with superior ergonomics and a very technical look and feel."

Once Castriota's team completed its design work, the selection of finish materials began. The objective was to introduce different textures, employing the latest technology in luxury soft goods. OmnAvia Interiors was tasked with delivering these finish materials, within a

tight timeframe ahead of the mock-up's introduction at NBAA 2014.

For the seats, OmnAvia recommended looking beyond standard perforated leather in favor of a new offering from Alcantara, an Italian manufacturer of automotive seating and headliner solutions. "Alcantara had just introduced Infinito, a collection of aircraft-focused designs that uses a variety of patterning techniques," says Robin Butler, managing partner at OmnAvia Interiors. "We felt that a small-scale geometric embossed pattern called Puntino would provide a unique texture, as well as offering the advantage of improved air circulation for the flight crew seat."

Alcantara's Puntino was specified in a stark white shade, and applied not only to the seats, but also to the headliner and window posts in the cockpit. It contrasts with a smooth black European semi-aniline leather, which was also used for parts of the seat upholstery. A bright red thread was used for the top stitch on the seats, providing a dramatic accent to the black-and-white combination. Willow Tex's Izit Leather, in Ebony, is used on the glare shield, and the side panels are covered with Izit Leather in Ice, completing the multi-textural effect.

Other finishing touches in the cockpit include brushed aluminum trim pieces produced by SyberJet, and a carbon fiber veneer trim that creates a contrasting 3D surface effect.

"OmnAvia was a fabulous resource for us," says Fairchild. "They went the extra mile to expedite delivery of products from Europe that had to meet a very tight

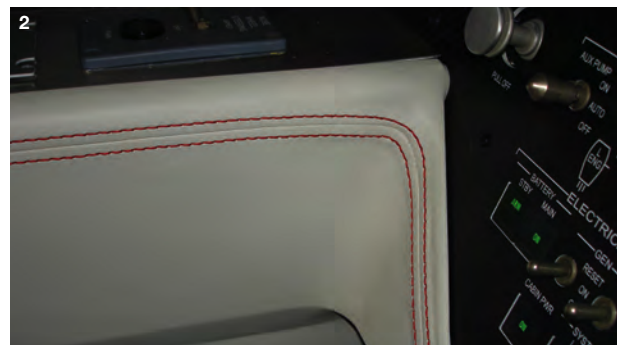
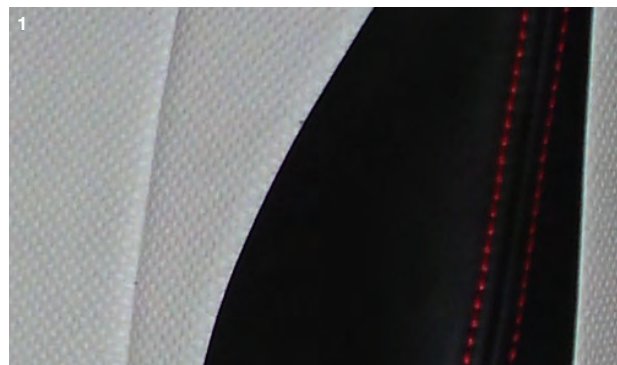
timeline. And they were truly a one-stop resource for all of the soft goods needed for this interior. The finished product exceeded our expectations, thanks to Jason Castriota and OmnAvia Interiors."

Other products in OmnAvia's portfolio include luxury carpets, upholstery and sidewall fabrics, Australian sheepskin hides and seating foam.

OmnAvia Interiors Reader Inquiry No. 511

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1-3. OmnAvia supplied soft goods for the cockpit of SyberJet's SJ30i





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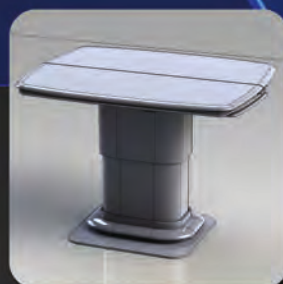
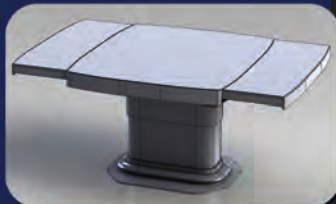
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top

A low-weight, rigid and space-saving design was the aim on Saint Louis Designs' latest development, a stowable arm table for divans

1-3. Saint Louis Designs' stowable arm table for divans, which is in development

The challenges involved in designing stowable divan arm tables suitable for VVIP interiors are well-known in the industry. Typically the goal is to produce a lightweight but rigid table mechanism that deploys from and stows smoothly into the divan arm pocket.

In an attempt to respond to the wish list of several completion centers, Saint Louis Designs modified its original vertical table mechanism to allow extreme articulation combined with severely limited stowage space.

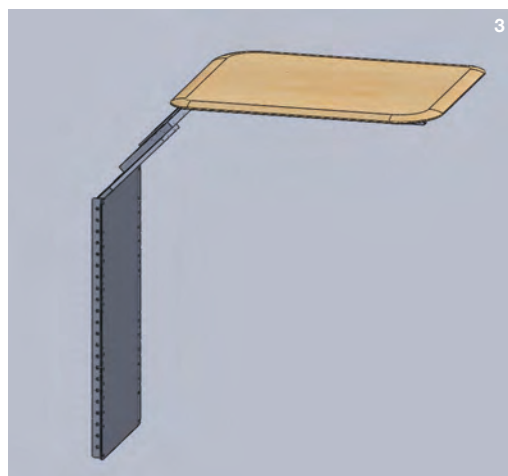
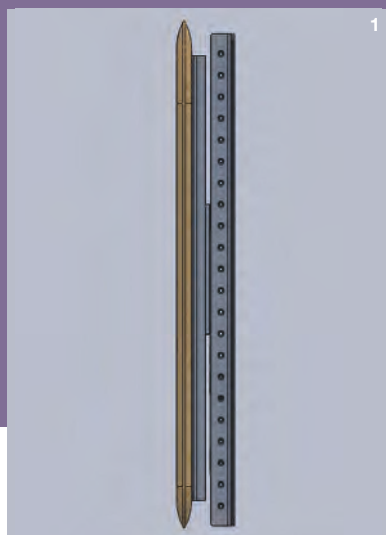
During deployment, the table will rise from the divan arm via a compound slide. To achieve ease of deployment, Saint Louis incorporated its patented counterbalance system. The tabletop will have a concealed bearing system, enabling 8in of slide travel once deployed. In the action

of stowing, the table is designed to glide and not drop into its stowed position. The mechanism will weigh approximately 7 lb, not including the tabletop.

The company says extensive research and testing was required to source commercially available bearing systems, to achieve a smooth and reliable motion with minimal weight. Throughout development, the mechanical components were designed with a focus on ease of manufacturing.

Saint Louis Designs says its patented cabin interior latches and mechanisms have evolved as a result of its ability to address customer requests and to continually improve its existing products. "Our products were developed by thinking along new lines, free from conventional approaches and traditional choices of materials," says Carole Tower, president, Saint Louis Designs. "We welcome mechanical design challenges."

As well as divan tables, the company's products include touch and secondary latches, pushers, limited travel hinges, electric and manual custom lifts, and various sizes of spring-deployed cup trays. The company is ISO 9001:2008 certified.



Saint Louis Designs

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plate expectations

"HighTech Finishing is dedicated exclusively to the aviation industry," says Rick Niefeld, vice president of sales and marketing at the company. "We don't process any commercial or industrial plating for a number of reasons."

One of these reasons is that business jet owners and operators demand the highest quality. "By plating only high-grade aviation parts, the risk of plating bath contamination is reduced," says Niefeld. "We deliver zero-defect parts."

In addition, HighTech says specializing in aviation enables it to structure its processing lines to accommodate quick turnarounds, small orders and custom parts, for an industry that relies heavily on zero-defect, on-time delivery.

"To get the very best finishing results on aircraft parts, we rely on the many years of experience of our craftspeople," says Niefeld. "They work each part by hand, while also utilizing the latest plating technologies available today."



HighTech has more than 25 years' experience in supplying decorative metal plating for interior hardware and trim parts to business and head-of-state aircraft operators around the world. The company offers more than 130 standard finishes and custom capabilities. Its customers include Gulfstream, Embraer and Dassault Falcon Jet, as well as well-known completion and refurbishment centers.

HighTech Finishing

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better than ever

Collaborating as a key supply chain partner to some of the world's leading aircraft manufacturers has helped the PPA Group become a leading force in the UK's MRO market.

The PPA Group says it can extend the life of aircraft interiors, transparencies and composite components. It has multiple in-house capabilities, reducing the number of suppliers needed on a project. Yet the company believes the greatest attraction to most operators is a combination of cost benefits, reduction in time to market, and component performance.

"We are seeing increased demand for our MRO services, as we are not only able to help our customers achieve cost savings while meeting environmental objectives, but we can also ensure maintenance is planned efficiently to reduce unnecessary downtime," says Pete Gunson, managing director of the PPA Group. "We understand the critical nature of supplying reliable parts of the highest quality when they are required. Additionally, our technicians have extensive knowledge of various fleets – including some that are no longer in production – which is extremely valuable in an MRO capacity."

During overhaul, these technicians also work to improve performance and overcome inherent

problems in function. "Many companies see MRO as a cost-saving alternative when investing in components," says Gunson. "Yet probably one of the most exciting aspects of MRO is that it can improve the functionality of the product. Our ability to supply products that are as beautiful in form as in function, at a fraction of the price of buying them new, makes us an obvious choice for suppliers throughout the aviation industry."

PPA Group

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into the ether

"Reliable Ethernet distribution is becoming increasingly important with the growth in internet connectivity, bring-your-own-device (BYOD) IFE, and digital cabin systems," says Dave Garing, vice president of sales and marketing at Innovative Advantage. "Our Audio/Video Distribution System (AVDS) has always provided a Gigabit Ethernet trunk over fiber-optic interconnect, but customers are increasingly asking for more ports. Therefore, we added more Gigabit Ethernet ports and a new four-port Fast Ethernet card."

Innovative Advantage says the AVDS has been used as a backbone for the distribution of high-quality, uncompressed audio and video. The AVDS can simultaneously support standard-definition, high-definition and 4K UltraHD video. "Adding lightweight, reliable Ethernet distribution to the AVDS's fiber-optic audio/video backbone was just a natural evolution for the product," says Garing.

As the Ethernet backbone, the AVDS supports self-healing capabilities in the event of wiring or hardware failure – automatically rerouting traffic via another path. The switch isolates heavy audio and video traffic from secure internet and control data. VLAN support enables the

separation of multiple networks using the same physical AVDS fiber backbone.

According to the company, the additional gigabit ports enable easier integration of very-high-speed connectivity equipment including AVOD servers, IP-based IFE equipment, and even 802.11n/ac WAPs. Innovative Advantage's new four-port Fast Ethernet card can be dropped into the existing AVDS Node architecture to enable additional local connections.

"The foreseeable future of IFE is a hybrid type system – a mixture of uncompressed and compressed audio/video distribution," predicts Garing. "Connectivity has also grown as a vital aspect of the cabin ecosystem. Innovative Advantage prides itself on offering a system that distributes the highest quality, uncompressed audio and video available, benefiting passengers on more than 500 aircraft. These enhanced Ethernet capabilities increase the AVDS's applicability as a backbone for compressed IFE and connectivity systems."

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newwave

A restaurant that takes inspiration from – and gives views of – the coral reef that surrounds it



This restaurant and event venue, Subsix, is 6m below the waterline, 500m offshore, and is part of the Per Aquum Niyama resort in the Maldives. The space opened in 2012 as a nightclub, but was recently restyled for its new purpose by Poole Associates.

Architect Ed Poole says the main aims were to add warmth and depth of detail, and take full advantage of the location. “We added a timber floor, clad the walls with a roused fabric that resembles Manta Ray gills and covered the ceiling with acoustic board and 35,000 capiz shells. Cladding the window frames with mirror greatly enhanced the views of the reef.”

Poole says the biggest challenge was the layout. “The space was originally designed as a club, so not all the dining tables could be placed next to the windows,” he says. “We had to make sure that the room had enough detail for guests not near the windows not to feel disadvantaged.”

Other details giving the feeling of the reef extending into the space include coral-like chandeliers and a clam-inspired fiberglass bar. Poole’s favorite detail is the seating. The chairs take inspiration from the 1952 Harry Bertoia Wire Series. For Subsix’s version, sponge cord made from ethylene propylene diene monomer has been knotted by hand to a stainless-steel frame, which is finished with a black leather seat pad. “The obvious reference to sea urchins will surely put a smile on people’s faces,” says Poole.

OTHER EYE-CATCHING DESIGNS FROM VARIOUS INDUSTRIES...



Ford created this Apollo Edition Mustang to auction at EAA AirVenture Oshkosh 2015, in aid of EAA youth education programs. The exterior and interior were both inspired by the NASA Apollo program.



This bench at Chatsworth House in the UK was created by Raw Edges using its Endgrain technique. Wooden blocks were dyed in various hues and glued together. The final shape was achieved with a CNC machine.



The interior and exterior of this electric urban coupé, Peugeot Fractal, were developed in partnership with sound designer Amon Tobin. The car has a 9.1.2 sound system, including two-channel tactile bass in each seatback.

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