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JANUARY 2019



Automotive IDEAS

WHAT CAN THE BUSINESS
JET WORLD LEARN ABOUT
SEAT TRENDS FROM THE
LATEST AUTONOMOUS
CAR CONCEPTS?

IFEC AND CMS

Experts predict the road ahead for virtual reality, flexible screens, inductive charging and more

PRAETOR 500 AND 600

Embraer reveals all about its two new models, as well as the Bossa Nova interior option

ACJ350 XWB

The three centers approved for completions on this type discuss the unique challenges involved



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Head down the runway with a selection of the latest cabin designs, case study news and completion announcements

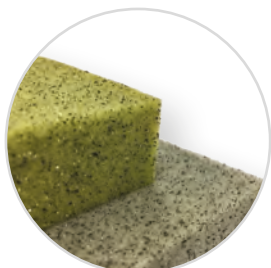
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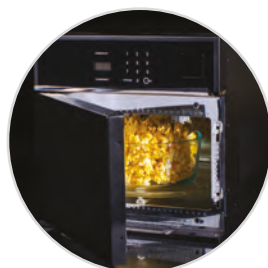
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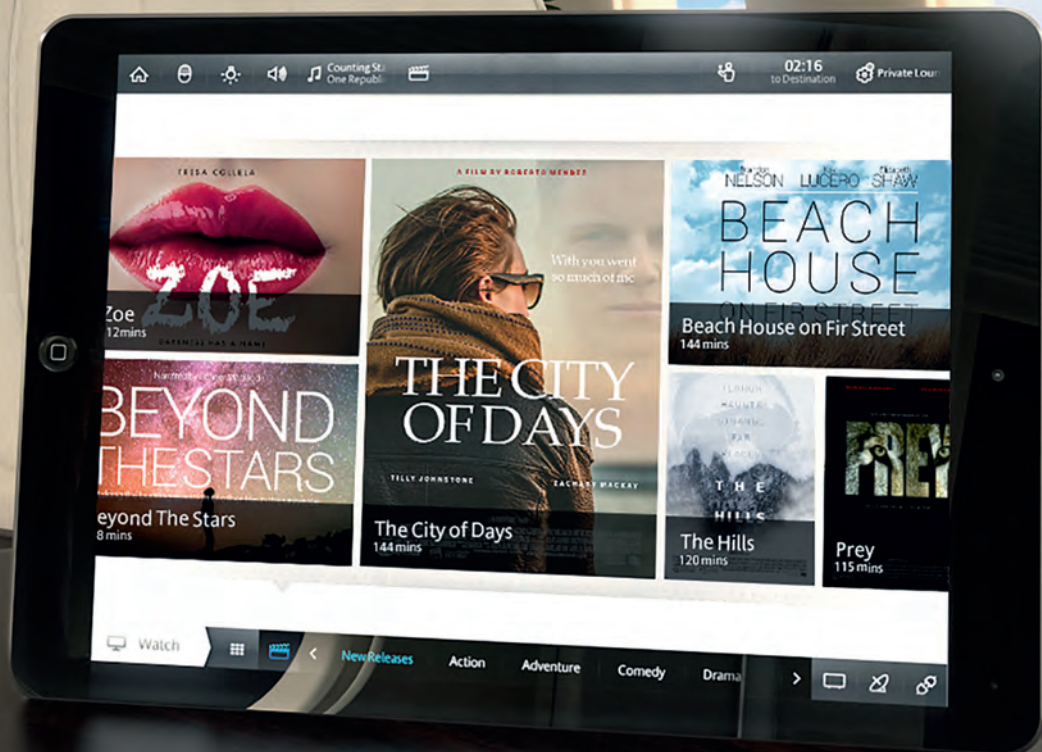
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Cover image: The 2018 Lagonda Vision Concept

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DRIVING FORCE

Having also been editor of sister title *Autonomous Vehicle International*, it is very clear to me that the dawn of autonomous cars is really not that far away. As driving responsibilities gradually transfer from humans to onboard computers, the interiors of these cars will be designed more for the kind of activities passengers enjoy in the air – sleeping, entertainment and work.

Does this mean we will see greater convergence between automotive and aircraft design? Are there lessons to learn from autonomous car designs such as the 2018 Lagonda Vision Concept pictured on the cover? These are fascinating questions that experts engage with in the feature on page 32, in particular with reference to seating.

Given that the autonomous revolution will start in the high-end segment, and that business jet buyers already expect the same features in the air as they are accustomed to in their homes and cars, I think it is wise to keep an eye on

developments in that sector. If you'd like to explore more automotive designs in depth, we publish several other relevant titles, among them *Automotive Interiors World*. Digital copies are available online at www.ukimediaevents.com/pub-automotive.php.

On the subject of translating innovations from other industries, on page 14 we take a look at the road ahead for various potential IFEC and CMS technologies – including inductive charging, flexible screens and VR IFE. We are clearly on the cusp of some exciting developments!

Also in this issue are two stories exploring new aircraft types. On page 46, you can read all about Embraer's new Praetor jets and Bossa Nova interior, and on page 24 you can find out how completion centers are preparing for the ACJ350 XWB. There is also a beautiful BBJ 747-8 interior to savor on page 40, while in our Supplier Showcase section, various companies share their latest innovations, along with the trends they expect to make a mark in the year ahead.

Izzy Kington, editor



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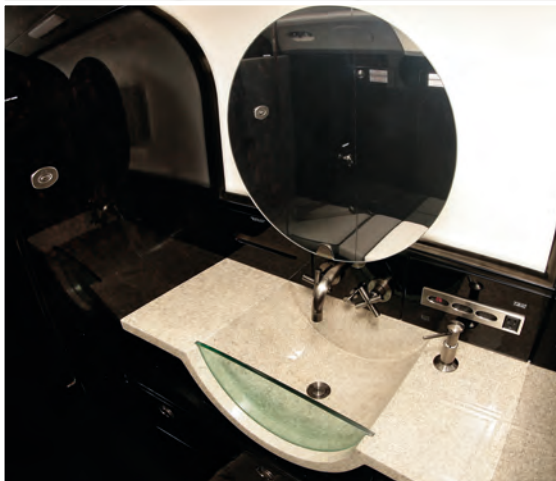
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RMD AIR AND FAI JOIN FORCES FOR CHALLENGER 300 REFURBISHMENT

This Bombardier Challenger 300 was completely refurbished in December 2016 by Farnborough Aircraft Interiors (FAI) at Farnborough Airport, UK. The interior and livery were designed by RMD Air, which also managed the project.

RMD Air undertook the concept design, space planning and layout development to provide a bespoke cabin. Every element of the existing interior was removed for refurbishment, including all seats, cabinetry, paneling, flooring and the complete aft lavatory.

The team then got to work restyling the seating, updating the cabinetry and trim, recovering the lining panels, installing a custom-made hand-tufted carpet and re-plating all the metal hardware. After all the necessary aviation certification and burn testing, the aircraft was delivered to the client on Christmas Day.





Q&A

Rupert Mann

DIRECTOR, RMD AIR



The aircraft has a 10-seat layout with a forward club four, aft club two and adjacent divan.



The 16g seats were restyled with a modern design inspired by luxury automotive marques. RMD Air specified a cream leather from Moore & Giles with detailed twin stitch, quail contrast piping and a strie-patterned embossed center filler. For the divan, a contrasting chenille was chosen in soft gray, with stitched leather side arms to complement the individual seats. The custom-designed embossed pattern was reused for the lower sidewall panels.



With Scott Group, RMD designed a bespoke hand-tufted carpet. It was custom dyed in a greige color, and features a bespoke de-embossed geometric pattern throughout in a silk and cotton weave mix.



The curtains are made from a blend of silk and wool and are complemented by detailed stitched leather tiebacks – a small detail that RMD Air says is often overlooked.



The wood veneer was replaced with a custom-stained dark brown sycamore veneer. The aim was to create a patina that would mean the grain would be visible under subtle lighting.



A unique finish was developed for the metalwork – fine black brushed lines run through a satin silver background.

What was the brief for this project?

The brief was to design a subtle and light interior with details and material combinations reminiscent of a classic marque motor car, for private and business use, including charter.

What is your favorite detail?

The side panels combine a custom metal finish set against a dark wood veneer, which contrasts very well with the background of light embossed leather panels.

Were any unusual aspects included?

All standard materials were customized – from the bespoke embossed leather to the special brushed finish of the metal components – giving this aircraft a genuinely unique interior.

What was the most challenging aspect of the project?

Keeping the project on track, especially with multiple suppliers, and also coordinating the livery with the interior fit-out, was complicated within the given time. Our solution was to work with an outfitter that could source and install all the interior components. This gave us more time with the client's team and the exterior paint team, and ensured that we hit the deadline.

How did you ensure the client's vision was realized?

We had many design meetings with the client at his office and provided him with 3D photorealistic visuals of the proposed ideas for both interior schemes and the livery design. We also worked extensively with FAI to generate control samples of each finish, to ensure design integrity was respected during the installation. Samples were also used in the design process – for example, proposed leathers were visually tested at 20,000ft to see how the colors would actually appear in service. Many people don't understand that certain neutrals may appear differently at altitude. Fortunately, our client was fastidious enough to embrace this process over an extended testing period in respect of the proposed materials to be used on this project.

What other projects do you have in the pipeline?

We are in the early stages of creating an interior scheme for a BBJ, as well as interiors for several lighter aircraft. We are also developing the interior design scheme for an FBO in an emerging market, which is an exciting crossover for us into another part of the industry.

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COMPLETIONS ROUNDUP

This quarter's announcements from completion centers around the world

BASEL, SWITZERLAND

Inductions at AMAC include a BBJ 777 in for a landing gear overhaul and C check; and an ACJ320 in for base maintenance, landing gear overhaul and a Ka-band installation. The company re-delivered an ACJ340 and an ACJ318 after maintenance work.

NUREMBERG, GERMANY

FAI Technik has begun refurbishing a Challenger 850 for FAI rent-a-jet.

HAMBURG, GERMANY

Lufthansa Technik converted an A321 for the German Armed Forces. There is a VIP area for 14 passengers and a delegation area for 70, part of which can be converted for medevac. The take-off weight was increased by four tons. The company is also opening an additive manufacturing center and won the contract to refurbish an ACJ319 for an Asian VIP in 2019, with upgrades to the IFE, sound insulation and Ka-band connectivity.

ST LOUIS, MISSOURI

A fifth hangar should open at Flying Colours in December 2018. The 30,000ft² (2,787m²) hangar can handle up to three large jets for maintenance, avionics and interior work.

FORT WORTH, TEXAS

Robinson Aerospace can now offer full completion and MRO services, having gained its Part 145 Air Agency Certificate.

PETERBOROUGH, CANADA

Flying Colours expects to open a fourth hangar – with a footprint of more than 100,000ft² (9,290m²) – in mid-2019, for large jet completion, refurbishment and maintenance. The company also completed its 100th major retrofit on the Challenger platform, overhauling a Challenger 604's cabin, avionics, connectivity and fuselage. The company also announced the redelivery of a Global at the end of July 2018, following an 8C heavy maintenance check. Seats, cabinetry, soft goods and livery were also updated.

BANGOR, MAINE

C&L Aviation Services will convert multiple EMB 145 family jets for JetSuiteX. The cabins will feature 30 seats, new interior panels and lavs, LED lighting, wi-fi and electrical outlets.

SANFORD, FLORIDA

Following an expansion, Constant Aviation now has nearly 100,000ft² of space in Sanford. Small- and mid-cabin work will be moved to the new hangar, so the existing structure can be used for larger cabin work.

CLEVELAND, OHIO

In June 2019, Constant Aviation will begin a Challenger 604 refurbishment for Evolution Management. The scope includes a custom interior, avionics upgrade, 192-month cycle inspection, FANS and landing gear overhaul.

WATERFORD, MICHIGAN

A SmartSky Networks 4G LTE connectivity system was installed by Pentastar Aviation. An AML STC was developed, so it can be used on GIV-X and GV-SP types. The company also became an authorized dealer and installer of Innov8's CabinFlex upgrade solutions, and will start with a Global Express installation.

INDIANAPOLIS, INDIANA

Comlux Completion carried out its 11th VIP completion, on a BBJ owned by a customer in the Far East. Highlights include pull-out tables with extensions designed specifically for this aircraft, ceiling domes with a handmade mother of pearl pattern, and a total interior weight of 14,400 lb (6,532kg).

EAST ALTON, ILLINOIS

West Star Aviation is to open a 60,000ft² (5,574m²) hangar at the end of 2018, to expand its maintenance programs. The company also achieved new STCs for Transmitting Portable Electronic Devices compatibility in the 2.4GHz/5GHz frequency band using IEEE 802.11 b/h/n/ac protocols on the Falcon 900EX, 900B, 2000 and 7X, the Gulfstream GIV, and the Challenger 604.

DUBAI, UAE

Jet Aviation simultaneously completed two 192-month C checks on Gulfstream GVs. The work included double engine changes and minor refurbishments.

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air apparent



This concept was created by Unique Aircraft with AMAC Aerospace to showcase possibilities for the upcoming ACJ350 XWB – making the most of the aircraft's extra-wide body and range. AMAC Aerospace is one of three completion centers that has been approved by Airbus Corporate Jets to work on the airframe.

"One of the strong selling points of the A350 as a VIP aircraft is the almost unlimited range," comments Eric Hoegen, director of completion sales and key account management at AMAC Aerospace. "The cabin should therefore offer comfort during flights of 15 hours or more. The design should also offer a good ratio of open spaces and closed compartments to ensure passenger privacy and comfort."

Warja Borges, principal at Unique Aircraft, set about creating an airy design making the most of the "ample cabin". She describes the main inspirations for the scheme as "aerodynamics, rotor blades and the spirit of flying".

The main design features are the wavy bulkheads that connect, encircle and separate the different areas of the cabin. "Their dynamic curves, unfolding like rotor blades and accented with indirect lights, change the entire cabin experience – from looking like a long tube to being a wide open space," explains Borges. "This is also emphasized by the loosely arranged seating groups, which take traveling in a comfortable and home-like environment to a new level."

Soft and hard materials – such as velvet for the seating and veneer for the sidewalls – were selected to create a warm and welcoming atmosphere. A special natural surface from Nature Squared, used on the coffee tables for example, adds a special touch.

Borges says the interior should be possible to build right now, although some of the natural surfaces might need additional investigation.

Turn to page 24 to read in detail about the ACJ350 XWB airframe, including how AMAC Aerospace is preparing for the technical challenges of completion – such as attaching components to the airframe's carbon-fiber fuselage.

LIGHTING

The lighting design is intended to emphasize the movement of flying, according to Borges. "The ceiling lights represent the air turbulence caused by rotor blades and highlight the flow of the design," she explains.



SIDEWALLS

The undulating shape of the veneer sidewalls creates a very fluid, organic-looking design.

TABLES

The occasional tables in the lounge area are topped with a product from Nature Squared made from feathers.

VISUALIZATION: ACA-3D



GAME *changers*

EXPERTS CUT THROUGH THE HYPE TO
DISCUSS THE REAL PROSPECTS OF
TECHNOLOGIES POSITED TO CHANGE
HOW PASSENGERS ARE ENTERTAINED
AND CONTROL THEIR ENVIRONMENT

Words by Tomás Romero. Illustration by Michal Bednarski

Although the actual date of the once far-off future that Marty McFly traveled to in the *Back to the Future* films came and went three years ago with nary a functional hoverboard in sight, Doc Brown's quote about the future being "what you make it" has never been truer. On the aviation front, a host of cutting-edge technologies are poised to take the commercial and private aviation market by storm.

While some of these technologies might not be ready to take flight just yet, Teague's creative director, Brian Conner, points out, "The reality of our world today is that, like it or not, every company is now a software company. Players in the aviation industry who embrace this will be making money and serving customers in new ways that aren't even envisioned yet today. Players who don't embrace this and try to hold on to traditional modes of operating do so at their peril."

Flexible displays

Although the concept of flexible displays dates back to Xerox's electric paper product Gyricon in the mid-1970s, flexible display technology has really hit its stride in the past five or six years, with flexible OLED displays being used in everything from mobile devices and TVs to Apple watches. With the next generation of OLED panels expected to be not only flexible but, in many cases, fully bendable, and Quantum Dot technology offering increasingly cheaper, thinner LED solutions, one has to wonder how such awesomeness could be applied to the business jet cabin as well.

"As flexible display technology develops, it presents a great opportunity for business jet interiors," says Tim O'Hara, director of design innovation at Gulfstream Aerospace. "Space and weight are factors we are always looking at in the aviation industry. Consider a 60in screen that right now would take up valuable storage, block windows and interfere with the living space. An ultra-thin, flexible screen would be able to roll up, retract and save weight."

Mike Sutton, senior project manager at Winch Designs, concurs: "One of our projects features a projector screen that can be pulled down onto the table. More advanced glass technology has enabled very thin

glass to be placed over the projector screen, creating a cinematic feel."

While Teague's Conner says he isn't convinced that the demand for flexible screen technology is there yet, the idea of using large-format formed displays in a dynamic way is appealing. "Imagine changing a business jet cabin to look like a small Italian bistro for dining, and then to a modern designer interior for working, or an outdoor scene for peaceful rest," he says. "But if we're looking to interact with flexible stuff, I see the interesting developments coming from another direction: taking materials that are already flexible, and making them smart. One of my favorite examples is Jacquard by Google, a fabric with sensors woven in to enable touch interactions. Having smart materials in a business jet cabin would lead to a new level of responsiveness for passengers. I imagine interactive surfaces woven into seat materials, or control surfaces seamlessly integrated into textile wall panels."



TOP: A BBJ INTERIOR CONCEPT INCORPORATING A FLEXIBLE DISPLAY, BY WINCH DESIGN

ABOVE: AN 'UNBREAKABLE' FLEXIBLE OLED PANEL CREATED BY SAMSUNG DISPLAY, WITH APPLICATIONS FROM SMARTPHONE SCREENS TO CAR DISPLAY CONSOLES

BELOW: DPI LABS RECENTLY UNVEILED OLED FLEXIBLE DISPLAYS FOR USE IN BUSINESS JETS, IN SIZES FROM 55-77IN. THEY ARE 4K AND HDR COMPATIBLE AND CERTIFIED UNDER A MULTIPLE STC



Inductive charging

Wireless charging pads are already commonplace in living rooms and coffee shops around the globe – Ikea even sells a five-piece round hole saw for US\$4.99 that enables users to insert the Rällen integrated wireless charger into almost any piece of furniture in its range. With many Android phones and the new iPhone Xs expected to support wireless charging at 10W and higher, and passengers using PEDs for entertainment more and more, why should this not be possible in luxury aircraft?

“In my opinion, there are no major safety or regulatory barriers to implementing wireless charging pads in private aircraft,” says Jean-Pierre Alfano, managing and creative director at AirJet Designs. “The integration of such systems will necessitate proper equipment certification [such as ETSO/TSO], and the proper aircraft modification certification [STC], but this is something that is standard in the aviation industry, and for which

the nature of wireless pads should not pose a particular problem.”

Conner of Teague notes that inductive charging features are already offered as a retrofit option for the BBJ 777 and BBJ 787, and many airlines are keen to have them as a line-fit option as well.

“The biggest challenge with wireless charging is emissions mechanical interference,” says Gulfstream’s O’Hara. “We also need to determine how wireless chargers would interact with the design finishes in our aircraft without sacrificing the excellence Gulfstream is known for, with the high-build veneers on our cabinetry, for instance.”

Another interesting facet of inductive charging, says Conner, is that multiple players can integrate it. “Is it a feature of the IFE system, the seat, or a separate component altogether?” he asks. “We’ve found that successful integration happens when the seat environment and IFE system are conceived as one experience.”

ABOVE: ASTRONICS AES’S NEW WIRELESS CHARGING MODULE CAN BE EMBEDDED IN MONUMENTS AND SEATS – THE FIRST INTEGRATIONS ARE SCHEDULED TO ROLL OUT ON AIRCRAFT IN EARLY 2019

INSET: DPI LABS SAYS ITS WIRELESS CHARGING TECHNOLOGY – UNVEILED AT NBAA-BACE 2018 – IS PENDING PMA AND NOW READY FOR INSTALLATION IN AIRCRAFT

Virtual reality

The jury is still out on the widespread adoption of VR IFE due to issues like user isolation and motion sickness, as well as practicality concerns such as charging and storage during take-off and landing. However, VR headsets are certainly making headway on the commercial aviation front – adopted on carriers including Joon, Corsair and Alaska Airlines.

“Technically speaking, if it can be done for the commercial aircraft market, it can definitely also be done for the private aviation market,” says AirJet’s Alfano. “But I think, at the moment, VR entertainment brings more value to commercial flights, during which passengers are demanding new entertainment to make the flight seem shorter. In private aircraft, passengers are usually working or spending time with their friends and/or families. In that context, VR entertainment is more attractive for video games, rather than immersive entertainment.”

Mischa Loeffler, manager of product planning and strategy for Bombardier’s Challenger and

Learjet aircraft, seems to agree.

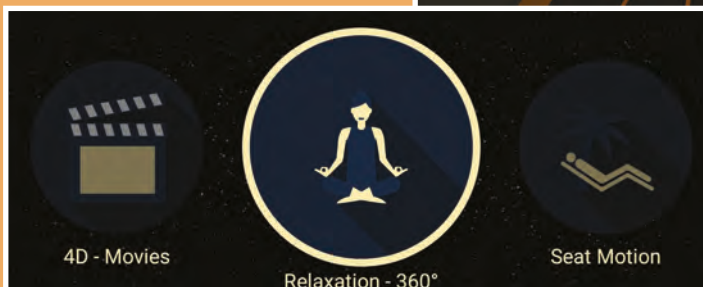
“A private jet offers a different cabin experience to a commercial aircraft,” he comments. “Most flights have very few passengers and they tend to know each other. A business jet is meant to be more of a collaborative environment and passengers don’t have the same need to separate themselves from the flight experience.”

Another stumbling block, adds Conner from Teague, is the comfort factor, with many users complaining about eye strain and fatigue after wearing VR headsets for more than 15 minutes. “Will people be watching full-length immersive feature films in VR? I personally doubt it,” he says.

But no matter what the future holds for VR IFE, O’Hara believes the virtual world is still no match for the real one. “VR in flight still has a long way to go to match the quality standards Gulfstream sets for its customers,” he says. “The virtual environment is still clearly artificial. Would you rather see a majestic view from one of our signature oval windows, or a simulated view you know isn’t quite real?”



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Wellness

Health-focused options have taken off on long- and short-haul commercial carriers the world over of late, with everything from IFE yoga programs and guided meditation series, to essential oil and rejuvenating face mist-laden amenity kits. Panasonic recently announced plans to take inflight well-being and mindfulness to the next level with Wellness, the latest solution for its Next platform. Wellness adds headphone-free active noise canceling technology, tailored seat lighting and nanoe air-cleansing technology. Is this a trend that will also play out in the private aviation market?

"Health and wellness is a critical concern for us," says Loeffler from Bombardier. "It factors into every facet of the Global 7500 business jet."

Citing the crucial role that lighting plays in reducing the effects of jet lag, Loeffler says Global 7500 passengers can use the CMS to set lighting schemes that correspond to their circadian rhythm and destination.

"We have everything from daylight simulation to enhance wakefulness, to warm evening lighting to promote relaxation," explains Loeffler. "In addition, the Global 7500 has an advanced air-management system that delivers both 100% fresh air, as well as a turbo heat and turbo cool feature to rapidly raise or lower cabin temperature."

"This is one area where the hotel and hospitality environments are ahead in terms of wellness and experience," adds Christopher Pirie, senior director of business development for Teague. "Wellness will continue to be sought after as a differentiating element in an OEM's business jet offering. Factors like humidity, fresh customizable fragrances and ionized air systems will be highly desirable. Cabin noise reduction technologies will also continue to be developed, as they are critical for a calm and stress-free air travel experience."



ABOVE: COULD GUIDED MEDITATION AND YOGA PROGRAMS BECOME A COMMON IFE FEATURE?

LEFT: GLOBAL 7500 PASSENGERS CAN SET CABIN LIGHTING SCHEMES TO SUIT THEIR CIRCADIAN RHYTHM

OUR LARGE FRIDGE, OR FREEZER, HOLDS A MASSIVE .17 CUBIC METRES/6.25 CUBIC FEET



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Smart screen/emotion AI

Although skeptics initially scoffed at the concept of emotion-aware smart screen apps and digital experiences, affective computing pioneers including Affectiva and Crowd Emotion have been applying emotion AI technology in everything from gaming to healthcare, retail, education, advertising, and to keep drivers awake.

Applying such facial recognition technology in flight could bring huge personalization possibilities for IFE. In addition, Sutton from Winch Designs is intrigued by the idea of using such smart screen technology to help calm anxious flyers or to change the cabin environment during the flight.

"All technology should be aware of the user's condition," adds O'Hara from Gulfstream. "Beyond individual smart devices, the next generation is the smart environment, one in which all devices work together as a symphony and support each other."

Describing a future cabin environment where smart screen technology could sense a passenger's mood and adjust the intensity and hue of the cabin lighting accordingly, O'Hara

says the future for such technology is wide open. Teague's Conner is a little less sure:

"As a passenger, do I want the IFE screen to react to every facial gesture I make while I'm watching a movie? Probably not. I see more use for a technology like this in the outlier use cases – being able to monitor a passenger with known health issues or to orchestrate the cabin environment to ensure optimal sleep.

"It goes back to understanding how commercial airlines and private carriers want to design the experience, especially from a service perspective. In premium cabins, the interactions with the real people serving you are what make the experience exclusive and elevated. Extending this into business aviation, principals often have personal relationships with their pilots and flight attendants. In short, nothing will replace human interactions." ❖

BELOW: RECOGNIZING PASSENGERS' EMOTIONS COULD LEAD TO GREATER PERSONALIZATION OF THE CABIN ENVIRONMENT AND IFE



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THREE COMPLETION CENTERS ARE PREPARING TO MEET THE CHALLENGES POSED BY THE ACJ350 XWB, PARTICULARLY IN RELATION TO ITS CARBON-FIBER FUSELAGE AND EXTRA-WIDE CABIN

Words by Izzy Kington



WELCOME HOME, AN ACJ350
XWB CABIN CONCEPT BY
LUFTHANSA TECHNIK



AMAC Aerospace has completed or refurbished more than 20 VIP and VVIP aircraft

“It is more complicated to drill holes in carbon-fiber fuselage skin and frames, and OEM advice is needed”

In May 2016, Airbus Corporate Jets launched the ACJ350 XWB, the corporate version of its A350 XWB airliner. “It’s the newest airliner in the world,” says David Velupillai, marketing director at Airbus Corporate Jets. “More than 200 A350s are already flying, so the aircraft is proven in airline service. Green ACJ350 XWBs could be delivered in the next year or so.”

The aircraft has a new fuselage, wings, engines and systems. Velupillai anticipates strong demand from governments that want to fly large delegations and private customers looking for “non-stop to the world” range – the aircraft can fly 10,800 nautical miles (20,000km) or 22 hours with 25 passengers. “The aircraft also gives a 25% fuel saving over the Boeing 777,” he adds.

Then there is the cabin space. The XWB in the aircraft’s name references the aircraft’s extra-wide body – the cabin is 5.6m (221in) wide – yielding 270m² (2,906ft²) of cabin space in the -900 version and 308m² (3,315ft²) in the longer -1000 version.

ABOVE AND OPPOSITE PAGE: AN ACJ350 XWB CONCEPT CREATED BY UNIQUE AIRCRAFT AND AMAC AEROSPACE, WITH VISUALIZATION BY ACA-3D

Three centers have been approved to work on the aircraft – AMAC Aviation and Jet Aviation in Basel, Switzerland, and Lufthansa Technik in Hamburg, Germany. All three have extensive wide-body outfitting experience. Velupillai says others could be approved in the future.

Eric Hoegen, director of completion sales and key account management at AMAC Aerospace, says the qualification process involved demonstrating skills in areas including engineering, manufacturing and composite materials.

The ACJ350 XWB is the first Airbus aircraft with a carbon-fiber fuselage and frames. “Outfitters typically drill several

See page 12 for more details on the ACJ350 XWB concept created by Unique Aircraft and AMAC Aerospace

CABIN STATS



ACJ350-900 XWB

Cabin width: 18ft 5in (5.61m)
 Cabin height: 8ft (2.44m)
 Cabin length: 168ft 3in (51.28m)
 Seats: 325 in airline configuration
 Range: 11,100 nautical miles (20,557km)
 Cruise speed: Mach 0.85
 Maximum cruise altitude: 43,000ft
 Price: US\$317m (airliner version)

hundred holes in the aircraft's skin and frames to attach walls, monuments and fittings," says Velupillai.

"Drilling such holes in the aluminum alloy skin and frames of traditional airliners is relatively easy and well understood, because metal is isotropic – it has the same strength properties in all directions – and has been around a long time. Carbon fiber is different, because its strength is in the plane of the fibers, and different fiber orientations are employed. Therefore, it is more complicated to drill holes in carbon-fiber fuselage skin and frames, and OEM advice is needed."

ATTACHMENT ANXIETY

AMAC's Hoegen says that with composite fuselages, the amount of data disclosed by an OEM determines how challenging completions are. "The main challenge of a composite structure is engineering solutions

WELCOME HOME

Lufthansa Technik says its ACJ350 XWB cabin concepts, such as Welcome Home, pictured on the previous page, are optimized for journeys that could last more than 15 hours.

"These concepts mix modern design elements with technical aspects such as indirect mood lighting, IFE systems, chrome and modern carpet patterns," says Jörg Löwes. "We will propose the latest wireless connectivity and IFE environment, as well as systems aimed at supporting well-being, for example humidification enhancement."

Löwes also says heavy-looking items and colors will be avoided to create a feeling of openness, lightness and brightness.

to attach monuments, galleys, bulkheads, seats and supporting structures such as ceiling grids and racks for electrical equipment,” he explains.

Hoegen says there are two ways to deal with this – one is for the OEM to give completion centers the basic aircraft data needed to develop their own engineering principles for installing a cabin, which he believes would lead to the same way of working as normal.

“The second and more likely option is that the aircraft manufacturer will not make all the data available,” says Hoegen. “This will mean they will have to be involved in the engineering phase, supporting the completion center in the structural engineering of attachments, because only they have the data required. This will mean additional subcontracted engineering efforts are required, with unknown effects on project cost and time – making it hard to quantify and commit to a fixed price for end customers.”

THE HOLE TRUTH

ACJ says that it is working with cabin outfitters to understand the challenges, and has addressed the attachment issue by



Jet Aviation's concept

The Jet Aviation Design Studio has worked on a number of bedroom concepts for the ACJ350 XWB, designed to suit the needs of travelers spending longer in the air. “The A350 really lends itself to VIP completions,” says Elisabeth Harvey of Jet Aviation. “Our concept considered how to use the aircraft’s increased

space and extensive range to provide the ultimate comfort in the air.”

The residentially inspired interior features a palette of cream and sandy hues alongside warm and cool gray and blue to create a relaxed, home-like mood. The bed frame is finished in cream leather with contrast stitching. Complementing the sand-colored veneer of the cabinet doors is a cashmere and silk carpet, which has a carved pattern designed to feel great under bare feet.

Intricate finishes and artisanal techniques are used to create a bespoke feel. For example, there are partially veneered monuments rather than full bulkheads, and decorative paint effects rather than more traditional plating. The screen housing features a paint finish from Pierre Bonneville, an artist who creates his own materials from

raw ingredients such as mineral powder, limestone and lava. “The finished surface seems to move where the light highlights the contours,” says Harvey. “This was paired with indirect lighting to create a striking and unusual visual effect.”

To cater for extended journeys, the design promotes flexibility. The main cabin features various seating and dining configurations – the forward and aft can be separated by curtains, while a large aft lounge area can be converted into two guest sleeping areas with en-suite bathrooms. The large screen can be covered with an artwork to change the ambience from cinema room to dining or conference space. “I’ve increasingly observed transitions in design in different industries such as yacht interiors,” says Harvey. “Lightweight and elegant electrically





operated screens are a nice example of developments in our designs."

Light was also a key aspect to consider. "The A350 offers larger windows than legacy airframes, increasing natural light, but the design also places emphasis on ambient and accent lighting," says Harvey. "Light was used as a design and architectural feature to enhance the residential feel. For example, throughout the cabin, spotlights can be dimmed to emphasize certain features such as a backlit wall, ceiling surround, artwork or architecture, while other lighting is dimmed to create drama and highlight the detailing of the cabin."

MAIN AND INSET: MASTER BEDROOM DESIGNS CREATED BY JET AVIATION'S DESIGN STUDIO FOR THE ACJ350 XWB



The first airline-configured A350 was delivered in December 2014

ABOVE: LUFTHANSA TECHNIK'S CONCEPT INCLUDES A SPA WITH A WATERFALL FEATURE

creating the Easyfit solution – pre-equipping the ACJ350 with hundreds of cabin attachment points.

"Working with new-generation materials always offers potential for new challenges when installing fixtures," says Elisabeth Harvey, director of design completion at Jet Aviation. "However, research and development into composite aircraft, combined with the Airbus Easyfit technology, means we can integrate a cabin without the need for complex and costly airframe modifications. The Easyfit package offers a lot of flexibility in the floorplan, which Jet Aviation sees as essential for meeting evolving customer demands and integrating truly VVIP cabins."

OTHER SAFETY POINTS

Jörg Löwes, head of product sales and design for Lufthansa Technik's VIP & Special Mission Aircraft Services division, also says the combination of advanced carbon fiber and aluminum creates new challenges for outfitting centers in terms of interior integration. "Structural load integration and airframe capability need to be fully understood and managed by the design engineering team," he adds. "In addition, provisions for cases of rapid decompression – required for the STC – will be very challenging in complex interior completions."

Further differences are to be expected in the aircraft's CMS data architecture. "Nowadays, the basic systems with which passengers interface – the lighting, air-conditioning and power, for example – have databuses that are physically separate from safety-related systems on board," says Hoegen of AMAC. "Installing a custom VIP cabin involves integrating these systems, but that can be challenging if manufacturers are reluctant to provide the information needed due to fears that their intellectual property may fall into the hands of their competitors."

Then there is the matter of electrical power management. "A specific challenge for completion centers is the fact that due to increased engine efficiency, the latest aircraft produce less electrical power than their predecessors, and yet they are equipped with more systems and equipment," says Hoegen. "There are more features to power – from



Lufthansa Technik's EASA Part 21/J design organization approval was expanded for the A350 in 2017, allowing it to develop and approve repairs and modifications under its own responsibility, to a limited extent

LEFT: LUFTHANSA TECHNIK'S WELCOME HOME CONCEPT INCLUDES A FAMILY FLEX AREA WITH LARGE SLIDING DOORS TO SEPARATE ZONES OR TO ENABLE AN OPEN-PLAN SPACE

“A budgetary figure for a completion could vary between US\$100m and US\$180m”

the electrical actuation of seats and tables to large monitors, dedicated heating, humidification systems, WLAN/broadband internet systems, etc. Intelligent electrical power management is becoming more important to accommodate all this equipment.”

Harvey of Jet Aviation also identifies electrical architecture as a key challenge, saying experience in other new-generation aircraft will come into play. “Jet Aviation has also worked closely with Airbus on integrating elements such as cameras and antennas onto the structure,” she adds. “These are next-generation aircraft. As designers and completion centers, we are really at the forefront of creating innovative concepts that match the technological advances of the airframe.”

DRESSED TO IMPRESS

In terms of the VIP interiors we can expect on this airframe, Hoegen of AMAC expects similar designs as on comparable legacy wide-body models, such as the B777 and A330/340 models.

Lufthansa Technik's Löwes envisages a combination of private areas and economy compartments for corporate customers, with room for up to 130 passengers. “If used for private travel, the aircraft's ultra-long-haul capability can be maximized by introducing features such as spa and steam showers along with luxury lounges, dining areas and private bedrooms,” he says.

With an extra-wide body to outfit, ACJ350 XWB completions will certainly keep completion centers busy for a sizable chunk of time. AMAC anticipates a 36-month cycle, with 18 months preparing for an 18-month completion downtime. “Depending on the level of elegance, interior selections, seating and systems configuration, a budgetary figure

for a completion could vary between US\$100m and US\$180m,” says Hoegen.

NINE-DIGIT FIGURES

Lufthansa Technik says specification and preparation could take 12 months, with a subsequent downtime of 15 to 18 months – depending on the complexity of the fittings and systems. “Without a detailed specification it is difficult to set the boundaries,” cautions Löwes. “Certainly, the required budget would be close to a nine-digit figure in US dollars.”

Velupillai says green aircraft will be delivered to completion centers about a year after order. ☒

AIR AND SOUND

Airbus Corporate Jets says that the ACJ350 XWB cabin environment is being engineered for maximum passenger comfort. It will offer 20% more fresh air than its predecessor, and 100% of the cabin's air will be exchanged every two minutes.

The cabin pressurization system will maintain a 6,000ft cabin altitude at 43,000ft, and the cabin also features seven air-conditioning zones.

In addition, Airbus Corporate Jets is targeting a cabin sound level that is 4dB SIL quieter than the competition.

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seat

WITH AUTONOMOUS VEHICLES LOOMING LARGE ON THE HORIZON, TOP-END CAR SEATING IS CHANGING IN FUNCTION, FORM AND LAYOUT, TO THE POINT WHERE IT COULD INCREASINGLY INFLUENCE BUSINESS JET INTERIORS

Words by Guy Bird

MAIN, INSET BELOW AND INSET
TOP RIGHT: VOLVO'S 360c CONCEPT
ENVISAGES NEW WAYS FOR
PASSENGERS TO TRAVEL, FREED
FROM DRIVING TASKS



The next phase of car design – due within years rather than decades – will see cars morphing into autonomous vehicles (AVs), where the driver will only need to take the wheel in certain scenarios – and eventually not at all. This is leading to concepts with much more flexible seating – and perhaps greater convergence with business jet design, as AVs share the same remit to enable occupants to work, rest and play in luxury.

You might have seen some already: large- and long-wheel-based car cabins with lounge-style seats configured in various directions, envisaged to enable future road travel to match or exceed business jet levels of luxury while dispensing with the hassle of check-in, take-off and landing. As Robin Page, Volvo's head of design, put it two years ago, "The next few years for any interior designer will probably be the most exciting time since we converted from coaches to cars. We have to start focusing not only on the driver, but on all the different modes you can go into."

Sleeping soundly

Given Volvo's strong history in safety, making three-point seatbelts standard on its cars as far back as 1959, it's no surprise that head of design Robin Page looked at sleeper safety in the autonomous 360c concept closely.

"The dilemma is, if you're lying down, the three-point

seatbelt is no longer relevant," he muses. "We suggested a safety blanket that attaches on both sides but is still loose. If you get into a crash situation, it would pull around you to keep you tight to the bed's surface. This is a potential solution, but we would really need to test it and go into more detail."

“The 360c stands out as a design that could easily be a business jet product”



BELOW RIGHT: A CABIN CONTROLLER INTEGRATED IN AN ARMREST ON THE LAGONDA VISION CONCEPT

BELOW: SAVILE ROW TAILORS HENRY POOLE HELPED ASTON MARTIN LAGONDA TO DEVELOP THE HANDWOVEN WOOL UPHOLSTERY FOR THE LAGONDA VISION SEATS

Adient Aerospace, a joint venture between Boeing and automotive seating expert Adient, recently began operations. The company will develop commercial aircraft seats for line-fit and retrofit, beginning with lie-flat business-class offerings for wide-bodies

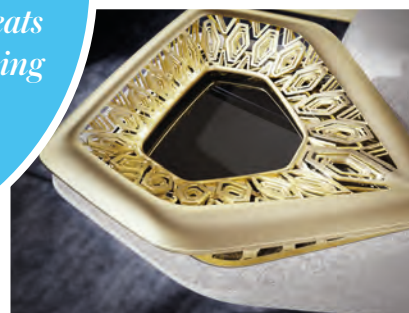
one you'd pick the client up from the airport or train station and have the meeting in the vehicle – then the VIP party, to take clients from the hotel to the restaurant, and the sleeping car.”

MARKET CROSSOVER

Designers who undertake both automotive and aviation work have certainly taken notice of Volvo's concept. “The 360c stands out as a design that could easily be a business jet product,” enthuses Patrick McCallion, senior designer at Design Q. “Its clean and simple Scandinavian design language shows new ways to use material and space in an efficient way.”

He's also impressed by Renault's EZ-Ultimo Concept, which is conceived as a special occasion AV limo that can whisk a couple away for the weekend. “It's a luxurious space that has a French flair and attention to detail, color, and materials that go further than what's available on the majority of business jets,” says McCallion.

As AVs will focus less on performance – certainly less on a customer handling that performance from behind the steering wheel – car makers



Wind forward to autumn 2018 and Volvo's 360c concept is exploring just that. It is intended as a personalized intercity travel pod to potentially rival short-haul flights, and given the luxury of the interior, Page admits the most likely market is business jet users. “You're not sharing with the general public,” he elaborates. “It's more like a hotel room. The bed is made, you've requested food, and it's nice and clean. As that sort of experience, it's more related to private air travel than a big aircraft with 320 people on board. It would be a competitor.”

FLEXIBLE CABINS

Volvo's Level 5 (fully autonomous) electric concept showcases far more layout flexibility than a conventional combustion engine vehicle steered by a human. “Now we have a scenario where you don't necessarily need a steering wheel,” continues Page. “This concept has four different interiors: the commuting car, the office alternative – instead of renting



are putting more effort into creating differentiation through stand-out interiors. "Automotive companies are investing heavily in their infotainment and color and materials departments to gain the edge," says McCallion. "Automotive interior designers have had more choice in recent years and it's creating the freedom to be innovative. Touch-sensitive woods, wireless phone charging surfaces and laser-perforated leather patterns are a few examples. The latest BMW Vision iNext concept features lots of these new ideas and is inspired by furniture design."

SHY-TECH

The 2018 iNext is something Holger Hampf, now president of Designworks (BMW Group's global creative consultancy) knows a lot about, having been responsible for the group's User Experience department until recently. He outlines two key automotive trends BMW is working on that are pertinent to business jets: "My team worked on 'shy-tech', where the technology is basically invisible and fluidly integrated into the cabin, like materials with woven-in fiber optics to provide the interface. Our second focus is called 'ultimately human', which references boutique hotels, comfort and very private spaces. Those two aspects can be experienced in a car and applied to aviation interiors as well."

This all sounds exciting, but can automotive seating ideas really be plugged into business jets without major functional and aesthetic changes to cater for stricter legislation? Hampf is optimistic. "There are a few manufacturers who produce both automotive and aviation seats, so there is knowledge-



"Injection-molding and carbon fiber are much riskier and massively more expensive in the aviation sector"





Intelligent seats

Beyond their customary passive function, Holger Hampf, president of Designworks, sees seats meeting customer needs better through in-built intelligence.

"Seats haven't changed for a very long time," he says. "There's been a lot of optimization in material cost and ergonomics, but I think innovation in seat design is just picking up again. Cars can now know who is entering the vehicle and who the driver is. And if the seat becomes more intelligent, it will know who's sitting on it, in terms of weight, temperature and comfort ranges. Seats will become less passive and start to predict situations and adapt accordingly. That's something we are definitely working on."

Automotive-inspired quilting is in demand for upholstery – turn to page 66 to read more about Townsend Leather's new capabilities in this area

MAIN AND ABOVE: THE JACQUARD CLOTH IN THE REAR OF THE BMW VISION iNEXT INCLUDES HIDDEN CONTROLS THAT LIGHT UP WHEN USED, THANKS TO LEDs UNDERNEATH THE CLOTH

BELOW: MATERIALS CREATE A CLEAR VISUAL SEPARATION BETWEEN ZONES FOR DIFFERENT USES ON THE BMW VISION iNEXT CONCEPT

TOP LEFT: THE BMW VISION iNEXT'S CENTER CONSOLE INCORPORATES A CRYSTAL GLASS PIECE THAT REFRACTS LIGHT TO CREATE A COLORFUL EFFECT

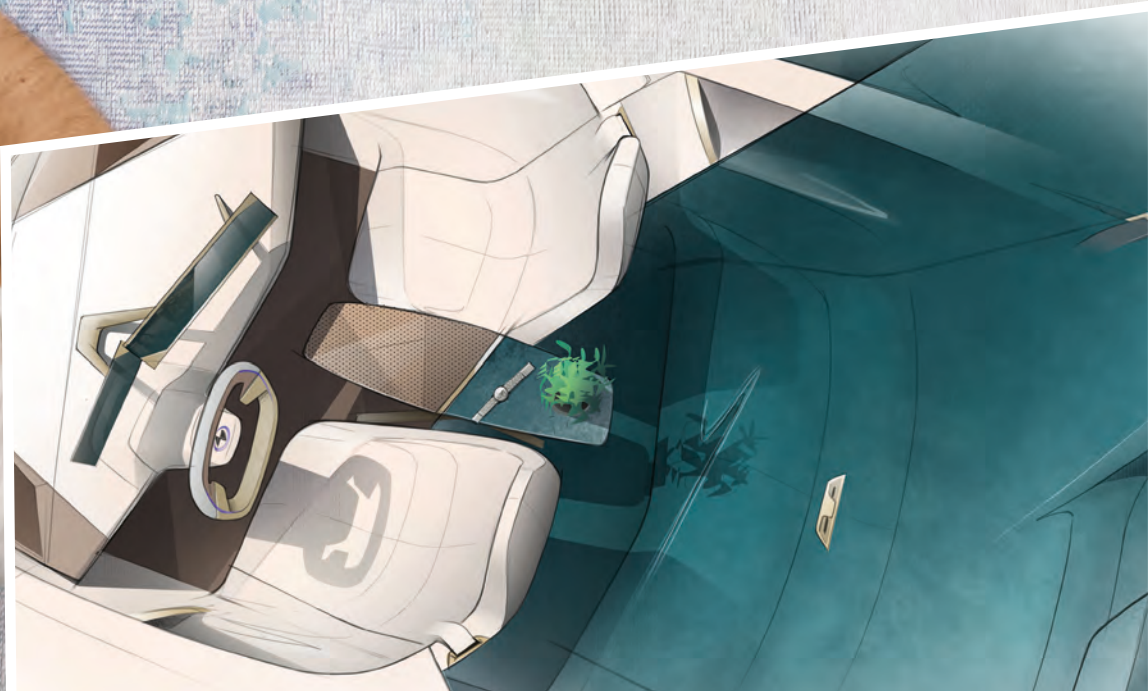
sharing already at the supplier level, to see what can be adopted from each industry," he says. "This is important."

DIFFERENCE OF SCALE

However, Philippe Erhel, who leads Bombardier Business Aircraft's Design Lab, a branch of the industrial design organization, is more cautious. "We work in smaller numbers, delivering about 150 aircraft a year," he explains. "The number of seats made is therefore relatively low – 1,000-1,500 – so it's difficult for a supplier to balance manufacturing constraints and make good margins. Those are very specific companies able to set up their industrial tooling to serve our needs. Business aircraft seats are really labor intensive in terms of assembly and upholstery. And even business- and first-class seats are very different from business jet seats. The former are in the 250-300 lb (113-136kg) category. Business jet seats are only 100-200 lb (45-91kg). For example, they don't embed as many actuators – as that makes them super heavy and affects overall reliability."

LIMITED OVERLAP

Even Design Q's Howard Guy – long a critic of the business jet industry's perceived lack of quality finishing, considering the money charged – concedes that the influence of the automotive market has its limits. "We can



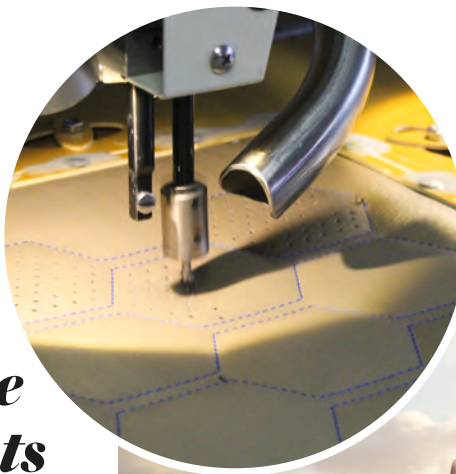
“The thing we did pick up from the aircraft industry is the exchangeability of seats to freshen up quickly”

take a lot from automotive seats in terms of upholstery techniques, but this is where the synergies stop,” he says. “The way in which you have to design a seat for 16g certification and head injury criterion (HIC), and the constant pressure to make seats lighter, means that the processes involved with injection-molding and carbon fiber are much riskier and massively more expensive in the aviation sector. Getting an aviation seat to market is much more difficult than a car seat. The certification process is not flexible, whereas the automotive process is.”

TWO-WAY STREET

The influence can go both ways too, as Volvo’s Page freely admits with relation to a potential business model involving pay-per-use AVs, which would have interiors that could be customized for different users. “The thing we did pick up from the aircraft industry is the exchangeability of seats to freshen up an aircraft quickly,” he says. “If you’ve ever been on an aircraft when a child next to you has been sick, within seconds the crew has changed it, by clipping out the seat panel. It’s that kind of innovation we thought could be used in this new business case. For our needs, we want it to be really super quality and not obviously interchangeable, but we’re working with suppliers on how we do that.”

Even in terms of aesthetics, Design Q’s Guy senses car and business jet design converging at the top end. “The 2018 Lagonda Vision Concept caught my eye because it is similar in type to Bombardier’s new Nuage seat for the



INSET ABOVE: TOWNSEND LEATHER PURCHASED A QUILTING MACHINE IN 2017, TO ENABLE IT TO PRODUCE CUSTOM QUILTED AND PERFORATED LEATHER PANELS

ABOVE AND BELOW: BOMBARDIER UNVEILED A NEW SEAT IN 2018. NUAGE IS AVAILABLE ON THE GLOBAL 7500, 6500 AND 5500



Global 7500,” says Guy. “For me, it is the most advanced business jet seat to date. We had some input into its concept, but all the credit goes to Bombardier for dictating a precise design for production. It is capable of cradling the occupant and moves and reclines in the same way as the famous Eames lounge chair from the 1950s.”

BODY BUILDING

This maybe goes to prove that great seat design isn’t specific to any one industry. Ultimately, the seat must meet the core needs of its occupants, as Bombardier’s Erhel concludes: “We’re conscious our industry cycles are different to the tech industry and we don’t want that gap to widen, but seats are a bit different, as the human body is not changing as fast as an iPhone.” ☒

HOMeward BOUND

Although many of Bombardier’s industrial designers have automotive backgrounds, Philippe Erhel is not convinced the links between the two industries are as close as some suggest.

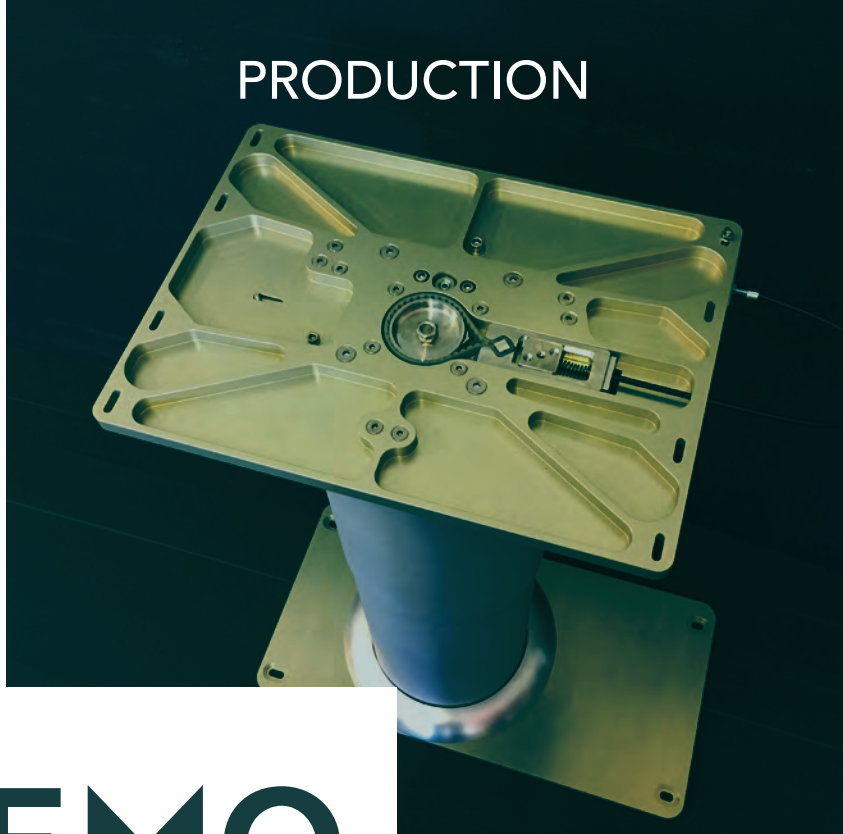
“From a scenario perspective, the autonomous car and the business jet are getting closer, because if you’re not driving, you’re working, relaxing, enjoying media and sleeping,” he says. “But when you decode it further, our cabins are much larger – you can stand up and walk around. There is a trend to compare business jets with cars, but to be honest they are two very different beasts. From my perspective, a business jet is much closer to a home than to a vehicle. For instance, there is no sense of acceleration in an aircraft in-flight, so why would we put bolsters on a seat in the lounge?”



ASSEMBLY



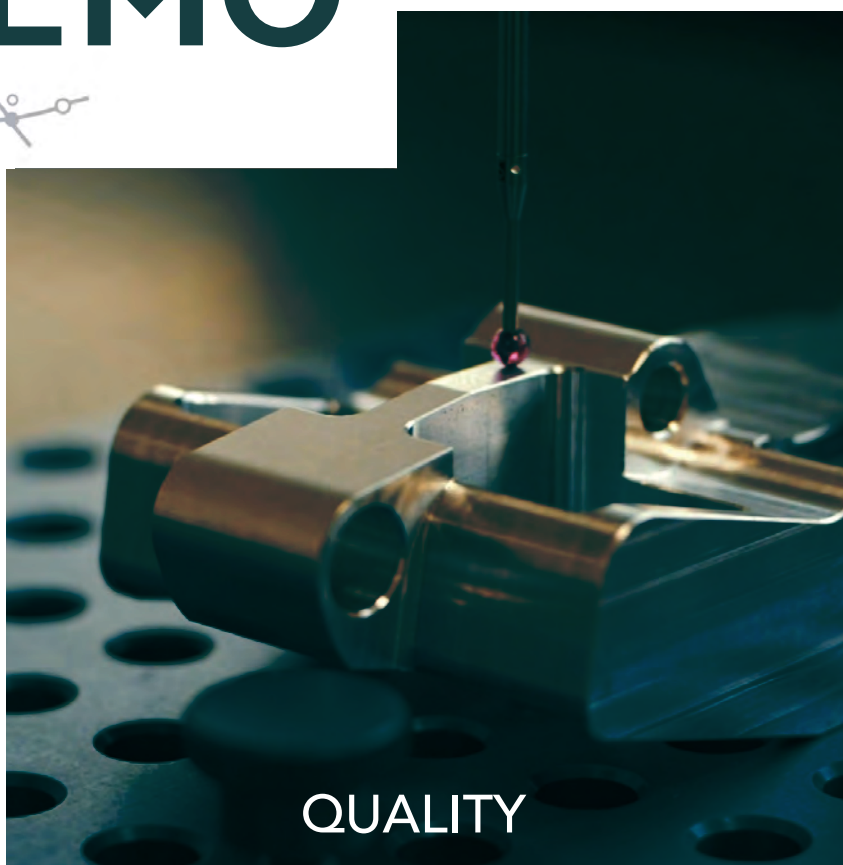
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MARTIN BRUNNER

EVERYTHING ON BOARD THIS BBJ 747-8
WAS CUSTOM-MADE – A MASSIVE
UNDERTAKING ON SUCH A HUGE AIRCRAFT

Words by Izzy Kington

labor of love

FIRSTLUXE
Home & Style
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LARGE SCALE

This BBJ 747-8 cabin was completed in 2015 by AMAC Aerospace in Basel, Switzerland, but the pictures were only recently made public. Alberto Pinto Interior Design, a design house led by Linda Pinto, completed the design between 2010 and 2012, when the aircraft was inducted. It is the biggest ever project undertaken by the company, according to Yves Pickardt, the head of its VIP aircraft interior department.

With a 420m² (4,521ft²) cabin, the Boeing 747-8 typically has room for 500 passengers in airline configuration. This VVIP version can accommodate 86 passengers, plus 13 crew, in luxury.

A green BBJ 747-8 costs around US\$250m, depending on the options chosen. Pickardt says a VVIP completion on this airframe costs around the same again.

THE BRIEF


The aircraft was completed for a "global citizen with a big family and homes in various countries", according to Pickardt.

The cabin is optimized for business and family flights. Rather than a display of ostentatious luxury, the owner wanted a warm and comfortable aesthetic, more like a family house than an aircraft. Pickardt sums up the look as a blend of classic French and softly modern influences. "The client was and still is very happy with the outcome and travels frequently around the world in this aircraft," he says.

Other features of the main deck include the main lounge and dining area, toilets, a waiting area, storage, three galleys, and a private office with a square table.

SPECIAL STEPS

The main entrance way is a large circular space dominated by the stairs leading to the upper deck. Pickardt notes that these presented one of the biggest challenges. "AMAC had to remove the original Boeing stairway and design and certify a custom stairway from scratch," he says.



IFE monitors are incorporated in several clever ways throughout the aircraft – several are hidden behind roller artwork, while others are built into bookshelves and cabinets.



PRIVATE AREA

The private area of the aircraft is accessed via Door 1 on the main deck. The entrance area also serves as a master dressing room. A corridor connects the master suite, guest suite (pictured) and family lounge. There is also private access between the master and guest suites. The master suite incorporates a bedroom with a king-size bed, divan and coffee table, and a bathroom with a shower, toilet and vanity, while the guest suite features a bedroom with queen-size bed, and a similar bathroom.



The aircraft's artwork includes lithographs by Calder, Miró, and Shirley Jaffe, and metalwork pieces by Juan and Paloma Garrido.

MATERIALS

Four types of wood veneer were used on board – a dark African wakapu (featuring hand-laid platinum leaf inlay in the main lounge), a pale blond sycamore, African zebrano, and a curly sycamore with a light mother-of-pearl effect.

Soft goods include wool and silk carpets from Tai-Ping, leather and suede from Foglizzo, fabrics from Leni's and blind fabric from Hermès. Natural parchment was used for some of the tabletops.

The plating is a mix of chrome and nickel, developed especially by Techno Aerospace.

All the seats on board were designed by Alberto Pinto. They have PAC structures and were upholstered by AMAC.

WEIGHT

Although weight is always a constraint on aircraft, Pickardt says it was not a major issue on this completion, given the greatly reduced passenger count compared with an airliner.

When delivered to AMAC, the aircraft weighed in at 197,761kg (435,988 lb). Following the completion, it weighed 240,116kg (529,365 lb).

The four table lamps in the main lounge are particularly weighty – more than 20kg (44 lb) each – as they were made using real Indian rock crystal. Pickardt says great care was taken to ensure they were attached very securely to the tables.

The typical strategy of backing wood and marble veneers with honeycomb material was employed elsewhere to save weight. Pickardt notes that the amount of soundproofing on board is the maximum that weight and technology would allow.

The main feature of the upper deck is the children's area. The children's lounge features a divan, a cabinet with built-in IFE screen, bookshelves and a coffee table.

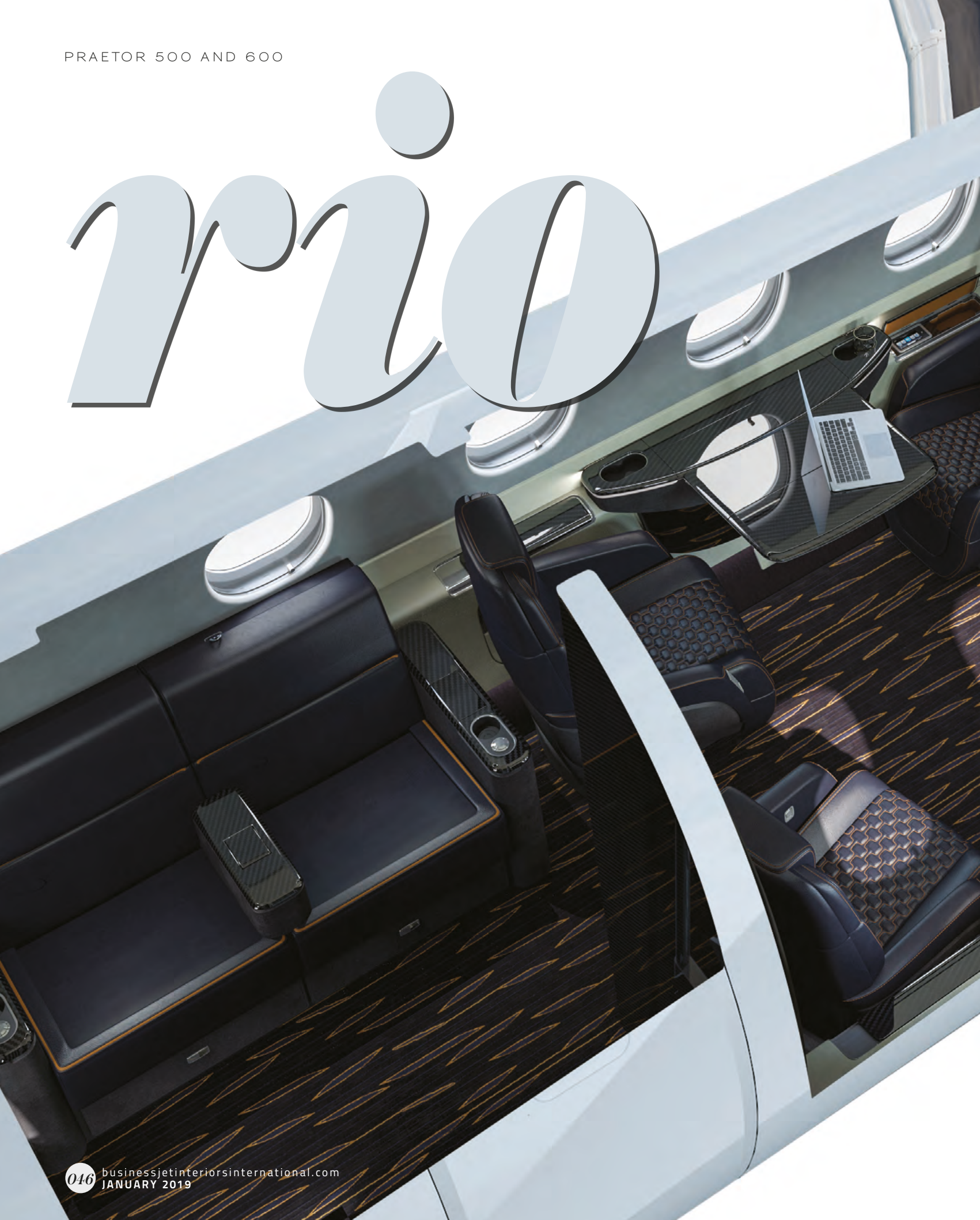
STAFF AND CREW

Many of the facilities for crew are on the upper deck. These include the cockpit, a crew rest, toilet and galley, an area for flight attendants, and the Aeroloft, which features eight bunk beds and a changing area. The Aeroloft is accessed by its own stairs from the main deck.

There are two staff cabins on the main deck, one cabin with 24 first class lie-flat seats and one with 12 business class seats, and two self-service bars. ✕

PRAETOR 500 AND 600

rio



grand

EMBRAER HAS UNVEILED NEW MIDSIZE AND SUPER-MIDSIZE MODELS, COMPLETE WITH A NEW INTERIOR DESIGN OPTION BUILDING ON THE COMPANY'S DESIGN DNA AND BRAZILIAN HERITAGE

Words by Izzy Kington

CARBON FIBER IS A FOCAL POINT OF THE BOSSA NOVA INTERIOR – EVEN WRAPPED AROUND COMPOUND CURVES ON THE TABLES

One of the biggest stories from NBAA-BACE in October 2018 was Embraer's launch of the Praetor 500 midsize and Praetor 600 super-midsize business jets. The aircraft are based on the Legacy 450 and Legacy 500 airframes (which are still available), with performance upgrades. Preliminary figures indicate a range of 3,250 nautical miles (6,019km) for the Praetor 500, which is 346 nautical miles (641km) more than on the Legacy 450; and a range of 3,900 nautical miles (7,223km) for the Praetor 600, 775 nautical miles (1,435km) more than on the Legacy 500.

Inside, the Embraer DNA design of the Legacy 450 and 500 cabins has been retained as standard on the Praetor 500 and 600. However, for an extra US\$750,000, customers can opt for a new interior design, Bossa Nova, intended to celebrate the performance enhancements, showcase the flexibility of the DNA design, and reference the company's Brazilian roots.

The design is named after a musical genre created in Rio in the 1950s when jazz was modified into "a more

The Praetor 500 displayed at NBAA-BACE 2018 had a standard DNA interior, in a light palette including a taupe oak with a flat-cut grain. Bossa Nova was shown only on the Praetor 600

complex, beautiful and elegant sound", explains Jay Beever, vice president of interior design at Embraer Executive Jets.

BOSSA NOVA

The genre is typified by *The Girl From Ipanema*. Beever and his team were inspired by imagery recalling that time and place – in particular, Oscar Niemeyer's architecture, the idea of a grand piano on the beach, and the work of Roberto Burle Marx, a designer who created many of the patterns that grace the walkways of São Paulo and Rio.

"All of that came together at that time," says Beever. "There was excitement about the future, about developing new trends and innovating in the fields of design, architecture and music. That same X factor is in Embraer, which combines the

LAYOUT AND KIT

The standard Embraer DNA design forms the basis for the Bossa Nova interior option. The layout features a forward refreshment center, seating including four lie-flat seats that can be converted into two beds, an aft lavatory with a vacuum toilet, and a baggage area that is accessible in flight.

Flight information and some CMS controls are accessible on the Upper Tech Panel. Passengers can also control the Honeywell Ovation Select CMS on their PEDs.

IFE is available as an option, and includes HD video, surround sound, and various audio and video inputs.

Ka-band connectivity is also available as an option. It is based on Gogo Avance L5 and uses ViaSat's Ka-band service, offering IPTV and speeds up to 16Mbps.

“Getting carbon fiber to wrap beautifully around the corners of compound curves takes a lot of careful planning”

BELOW: THE SQUARE ZONES ON THE DIVAN CAN BE KEPT PLAIN OR FILLED WITH IPANEMA STITCHING

BELOW LEFT: THE FOUR FORWARD SEATS CONVERT INTO TWO LIE-FLAT BEDS



Baggage capacity is 150ft³ (4.2m³) on the Praetor 500 and 155ft³ (4.4m³) on the Praetor 600



best of the two Americas, North and South. We've got the capabilities, the design story and the history. The world is ready and the DNA interior is the canvas to do it on."

COMPLICATED CARBON


One new aspect is the carbon fiber, which is used on tables, the bulkheads and monuments in a way that Beever believes hasn't been seen before. "As with Bossa Nova music, it's the complication that makes it beautiful," he says. "Getting carbon fiber to wrap beautifully around

the corners of compound curves takes a lot of careful planning. You can't cut the strands or the weave because the patterns won't run properly. It's a very complicated execution, but worth it because what tells a performance story better? Carbon fiber is lightweight, structurally strong, durable and elegant."

Embraer worked with F/List on the carbon fiber. "I can't say enough about what a nice job they did in executing the detail," says Beever.

The cabin also features a special piano black finish, used on the sideledge lids, the side shroud underneath the table and the upper valance areas, as well as the Upper Tech Panel. "Aluminum-backed veneer that's stable, structural and won't crack is finished with piano black

CABIN STATS



Praetor 600

- Cabin width: 6ft 10in (2.08m)
- Cabin height: 6ft (1.83m)
- Cabin length: 27ft 6in (8.4m)
- Seats: 2 crew + 8-12 passengers
- Range: 3,900 nautical miles (7,223km) with four pax and NBAA IFR reserves
- Maximum cruise speed: Mach 0.83
- Maximum altitude: 45,000ft
- Price: US\$20.99m (2018)



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RELEASE THE PRESSURE

Embraer has improved cabin pressurization in its Praetor jets, achieving a 'best-in-class' cabin altitude of 5,800ft at 45,000ft. Below 27,000ft, cabin pressure stays at sea level.

Embraer says this development also makes the cabins quieter. Indeed, Beever recalls a recent Praetor 500 flight where sound levels were 50-52dB on take-off.

The aircraft also feature fly-by-wire technology and active turbulence reduction. The Rockwell Collins Pro Line Fusion flight deck has new features such as vertical weather radar, which allows the aircraft to see turbulence further ahead, so the pilots know about it earlier. It also includes ADS-B in and Doppler radar.

paint and a top coat so there won't be any ripples or warping," says Beever.

BLACK METAL

Embraer has also debuted jet black metal plating. "It's like the perfect black leather patent shoes," says Beever. "The combination of carbon fiber, piano black and jet black metal just screams, 'I'm ready to go to the party.'"

The seats feature the Ipanema sew style unveiled earlier in 2018 alongside the London and Milano styles.

This is Beever's favorite detail of the new design.

SEW DIFFERENT

"The Ipanema sew style reinvents the diamond stitch," he says. "It celebrates the incredible achievements taking place in Brazil when it comes to design and technical refinement – how we got here and what Embraer represents that is different from the rest of the OEMs. It also makes for a really comfortable seat; it feels like a bunch of small pressure point pads."

Like on the Phenom 300E, the divan features racetrack tuxedo stitching, outlining square zones on the cushions that could be filled with the Ipanema sew style if requested. The newly customized divan also features carbon fiber cabinetry.

The new silk and wool carpet was inspired by the reflections of sunlight on a calm ocean.

"We have these linear ripple light reflection patterns in the carpet to

CABIN STATS



Praetor 500

Cabin width: 6ft 10in (2.08m)
Cabin height: 6ft (1.83m)
Cabin length: 24ft (7.32m)
Seats: 2 crew + 7-9 passengers
Range: 3,250 nautical miles (6,019km) with four pax and NBAA IFR reserves
Maximum cruise speed: Mach 0.83
Maximum altitude: 45,000ft
Price: US\$16.99m (2018)

ABOVE: THE IPANEMA SEW STYLE WAS INFLUENCED BY FAMOUS PATTERNS CREATED BY ROBERTO BURLE MARX

Embraer says the Praetor 500 will be the fastest midsize jet, while the Praetor 600 will have the longest range in the super-midsize category

represent the perfect morning in Ipanema," says Beever.

As well as customized seat and divan inserts, carbon fiber application, special plating options and a piano black valance, Embraer's Bossa Nova package includes stone flooring in the galley and lavatory, stone veneer countertops, and an enhanced CMS/IFE package. Customers can add to the standard galley (which includes an ice drawer) with options including a convection oven, microwave and refrigerator/wine chiller.

in the second and third quarters of 2019 respectively. Two Praetor 600 prototypes, as well as one production-conforming aircraft, are currently in flight tests. One production-conforming Praetor 500 is in its maturity campaign.

Beever warns that we should expect new interior designs to appear regularly under the Bossa Nova label.

"The name means 'new trend' and has a mental and emotional connection to the heritage of Embraer and Brazil, so we've decided that we'll always have a Bossa Nova interior," he explains. "Next year there'll be another design that everyone's going to try to keep up with. It's our mission to continue surprising and delighting our customers with value that they would appreciate." ☼

AT YOUR SERVICE

The order book is open now – the Praetor 600 and 500 are expected to enter service

THE EMPEROR'S NEW GROOVE

The name change from Legacy to Praetor was partly made to differentiate the purpose-built business jets from the Legacy 650, an airline derivative. "It was a bit confusing to those newly discovering Embraer," says Beever. "Also, a name with soul challenges us to continue making the product live up to its promise."

This is why Phenom – meaning something of phenomenal ability – was the name chosen by Embraer for its light jets. Praetor, as well as being another 'P' word, was the name given to the top magistrate handpicked by the emperor of Rome in ancient times. "This individual was given almost all authority, and really, was the ultimate butler," says Beever.

This ties in with Beever's vision of the cabin being a 'butler with wings', taking care of the owner's needs behind the scenes. "This do-it-all aircraft is the ultimate servant to the emperor, who is the owner sitting in the back. Also, the Latin root of Prae means in front, leading the way."

But what of the numerical move from 450/500 to 500/600? Beever says this gives Embraer a 'clean' portfolio, with room between the Phenom 100 and 300 light jets and the Praetor 500 and 600 for future developments – "either going up from the Phenoms or down from the Praetors".

"Next year there'll be another design that everyone's going to try to keep up with"



RIGHT: THE GALLEY BLENDS STONE AND CARBON FIBER FOR A MODERN EFFECT



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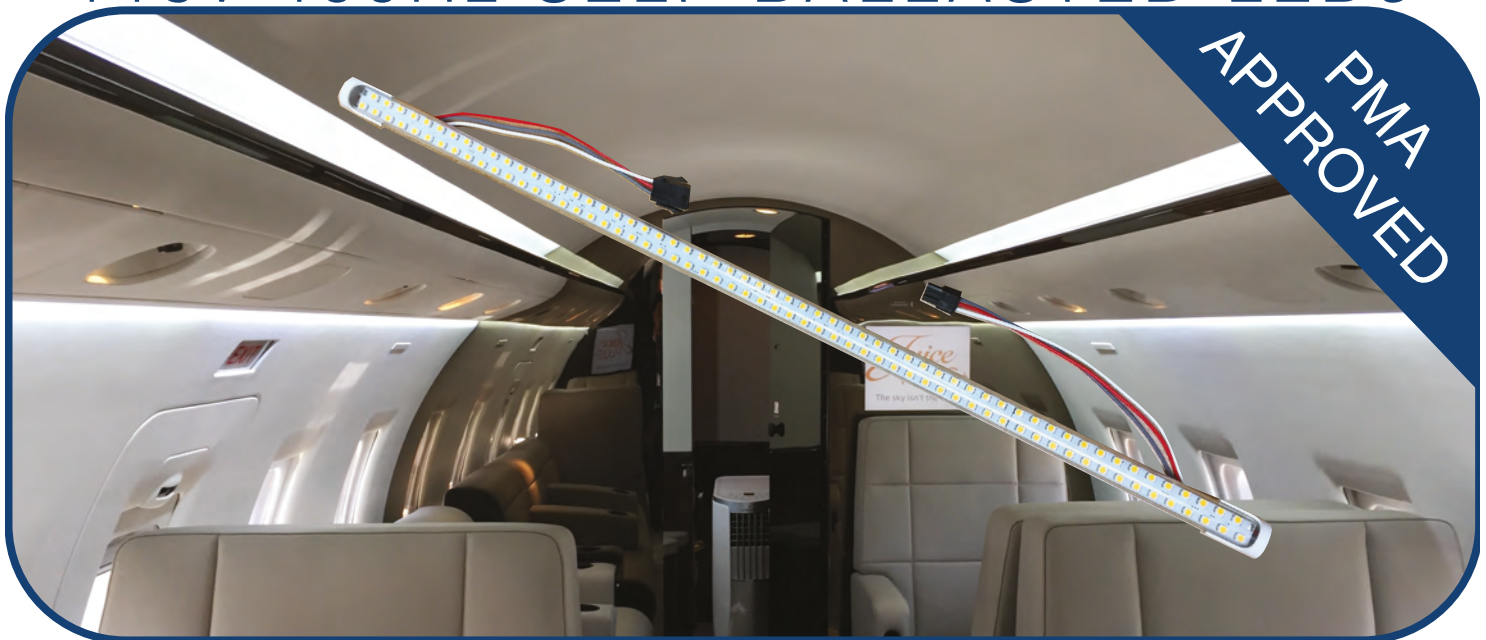
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PERSONAL SPACE

Constant Aviation reports that the days of the cookie-cutter generic interior are gone

Business and private jet owners are seeking more ways to enhance the inflight experience and individualize their aircraft interiors, both in completions and refurbishments, notes Constant Aviation.

"Clients want something completely different and individualized, from styled to wild," says Scott McCool, vice president of interiors at Constant Aviation. "With resale values remaining strong, clients are more focused on infusing their personal preferences, reimagining the space, and enjoying an interior kitted out to their specifications."

McCool notes that across the industry, an increase in aftermarket activity for business and private jets has raised demand for high-quality, luxury refurbishments and, to an even greater extent, complete reconfigurations. "Owners and operators want high-end materials, luxury designs and veneer styles that more closely emulate a living/entertainment environment versus a typical private aircraft," he adds.

CONNECTED CABINS

In today's market, clients have fundamental expectations that must be met before true customization begins.

"On-demand connectivity is quickly becoming the norm," says McCool.

"Providers must be able

Constant Aviation has facilities in Cleveland, Ohio; Orlando, Florida; Mesa, Arizona; and Las Vegas, Nevada

to offer and install leading-edge avionics technology that provides passengers with connectivity for all their devices, including smartphones and tablets. The demand for faster broadband, streaming live media such as sporting events and TV, and pulling content from Amazon Prime or Netflix accounts, has forced

manufacturers to offer additional upgrades and enhancements that are installed along with the new interiors."

Digital CMS installations have become a key element in interior refurbishment and reconfiguration projects. Clients plan for both business and leisure amenities as part of the overall design process. "More often, our clients are including new CMS equipment as part of the overall





Trend Talk

"Business and private jet owners and operators are gravitating more toward custom interiors styled to their individual preferences. Interior spaces have become more luxurious, digitally connected and multifunctional. To a greater extent than ever, clients can create spaces for business, entertaining and dining, with unique configurations, well-appointed materials and hand-crafted fixtures and furnishings. Owners are expressing their personality and style through creative cabin interior design concepts."

*Scott McCool, vice president of interiors,
Constant Aviation*

BELOW AND INSET: CONSTANT'S KIBITZER SEATS, WHICH ARE STOWED IN A CREDENZA, ARE A POPULAR OPTION



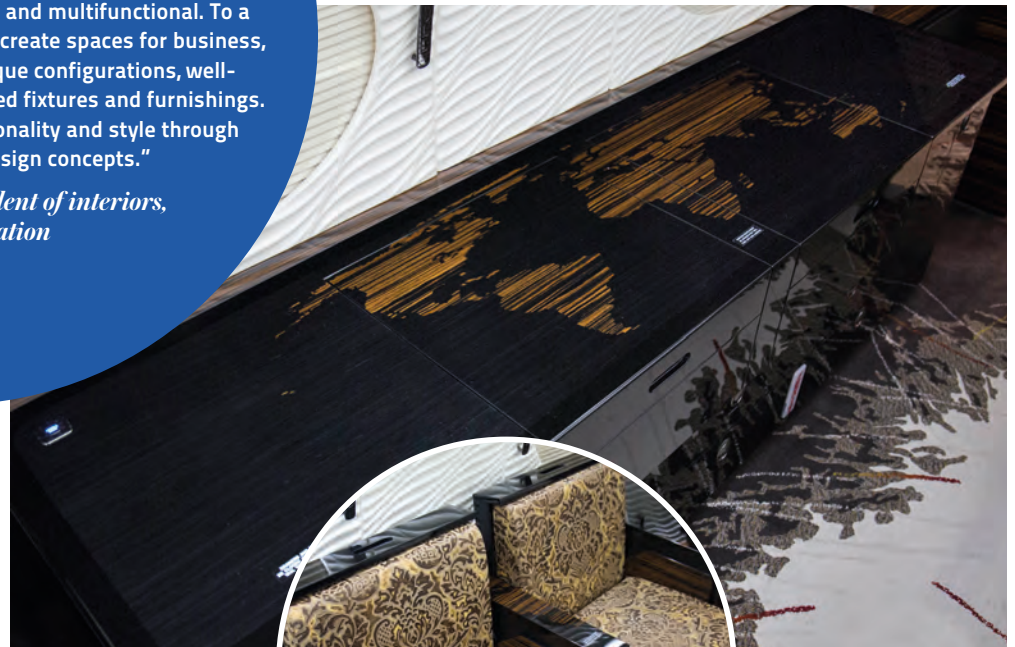
MAIN: FLATSCREEN UPGRADES ARE VERY COMMONLY REQUESTED

BOTTOM LEFT: RETROFITTING CMS CAN GIVE PASSENGERS CONTROL OVER CABIN EQUIPMENT INCLUDING WINDOW SHADES

project," says McCool. "The ability to integrate IFE and increase business productivity influences special design elements and helps reimagine how clients interact in the space."

CMS AND FLATSCREENS

Today's CMS offerings can give passengers the ability to control a variety of cabin equipment and conditions –



including lighting, seats, temperature, window shades, and more – through a simple touchscreen or from their mobile device.

There is also demand for large screens that add to the functionality of the cabin. HD flatscreen monitors can be complemented with full surround sound for watching movies, and can also be used by passengers to review presentations with colleagues during a business trip. "Smart design and top-tier craftsmanship are required to integrate these large screens into cabinetry, and optimize their location within the cabin," says McCool.

All facets of design, engineering and installations are focused on creating a highly functional and luxurious interior. "Our clients expect a high level of craftsmanship and impeccable attention to every detail, right down to the china cabinet inserts," says McCool. "The

journey for our clients begins with a session with our designers to get to know them, and to discuss their vision and expectations.

This is much like a session with an interior decorator. It is an in-depth conversation to discover the client's likes and dislikes, style preferences, how they intend to use the space, and to reveal a sense of their personality."

Clients receive 3D renderings and customized sketches intended to give an authentic visual preview of the interior. Design boards are provided to showcase the textiles and surfaces, and give a sense of their tactile qualities.

MULTIFUNCTIONAL KIT

Cabins can be customized to maximize multifunctionality. For example, the same seats and screens can support uses varying from business meetings to family dining and movie viewing. In many cases,



LEFT AND INSET: UNIQUE STITCHING STYLES ARE IN DEMAND FROM CUSTOMERS WHO WANT PERSONALIZED DETAILS

the cabin is completely reconfigured to create zones of activity. The design process includes contemplating potential acoustic elements and layout options.

One popular element is Constant's custom-made kibitzer seat, introduced in a Global 6000 a few years ago. "It takes its name from the Yiddish word for a spectator who offers commentary or analysis," says McCool.

Two kibitzer seats can be stowed within a credenza opposite the dining/work table and unfold to create two additional seats across from the table. "The kibitzer seats have become so popular, almost all new large-cabin reconfiguration clients are requesting this add-on," says McCool. "Another unique design element is a handcrafted cabinet that houses a retractable HD flatscreen monitor, turning the surface into a workspace when not in use. Other examples include single seats reconfigured into a multiplace divan, distinctive galley layouts, crew areas and extended lavatories."

PERSONAL TOUCHES

Color palettes and textures emerge once the form and function have been defined. "As in the luxury home, yacht and automotive industries, clients want to imprint their own style when selecting materials," says McCool.

Clients can put their fingerprint on the interior through custom color schemes, bold patterns, non-traditional upholstery, distinctive accessories and unusual materials.

"Each project is tailored to each client," says McCool. "We have incorporated custom diamond-pattern hand-stitching, ostrich leather upholstery, satin nickel hardware and other unique plating, silver embossed leather inserts, artistic wood inlays, reshaped headrests, more ergonomic seating, hand-tooled hardware styles, exotic woods, and more. One of my favorites is the Zericote wood used to handcraft a gorgeous veneer. This exotic wood from South America has grain lines and color streaks that tend to form abstract art. It is one of the many luxuries our interiors team offers in cabin redesigns."

THE ICING ON THE CAKE

Replicating the style and flair of a special customized interior with the exterior paint scheme is the icing on the cake. "First impressions are made on the approach to the aircraft," says McCool. "Taking advantage of the opportunity to carry the design to the exterior surface adds that wow factor."

Colors, designs, logos, emblems, flags and more can be created for personalized paint schemes. "Clients can include that added touch when planning interior work," says McCool. "We use high-quality paint and coatings and offer custom color-matching capabilities, including single-stage, metallic, mica and pearl coating applications."

Constant Aviation has aircraft interior modification and refurbishment facilities at all its locations in the USA. The design centers are staffed with professional designers dedicated to providing clients with an in-depth personalized experience like no other.

"Making our clients' vision a reality is what drives us to exceed their expectations," comments McCool. "Clients want to work with a company that strives to create a cabin interior that becomes an extension of their lifestyle and their home. With superior craftspeople and innovative teams, Constant Aviation delivers amazing, luxurious designs that dare to be different." ✖

Aircraft supported by Constant Aviation include Bombardier, Dassault, Embraer, Gulfstream, Nextant and Textron Aviation types

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FOAM COMFORTS

The latest foams from Aerofoam Industries were developed specifically for aircraft seating, and therefore address the market's requirements head on

Over the past five years, a new series of graphite-filled foams has been in development and in use by Aerofoam Industries.

"We use these foams to fabricate the most comfortable and lightest cushion systems for seating OEMs and major airlines," comments Jim Barrett, vice president at Aerofoam Industries. "Having an in-house foam readily available at all times enables us to make prototypes quickly, submit our cushion systems for evaluation, and beat almost every competitor that attempts to challenge our products. It's been a successful business model and gives us an unmatched advantage when it comes to designing seat cushion systems to meet customers' stringent weight and comfort challenges."

The company believes that its ability to design its systems using foams that are not the normal off-the-shelf products used by every other cushion system supplier has helped the brand to stand out. The foams are unusual in having been developed specifically for aircraft seating applications – rather than adopted from another industry, such as furniture or bedding, in the hope that they would work.

POPULAR DEMAND

Now the product is sparking interest in the general aviation market. "Several months back, we were asked to provide technical input for a series of articles related to foams, which to our surprise, spurred an onslaught of inquiries from the general aviation side," explains Barrett. "The demand for new foams was so overwhelming it opened up discussions within our organization regarding the possibility of distributing our products within this market. Demand continued to grow – spurred by price



Aerofoam also specializes in thermoformed and injection-molded components and assemblies, as well as seat covers

adjustments for the off-the-shelf products currently available in the market – making our decision to release these products to the general aviation market that much easier."

Barrett adds that these foams have been successfully used in service, meeting required comfort criteria and passing a vast array of exhaustive tests. The foams are part of various cushion systems that were designed for TSO-certified applications and which are now flying on aircraft ranging from regional to wide-body platforms. The foams are also included in cushion systems used by two

of the world's leading airlines. With the foams now proven in commercial aviation applications, Aerofoam decided it made perfect sense to offer them to the vast general aviation market.

The new range includes comfort/lamination foams and memory/visco foams. Each of these materials is unique to the aviation industry and specifically formulated and developed for its intended application.

COMFORT FOAMS

The seating or comfort foam range features six highly resilient foam



Trend Talk

"We see the demand for high-performance, competitively priced graphite-filled comfort foams taking over market share. The adoption of graphite-filled memory foams for seating is happening very quickly, because the flying customer is demanding the same level of comfort on board as they are accustomed to in the other aspects of their life."

*Jim Barrett, vice president,
Aerofoam Industries*

MAIN AND
OPPOSITE PAGE:
AEROFOAM'S
RANGE OF
GRAPHITE-
FILLED FOAMS
FOR GENERAL
AVIATION
APPLICATIONS

ABOVE: MANY OF THE FOAMS CAN BE LAMINATED TO DRESS COVERS MADE FROM VARIOUS MATERIALS

All Aerofoam products are designed and fabricated at its in-house facility in California, USA



The entire series of foams has been subjected to ASTM D3574 testing and has also undergone extensive testing for height loss through constant pounding testing, as well as for shear. The foams meet FAR25.853 (a) requirements and pass the C burn test without the use of fire-blocking materials.

materials that were formulated with specific properties to address common problems found in aircraft seat cushions. "Frequent issues include lack of comfort, rapid cushion height loss, shear or tearing due to movement and weight concerns," comments Barrett.

The new foams are designed to offer higher resilience than their conventional foam predecessors. "The improved resilience was achieved by formulating a staggered cell structure rather than a linear cell structure," says Barrett. "The staggered cell structure acts like tiny springs that rebound against the passenger's body, greatly adding to the foam's comfort while preventing height loss. The rebound forces can best be described as making the new foam feel alive in comparison with the dead feeling of conventional foams."

LAMINATION OPTIONS

All of these graphite-filled foams – including the four grades of high-resilience foam and the visco/memory foams – are designed for lamination to

dress covers, and each offers a unique feel. The foams bond using pressure lamination systems and do not require special fire-blocking materials for compliance with aviation regulations.

These foams work with all dress cover materials, including fabrics, PU leathers, e-leather and leather.

GREATER RESILIENCE

"What makes these foams unique is their highly increased tensile and tear strength, which prevents shearing and rapid breakdown of the foam material, something that is all too common with standard foam materials in these types of applications," says Barrett. "With six grades available, there are various comfort options."

The entire comfort series is also offered with antimicrobial and/or temperature-regulating phase-change coatings. The products are available in full blocks or cut-to order sheets, and a few offerings are available in rolls that are 0.25in (0.64cm) and 0.50in (1.27cm) thick, and in various lengths.

ABOVE LEFT: AEROFOAM OFFERS VARIOUS GRADES OF FIRMNESS, ENABLING CUSTOM SEAT BUILD-UPS

TREASURED MEMORY

The two aerospace-grade memory foams are available in a soft and a firm grade. Barrett says they are unlike anything currently on the market.

"The tensile and tear strength has been adjusted so that it can be used on the top surface of bottom, back and headrest cushions without suffering from breakdown or degradation – something that happens all too frequently with the mattress-grade foams that are commonly used," he says.

The company believes these aerospace-grade memory foams to be the lightest-density foams available on the market today.

"The lighter weight of these memory foams means they can be implemented in designs without the weight impact concerns associated with traditional memory foams," says Barrett. ☒

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REST ASSURED

Business jets are commonly used to maximize the productivity of busy executives – so the soft materials inside must support true comfort, including the ability to sleep



While replicating the look of leather, Ultraleather also has the advantage of being verified as a vegan material



The entire executive aviation sector is built around the ability to move key personnel and high-net-worth individuals from point to point efficiently, to maximize the most precious commodity of all – their time. For example, after inspecting production line improvements in far-flung locations, company leaders are expected to be back in time to report at the monthly board meeting, and to be at the top of their game. These people need to be treated with the maximum standard of care. These are important factors in why the business jet market continues to thrive.

Business jet interiors are evolving to better meet the demands of these corporate executives, who are increasingly demanding continuity in terms of what they experience throughout their busy lives.

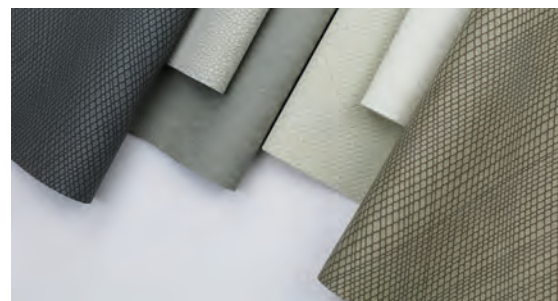
Passengers' first priority is comfort. Survey after survey finds that a comfortable seat is key to this, especially as business jet manufacturers increase the range of their aircraft, leading to longer flights. Tapis has developed products such as Ultrasuede specifically for enhanced comfort.

"Ultrasuede is a high-performance microfiber fabric," says Jason Estes, vice president of global sales and marketing at Tapis. "Microfibers are embedded into a backcloth, giving a brushed surface texture. The combined strength of the microfibers provides buoyancy to the occupant – longer fibers mean a larger surface area is in contact with the passenger, so the pressure exerted by the passenger on the material is decreased, and they experience increased support. In addition, cooling convection currents can

form between the passenger and the seat's surface.

POWER NAPS

Another important factor for passengers is the ability to sleep on board. "Every executive traveler will tell you that sleep is a luxury that they will take whenever they have the opportunity," says Estes. "The cabin environment – free from





Trend Talk

"Technical textures that deliver the look of a fabric but the performance advantages of an engineered leather have become increasingly popular. For example, the newest product in the Ultratech collection, Wired, is now being seen in applications – including in a recent Bombardier Global Express interior by West Star Aviation."

Jason Estes, vice president of global sales and marketing, Tapis

FAR LEFT: ULTRALEATHER TOTTORI

BELOW AND MIDDLE: ULTRASEUDE

BOTTOM LEFT: ULTRATECH

telephone calls and customer requests – provides a perfect opportunity to repay part of the sleep debt."

Materials such as Ultrasuede play a supporting role in this. "With its soft brushed texture, Ultrasuede provides a functional, FAA-compliant surface with super softness and comfort," says Estes. "The microfibers support the entire body when lying flat, and the surface is cozy to the touch, making for a comfortable bed."

Another product that Tapis recommends for its ability to support sleepers is its new Ultratech material, which is manufactured using Ultrafabrics Takumi technology. The four-layer Takumi technology incorporates a microfoam layer between a fabric base layer and a top skin layer.

The microfoam layer's core attribute is heat dissipation – it is designed to wick

away the heat generated by the passenger in a similar way to how some of the major sporting clothing brands keep athletes at their optimum core body temperature. "Studies have shown that maintaining core equilibrium temperature is one of the key factors in determining a good night's sleep," says Estes.

ROAD TO THE SKY

Passengers are also looking for commonality in terms of the materials they experience in every aspect of their life. "Ultrasuede, with its clean lines and finish, has a luxurious aesthetic that does not feel out of place in a luxury cabin," says Estes. "It provides a compatible fit for the modern executive who has probably experienced the same Ultrasuede in their luxury vehicle or yacht. The same can be said of

Ultraleather, which is becoming ubiquitous in modern, high-quality electronic vehicle interiors.

"Wrapping your executive cabin in a sensorial experience means your passengers can arrive refreshed and revitalized, on time, every time," says Estes. "There's a feeling of consistency in the brand experience offered by our materials – not only in terms of aesthetics, but also in the intrinsic high performance that has made them the go-to products for business jet interiors. These products offer the luxury and performance required to support the executive lifestyle." ❖

FREE READER INQUIRY SERVICE

To request more details from Tapis, visit www.ukimediaevents.com/info/aimbj

NATURAL SELECTION

Fifty years on, Townsend Leather continues to elevate leather to new heights through customization and innovative capabilities such as quilting

Townsend Leather celebrates its 50th anniversary in 2019. Over the years, the Upstate New York-based manufacturer has adapted to different needs and expanded its capabilities through new technologies.

Throughout the 1970s and much of the 1980s, Townsend focused on finishing large quantities in basic colors for the garment and shoe industries. In the early 1990s, the company found its niche, producing custom colors matching carpet, fabric and other references for low-quantity orders, with quick turnarounds, for aircraft – serving head-of-state, OEM and refurbishment projects. The range has expanded from a handful of products to well over 80 lines, encompassing a variety of hides.

Townsend always believed that its leather could be a high-end design tool. Over time, the company has increased its options for personalization – starting with custom colors, and adding the ability to provide different sheens, embossing and hand-tipping effects.

TRUE PERSONALIZATION

Today, Townsend is amazed at how far the production and personalization of leather has come. This past year has seen an unprecedented number of projects requiring special techniques. Laser-etching has been used to create logos and instructional messages. Custom embossing has been employed to spell out monograms or provide whimsy. The company says digital printing is now easy and affordable, and the sky is the limit for designs and color combinations. Ombré effects, as well as highly conceptual ideas such as a lunar eclipse, have been implemented by hand.

Townsend also now has a machine to create custom quilted and perforated designs. "Last year, we purchased



MAIN: A HAND-PAINTED AND TIPPED HEADBOARD MADE FROM TOWNSEND'S LEATHER



INSET: QUILTING AND LASER ETCHING FINISHES ARE POSSIBLE

a quilting machine that will allow us to provide quilted leather panels that are already sewn and backed with foam," says A J Kucel, Townsend Leather's aviation sales representative. "We've been asked to provide this capability by many of our customers over the last couple of years. It first became popular in the high-end automotive market and end users want this look in their aircraft."

Kucel adds that some projects do not have the budget for real quilted panels and so the company has expanded its range of products embossed with quilted diamond and woven looks. "These embossing plates and rolls provide the desired aesthetic, but can be engineered to meet specific budgets," he says. "We can also add hand-tipping or antique effects that highlight the patterns and give a more authentic look."

Trend Talk

"Our medium double-diamond stitching is very popular these days. It comes in standard colors and we can customize with multiple color effects, sheens or other finishes. We can also provide it in different scales – we can scale the pattern up or down, based on the customer's direction. It can be fun for designers to mix and match the use of a pattern in different sizes for various applications within the same interior."

*A J Kucel, aviation sales representative,
Townsend Leather*



Kucel says there is no idea that can't be created on leather; if customers have an outside-of-the-box idea for the material, Townsend can make it happen. "Providing solutions to give interior designers and their clients a way to achieve their vision on our leather is something we take great pride in and something we accomplish in reasonable timelines, working hand-in-hand with our customer and their customer," he says.

The company is very excited to see how leather can be further elevated over the next 50 years. ☼

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To request more details from Townsend Leather, visit www.ukimediaevents.com/info/aimbj

Leathers with allure



◆ Medium Double Diamond Stitches ◆

Geometric patterns, *like our newest development in an oversized, embossed-stitched diamond*, can change the visual dynamics of spaces and make for striking interiors.

This leather draws inspiration from contemporary design, melded with new technologies to quickly entice the eye with its charm and beauty. It's a bold and powerful pattern that creates structure and sharp lines throughout its design, but is produced on luxuriously soft cowhide that keeps the natural aesthetic of leather intact.

GET YOUR TEMPTING SAMPLES AT
WWW.TOWNSENDLEATHER.COM/LEATHER

DREAM TEAM

A recent Global refurbishment demonstrates the collaborative spirit fostered at Duncan Aviation

Duncan Aviation can perform full interior refurbishments in Lincoln, Nebraska, and Battle Creek, Michigan, and will offer the same in Provo, Utah, by Q2 2020



The phrase ‘we’re all in this together’ resonates with every person who works on aircraft interior projects, particularly big renovations. Duncan Aviation’s facility in Lincoln, Nebraska, recently completed one such project on a Bombardier Global. Whether working on the floor, in the shops, at the design center, or in the sales offices, every team member who has a role on a project such as this watches with pride as the aircraft is returned to service.

Prior to buying the aircraft, the new owner had selected Duncan Aviation to perform the pre-buy evaluation. Pleased

with how the transaction had gone, the customer asked Duncan Aviation to completely renovate the interior, in line with drawings he provided. The teams involved in this project came together to take his plans from conceptual designs to an actual interior.

EXPERT GUIDANCE

“Although the designs came from an outside firm, the entire project was spearheaded and facilitated by Duncan Aviation’s senior lead designer, Mary Lee,” comments Matt Spain, senior sales representative for completions and modifications at Duncan Aviation. “If not

ABOVE: A SPECIAL STARBURST DESIGN WAS CREATED FOR THE MID-CABIN BULKHEAD

for her efforts and guidance, this project would not have happened. The designer had worked on green aircraft, but had never done a retrofit modification. Mary guided him and his team through the entire complex process.”

In addition to the guidance provided by Lee, Duncan Aviation’s cabinet, interior and fabrication shops had to find ways to create the unique design features using materials certified for use in aircraft.

DIMMABLE SHADES

The ability to control light enables passengers to sleep or work when they need to, regardless of the time of day.



Trend Talk

"Cabin technology continues to be all about connectivity, with international capabilities and high speeds a priority.

Some of the recent aesthetic trends include antique and rose gold tones in plating, accompanied by warm, neutral colors. Customers are also requesting lighter carpets and seats, and prefer intricate seat designs that include quilting and dark welt cord or stitching accents. Dark straight-grain veneer continues to be a frequent selection for cabinetry and drink rails."

*Mary Lee, senior lead designer,
Duncan Aviation*

The dimmable shades installed on this aircraft have no moving parts, which Duncan Aviation says makes them durable and easy to control; once they're energized, they darken to block the outside light or prevent glare in the cabin.

The rear bulkhead was outlined with a veneer band, with panels fitted inside. The left panel was hydro-dipped to create a hydrograph finish with a crushed oyster pattern. The process involves laying film across a bed of hot water and laying the panel into that so the pattern adheres to the panel, then applying a top coat to protect the finish.

The other bulkhead panel was also hydro-dipped and the cabinet shop also slipped a film insert between the two layers of polycarbonate. This film dims and turns opaque when energized, creating privacy and darkness in the aft cabin when required.

The visual centerpiece of the new interior is a design that forms a starburst when the door on the mid-cabin bulkhead

closes. Teams from the cabinet, interior and fabrication shops collaborated to figure out a way to create the intricate design without exceeding weight restrictions.

STARBURST INLAY

"Typically crafted from aluminum, the starburst inlay would have been far too heavy if all made from metal, so the CNC shop created polycarbonate strips," explains Nick Dahlberg, cabinet shop crew leader on the project. "The strips, with domed tops and rounded ends, were then set into the door and matched to those inlaid in the bulkhead divider so the starburst design aligns perfectly when the door is closed."

Other special features on board include a French-stitched seam above and below every window panel. "These eye-pleasing details also pick up the stitching in the seats," says Spain. "The seats, made of hair-on-hide and

perforated leather, really show off the talents and abilities of our teams in the upholstery shop."

Visit businessjetinteriorsinternational.com/videos to view a timelapse video of the project. ☒

BELOW LEFT:
ONE OF
THE REAR
BULKHEADS
FEATURES A
DIMMABLE
PANEL

BELOW:
CREATING THE
STARBURST
PATTERN USING
POLYCARBONATE
INSTEAD OF
ALUMINUM KEPT
WEIGHT DOWN



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To request more details from Duncan Aviation, visit www.ukimediaevents.com/info/aimbj

HAUTE CUISINE

Galley inserts crafted for optimum performance and design can have a big impact on the overall experience of flying in a private aircraft

Trend Talk

"Our customers expect inserts to incorporate the trends they see in the commercial appliances sector. Touchscreens, Bluetooth connectivity and steam cooking will be the next innovations to dominate the market. As for the design, we are moving toward increased customization and craftsmanship to convey a feeling of luxury and authenticity not seen before."

*Stephane Oliver, sales manager,
Zodiac Executive Aircraft Inserts*



Often right at the entrance of a jet, the galley helps to inform first impressions of the aircraft. Its appearance and functionality are both vital. With more than 30 years of experience, Zodiac Executive Aircraft Inserts specializes in sleek, custom-built appliances that are worth showing off. Recently, it developed inserts for the Gulfstream G500 and the Bombardier Global 7500. Overall, the company says galleys are becoming as elegant as they are functional, with the newest inserts – such as its Atmosphere line – combining sophisticated style and practicality.

INTELLIGENT LAYOUT

The challenges involved in designing new appliances include the size and function of each insert, and the overall layout of the galley. "It all looks very simple, but a lot of thought goes into that simplicity," says Stephane Oliver, sales manager at Zodiac Executive Aircraft Inserts.

A modern, bespoke kitchen design demands built-in appliances that are made to work together. "The Global 7500 ovens, for example, are positioned

furthest from the cabin threshold, allowing the crew to serve passengers while attending to the kitchen," explains Oliver. "Appliance doors open toward the cockpit to ensure easy access to the countertop at all times. Stainless-steel fridges integrate perfectly with large wine coolers, while ovens are aligned with built-in coffee machines. We want our inserts to stand out, but also seamlessly blend into the cabin design."

THE TASTE TEST

Cooking in a confined space at 41,000ft is a challenge. "Low humidity and reduced air pressure can inhibit smell and taste receptors, as well as slow metabolism," says Oliver. "Therefore, we take a great deal of care when developing executive appliances, focusing not only on the design but also on the performance."

This is why insert manufacturers consult with expert flight attendants and



chefs. Zodiac Executive Aircraft Inserts worked with the American Coffee Society to develop its Atmosphere beverage makers. "They use bottled water for a better taste and offer a slower brew for the best full-bodied aroma," says Oliver.

Passengers can choose from various espresso-based beverages, including cappuccino, latte, macchiato and flat white, plus their favorite brand of tea.

With jet owners looking for increased flexibility from ovens, the company is working to maximize volume, options and performance. "We have redefined our existing cooking technologies, using thermodynamics to redesign the oven cavities and circulating fans so that our inserts don't just heat prepared food, they can be used to create five-course meals from scratch," says Oliver. "Our products bring guests together around fine cuisine, meticulously prepared in bespoke appliances." ❁

FREE READER INQUIRY SERVICE

To request more details from Zodiac Executive Aircraft Inserts, visit www.ukimediaevents.com/info/aimbj

Elevate Your Culinary Experience

Versatile Cooking and Brewing • Engineered for Intuitive Controls • Reliable • Quality Workmanship

Atmosphere
SIGNATURE LINE



ZODIAC EXECUTIVE AIRCRAFT INSERTS

Zodiac Cabin
Cabin Equipment Division

**ZODIAC
AEROSPACE**



happy marriage

TWO INFLUENCES ARE BLENDED SEAMLESSLY IN THIS RESIDENTIAL DESIGN FOR A COUPLE OF NEWLYWEDS AND THEIR CHILDREN

For this six-bed family home in Mountain Lakes, New Jersey, Susan Knof, founder and creative director of Knof Design, had to reconcile the tastes of a newly married couple – combining the wife's love of French furniture and the husband's of Art Deco.

Knof says the answer was to "treat both influences with a light touch, so that the scheme avoided clashes of style or any kind of obvious, themed look and maintained a cohesive feel".

The influences are felt in choices such as the mirrored furniture, chandeliers and distressed timber. Soft furnishings create a luxurious feel, most notably in the formal living room, which is dominated by a buttoned Cambridge sofa in

tufted, vintage indigo velvet, complemented by a mix of cushions in metallic fabrics.

Other highlights include woven silk wall coverings, a lily pad table and a hand-painted screen with Japanese cranes. The owner's artwork has also been incorporated. "Luckily, the portrait of the reclining lady above the console couldn't have been a better choice," says Knof. "Her green and blue outfit fits perfectly with the scheme and the antique frame adds contrast to the room's contemporary furnishings." ✕



PHOTOS: SEAN LITCHFIELD

OTHER EYE-CATCHING DESIGNS FROM VARIOUS INDUSTRIES...



- 1 Art of Life, a ready-to-build concept for a 115m (377ft) yacht, was created by Sinot Yacht Architecture & Design. Highlights include many skylights and floor-to-ceiling windows, a 384in retractable cinema screen, and precious materials.



- 2 This Porsche 911 Speedster concept study, Porsche's second of the year, features partly perforated black leather with red highlights. The car is also available with new Heritage design packages by Porsche Exclusive, entering production in 2019.



- 3 This loft in San Francisco, USA, was remodeled by architect Studio Vara and interior designer Toni Ambus of Design Details. Walls were stripped back to the concrete, and most finishes and furniture stick to a natural palette – making the Stark carpet really stand out.

PHOTO: BRUCE DAMONTE

the bench seat



by the benchmark

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A stylized graphic of a hand or wing, rendered in a dark, flowing shape, positioned below the 'AERISTOCRAFT' text.

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