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JULY 2013

THE INTERNATIONAL REVIEW OF BUSINESS JET INTERIOR DESIGN AND COMPLETION



growthmarkets

THE RISE OF BRAZIL, RUSSIA, INDIA
AND CHINA – AND WHAT IT MEANS
FOR COMPLETION CENTRES

 ALSO IN THIS ISSUE: NEXTANT 400XTI **BBJ 3 DELIVERIES** CABIN ATMOSPHERE **GALLEY DESIGN** COMPLETION CRAFTS **LIGHTING**

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oldandnew

At EBACE this year I was lucky enough to be guided by Elisabeth Harvey, head of Jet Aviation Basel's interior design studio, through a BBJ 3 the company recently designed and completed for a Middle Eastern client. Guided is an apt word to use, because the BBJ 3 airframe is mind-bogglingly long. As we made our way through room after room after beautiful room, I began to wonder if the cabin would end at all! Lucky is another apt word, because Elisabeth is a great guide, generous with her insights into the thinking behind, and the execution of, all the intricate details (which I in turn share with you on page 38).

Another thing that struck me on the BBJ 3 – particularly when I spied a veneer-encased monitor in the bedroom – was how much our industry is concerned with balancing the old and the new. Clients want both – the functionality of the latest technological kit and the beauty of time-honed handcrafts that have passed from generation to generation. But although they certainly have heritage, crafts such as cabinetry and upholstery are not fossilised relics trapped in amber. When, for our feature on page 47, I interviewed people actually employing them, I found that the traditional crafts are evolving with the times, assimilating knowledge of new materials and methods of working, in response to shifting demands.

One of the people who shares their story is Po Yim Yu, head of cabinetry at TAECO Cabin Completion Centre in Xiamen, China. It is very interesting to see how that company has built up its craft capabilities, in a country that is a relative newcomer to business aviation, but is already hugely important to completion centres around the world. You can discover just how vital a market China has become in our feature on the BRIC countries (Brazil, Russia, India and China) on page 30. Rounding off the Chinese theme in this issue is the design brief on page 16 – a TAECO design complete with panda-inspired chairs.

Looking ahead to the next issue, I can't resist divulging some exciting news: in association with Aviation Catering Consultants, we are conducting our first survey! Building on this issue's design panel, which provides a platform for experts to troubleshoot galley equipment, we are asking business jet flight attendants to add their in-service experiences and insights. Don't miss the results in the September 2013 edition!

Izzy Kington, editor



Cover image:
A concept by TAECO
of Xiamen, China



“Having a local presence with native staff is a huge asset, as they not only share a language with the owner but can also understand subtle but important cultural concerns”



newhorizons
Completion centres around the world are tapping into the growing potential of Brazil, Russia, India and China

Brazil, Russia, India and China – together making up 60% of the world's population – are the four fastest growing economies in the world. The growth of these four nations is driving a global boom in the aviation industry, with new airlines and aircraft being commissioned to serve these markets. This has led to a surge in demand for aircraft interiors, particularly for the BRIC nations.

newhorizons is a leading provider of aircraft interior solutions, with a focus on the BRIC nations. The company has a strong presence in Brazil, Russia, India and China, and is well-positioned to serve the growing demand for aircraft interiors in these markets.

newhorizons offers a wide range of aircraft interior solutions, including cabin interiors, galley interiors, lavatory interiors, and crew rest areas. The company's designs are modern, functional, and tailored to the needs of the BRIC nations.

newhorizons has a proven track record of delivering high-quality aircraft interior solutions to its clients. The company's expertise and experience in the BRIC nations make it a trusted partner for airlines and aircraft manufacturers.

newhorizons is committed to providing the best possible service to its clients. The company's dedication to excellence and innovation ensures that its clients receive the highest quality aircraft interior solutions.

newhorizons is the leading provider of aircraft interior solutions for the BRIC nations. The company's expertise, experience, and commitment to excellence make it the ideal partner for airlines and aircraft manufacturers looking to serve the growing demand for aircraft interiors in these markets.

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COMPLETION CENTRES AROUND THE WORLD ARE
TAPPING INTO THE GROWING POTENTIAL OF
BRAZIL, RUSSIA, INDIA AND CHINA
Guy Bird, Business Jet Interiors International

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bornagain

Nextant's 400XT programme has breathed new life into the Hawker 400XP – and the 400XTi package goes even further with the interior

The Hawker 400XP is a well-known aircraft in the business jet world, and Nextant's 400XT programme has breathed new life into it. The 400XTi package goes even further with the interior, offering a more modern and luxurious cabin environment. The aircraft is now available with a variety of interior options, including leather seating, wood paneling, and advanced avionics. This upgrade allows owners to enjoy the performance and reliability of the 400XP while experiencing the comfort and elegance of a modern business jet.

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NEXTANT'S 400XT PROGRAMME HAS BREATHED NEW LIFE INTO THE HAWKER 400A/XP – AND THE 400XTI PACKAGE GOES EVEN FURTHER WITH THE INTERIOR

Tim Kern, Business Jet Interiors International

BBJ 3 deliveries

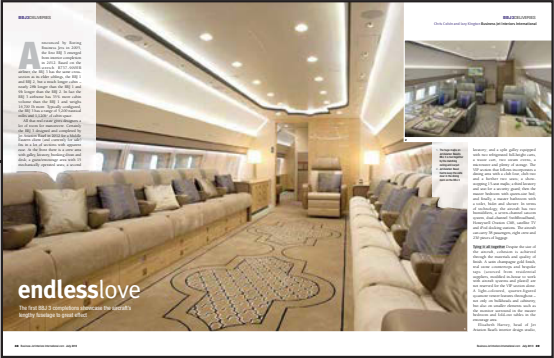
THE FIRST BBJ 3 COMPLETIONS SHOWCASE THE AIRCRAFT'S LENGTHY FUSELAGE TO GREAT EFFECT

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The first BBJ 3 completion showcases the aircraft's lengthy fuselage to great effect



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328 AND TURKISH TECHNIC COMPLETE FIRST JOINT CONVERSION

In May 2013 the 328 Group and Turkish Technic completed and certified a Gulfstream G-IV interior refurbishment for the Turkish government – the first fruit of the companies' agreement to collaborate on design and certification projects.

328 entered into the arrangement with Turkish Technic in January 2012. From an original remit to undertake simple modifications and support certification of the design and materials selected by Turkish Technic, this first project grew into a much more complex undertaking.

"This is another important step to further develop our business capabilities on aircraft other than the Dornier 328," said Dave Jackson, managing director of 328. "This project has proved highly successful and we are already in discussions with the team about the next project's requirements."

Can Sasmaz, vice president, technical, at Turkish Technic, added, "Turkish Technic and 328 have developed an excellent working relationship and we are impressed by the company's outstanding conversion capabilities. As aviation is continuing to expand in Turkey, we value sharing their experience as we work towards improving our own in-house knowledge and experience. We will continue to work with them to explore future projects."



Before the refurbishment, the aircraft galley had only loose equipment, so it was updated with the installation of aircraft-approved inserts.



328 recommended Rockwell Collins' Venue IFEC/CMS system for this aircraft, having had a successful experience installing it on its Dornier Business Jets. This system provides full HD images to personal and bulkhead monitors. As well as supporting the installation, 328 designed and made the system's harness and controls.



Turkish Technic removed a triple-place divan and installed two VIP seats in its place, which the company designed in-house.

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Q&A: RAY MOSSES, DIRECTOR OF SALES AT 328

WHAT WAS THE BRIEF FOR EACH COMPANY?

Turkish Technic carefully selected the interior colours for the Gulfstream G-IV interior conversion. While 328 is capable of performing a full interior fit, in this instance our role was to ensure that these elements could be certified. The brief was to update the interior styling, while demonstrating that cost savings could be achieved by undertaking the work in Istanbul, Turkey. All the veneer and leather work was undertaken by Turkish Technic's craftspeople and designers. Quite clearly, they have achieved a fantastic level of quality for this, their first VIP conversion.

WHAT WAS THE MOST CHALLENGING ASPECT?

The collaboration could have proved challenging culturally, in that 328 is a TC holder and STC provider, and Turkish Technic an international MRO, but in fact the team worked well together and even formed some friendships. That was another special element of this project – how the relationship progressed.

HOW DID THE COOPERATION WORK LOGISTICALLY?

The aircraft was completely modified in Turkey, so our certification verification engineers had to make a number of site visits to oversee the documentation and the physical modification of the aircraft. Because a divan was removed, 328 had to design, manufacture and certify a 2m-long piece of sideledge. So that we could see exactly what was required, the team in Turkey shipped a similar part to our facility in Oberpfaffenhofen, near Munich, Germany. This reduced the manufacturing time considerably. We then shipped the part for Turkish Technic to install on the aircraft. These processes worked well and helped to keep downtime to a minimum.

WHAT IS THE BENEFIT OF THIS SORT OF PARTNERSHIP?

This project demonstrated 328's flexibility in carrying out such a task and reinforced the fact that modifications can be achieved very successfully locally – we do not need to bring an aircraft back to our facilities. We can design, manufacture, certify and even install components without the aircraft being physically located at 328's facility in Germany, or sister company JETS' facilities in the UK (Bournemouth and London Biggin Hill). Obviously, if a customer is already based here we can support this requirement, but it is not a necessity. Turkish Technic's engineers also drew added confidence and peace of mind from the knowledge that they were being supported by a Level 1 design and EASA production organisation that has converted many aircraft in the past, and was willing to share that knowledge and experience.

WHAT OTHER PROJECTS HAVE YOU GOT LINED UP?

We are in preliminary discussions with other parties on a range of projects, some of which do not involve VIP aircraft. For example, Turkish Airlines has more than 200 aircraft in its fleet and it is possible that we may work together to modify these. We may also make use of Turkish Technic's MRO capabilities in our projects.



Under the guidance of 328, Turkish Technic renewed all the upholstery and veneer.



Some of the interior lighting was replaced with LED lights supplied by Emteq.

COMPLETIONS ROUND-UP

THIS QUARTER'S ANNOUNCEMENTS FROM COMPLETION CENTRES AROUND THE WORLD

MONTREAL, CANADA: GAL Aviation and engineering and STC provider Aerotec Concept of Toulouse, France, have formed a strategic alliance. They plan to offer plug-and-play integration services for cabinetry, interior components and cabin reconfiguration.

KIRKLAND, WASHINGTON, USA: Greenpoint Technologies received AS9100 Rev C Aerospace Quality Management System recertification.

TULSA, OKLAHOMA, USA: BizJet International won a BBJ contract from Yunnan Jingcheng Group of China. The completion should start in November 2013.

INDIANAPOLIS, INDIANA, USA: Comlux America is outfitting the first ACJ321 with a VVIP cabin for Fly Comlux. It is due to be completed in 2014. Meanwhile, Comlux Aviation Services is to perform maintenance and cabin rework on an ACJ319 for Jet Premier One of Malaysia.

DALLAS, TEXAS, USA: Associated Air Center (AAC) took delivery of a Latin American head of state's BBJ 757-200ER for scheduled maintenance, cabin and system enhancements, and communication upgrades. The centre also signed its 10th BBJ 12-year overhaul phase maintenance inspection check, which includes the installation of a new CMS and LED lighting. AAC also received DOA renewal from the UAE; and AS9110 certification.

PETERBOROUGH, CANADA: Flying Colours Corp was contracted by Bombardier to modify the interiors of seven CRJ700 NextGen aircraft for a Chinese client. The company also gained an AS9100 certificate.

LUGANO-AGNO, SWITZERLAND: RUAG Aviation completed its inaugural D inspection on a Piaggio P180 Avanti. As well as heavy maintenance tasks, the company replaced carpet, carried out a minor interior refurbishment and touched up the livery.

SAN ANTONIO, TEXAS, USA: Gore Design Completions (GDC) is under new ownership following its sale to MAZ Aviation of Saudi Arabia. GDC delivered a head-of-state ACJ340 in April 2013.

WACO, TEXAS, USA: L-3 Platform Integration earned a four-year extension to its FAA Organization Designation Authorization (ODA) and passed a biennial audit of its ODA-related processes. The FAA also added the BBJ 787 to the types of aircraft L-3 is authorised to modify.

TOULOUSE, FRANCE: Airbus Corporate Jet Centre (ACJC) was picked as the best improver from Airbus Corporate Jets' network of approved completion centres. ACJC also announced Russian Part 145 maintenance organisation approval; and approval by EASA as a Continuous Airworthiness Management Organisation.

NUREMBERG AND ERFURT, GERMANY: OHS Aviation Services is cooperating with FAI Technik for the companies' first full refurbishment together – a Global Express. FAI Technik will carry out all the maintenance in Nuremberg, and OHS Aviation Services will refurbish the interior, including replacing all surfaces, in Erfurt.

STUTTGART, GERMANY: OHS Aviation Services is joining up with DC Aviation to offer refurbishment and cabin modernisation services at the latter's facility in Stuttgart.

HAMBURG, GERMANY: Lufthansa Technik was named best VIP cabin outfitter by Airbus Corporate Jets. The award also recognises the work of subsidiary BizJet International in Tulsa, Oklahoma, USA.

BORDEAUX, FRANCE: Sabena technics has launched a new cabinetry shop. In other news, in March 2013, after Sabena technics painted one of the first BBJ 3 aircraft, Boeing Business Jets added the company as a recognised painting facility.

OBERPFAFFENHOFEN, GERMANY: In April 2013, 328 delivered the third of three converted Dornier 328s to Nigerian charter company SkyBird Air; and was contracted to convert a Dornier 328 for Lagos-based SpringChild Investments.

OBERPFAFFENHOFEN, GERMANY: RUAG Aviation has completed its first cabin – a Bombardier CRJ200 airliner that was converted into a 10-seat VIP aircraft. The project involved overhauling the layout, design and electronics. The cabin now features a private VIP area, a club seating and dining area, and a lounge. A new wireless IFE system runs a browser-based application that enables passengers to control audio, video, cabin lighting and electric window shades via tablets or smartphones.

HONG KONG, CHINA: Metrojet is to become part of The Leather Institute's affiliate network, offering care services such as leather component refinishing.

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PINBOARD



Timeless (left) and Visionary (right) concepts for wide-body aircraft, designed by the Jet Aviation Basel Design Studio



Andrew Trujillo Design debuts in the business jet market with this ACJ320 conversion concept



Airbus' Gala concept for the ACJ330 and ACJ340, which combines VIP and airline-style sections

LAUNCHES



A 28V version of Aerolux's Espresso Coffee Maker



Green Hides' new full-grain leather, Prince



A double VIP seat by Iacobucci HF

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LUXURY LIVING



Goût de Diamants champagne bottle by Alexander Amosu; £1.2m (US\$1.86m)



Bissol Calibre 788 timepiece for iPhone 5; US\$460 (£296.37)

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LOG BOOK

Event: EBACE

When: 21-23 May 2013

Where: Geneva, Switzerland

Geneva's Palexpo welcomed 12,353 delegates for EBACE 2013. The event provided a showcase for 460 exhibitors (the third-highest number in the event's 13-year history) and 52 aircraft on the static display nearby.

Big announcements included the Challenger 350, unveiled by Bombardier with launch partner NetJets. Highlights of the interior include a flat floor, Lufthansa Technik's next-generation nice HD CMS, a contemporary seat design, a modular galley and a sideledge featuring an authentic metal trim.

Another jet launch came from Pilatus, which branded its new PC-24 a "super versatile jet" because of its ability to use short runways, paved or unpaved, and the inclusion of a cargo door. Meanwhile, Nextant revealed the 400XTi, an updated version of its remanufactured 400XT – for all the details, see page 22.

EBACE 2013 also saw the world debut of Embraer's Legacy 500 prototype, a clean-sheet mid-size design with a 6ft (1.83m) stand-up cabin and a wet galley.

A couple of companies also used EBACE 2013 to hint at launches still to come – SR Technics announced it is working on a "multilayered" VIP cabin concept for BBJ and ACJ aircraft that it intends to reveal in 2014; and Dassault said it will launch a new aircraft later in 2013.

Postscript: EBACE will return to Geneva on 20-22 May 2014



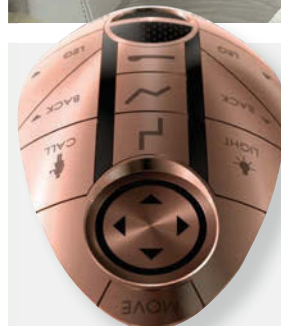
Bombardier's
Challenger 350

Greenpoint Technologies unveiled this BBJ 747-8 interior design in a 1/20th scale model



EDITOR'S PICK

A particularly striking interior debuted at EBACE 2013 was the Astral concept for ultra-long-range corporate jets, designed by Yasava Solutions of Lausanne, Switzerland. The modular design has dedicated zones for working, dining and relaxing. It also incorporates a full galley that can be adapted to clients' preferences; a quick-change module for crew rest and stowage; a staff cabin; and a day lounge that converts into a bedroom with a patent-pending articulated bed. Central to the concept is the aiana seat, a prototype of which was exhibited at the show. The electrical 16g seat offers full tracking and swivel, and the width is variable, enabling increased width in flat mode (the seat unfolds into a 2m-long flat bed). Customers can opt to control the seat through a handheld wireless unit – ai-zen. Each ai-zen will be handcrafted with precious materials and fully customised.



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NATIONAL TREASURE

This modern concept was created by TAECO – a completion centre based in Xiamen, China – for an ACJ319 or BBJ. “I really wanted to create something that would bridge the owner’s business and family lives, and that was modern and yet recognisably Chinese and natural in character,” says Xiao Huan Zhang, senior manager of engineering (industrial design) at the company.

Specifically, inspiration was drawn from the much-loved panda – as is particularly evident from the cabin’s palette of black and white, and in the generous curves of the seats. Likewise, doors are decorated with a Chinese-style pattern, and a bamboo motif graces cabin dividers, tables and cushions.

Zhang says another aim was to “harmonise nature with the modern world” – which is why natural influences (the panda and bamboo) and materials (wood veneer and leather) are used alongside man-made materials such as fibreglass. The latter was used for cabin dividers and tabletops. “These elements create a modern and natural interior that looks fresh and cheerful,” elaborates Zhang. “The natural tones of the wood veneer also warm up the black and white colour scheme and make the cabin feel more homely.”

As well as being eye-catching, TAECO believes the cabin (and particularly the inclusion of a private conference room and two separate lounge areas) addresses the practical concerns of Chinese aircraft buyers. “It needed to be just as suitable for carrying business partners as it is for family,” says Zhang. “The flexibility of the layout means it should be equally appealing to private and charter operators.”



SEATS

The panda has inspired both the shape and colour of the seats and divans. “The panda is charmingly naïve and has large, soft curves,” says Zhang. “The colour scheme is also drawn from the panda’s distinctive markings and looks simple and clean.”

GUIDED TOUR

BUFFET

The buffet serving area was included to create a relaxed environment where passengers can switch off. It is envisaged as a serving area only, with food prepared in the galleys at the front and rear of the aircraft.

TABLES

A fibreglass surface sits atop a composite stand – adding a modern counterpoint to the more traditional and natural finishes and motifs.

ENTRANCE

Zhang kept things simple in the entrance-way, letting the dark brown ebony veneer, waterproof flooring and handmade wool carpet exude a feeling of understated and modern luxury.

CONFERENCE AREA

The private conference room seats six for working or dining. Its seclusion from the aircraft's two lounge areas is intended to make the aircraft suitable for both business and private family use.



WASHROOM

Symmetrical cabinets on either side of each washbasin provide plenty of easy-to-reach storage. "Customised toiletry receptacles will further enhance the elegance," says Zhang. "A towel rack has been included below the basin for convenience and a homely feeling."

BEDROOM

A couple and their child could stay in the private suite, which can accommodate a king-size bed. "The room was designed to feel like home and is fairly simple, but has important additional comforts such as mood lighting installed behind the window shades, to replicate the feeling of day and night, and help passengers to sleep well," says Zhang.



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DESIGN PANEL: GALLEYS

SPACE, POWER, PLUMBING AND FUNCTIONALITY DEMANDS MAKE DESIGNING AND INSTALLING BUSINESS JET GALLEYS A MATTER FOR THE EXPERTS



GLENN McQUIRE: The ratio of electrical power to passengers, as well as the size of the galley envelope, seems to be mismanaged at the point of early aircraft design. For example, we had a case where the client wanted to provide warm food for 10 passengers using an oven and espresso coffee maker. The power available for the oven was a minuscule 650W, with the espresso machine pulling a similar amount. The recovery time to produce decent coffee was acceptable; however the oven presented another story. The space envelope offered for the oven dictated that the unit had to be similar in size to a very small domestic microwave. The number of off-the-shelf supermarket chilled meals that the oven was intended to reheat to the food safety guidelines would be six at most, which meant that some passengers would have a lengthy wait. In addition, the physical limitations of the galley's construction with respect to depth prevented the addition of an air circulation fan to the oven, which would have ensured an even heat distribution. So by overzealous seat allocation, by perhaps one place, a situation was created whereby catering for the passengers was virtually impossible.

JAY BEEVER: Some of the hurdles are space, location in the fuselage, plumbing, storage, trash storage, cooking equipment, countertop space and weight. In addition, customer preferences have to be taken into account, and there needs to be the ability for reconfigurations. Each customer uses their jet in a unique way and requires flexibility in options.

JOHN THAXTON: Integrating customer requests for specialised appliances within the safety and certification requirements is constantly challenging. Then there is coordinating the delivery of approved components, assembling the galley, and installing and testing it in the aircraft. Galleys must comply with 14CFR Part 25 regulations in multiple disciplines – strength, function, electrical and mechanical systems, cabin safety, smoke detection, emergency lighting, oxygen requirements and environmental effects. Certification requires extensive analyses, supported by ground and flight tests.

WHAT ARE THE CHALLENGES IN DESIGNING/INSTALLING BUSINESS JET GALLEYS AND COMPONENTS?

ED HILBERT: The biggest challenge with galley inserts is recreating the look, feel and performance of high-end kitchen appliances in an extreme environment with limited space and serious safety requirements. These are the challenges that keep our engineers hard at work designing appliances that can produce a meal or a beverage that equals the quality that a typical business jet traveller would enjoy on the ground.

SEBASTIEN RAMUS: The design of business jet galley inserts requires clever trade-offs to balance the limited space and power, weight constraints and the broad range of functionality required.

THE PANEL



JAY BEEVER
vice president of interior design
at Embraer Executive Jets



GLENN McQUIRE
engineering manager at Aerolux



SEBASTIEN RAMUS
VP and general manager for
beverage maker products at
B/E Aerospace



JOHN THAXTON
director of engineering at
Gore Design Completions



ED HILBERT
CEO of the Executive Aircraft Galley
Inserts unit at Zodiac Aerospace

HOW DO YOU OVERCOME THESE CHALLENGES?

GLENN McQUIRE: We have developed a 28V version of our Nespresso espresso machine, which uses Nespresso's patented capsule system. The main benefit is that the unit will run on much less power, while providing the same quality and convenience offered by our current machine (for more details see page 65).

JAY BEEVER: To design the ideal galley for our Legacy 500 mid-size jet, we made multiple mock-ups for customer feedback and approval. The galley fitted in our first aircraft was conceived in 2008. We built a fully functional mock-up in 2009, and in 2012 the galley was installed in our full interior mock-up, for six months of simulated flight conditions with real-world service conditions. Those interactions led us to improve the product by adding the necessary level of customisation, and other changes focused on the practicalities of operation. One example is the latches, which were improved to enable female flight crew to operate them without breaking their nails, which often happens with conventional hardware. Another example of human factors planning was placing the ice and trash drawers apart to avoid confusion or accidental misuse. We also added dedicated wine bottle storage.

JOHN THAXTON: Coordination and communication are essential. A team effort is required to build and certify a safe, reliable galley that will satisfy the world's most demanding clientele. Fortunately, the market has responded with an impressive array of high-end items for us to install – including steam ovens, convection ovens and espresso makers.

SEBASTIEN RAMUS: By investing in hardware integration, a compact heating system, ergonomics and intuitive human-machine interfaces, B/E Aerospace designed the multifunctional Gourmet Beverage Maker. The product blends the essentials of function with sophisticated design, for a gourmet beverage service. The unit provides espresso, coffee, cappuccino and hot water – in power, weight and size specifications that were previously unachievable.

ED HILBERT: Testing, testing and more testing. Our product teams make thousands of meals and beverages throughout the product development process. You can meet technical performance requirements on paper and still end up with a substandard food product. Our process requires extensive testing with a variety of foods to ensure quality.

JOHN THAXTON: Combining the finest artistry and craftsmanship with the latest technologies. The market may demand more specialised preparation and cooking equipment for specific cuisines, with an emphasis on luxuriously appointed commercial-style equipment. Possibilities are limited only by customers' desires, challenging the ingenuity of our engineers and regulators.

JAY BEEVER: Our focus is on environmental design and making the utility areas feel more like home. Therefore the aesthetics and function should be familiar and comfortable. Kitchens are often homeowners' pride and joy, and if we can give a similar experience on their jet then we have succeeded. Obviously size is not comparable, so the focus is on the execution of materials and details.

WHAT DO YOU THINK THE FUTURE HOLDS? HOW COULD BUSINESS JET GALLEYS BE IMPROVED?

ED HILBERT: Galleys should have all the comforts and conveniences of a home kitchen – including a garbage disposal unit, a dishwasher and other amenities. I would also like to see more harmony with other aircraft systems and the environment at altitude. We are working on ways to harness the heat created by other aircraft systems to reduce the power required to cook, as well as exploring a similar concept with cooling. We see a lot of potential for weight, space and power savings.

GLENN McQUIRE: More forethought is required for the layout and a respectful amount of power should be made available if the galley is to be used for preparing anything other than warm snacks.

SEBASTIEN RAMUS: Galley inserts are becoming more versatile, lightweight and power-nimble. These design advancements enable smaller aircraft galleys to offer the same level of service available in larger cabins.

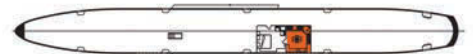


A WIDE-BODY AFT GALLEY CONCEPT BY GORE DESIGN COMPLETIONS, WITH RECYCLED 'GLASS' COUNTERTOPS, VENEERED CABINETRY, MOTHER-OF-PEARL BACKSPLASH AND FAUX QUARRY TILE FLOOR

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bornagain

Nextant's 400XT programme has breathed new life into the Hawker 400A/XP – and the 400XTi package goes even further with the interior

The Hawker 400A/XP (néé Beechjet 400, néé Mitsubishi MU-300 Diamond) can claim to be one of the most popular jets in the light category, with more than 600 examples still registered. In 2007 it found a new champion in Nextant Aerospace, which decided to use it as the base for its remanufacturing concept.

1-3. The Nextant 400XTi

The idea was that every single component is refurbished or replaced, effectively resulting in an entirely new aircraft, which comes with a fresh data plate and production number to reflect its new date of manufacture. Nextant sold the 400XT concept as offering modern performance (with replaced engines and cockpit) at half the price of a clean-sheet design.

"There is a lot of value in the original Beechjet that remained unrealised," says Mark O'Donnell, executive vice president at Nextant.

WE WERE ABLE TO IDENTIFY BIG VOIDS BETWEEN THE CABIN WALL AND THE INTERIOR

“We looked at where we could add the greatest value.”

The idea was validated by FAA certification in 2011. “We knew there had to be a way to add technology without going to a clean-sheet design,” says Jay Heublein, executive vice president of global sales and marketing at Nextant. “New aircraft purchases deliver many good things – a tip-to-tail warranty, global product support and so on. But with remanufacturing we can offer all that and do it for 50 cents on the dollar.”

In the 14 months since certification, Nextant has delivered 28 aircraft to customers in six countries: China, Europe and India are key markets. Production now stands at two aircraft a month but the facility will soon be able to accommodate four.

Despite a healthy backlog of orders – worth around US\$175m (£112m) –



4

Medical attention

Partnering with Spectrum, Nextant also offers a certified convertible air ambulance module for the 400XT, for an extra US\$100,000 (£64,000). It features quick-change modules using seat rail adapters, enabling conversion from VIP interior to air ambulance in about 30 minutes.

The ambulance module is a self-contained system that includes a 3,500-litre oxygen bottle, inverter, dual air pumps and vacuum pump, manual loading system, and a stretcher bridge with mounting poles.

Nextant says demand for special-mission aircraft is high, especially in the Pacific Rim. It is also working on a dedicated air ambulance, targeting certification by the end of 2013.

at EBACE 2013 Nextant announced an upgrade to the programme. Aside from the addition of auto throttle and raked winglets, the headline updates all relate to the interior. With a range of 2,003 nautical miles enabling five-hour flights (more than half of Nextant's customers regularly fly trips of 3.5-4 hours), comfort is important in a 400XTi. Features that proved popular on the 400XT (such as the flat floor and the squared oval cross-section) have been retained. The main improvements on the 400XTi are a



5

4-5. A 400XT fitted with the convertible air ambulance module

composite shell that yields more cabin space, a new floorplan and improved sound attenuation.

Saved by the shell The new composite fuselage shell, the creation of Jeff Bonner Research & Development (JBRND), runs the full length of the pressurised area of the aircraft. In conjunction with space-efficient insulation by Olen Nelson at N2 Aero, the shell gives back 3in at shoulder level and 2.5in of headroom. “We were able to identify big voids between the cabin wall and the interior,” says Heublein.

N2 Aero's input has also paid off with a big acoustic improvement. “The ambient noise in the original Hawker

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400XP cabin is about 81dB at 41,000ft,” says Heublein. “In the 400XT we reduced it to 76dB and in the XTi it’s 72-73dB. The XTi is by far the quietest aircraft in its class. I’ve flown in these aircraft for hundreds of hours. We had a quiet jet and now we have a spectacularly quiet jet.”

O’Donnell says that “a lot of little things added up” to reduce noise. “We can isolate, tune and treat various frequencies to eliminate the most annoying – frequencies that increase fatigue or interfere with understanding speech,” he adds. “We have made a lot of passive sound reductions.”

Front to back There is also a new floorplan, although two popular earlier layouts are still available. Nextant has found that its light jet is typically operated with three or fewer passengers. Therefore, although the XTi still has seven seats (plus the lav), comfort is maximised for the four passengers in the club four, which has been moved aft. At the front of the passenger cabin is a new, certified 60in side-facing divan that officially seats three. The seat that abuts the divan can rotate and recline, providing room for a 6ft 5in passenger to stretch out.

“We have solved the problem of how to get four adults comfortably in a light jet,” says O’Donnell. “There is just no way with a traditional forward club. You’re stuck with insufficient legroom



and a tiny table. We moved the divan to the front, where passengers still have a flat floor and lots of legroom in front of them.”

Paul Gorman, sales manager at Nextant, believes the rearrangement makes the cabin seem longer. “When people see the interior, they ask where we added the plug,” he says. “We didn’t. It’s the same fuselage.”

Nextant and JBRND have also certified a new table. “We have a 27in-wide table with a titanium frame,”

- 6. The new floorplan positions a three-place divan ahead of the club four
- 7. A refreshment centre sits opposite the new divan

NEXTANT TIMELINE

2007

Nextant Aerospace established; 400XT announced

2010

First 400XT flight completed; 40 400XTs ordered by Flight Options

2011

400XT certified by FAA; first 400XT delivered

2012

400XT certified by EASA; first 400XT delivered in Europe; 10th 400XT delivered; additional manufacturing facility acquired; 400XTi project initiated

2013

400XT air ambulance conversion module announced; 400XTi announced and certified; next programme announcement expected

3

VIP interior floorplans to choose from

1

special-mission module

7

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In the frame

Nextant's business obviously relies on being able to source donor aircraft. Happily, there is a pool of 600 Hawker 400A/XPs, plus another 180 in military service. "There is no problem locating donor aircraft," says Heublein. "Their value is coming down, particularly because of operating costs. That's good for us."

Richard Thomas, Nextant's communications director, notes that sister company Flight Options provides a particularly convenient supply. "We are also always on the lookout for good airframes on the market and will buy them at the right price," he adds.

For the future, Nextant has plans to apply the remanufacturing concept to other airframes. "We are looking at candidates in the mid-size, super-mid-size and large categories," says O'Donnell. "We have a leading market research firm – ARGUS – looking at the markets for all of these." Expect an announcement at NBAA in October 2013.

says Heublein. "It's similar to those in head-of-state aircraft. It's a very wide work surface, like in a G-IV, and unheard of in a light jet." Titanium was used to save weight and add strength to a piece of furniture that Heublein notes can tend to be a high write-up item in light aircraft.

"Our idea is to bring a sturdy table into the small aircraft world, where you typically had a table with reduced size and stability," adds Jeff Bonner, owner and CEO of JBRND. "With our mechanism you get a proper table, and a strong leaf that uses four hinges."

Other updates include the lighting, which is now all LED and offers six settings. Nextant says LED technology was chosen because it is cooler, often brighter, has a greatly extended life, and draws much less power compared with incandescent lamps. The redesign of the lighting system (inside and out) and new winglets shaved off 27 lb. The smaller Li-ion battery saved another 16 lb, and its maintenance cycle is two years, a big improvement on the lead-acid battery's 90 days.

Popular equipment retained from the 400XT includes Rockwell Collins' Venue CMS; 110/220V power outlets; and the Aircell Axxess cabin communications system, which



provides wi-fi, intercom, Ethernet and satellite phones.

Customisation When customers order an XTi, they will start by spending a day with Nextant's designers. It usually takes a further few weeks to finalise the interior after that meeting. "We can make a custom interior in a cookie-cutter shell," says O'Donnell. "We mass-produce the shell and customise within it. We have standard acoustics and three floorplans. We build using one set of tools and fixtures – our furniture and possible mounting



points are standardised. Everything is easier to install, it all fits and it's easier to maintain. This process isn't what's done in a modification shop and it's different from what the OEMs do."

Nextant partners with JBRND for certain interior components. "For the XTi we designed and built the interior shell, table assemblies, LED reading lights and indirect washlights," says Bonner. "We also fabricate and assemble the Nacelle installation kits as per Nextant's drawings."

The partnership obviously works well; the 400XTi interior went from an idea on paper in October 2012 to certification in time for EBACE in May 2013. "We put the right engineers and project managers in place," says Heublein. "Our product managers are problem solvers, and our engineering team can take a project from concept to certification very quickly." **END**

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newhorizons

Completion centres around the world are tapping into the growing potential of Brazil, Russia, India and China

Brazil, Russia, India and China – together labelled the ‘BRIC’ countries – have rapidly become very important markets for VIP completion centres all over the world. One such example is BaySys Technologies of Virginia, USA. “Of our business today, 80% is in the BRICs,” says Steve Walton, CEO at the company. “None was being conducted there five years ago.”

It’s a common tale and one that can be explained by the dramatic rise in the economic fortunes of the BRICs over the past decade. The signs were already very positive back in the mid-2000s. Between 2006 and 2007 the BRICs took four of the top five spots in *The Economist* Intelligence Unit’s GDP growth chart on the back of booming exports and domestic demand – with China first (11.4% growth), India second (7.9%), Russia third (7.4%) and Brazil fifth (5.1%) – only Poland got in between them.

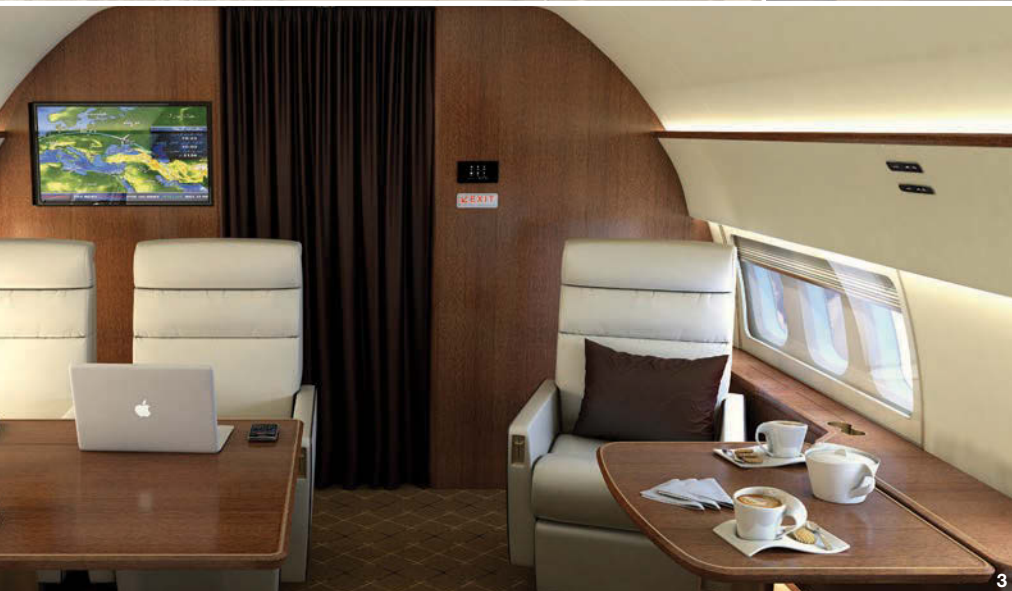
Five years later, the World Wealth Report 2012 from Capgemini and RBC Wealth Management saw the Asia-Pacific region beating North America for the first time to become the largest home of high-net-worth individuals (HNWIs – people with investable assets of US\$1m or more). According to the

report, in 2011 there were 3.37 million HNWIs in the Asia-Pacific region compared with 3.35 million in North America, although the latter retained greater overall wealth. The greatest HNW rise in the top 12 countries by population was Brazil, up 6.2%. Indeed, according to Wealth Insight Intelligence there are now 4,123 ultra-high-net-worth individuals (UHNWIs – people with US\$30m or more in disposable income) in Brazil. The BRICs are clearly home to a lot of potential customers.

Mind your language China is the biggest of the BRIC markets, so unsurprisingly the one that most completion centres look to first. Eric Gillespie, vice president of Canada-based Flying Colours Corp, says BRIC customers account for 60% of the firm’s business – up from 20% five years ago – with China leading. He concedes there are challenges in these countries in comparison with North America and Europe. “The business aviation infrastructure is in its early stages in the BRIC countries, which can cause some delays in doing business, and there are obvious challenges such as language and cultural differences,” he comments. “But we have brought in Mandarin- and Russian-speaking staff,



1. An ACJ319 designed by Cabinet Alberto Pinto for a young Chinese customer
2. A BBJ delivered by Greenpoint in 2009 to a Russian client
3. A BBJ concept designed by Altitude for a Chinese client
4. A Challenger 850 completed for a Chinese customer by Flying Colours Corp
5. A narrow-body concept by TAECO
6. The master bedroom on the ACJ319 by Cabinet Alberto Pinto



DESIGN IN BRIEF

Cabinet Alberto Pinto designed this ACJ319 cabin for a young Chinese tycoon. Once delivered to the owner in 2014, the aircraft will be used privately.

CAPACITY: The layout accommodates 18 passengers, two crew and a chef. The owner stipulated a large and functional galley, so a chef could prepare gourmet meals for him and his guests.

RACING LINES: The owner is passionate about high-end sports cars, and wanted to inject their DNA into his aircraft. "He wanted to use as much carbon fibre as possible, mainly for the seats, and minimise the number of materials used in the aircraft," explains Cabinet Alberto Pinto's VIP aircraft interior department. "In addition, when designing the furniture, we tried to avoid using straight lines, instead using very tense curves. Speed and modern technology were the two most important sources of inspiration for this cabin design."



which enables us to communicate more effectively in meetings and correspondence with our customers."

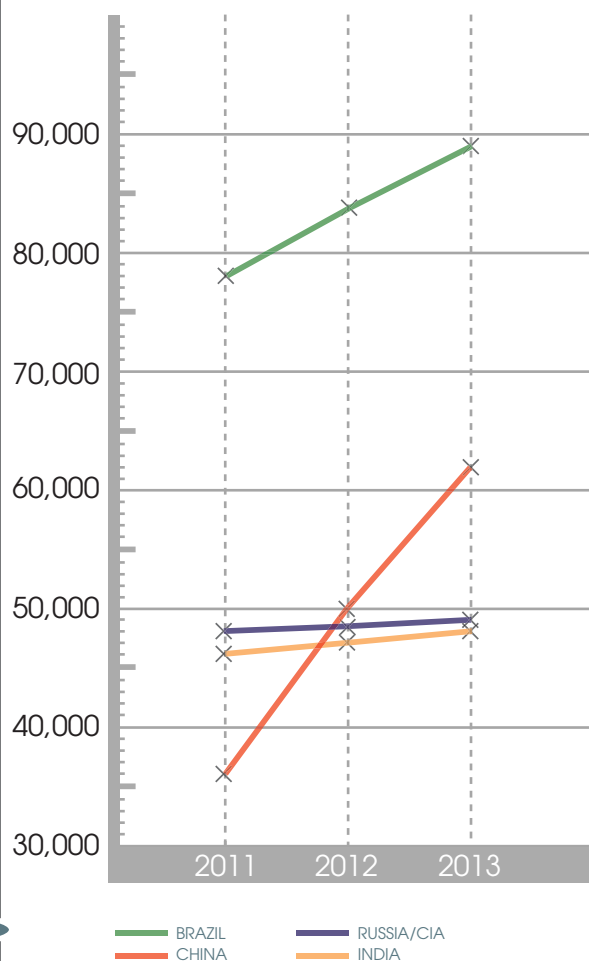
The potential language barrier is also acknowledged by Chris Schechter, vice president and general manager of Associated Air Center (AAC), a completion centre based in Dallas, Texas, USA. He stresses that when hiring translators, it's key to employ people who are not only truly bilingual, but who also benefit from "a technical background in the completion business".

Roman Aerne, head of completions management at ExecuJet, Switzerland, stresses there is also a cultural benefit to employing such personnel: "Having

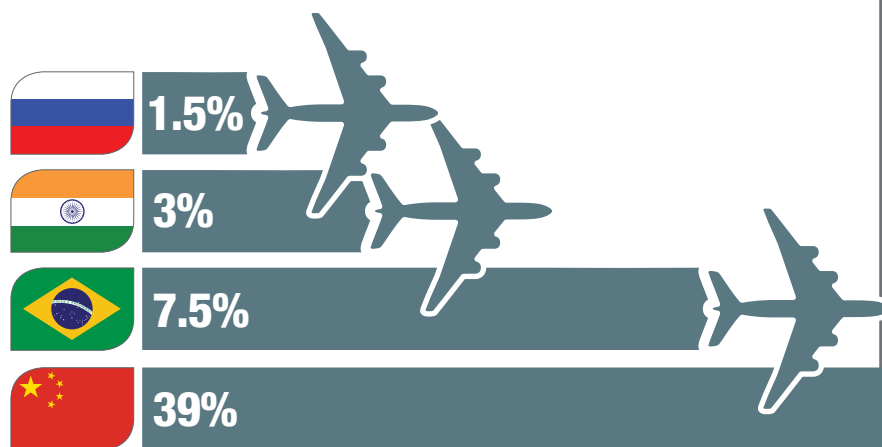
a local presence with native staff is a huge asset, as they not only share a language with the owner but can also understand subtle but important cultural concerns," he says. "ExecuJet's presence in Russia has allowed us to understand that market well and we expect to replicate that success in China as our operation there grows."

Culture club Sue Hart, sales and marketing manager at Altitude of New Zealand, also emphasises the need for cultural understanding before entering these markets. "In China, you need to develop good relationships and strong contacts within an organisation before you can expect to get around the

ESTIMATED BUSINESS AIRCRAFT MOVEMENTS



GROWTH IN BUSINESS AIRCRAFT MOVEMENTS BETWEEN 2011 AND 2012



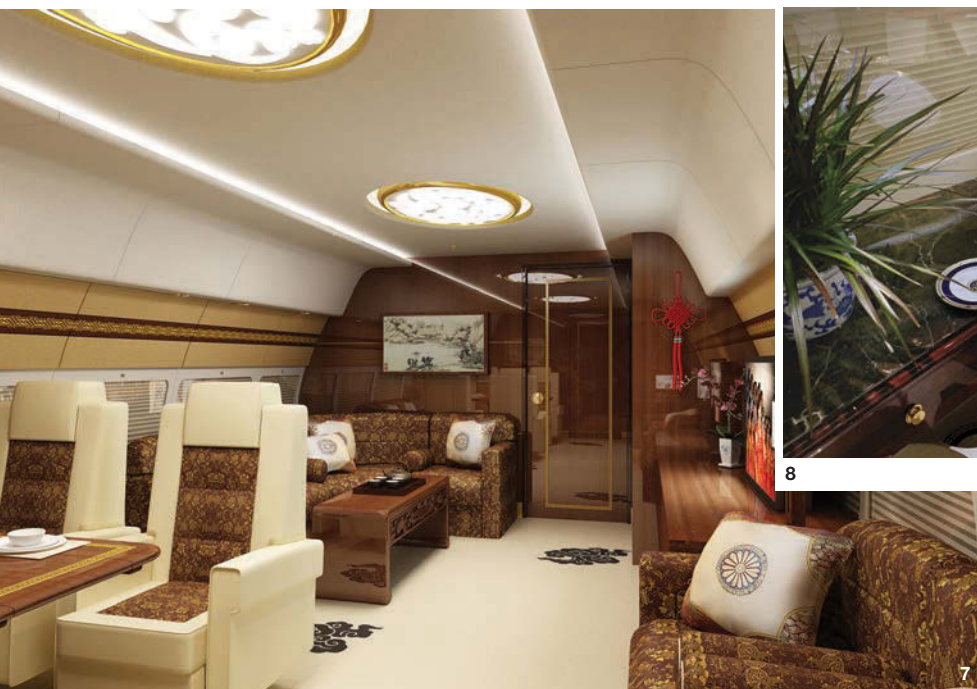
Data: WINGX Advance





CHINESE ELEMENTS: Wooden bulkheads are decorated using a stencil pattern of pale golden lines and Chinese symbols of prosperity. “Of course the client’s culture had an influence on our design, but we weren’t aiming for a Chinese look as such,” says the team. “The owner wanted a very modern interior, but with discreet nods to Chinese culture. Chinese culture is today among the world’s most modern and advanced, building on a 5,000-year history. We cannot make general statements; each customer has their personal background and taste, whatever their country. However, we have noticed an orientation towards modernity and high quality with Chinese customers; they tend to have a strong artistic sensitivity and pay close attention to details. All our customers travel a lot and have access to lots of information worldwide; they expect unique, unprecedented designs.”

Images: 3D by Romain Bardy, French Code



- 7. A lounge on a narrow-body concept by TAECO
- 8. One of Greenpoint's first VIP completions for a Russian client

negotiating table,” she says. “Although that’s true for customers around the world, it takes longer in countries like China. Having local representation helps to bridge the gap.” Disparate time zones can also cause logistical problems, which can be overcome by using local representatives, video conferencing, and as Hart says, “a lot of overseas travel”.

One company that bypasses the need for such measures is TAECO of Xiamen, China. The VIP completion centre was established in 2008, growing out of parent company HAECO’s MRO business, which itself was set up in 1996. TAECO also benefits from the expertise of sister company HAECO Cabin Solutions, an engineering design house based in San

Antonio, Texas, USA. However, being the first to set up shop in China was challenging. “We have had to invest heavily in training and development for our staff,” says Peter Murton, vice president, commercial, at TAECO Cabin Completion Centre. “Engineers and craftsmen have visited Europe and the USA, and experts have been brought into China to ensure that our staff can compete with the best from around the world.”

Another challenge for TAECO is the VIP supply chain. “We have to import seats, IFE systems, linings, window shades, leathers, fabrics and lighting systems from Europe and the USA,”



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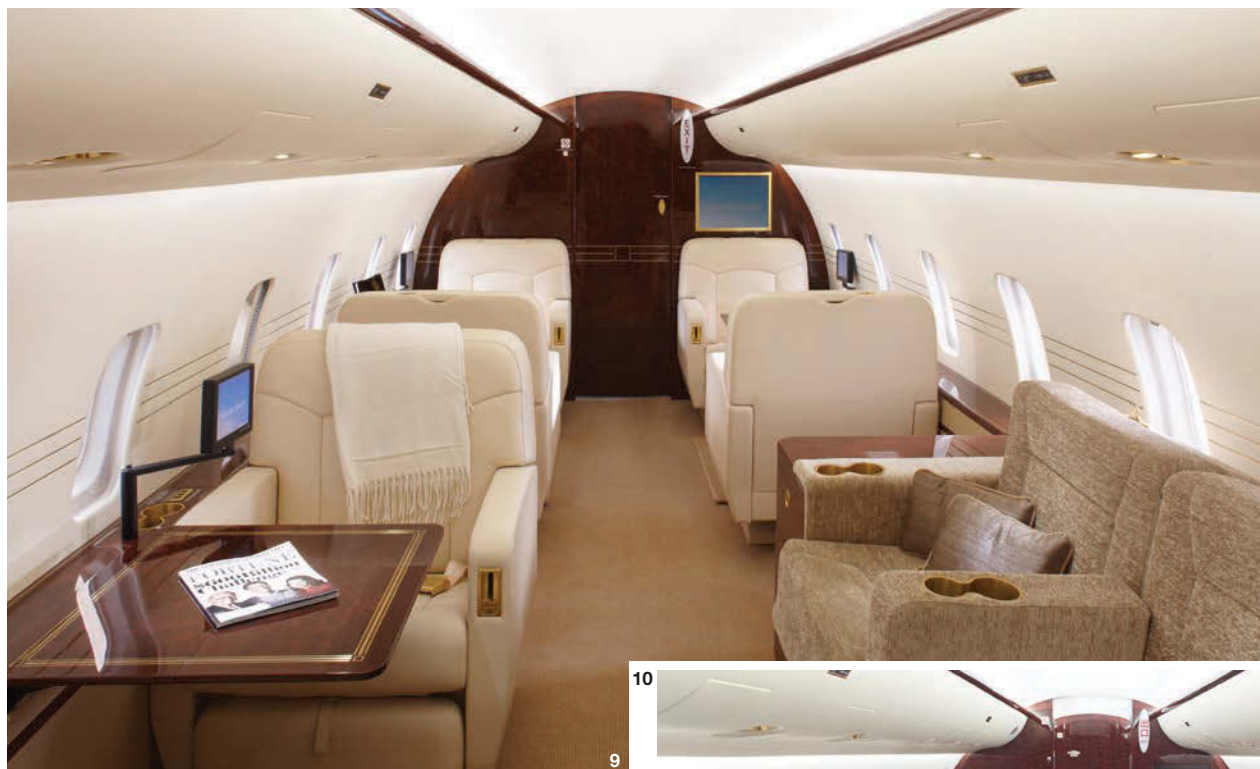


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9-10. Bombardier Challenger 850s completed by Flying Colours Corp for Chinese clients



10



says Murton. “We have developed partnerships in Europe to assist on the vendor management front and we are always looking for opportunities to team up with suppliers looking to manufacture in China.”

Despite these and other challenges, Murton firmly believes the effort is justified. “It’s clear both Airbus and Boeing see China as the biggest opportunity for new aircraft sales,” he says. “The wealth and the desire are certainly here; people want the bigger aircraft and can afford them. Private

Busiest five airports for business aviation in 2012

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Chennai
Nagpur
Ahmedabad

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Beijing
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Haikou Meilan

BRAZIL

Rio de Janeiro Santos Dumont
São Paulo Congonhas
Goiânia
Rio de Janeiro Jacarepaguá
Belo Horizonte Pampulha

RUSSIA/CIS

Moscow Vnukovo
Saint Petersburg
Moscow Sheremetyevo
Moscow Domodedovo
Baku Heydar Aliyev

Data: WINGX Advance

aviation in China still faces some challenges in terms of infrastructure and regulation, which means that it will be a while before business aviation can be the flexible, time-saving tool that it is in the USA, but the trends are all positive and we expect the influx of aircraft into the mainland to continue.”

Global tastes Given the growing potential customer base in the BRIC countries, cabin designers might reasonably investigate whether there are any region-specific aesthetic and functional preferences to bear in mind. Slight cliché it may seem, but according to Flying Colours’ Gillespie, many of his Chinese customers do indeed have a preference for red interiors, while Russian clients prefer a

more dramatic exterior paint scheme. “These trends haven’t occurred in every project we’ve done for BRIC-based clients, but they have taken place multiple times,” he qualifies. On a functional note, AAC’s Schechter has witnessed “heightened concern for post-delivery support and spares – specifically around the CMS, with multiple languages and dialects – plus certification by the EASA and the FAA”.

For his part, Ruedi Kraft, vice president of market development and completions sales at Jet Aviation in Zurich, Switzerland, has seen instances where floorplans were adapted in line with regional customs: “For example, principles relating to feng shui – the belief that positive life energy can be gained by arranging structures



11



12

11. A private office on the BBJ delivered by Greenpoint to a Russian customer in 2009
12. The lounge and dining area on the Greenpoint BBJ

including rooms and furniture in an auspicious manner – are far more important to Chinese clients than to Russian ones, who are fully westernised in their tastes and expectations,” he says. “However, Chinese tastes in terms of style and colour schemes are increasingly westernised. It is not unusual for clients to request timeless materials already familiar to them, but, ultimately, client requests are often more similar than one might think.”

Schechter concurs. “Trends do not seem to be aligned by country,” he says. “All of our customers are either heads of state or extremely HNWI

who have travelled extensively and sampled the best luxury goods from all over the world.”

Target areas Despite the grouped potential of the BRICs, China and Russia seem to be the two biggest targets for completion centres at the moment. Walton says BaySys currently has an ACJ319 nearing completion and a BBJ 747 in the design phase for BRIC customers, but states that “China is where we want to be”, helped by the fact he feels the country “is coming into its own in the VIP client market”.

Gillespie of Flying Colours also has an eye on the next set of emerging

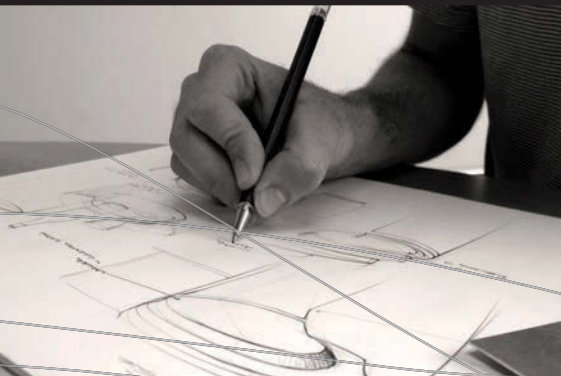
economies. “If I had to pick one BRIC market we’ve had the most success in to date it would be China,” he says. “I think the main reason for that is because they have been purchasing a lot of the green Bombardier aircraft we have completed. We will actively be marketing our services to all BRIC countries over the next five years. Outside of the BRIC countries, we have also seen an increase in demand from Indonesia, Malaysia and Africa, which will also be a focus for us over the next five years.”

But whether the client is from Rio, Shanghai or indeed Lagos or Kuala Lumpur, Gillespie concludes the main lesson he’s learned is to “make sure that you communicate clearly so that there are no misunderstandings or miscommunications”. There’s growth potential aplenty in the BRICs and beyond – just take care with the approach and landing. **END**

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Announced by Boeing Business Jets in 2005, the first BBJ 3 emerged from interior completion in 2012. Based on the stretch B737-900ER airliner, the BBJ 3 has the same cross-section as its elder siblings, the BBJ 1 and BBJ 2, but a much longer cabin – nearly 28ft longer than the BBJ 1 and 9ft longer than the BBJ 2. In fact the BBJ 3 airframe has 35% more cabin volume than the BBJ 1 and weighs 16,700 lb more. Typically configured, the BBJ 3 has a range of 5,200 nautical miles and 1,120ft² of cabin space.

All that real estate gives designers a lot of room for manoeuvre. Certainly the BBJ 3 designed and completed by Jet Aviation Basel in 2012 for a Middle Eastern client (and currently for sale) fits in a lot of sections with apparent ease. At the front there is a crew area with galley, lavatory, bunking divan and desk; a guest/entourage area with 15 mechanically operated seats; a second

endlesslove

The first BBJ 3 completions showcase the aircraft's lengthy fuselage to great effect



2

1. The huge majlis on Jet Aviation Basel's BBJ 3 is tied together by the matching ceiling and carpet
2. Jet Aviation Basel had to keep the exits clear in the dining room on the BBJ 3

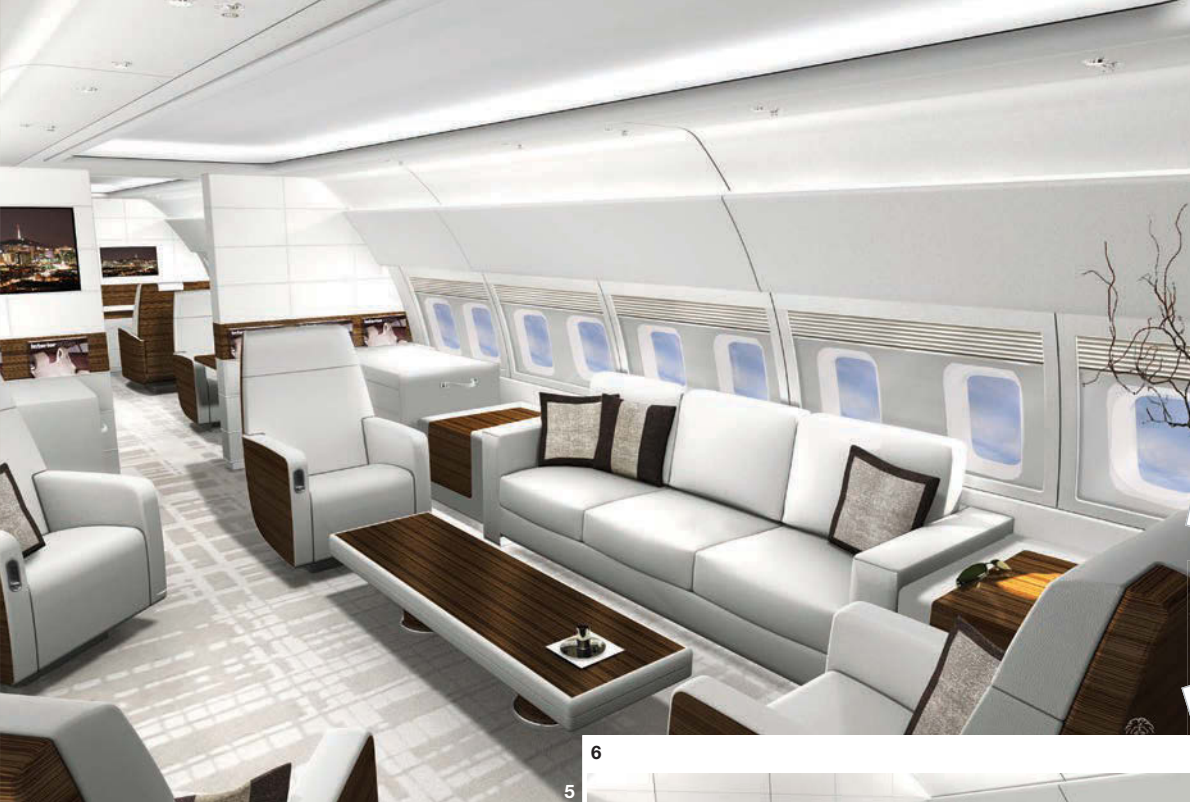
lavatory; and a split galley equipped with two refrigerated full-height carts, a waste cart, two steam ovens, a microwave and plenty of storage. The VIP section that follows incorporates a dining area with a club four, club two and a further two seats; a show-stopping 15-seat majlis; a third lavatory and seat for a security guard; then the master bedroom with queen-size bed; and finally, a master bathroom with a toilet, bidet and shower. In terms of technology, the aircraft has two humidifiers, a seven-channel satcom system, dual-channel SwiftBroadband, Honeywell Ovation CMS, satellite TV and iPod docking stations. The aircraft can carry 38 passengers, eight crew and 230 pieces of luggage.

Tying it all together Despite the size of the aircraft, cohesion is achieved through the materials and quality of finish. A satin champagne gold finish, real stone countertops and bespoke taps (sourced from residential suppliers, modified in-house to work with aircraft systems and plated) are not reserved for the VIP section alone. A light-coloured, quarter-figured sycamore veneer features throughout – not only on bulkheads and cabinetry, but also on smaller elements such as the monitor surround in the master bedroom and fold-out tables in the entourage area.

Elisabeth Harvey, head of Jet Aviation Basel's interior design studio,

1





6



admits the sheer amount of veneer used necessitated a lot of book matching. “We were extremely careful with how we matched it,” she adds. “We had to work very hard to make sure we had the right logs and the right quality of wood to create the finish. It took a lot of work.”

The attention to detail is clear from a look inside cupboards – which are all veneered, with colour-matched cover plates, integrated lighting and gros point finishing. “Every little detail is thought through. You don’t open a cupboard and see that it’s empty – you see a beautifully finished element,” says Harvey. “It makes a difference to the final product if you’ve really gone through all the details – such as where the junctions should be, the symmetry of split lines, how every element is finished.” Likewise, the completion centre has taken great care to make sure lines in the leather, Ultraleather and fabric of the window shade surrounds line up exactly.

As the BBJ 3 needs to comply with 16g regulations under EASA and FAA certification, seat installations, particularly those in the overwing area, needed careful attention. “One of the challenges was to ensure we installed the dining area seats in the locations preferred by the customer, while respecting the passageway to the overwing exits, which we had to keep open and activated because of the passenger count,” says Harvey. “We installed a hi-lo table in this area as well, to ensure that it’s practical for the

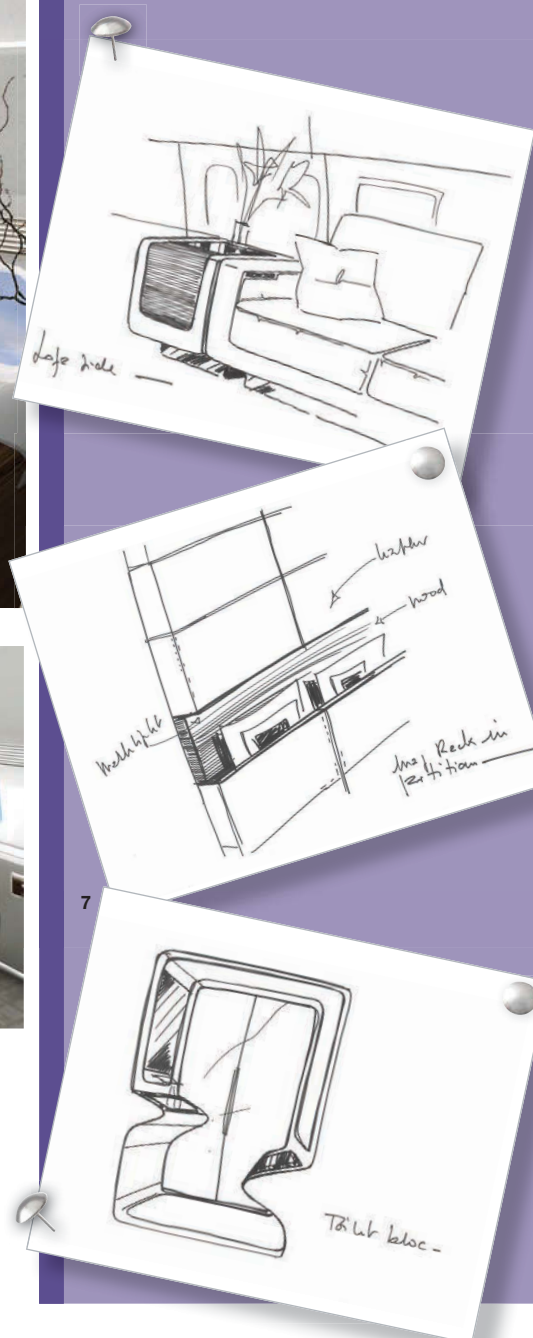
IT'S AN UNUSUAL ENVIRONMENT FOR A NARROW-BODY AIRCRAFT

3-4. Jet Aviation
Basel's BBJ 3
5-7. A BBJ 3 concept
designed by
Pierrejean Design
Studio for a
Chinese client

passengers and to give maximum flexibility for dining.”

Perhaps the clearest use of the airframe's length is the extended majlis area. “It’s an unusual environment for a narrow-body aircraft,” says Harvey. The client wanted the seven-place, side-facing divans to be usable for meetings, dining, sleeping and entertainment. The team enabled this by developing fold-down armrests integrating IFE controls, headphone jacks and plug-in points for tables. “The seats became a really big project,” says Harvey. “We had to develop the armrests especially for the aircraft and integrate ventilation behind, because we have switch panels in them as well.”

The principal seat was another special development – an electrical seat



7

BBJ 3s sold

2

BBJ 3s in completion

4

BBJ 3s in service

16

centres approved for BBJ completions



THE BBJ 3 AIRFRAME HAS 35% MORE CABIN VOLUME THAN THE BBJ 1



CABIN
STATS

BBJ 3

Cabin width: 11ft 7in

Cabin height: 7ft 1in

Cabin length: 107ft 2in

Seats: 2 + 1 crew + 20 passengers

Range: 5,275 nautical miles with NBAA reserves and 20 passengers

High-speed cruise: 470kts

Max altitude: 41,000ft

Price: US\$71.5m (£45.7m) for 2013 delivery

with an external manual override. "Normally with a mechanical override you have to pull up the seat cushion to make an adjustment," says Harvey. "This one has controls integrated underneath the armrest."

Next to the principal's seat is a deep sideledge for maximum storage, its top kitted out with a lamp that was certified in-house, bespoke magazine racks and a telephone modified with the leather that is also used elsewhere in the cabin.

Ocean view Across the Atlantic in San Antonio, Texas, USA, Gore Design Completions (GDC, which was recently sold to MAZ Aviation of Riyadh, Saudi Arabia) has completed a BBJ 3, with a design by Kim and Ralph Emery of Aviation Concepts. The aircraft was delivered in February 2013 after a

completion that took 18 months – a time necessitated by the level of detail specified by the customer. "This was more than VVIP – you can place a couple of extra Vs in front of this one," says Ken Harvey, GDC's director of design, who adds that the look was inspired by high-end yachts.

The aircraft accommodates 35 passengers plus crew. The crew and senior staff have the use of a forward cabin incorporating a lavatory and a crew rest area with two full-function, berthing electric seats; a refreshment centre; large IFE monitor; telephones; and a printer. Next is the mid-forward galley, comprising two cabinets facing each other with a central work area. The galley stores commercial-size carts and chillers, and also features an attendant seat that can be folded into the cabinet wall, effectively creating a



9



8

second crew rest area. The cabinets are closed off from the passageway by a pair of sliding pocket doors.

Beyond the galley is the dining/lounge area plus another lavatory, followed by a VIP bedroom and bathroom complete with shower and bidet. The bed and nightstand in the rear cabin track inboard 6in to facilitate making the bed and creating space on the outboard side.

In terms of aesthetics, much of the cabinetry combines high-gloss painted areas with wood veneer accents and almond gold plating. Decorative sconce lighting provides accents and ties the design together. A composite wood-veneer floor runs from the forward entry to the galley, sandwiched between a plastic layer below and a frosted, slip-resistant vinyl above. The wood has a curved design

8. The dining room on Jet Aviation Basel's BBJ 3

9. PATS's facility in Georgetown, Delaware, USA

incorporating circles and various colours, according to Manuel Rivas, GDC's project designer for the aircraft. "It's a sweeping design that runs through the room with inlaid patterns," says Harvey.

The aircraft also features plenty of technology. The all-digital CMS from CCC includes distributed HD television and surround-sound audio. IFE components are highlighted in a decorative installation opposite the mid-cabin lavatory, featuring frosted doors (a look that also features in the galley) and accent lighting.

In the aft lounge a 46in LCD monitor is installed with a custom electric lift in a cabinet "that functions as a bulkhead", says Harvey. A privacy panel that is part of the bulkhead and forward of the monitor has an electric frosting feature. "It can be clear or you can activate the frosting to obscure the view into the adjacent room," he adds.

Seats were also highly customised. The seat vendor, Goodrich, worked with the customer's designer to develop pullout tray tables that were especially rigid. "That was a big issue with the customer," says Harvey. GDC also put a lot of effort into extra sound damping, to enhance cabin comfort.

Intricate detailing Other completion centres that have taken on the BBJ 3 include Greenpoint Technologies of Kirkland, Washington, USA; and PATS Aircraft of Georgetown, Delaware, USA.

BBJ TIMELINE

1996

BBJ 1 announced

1998

FAA/JAA certification for BBJ 1; first green BBJ 1 delivered

1999

First BBJ 1 completed; BBJ 2 announced

2001

First green BBJ 2 delivered

2002

50th BBJ service entry

2005

BBJ 3 announced

2006

100th green BBJ delivered

2008

First green BBJ 3 delivered

2009

BBJ-C announced

2012

First BBJ 3 completed



Strategy change at PATS

After the 2010 sale of DeCrane Aerospace (a collection of aircraft cabin suppliers) to Goodrich (which was subsequently acquired by United Technologies), PATS Aircraft was spun off as a separate company.

Matthew Hill, vice president of business development at PATS, believes the change has been very beneficial. "Last year was our most successful year, both financially and in terms of dramatically solidifying our reputation," he says.

With this new start came a new approach. "Back in 2008 we had 10 completions in work, and that was too many," concedes Hill. "Now we have seven bays – two for auxiliary fuel installations, two or three for completions, and two or three for maintenance and modifications. That's our ideal capacity."

10

Greenpoint's BBJ 3 was delivered in January 2013. Teaming with sister firm Odyssey Aerospace Components for cabinetry, and Strack and Associates for the interior design, Greenpoint's engineering and design team created a cabin featuring multiple rooms, wireless technology, "meticulous" inlays and "dramatic" cove ceilings. "This is one of the most intricately detailed interiors built and delivered, while maintaining all functional parameters set forth by the customer," comments Cheryl Strack, CEO of Strack and Associates.

Meanwhile, PATS's head-of-state BBJ 3 is nearing completion. The interior, designed by Edese Doret, features two galleys, lots of passageway cabinets, a forward stateroom with private bedroom and bath with shower, three more lavatories, a majlis with a 55in flatscreen, a senior staff seating area and a general staff area behind that. In total, there is seating for 44.

Doret ties the look together with horizontal panels of dark wood veneer set in dark and light wood veneer (from Carl Booth), accented by gold-plated strips. Another special detail is a patterned inlay on an inner entry door. Nordam provided the cabinetry. Fabrics are in shades of brown, while

NOT ALL STCs FROM THE BBJ 1 AND BBJ 2 TRANSLATE TO THE BBJ 3 AIRFRAME

real marble was used for some of the countertops. "It all boils down to how much weight you can give up – elegance versus performance," says Mark Ryan, vice president for BBJ and hangar programmes at PATS.

Other key vendors on the project include PAC for the full-function executive electric seats and CCC for the CMS/IFE. The seats, which have in-arm monitors and heavy electric functions including legrests, required palletised installation. "They have every bell and whistle on them," says Ryan.

The PATS BBJ 3 will go through two weeks of flight testing – by the customer and Boeing – before delivery. Each test flight will last 4-8 hours.

Flexibility According to Ryan, aside from extra space and more operational exit doors, the BBJ 3 does not present unique engineering challenges over its smaller siblings, or require longer

completion times. "It's all based on floorplan – obviously there is a lot more flexibility with the extra space," he says. "When we get the aircraft the additional exit door is locked, so we are certifying the operation of the door through our STC instead of it being part of the basic aircraft certificate. We unlock the door and put in the sensors and electronics on the flight deck so that the door warning actually works."

Ryan says the BBJ 3 also differs slightly with regard to antennas and other minor installations, meaning not all STCs from the BBJ 1 and BBJ 2 translate to the BBJ 3 airframe without additional engineering work.

While comparatively few BBJ 3s have been sold so far, the outlook looks positive. The airframe is expected to appeal in particular to customers retiring BBJ 757 and other larger aircraft. As GDC's Harvey sums up, "The BBJ 3 is a worthy successor to the BBJ 757, for customers who need range and a larger cabin." **END**

10. PATS has the capacity to perform three BBJ completions at a time

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craftwork

Three completion artisans provide a snapshot of their various disciplines, revealing how age-old crafts are evolving in response to technological advances and emerging markets



HERVÉ VALTHIER

"Emerging markets are changing the way we design cabin interiors – we are developing new layouts incorporating new materials, colours and shapes"



THOMAS MARTENS

"Some parts could also be cut by hand, but the more sophisticated parts – such as cut-outs for decorative elements – can only be done using this technology"



PO YIM YU

"There is definitely a place for film transfer on certain types of aircraft – particularly those used for charter – so we have developed the in-house capability to offer it"





HERVÉ VALTHIER

Cabin finishing expert at
Airbus Corporate Jet Centre
in Toulouse, France

WHAT ATTRACTED YOU TO THE ART OF CABIN FINISHING?

I trained in cabinetry and marquetry at a specialist school in the Toulouse region of France. I then worked for a luxury interior fitting company, then for an Airbus supplier that made galleys for airlines. As I wanted to work with luxury products again but stay in aviation, I joined Airbus Corporate Jet Centre in 2009 as a cabin finish artisan, in a team led by Bob Sanders. I work with all the materials used in a VIP cabin – wood, leather, metal, stone, fabrics and innovative materials such as thermoplastic film. I also design and make special items and touch-up solutions.

WHAT ARE THE MAIN CHALLENGES?

Every VIP cabin is a unique work of art and in addition, our customers are extremely demanding. I particularly remember a request from a customer who wanted me to modify the light provided by the ceiling dome. The cabin finish team had to work very hard and very quickly to find a solution based on Plexiglas to soften the light effect. My role is to make sure that form and function work together according to our customers' expectations.

HOW DO YOU GET THE BEST FROM THE MATERIALS?

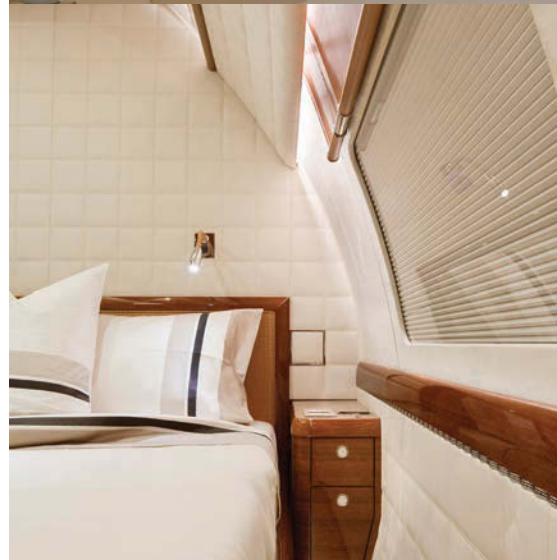
I love working with Alcantara and cow hide because of their suppleness and stretch. The most challenging materials to work with are those that are varied and fragile, such as plating. Some other coatings are wonderful in terms of aesthetics but can be difficult to touch up when damaged. To make the most of the materials, I always follow a rule I learned at school – if you want to make things properly, you have to take your time. My knowledge is based on experience. I have been working for years in various companies, learning each material's unique characteristics and reactions to elements such as glue. If I am unsure about something, I can ask a colleague. Everyone in the team has a lot of experience in cabinetmaking and upholstery, so I am never alone in facing an issue.

WHAT TRENDS HAVE YOU NOTICED?

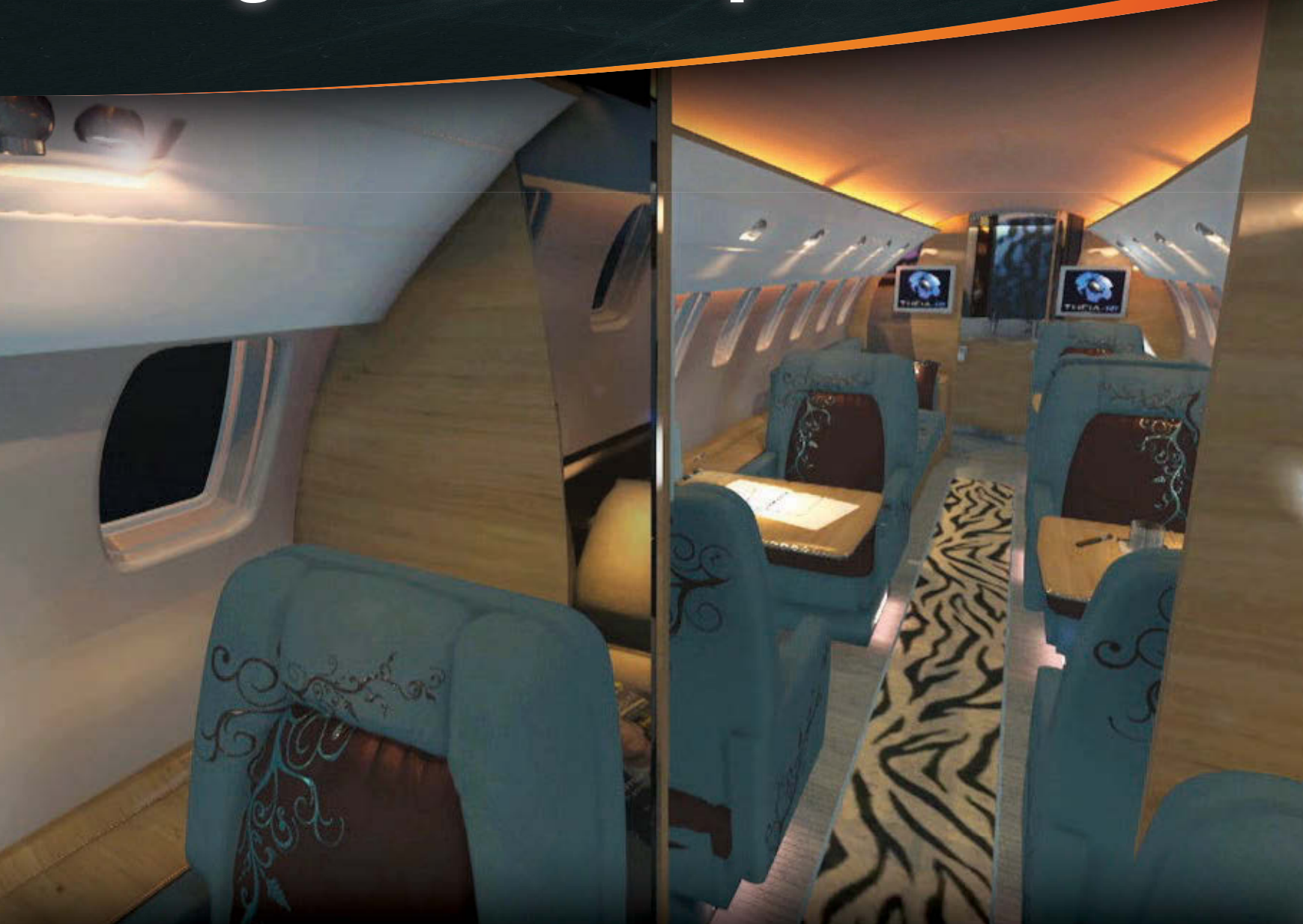
Materials have evolved hugely in terms of resistance (in response to certification requirements) and weight. Most of the time, the biggest innovations are invisible to the customer – they only know that they can fly further because of the weight we have saved. In addition, materials such as thermoplastic film coatings have recently brought about a kind of revolution, enabling more complex trim shapes. They are a very good complementary solution for special furniture. The design of furniture has also changed to accommodate new IFEC equipment. Our customers want 'flying desk' solutions such as iPhone docking stations and rotating screens.

WHAT DOES THE FUTURE HOLD?

Emerging markets are changing the way we design cabin interiors – we are developing new layouts incorporating new materials, colours and shapes. These new materials require new ways of working. But I believe natural materials such as wood, stone and leather will always be used in VIP cabins. In terms of the talent pool, I think the craft is very attractive to young people. Most of them come from the same school as me and they are very interested in learning cabinetmaking and upholstery. Working with the materials used in VIP cabins is a unique experience for them.



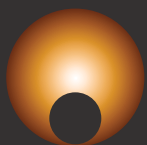
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THOMAS MARTENS

Cabinetmaker at Lufthansa Technik in Hamburg, Germany

WHAT IS YOUR BACKGROUND?

I am a cabinetmaker. I started working in Lufthansa Technik's VIP aircraft department in 2006. About four years ago I was asked to join the moulding team. CNC moulding had been familiar to me ever since my apprenticeship, and in-house training helped me to master the subtleties of working with honeycomb sandwich materials on these machines.

WHAT WORK DO YOU DO WITH THE CNC MOULDING CUTTERS?

My team begins the whole process of crafting VIP aircraft furniture. Starting with large honeycomb sandwich sheets, we cut out the parts that our colleagues in the joinery then assemble.

WHAT ARE THE BENEFITS OF USING THIS EQUIPMENT?

Some of these parts could also be cut by hand, but the more sophisticated parts – such as cut-outs for decorative elements – can only be done using this technology. The machine also enables us to make exact copies of pieces; it's far easier than reproducing parts by hand.

HOW IMPORTANT IS HUMAN INPUT?

We need to tell the machine what to do. We write a software program for every part that needs to be cut; all the cutters in the machine move exactly where we tell them to. I would say that I spend the same amount of time preparing the program as I do on the machine, preparing the material and supervising the cutting. We also advise the engineering department on the feasibility of cutting and building their designs.

WHAT'S THE BEST PART OF THE JOB?

I especially enjoy making complex parts, because they are very challenging to produce. I enjoy programming and cutting parts from curved, rather than plain, sheets of honeycomb material. Sometimes we mould cut-outs from parts that have already been finished with valuable veneer and coated with lacquer. This is very sophisticated work, especially when you bear in mind how many hours have already been spent on the part. That's why I do some test cuts before taking the real piece to the machine. So far it has always worked out just fine.



Images: Sonja Brueggemann





PO YIM YU

Head of cabinetry at TAECO
Cabin Completion Centre
in Xiamen, China

HOW DID YOU LEARN YOUR CRAFT AND HOW ARE YOU HELPING OTHERS TO DEVELOP THEIR SKILLS?

I have been working in aviation for 25 years, 20 of which were spent working in MRO interior refurbishment shops repairing airline seats and monuments and performing interior modifications. When TAECO began to develop its VIP completion capabilities in 2007, I moved across to help build the ACJ mock-up we have here in Xiamen. At that time we received a lot of training from Airbus, and invited partners from the USA to come to China to train us in VIP seat upholstery and cabin monument fabrication. We also had experts from Germany spend time at TAECO, building up our woodwork and veneer capabilities. Now we are strengthening our experience using a range of materials and techniques – I cooperate closely with our procurement and design teams to select materials for the cabinetry team to test and train on. In terms of equipment, we are fortunate that TAECO has invested heavily in building its completions capabilities – our backshops are equipped with CNC machines, routers, traditional standard wood tools, dust-free paint booths, levelling tools and so on.

WHAT MAKES BUSINESS JET CABINETRY ESPECIALLY CHALLENGING?

It is extremely challenging – each piece for a VIP aircraft is unique and must look and feel perfect, as well as exactly matching its function. We have to build things that exceed the expectations of people who really understand quality and luxury. On top of this there are all the stringent technical aspects such as passing flammability requirements. The minute level of detail required is a huge challenge and we need to spend a lot of time making sure that everything is just right.

HOW DO YOU INTERACT WITH COLLEAGUES IN OTHER DEPARTMENTS?

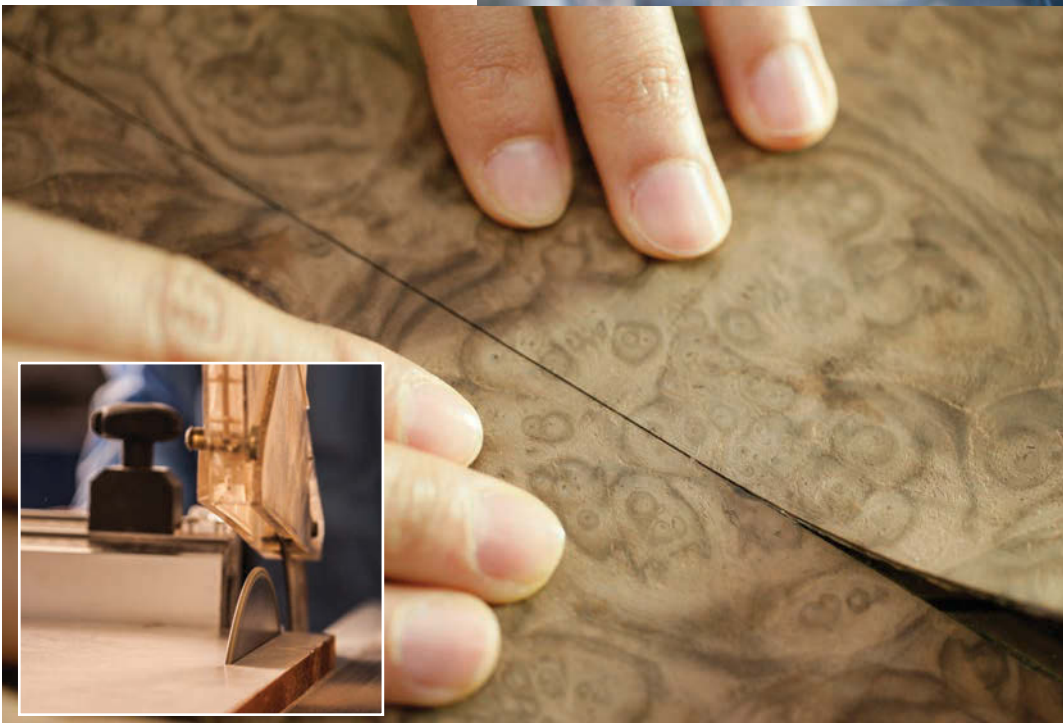
We offer advice to our conceptual design team and procurement department so that they understand the impact of their material and vendor selections on the production side. This helps them to select the materials that best fit the demands of the project.

ARE TECHNOLOGICAL ADVANCES AFFECTING THE MATERIALS YOU USE?

For true luxury, most private jet owners are probably always going to prefer real wood veneer, because it has a lot more texture than film after varnishing, and provides a truly unique grain. Having said that, there is definitely a place for film transfers on certain types of aircraft – particularly those used for charter – so we have developed the in-house capability to offer it, which we are now in the process of bringing to maturity.

WHAT IS THE FUTURE FOR YOUR CRAFT?

In China presently there really are very few craftspeople with aviation experience, so we are training people ourselves – which I know from my experience takes time. This is to be expected though – TAECO is the first company doing this in China. We now have a talented team of around 50 people working on upholstery, cabinetry, veneer and other crafts and we will continue to expand our team.



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One of the fundamentals of cabin comfort is temperature, and it can be tricky to get right given the parameters that business jets operate in.

Aircraft sitting on the tarmac can be baked by unshielded sunlight, and once aloft, temperatures outside can drop below -45.5°C.

“Our customers have increased their expectations for good ventilation systems that keep them comfortable, without blowing their hats off,” says Terry Shriner, Cessna’s business leader for the Citation Latitude, Longitude and XLS+. “They also expect a better level of cooling inside aircraft we build, whether on the ground or in the air.”

To answer these demands, Cessna is installing a new generation of Honeywell air cycle machines (ACMs) in its new generation of jets, the Latitude and Longitude (due to enter service in 2015 and 2017 respectively). “These new ACMs will deliver huge increases in cooling capacity,” says Shriner. “This is because they are actually designed to be used on larger regional jets. They output subfreezing air, which is mixed with warm air to create the right cabin temperature. Starting out with colder air allows us to reduce cabin temperatures sooner.” The Honeywell ACM supports separate zones for the cockpit and cabin, and can be controlled from the cockpit and by passengers at their seats.

Embraer is also making a big effort to improve cabin climate in its business jets – including using computational fluid dynamics (CFD) to simulate cabin airflow and therefore generate more accurate data about heating and cooling system performance.

“We started a very interesting initiative in 2012,” says Marco Tulio, senior vice president of operations and chief operating officer at Embraer Executive Jets. “Together with three Brazilian universities, we created a Comfort Engineering Center, which features an E-Jet section mock-up. The mock-up is designed to reproduce inflight conditions (including aspects such as temperature, light and pressure variations) for up to 30 passengers, enabling the collection and analysis of data that will foster the development of continuously better cabin solutions.”

1. Cessna's Citation Longitude will feature new air cycle machines from Honeywell





hiddenagenda

OEMs are working hard to improve the perhaps less tangible contributors to cabin comfort – temperature, humidity, sound, air quality and pressurisation



Image: Embraer Executive Jets

2. Embraer's upcoming Legacy 500, which should have a maximum cabin altitude of 6,000ft
3. ATG's Powertech shade system helps control light and heat entering the cabin

On its current family of business jets, Embraer offers vapour cycle or air cycle conditioning systems. All Embraer jets have two temperature zones for the cockpit and passenger cabin – apart from the Lineage 1000, which has climate control for three zones. Temperature can be controlled via individual passenger control units. Embraer also plans to offer heated seats in its upcoming Legacy 500 and 450 aircraft (the Legacy 500 is due to enter service in 2014, with the Legacy 450 on target to follow later).

In terms of climate control system suppliers, one of the big players is Liebherr-Aerospace, which provides auxiliary heating and cooling systems – in both automatic and manual versions – to keep the cabins of mid-size and large-cabin jets at specific temperatures. Like the Honeywell and Embraer systems, Liebherr's solutions enable different zones to be controlled

EMBRAER PLANS TO OFFER HEATED SEATS IN ITS UPCOMING LEGACY 500 AND 450 AIRCRAFT

separately. "Typically, we have two or three zones in business jets and up to eight zones in commercial aircraft," says Francis Niss, Liebherr-Aerospace & Transportation SAS's president.

Not a dry eye in the house Some cabin air systems also incorporate technology to redress the lack of humidity at altitude. "The average humidity of untreated aircraft air is 5%," says Peter Landquist, vice president of sales, marketing and customer support at CTT Systems. The company's Cair solution is designed to boost humidity

to 20% or more, while also incorporating a system to prevent condensation. So far it has been selected for more than 50 corporate jet installations – for aircraft including the BBJ, BBJ 747-8, BBJ 777, ACJ320 and ACJ340. The company is now working on a smaller version for smaller corporate jets.

Liebherr-Aerospace also supplies a range of humidification solutions, which feature on large-cabin jets such as Bombardier's Global 5000 and 6000, and Dassault's Falcon 7X. "Two technologies are available," says Niss. "The first – which is more adapted to new aircraft – is based on the use of engine bleed air power, optimising the aircraft's power consumption and allowing for substantial savings in fuel and CO₂ emissions. The second technology uses electricity to boil water and is more adapted to existing aircraft, as it requires fewer modifications."

Silence is golden Another vital goal is reducing noise – both from the outside and from internal systems. "In air management systems, there are several sources of noise, mainly air cycle

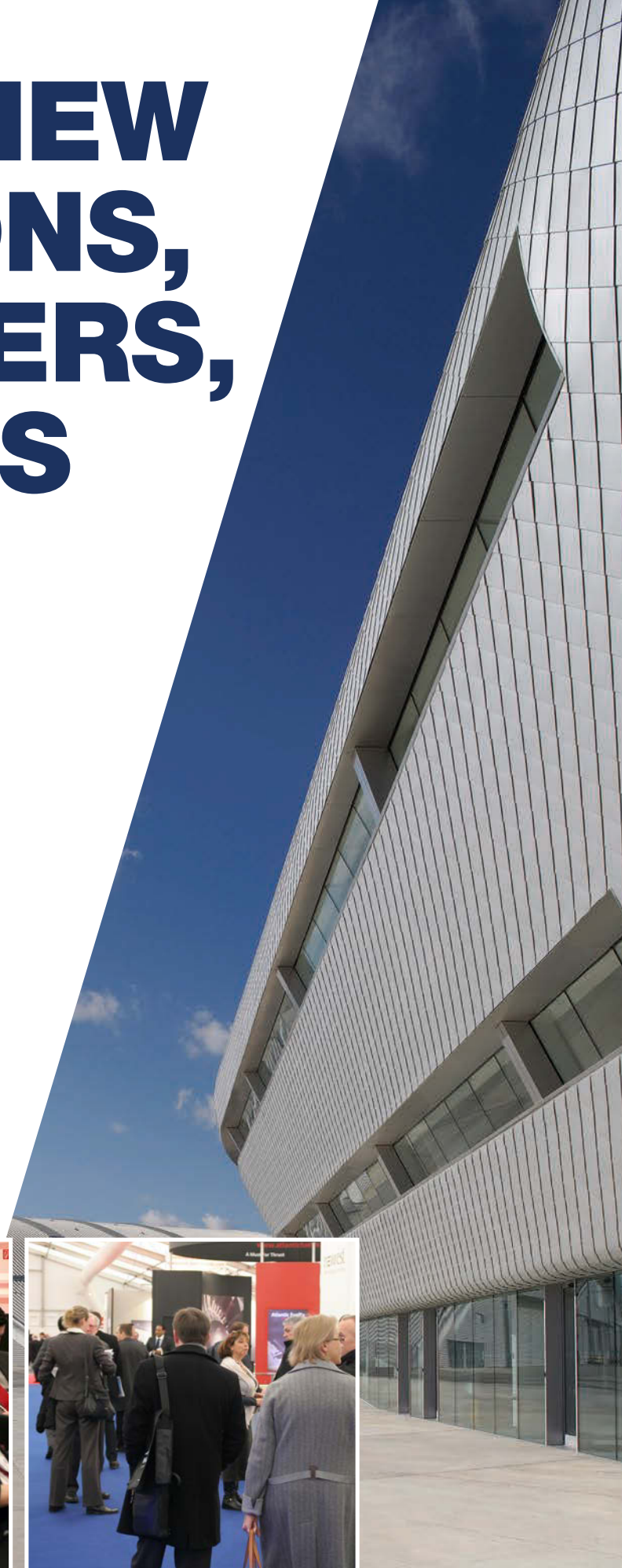


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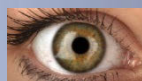
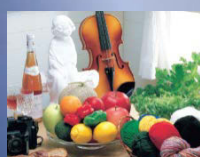
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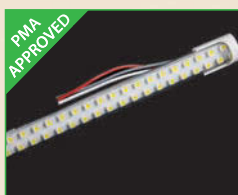
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WE HAVE PUT SOUND-DAMPENING BLANKETS ON THE BACK OF SIDEWALLS TO REDUCE NOISE



machines, fans and air velocity inside valves or ducts,” says Niss. Liebherr addresses this through direct (reducing noise at the source) and passive treatments. It is currently engaged in collaborative research and technology programmes to further reduce onboard noise, as perceived from inside and outside the aircraft.

Cessna says its Latitude and Longitude will have the quietest cabins in its family. “The cabin sound-dampening material will be the same as on Sovereign models,” says Shriner. “However, the larger cabin diameter and location of seats in relation to the sidewalls will provide a reduced level of noise.” New cabin doors and seals will also reduce noise, by narrowing the gap between the door and its surrounding structure. “Cessna will also provide an interior barrier, located just aft of the main cabin door, reducing main cabin noise,” adds Shriner.

Meanwhile, Tulio says Embraer uses “extensive computational simulations, performed long before the actual aircraft takes shape”, to build-in noise reductions. The technologies it applies then include acoustic attenuators and mufflers in cabin shells and systems, plus “fuselage damping elements and new absorption materials capable of



4. Flying Colours Corp developed a smoke extraction system for this Bombardier CRJ conversion
5. ATG window shades installed on a Dassault Falcon 2000

reducing noise transmissions more than more traditional insulation solutions,” says Tulio.

Aftermarket completion centres are also seeing demand for noise reduction installations. “There are a lot of different techniques, such as using sound-dampening materials that are bonded to the inside of the aircraft frame,” says Sean Gillespie, vice president at Flying Colours Corp. “We have also put sound-dampening blankets on the back of sidewalls to reduce noise.” The company also installs the Silentium active noise-

Window of opportunity

Contributing to the temperature issue on business jets is the demand for ever-bigger windows, which can let in more glare and heat. In response, OEMs and aftermarket installers are turning to advanced window and door shade products such as those made by Aerospace Technologies Group (ATG), InspecTech Aero Service (IAS) and Vision Systems.

ATG’s products include the Powertech shade system, a dual-pleated, electromechanical window shade that offers both translucent and blackout cellular pleated shades, operated at the push of a button. “Each unit draws only 85 milliamps when in use, and can be easily serviced and replaced in the field,” says Simon Kay, CEO at ATG. “Of course, this is rarely necessary given our in-service mean time between failure exceeding 100,000 flight hours.” ATG says its window shade products are standard equipment on multiple models from most major OEMs.

IAS offers electronic dimmable window (EDW) solutions for windows and doors, based on transparent laminated plastics and built around an electrical reactive core that can be triggered to allow in as much or as little light as desired, essentially making them electronic window shades with no moving parts. “Our E-Shade light control film technology provides light, glare and heat control just by applying a very small amount of electrical power to the window,” says James Lang, CEO of IAS. The company’s I2 shade uses the same technology combined with a stainless steel and copper solar reflective matrix.

Recently, ATG joined forces with IAS on the Panacea system, which consists of ATG’s electromechanical shades integrated with IAS’s EDW technology – so as well as being able to dim the window from clear to blackout, passengers can deploy a fabric shade for diffused light. On the ground, the EDW automatically switches to the maximum heat-blocking state.

Vision Systems offers the Nuance and Noctis polarising and dimmable solutions, which are designed to offer 99% UV protection and high reactivity from transparent to dark. Controlled through the CMS or at the seat, Nuance and Noctis gradually move from transparent to dark in three seconds. Noctis enables total blackout.

reduction system on business jets. Silentium measures soundwaves inside an aircraft using a microphone, and then generates opposing soundwaves to cancel out the first waves via destructive interference.

Quality control Cabin pressurisation and air quality are other aspects being taken very seriously. Besides offering an ozone converter as standard equipment on newer aircraft, Cessna is evaluating an in-line HEPA filter for the recirculation system. A new electronic pressurisation system on the Latitude

CUSTOMER AWARENESS OF AIR PRESSURE AND QUALITY IS HIGHER THAN PREVIOUSLY



and Longitude will allow those aircraft to maintain 6,000ft cabin pressure, the aim being to reduce passenger fatigue.

Embraer is also targeting a 6,000ft maximum altitude with its Legacy 450 and 500 cabins. "The most recent technologies for ozone conversion and HEPA filtration are available in our latest programmes," says Tulio.

Niss says Liebherr-Aerospace has invested heavily in R&D regarding air quality standards on board aircraft, and adds that this has paid off with advances in "air filtering, air cleaning and ozone conversion devices, which are integrated into our air-conditioning systems". He says the company has added some "unique control laws" into its cabin altitude and pressure rate-of-change control software that allow the

- 6. Capital Aviation's Protek material being tested for fire resistance
- 7. An electrical heater from Liebherr
- 8. CTT's Zonal Drying System

Insulation innovation

A lot of R&D is conducted in the quest for sound and heat insulation materials that better address the market's needs. One recent development is Protek, a naturally sourced material that has been certified for use on aircraft. It is the invention of Scot Webber, executive vice president of Capital Aviation, a business jet refurbishment shop in Oklahoma, USA.

"I got the idea after all the problems we have had in dealing with fibreglass and the dust it creates," Webber explains. "We wanted something that was just as good, or better, but that didn't give off dangerous particles, requiring crews to wear face masks and gloves." Webber says a 0.25in-thick sheet of Protek can provide better sound and heat insulation than a 3.5in-thick sheet of fibreglass foam when installed in a business jet. "Actual audio measurements show that Protek lining is far more effective at reducing ambient noise than fibreglass," he says.

Webber has also posted a YouTube video to prove the material's fire resistance. "Protek's ability to reflect heat is part of the reason it's fireproof," he says. "This is why aircraft insulated with Protek stay much cooler on sun-drenched runways. It turns the cabin into a Thermos bottle, where the inside is protected from the temperature outside."



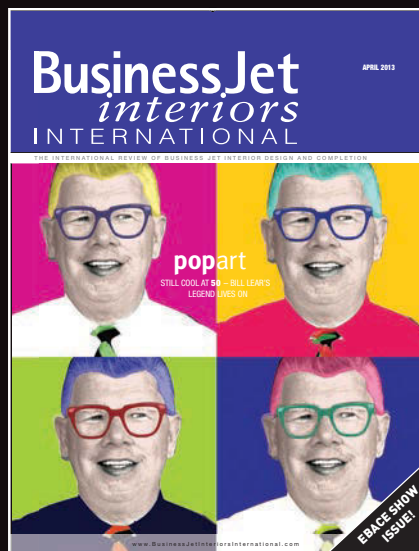
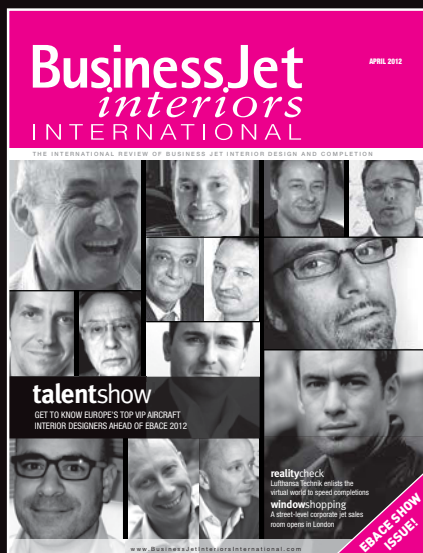
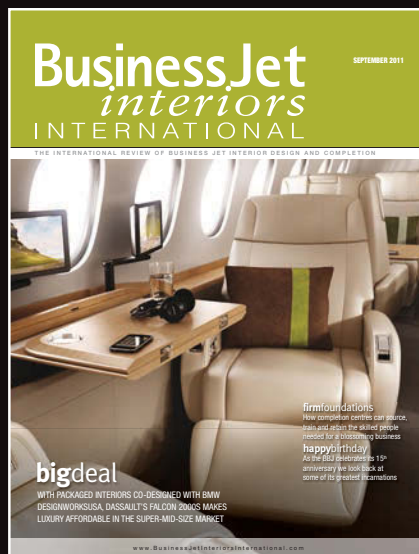
system "to automatically monitor the cabin throughout the whole flight, with virtually no cabin air pressure changes that could be painful to the passengers or crew members".

Flying Colours Corp has also seen increased demand for improved cabin pressurisation and filtration. "Customer awareness of air pressure and quality when designing or refurbishing an aircraft is higher than previously," says Gillespie. One customer even asked for a smoke extraction system, so that he could smoke in the cabin without

affecting the air purity. "We designed, developed and implemented a system on his behalf," says Gillespie.

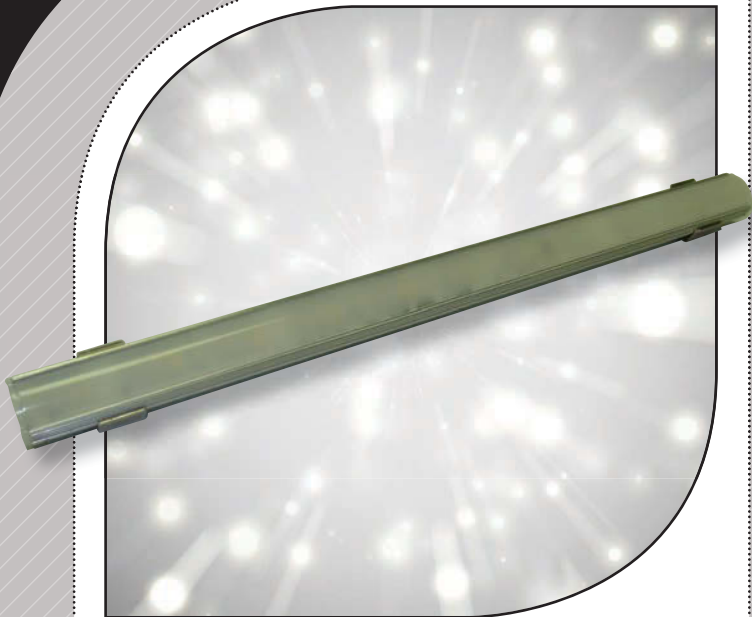
Clearly, improvements in aesthetics, seat comfort and IFEC functionality are not the only advances being made in response to passengers' demands. **END**

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99 SERIES

The latest lighting development from B/E Aerospace is the 99 Series washlight. The RGBW system uses LED technology and digital controls to produce a full array of colours, including white light, across the spectrum of Kelvin colour temperatures. It is also capable of colour shifting for a variety of cabin scenes, the most popular being sunrise and sunset.

The product has been designed to be small in size, intense in output, efficient in power consumption, and reliable throughout its lifetime. It integrates with IFE/CMS systems.

www.beaerospace.com



SPECTRUM

This solution from Custom Control Concepts (CCC) is for the entire VIP cabin – incorporating ceiling, wash, reading, accent, emergency and custom lights. Using LED technology, each light provides full-spectrum RGB colour with 100% dimming.

Developed specifically for VIP installations, the system features custom bezels and touchscreen controls. It was designed to integrate seamlessly with CCC's IFE/CMS system, including the company's iPlane cabin management app, which enables passengers to control lighting via their Apple or Android devices.

VIP aircraft orders for Spectrum lighting include multiple BBJ 747-8 and ACJ330 aircraft.

www.custom-control.com

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JACQUES PIERREJEAN, PRINCIPAL OF PIERREJEAN DESIGN STUDIO



NICEMOOD

The main aim when creating this LED lighting system for aircraft cabins was to ensure unchanging colour throughout its life. Development partners Lufthansa Technik and Schott say this is achieved by the control system, which mixes and regulates the output of individual diodes. Its sensors are designed to identify age-related colour changes in individual diodes, and adjust the output mix accordingly.

nicemood is available in classic white and full-colour versions, and can be programmed to output colour sequences and scenarios.

The system consists of four elements – a wireless access point and an interface unit from Lufthansa Technik; Schott's Heliojet True Colour Stabilization (TCS) lighting system; and a controller. In VIP applications the controller is a smartphone, and in commercial aircraft it is a touchscreen operated by cabin crew. It can be installed in any size of aircraft.

www.lufthansa-technik.com; www.schott.com



BE-BOP'TIC AND CALYPSO

PGA Electronic introduced the Be-Bop'tic fibre optic system in April 2013. It enables control over colours and luminous intensities. The company says the main advantages of Be-Bop'tic are gentle and homogeneous illumination without the need for a diffuser, weight and power savings, and low maintenance as a result of the small number of light sources used.

Another new PGA product is Calypso, a monument reading light. As well as the white LED that provides the main source of illumination, the unit has three smaller coloured LEDs that enable it to be seen and operated easily in the dark. The light is compatible with systems ranging from 5-28V DC. PGA says Calypso's flush design enables it to be integrated into any monument type.

www.pga-avionics.com

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powercouple

Through its agreement with Nespresso, Aerolux can now make a 28V version of its popular Espresso Coffee Maker

1. Aerolux's 28V Espresso Coffee Maker, which is compatible with Nespresso capsules

Since the launch of Aerolux's Espresso Coffee Maker (ECM) in 1995, more than 3,000 units have been installed, on aircraft ranging in size from Airbus and Boeing wide-bodies through Bombardier, Dassault, Embraer and Fokker aircraft to Eurocopter and Sikorsky rotorcraft – for airline, private and business jet operators. "Aerolux took the lead in offering customised and airworthy units for the business jet market," says Sylvie Abina, sales and customer liaison executive at Aerolux. "The 9, 17 and 29 ECM variants were the first designed to business jet OEMs' requirements – with manually filled water tanks, ergonomic designs to fit small spaces, and increased functionality."

The ECM's compatibility with Nespresso capsules is another key attraction. "The availability of Nespresso coffee, acknowledged worldwide as a top-quality luxury brand, enables the operator to provide customers with a recognised and respected product," says Dave Brennan, chief electrical engineer at Aerolux.

Reflecting its commitment to continuous technological advancement, the company recently announced that it can offer a 28V version of the Nespresso ECM. The main

advantage is that the unit requires much less power to produce a constant supply of the same high-quality beverage.

Indeed, the quality of the coffee is the main focus for Nespresso. Specifically, Nespresso required Aerolux to ensure: the quality and consistency of flavour for various types of coffee; the amount of coffee produced; the amount and quality of the crema (the foam layer, which had to support a sugar portion for at least two seconds); the coffee's temperature after the unit has been on standby, and for repeated servings; the pressure the unit can produce with various coffee types; the amount of drips at the end of the brewing cycle; and the movement of the cup during the dispensing cycle.

Aerolux is also incorporating several new features to aid ease of use and maintenance: the machine will be self-draining; it will have an automatic de-scaling feature; and it will also have a cold-detection function, which means that the unit will not operate if it, or the ambient temperature, is too low.

These features will be standard on the 28V ECM and can be added to the 115V ECM via a modification. They were developed in response to customer feedback and in-service data. Aerolux nurtures very close relationships with its customers, as it manufactures to order, and frequently tailors its products in line with individual requirements. It can supply a wide array of 28V and 115V equipment, including: ovens ranging in function from 1-48 servings; refrigerators and freezers ranging in capacity from 1-3ft³; and various beverage makers.

"We are often approached to supply one-off VVIP versions of our products," comments Rob Shelton, sales director at the company. "Most of our recent requests were completion centres asking for refrigeration units and variants of the iconic ECM. We will continue to work closely with operators and OEMs to supply standard and customised equipment. This is one of Aerolux's biggest advantages – the flexibility to satisfy specific requirements, through continuous innovation."

Aerolux

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fullflow

A raft of new products is being launched by PGA Electronic in 2013 and 2014, incorporating wireless streaming, HD, touchscreen and fibre optic technologies

French company PGA Electronic offers a wide array of IFEC/CMS, lighting and motion system solutions – a range that continues to expand with the incorporation of the latest technology.

The first of the company's 2013 innovations – the HD Wi-Fi Streaming System – was unveiled at Aircraft Interiors Expo, held in Hamburg, Germany, on 9-11 April 2013. With this system, passengers can manage their media whenever they want, and in any part of the aircraft, using their own wireless devices.

Audio and video content is stored on an ARINC server, and passengers can stream this media to their personal wireless devices or to cabin monitors. They can also send media (such as pictures and movies) from their smartphone or tablet to the cabin screens. All content is streamed in full HD.

The system also enables each passenger to use their wireless device as a remote control for cabin features – including lighting, attendant call, doors, satellite TV, security cameras, moving maps and power management systems.

The HD Wi-Fi Streaming System is compatible with the Apple iPad and iPhone,

Samsung Galaxy, and various other smartphones and tablets.

PGA is now working on a Full IP IFEC/CMS system, which it says will be available in September 2013. It is being designed to offer excellent image quality, while benefiting completion centres by coming in a smaller hardware package with simplified wiring for easier installation and maintenance, plus plug-and-play automatic configuration.

The key aspect of the Full IP system will be the Global Entertainment Server (GES). Among its many features, the GES will store media, broadcast it via Ethernet streaming, and manage the set-up and configuration of devices automatically.

PGA has also extended its offering of HD Xtra Flat monitors by adding 32in and 46in versions. The company says the monitors – which come in sizes from 12.2in to 55in – offer stunning picture quality and are easy to install in any cabin. Xtra Flat monitors incorporate technologies such as DLNA, IP TV and USB inputs. In addition, there are three new versions of the Keyboard line of touchscreens, designed in response to customer requirements for space saving or individual listening. This new



system will be installed on a BBJ 747-8 at the beginning of 2014; in fact the entire cabin will be equipped and controlled by PGA IFEC and CMS technology.

PGA is also making developments in lighting. Its latest lighting launch was the Be-Bop'tic fibre optic system. This enables passengers or crew to vary the colour and intensity of their cabin lighting.

PGA Electronic

Reader Enquiry No. 502



Image on monitors: Stefan Körber/fotolia.com

1. The Be-Bop'tic lighting system
2. The HD Xtra Flat range of monitors



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golden anniversary

In 2013 FH Lambert is celebrating 50 years in the decorative metal plating business

Frank Henry Lambert established the company that bears his initials in 1963. In the 50 years since, FH Lambert has grown into a world-renowned specialist in decorative metal plating.

Born and raised in Watford, Hertfordshire, UK, Lambert started out making jewellery at home. He completed an apprenticeship with Roy King – a manufacturer and designer of jewellery – and later bought the company, incorporating it into his own business, FH Lambert.

As well as designing, making and electroplating jewellery, at this time Lambert was also producing up to 2,000 watches a week for companies including Bulova, Favre-Leuba, IWC Schaffhausen, Longines, Omega and Tissot. In 1986, when he felt that the tide of market demand was turning to cheaper digital watches, Lambert made the decision to specialise solely in electroplating.

The company most recently adapted its current facility to its requirements in 2011. The large site has a wide array of precious metal plating tanks, enabling it to specialise in many variations of gold, silver, rhodium, chrome, nickel, copper, antique-look and lacquer coatings. FH Lambert's work has featured in some of the finest aircraft interiors – on types ranging in size from the Hawker 125 to the A380.

Throughout its 50-year history, FH Lambert has remained a family-run business. Today it is led by Lambert's wife, Sandy, and their three sons, Jamie, Daniel and Paul, although Lambert remains very actively involved as chairman.

"After meeting such interesting people and tackling such challenging projects, I would like to thank all my loyal customers and suppliers who have worked with us throughout the company's existence," he comments. "I feel proud and very confident with Jamie, Daniel and Paul taking the company into the next 50 years."

FH Lambert

Reader Enquiry No. 503



1. Frank Henry Lambert



- est. 1963 -



Celebrating 50 golden years

“Watfords Mr. Goldfinger”

Frank Henry Lambert started the company in 1963 that bears his initials. Over the next 50 years F.H.Lambert Ltd grew to become a respected leader in specialist decorative metal plating. Its work has been featured on some of the aviation industry's finest interiors - on aircraft ranging in size from the Hawker 125 to the Airbus A380.

Amongst having the largest and newest precious metal plating facility, F.H.Lambert also has the largest silver plating tank and greatest variety of precious metal plating tanks in the UK and Europe.

Specialising in many variations of gold, silver, rhodium, chrome, nickel, copper, antiques, and lacquer coatings.

Since 1963, F.H.Lambert has proudly remained a family-run business. Led by Frank's wife Sandy, three sons Jamie, Daniel and Paul, Frank still remains actively involved in the company's operations as chairman. Together they have established an outstanding reputation on the strengths of its vast experience, unsurpassed plating knowledge, exceptional workmanship and distinguished service.

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efficiencydrive

In 2014, SR Technics plans to unveil a big iron product that it believes will make cabins more functional and efficient

- 1-2. Details from some of SR Technics' past projects
3. The company's hangar in Zurich



1



2

In Zurich, Switzerland, SR Technics' design and engineering teams are working on a "multilayered cabin product" for BBJ and ACJ aircraft that they believe will change the VIP flying experience for good. The company is devoting 18 months to the project, and aims to unveil it at EBACE 2014.

The company says the concept will show how the cabin experience can be adapted to fit the client's needs and lifestyle, playing with light, symmetry and multifunctionality in combination with quality-of-life concepts, engineering solutions and high-end production. Eric Jan, head of interior design at SR Technics, makes the definition that this is not a concept, but rather a product that integrates interior design and production. He says the new generation of VIP aircraft owners require less opulence but greater functionality. A key focus for the team is to reduce completion and maintenance downtime, for efficiency and a streamlined price.

"This is something we are taking very seriously, and we are investing a lot of time and effort into the project," says André Wall, president at SR Technics. "More than 18 months of interior design, engineering and production research will form the foundation of our multilayered concept. Be prepared for a whole new cabin experience. By introducing new space-planning approaches, adjusting to and accommodating new lifestyles, and bringing together new cabin solutions, we will redefine the art of travel. Our approach turns the cabin concept on its head, challenging today's interior design and engineering approaches."

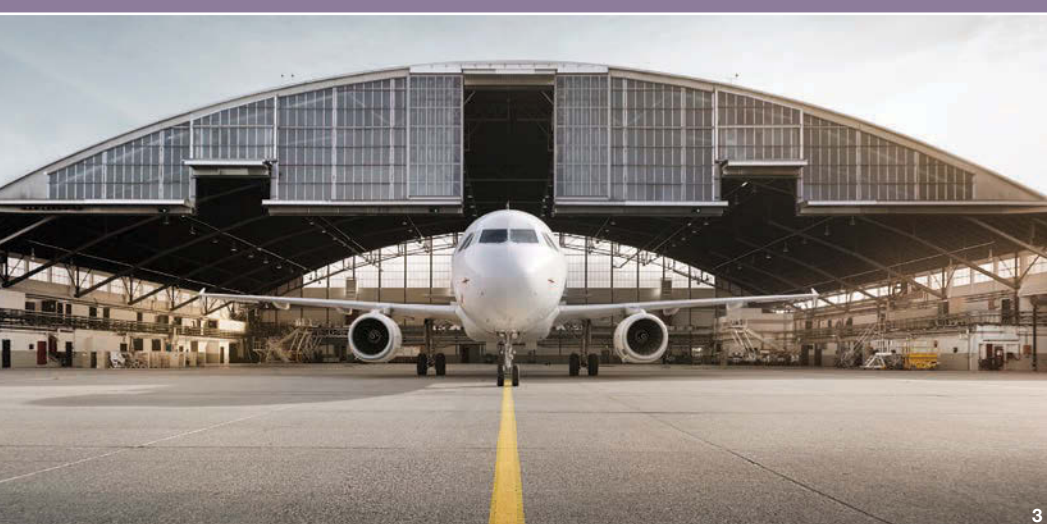
Over the past 15 months, SR Technics has invested in new engineering tooling and systems, and has almost doubled the size of its dedicated VIP team. To enable it to handle and manage design data as accurately as possible, the company has invested in a global concept based on Enovia V6 with multi-CAD integration using Catia V6 for 3D design and computer-aided manufacturing, as well as AutoCAD for 2D applications.

To date, the company has completed two wide-body Airbus refurbishment projects, both of which were delivered on time. As part of the Mubadala Aerospace MRO network, SR Technics can combine MRO activities with VIP completion services – as it did on both projects.

"Our key competencies in airframe, engine and component maintenance place us in the unique position of being able to offer customers the opportunity to combine heavy maintenance with a cabin refresh and technology upgrade in a minimum downtime," says Wall. "We've invested heavily in the past year to ensure we employ highly skilled experts, who listen to customers' needs, have the capability and the right tools and systems to deliver exceptional quality and customised solutions, and will reliably redeliver an aircraft on time. This is an essential in our business and something we pride ourselves in. This, combined with our inherent Swiss understanding of customer confidentiality, means we have an exceptional team on hand to deliver an exceptional aircraft."

SR Technics

Reader Enquiry No. 504



3

GREEN GODDESS

A COLOURFUL MEGA-YACHT INTERIOR
DESIGNED BY STUDIO ZUCCON AND CRN



The 60m-long 125 J'Ade yacht is meant to feel at one with the sea. As such, it features full-height windows on the upper salon; a 'beach club' – a platform by the water; and a flooded garage that can be used to store an 8m Riva Iseo yacht, or as a swimming pool.

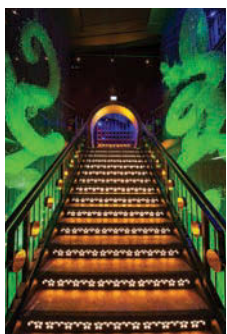
Across the four decks and subdeck there is room for 10 guests (with four guest cabins and a master suite) plus 13 crew members. The master suite features furniture clad with white/silver nuance coconut leather by Fendi Club House Italia; a silk carpet; and cashmere textiles and curtains by Loro Piana. The adjacent bathroom is furnished with Afyon and Emperador dark marble, and features an anti-steam mirror concealing a television; petal-shaped washbasins; and an oval bathtub by Boffi.

Various shades of jade make this a bold and bright yacht – from the Sicis mosaics in the Turkish bath and gym area, to the marble of the main salon's bar. The green is balanced by the more neutral hues of Canaletto walnut, polished rosewood, brown and beige leathers, white travertine marble, white Tai Ping carpets and Afromosia floors.

Other highlights include two 14-seat dining tables, one with a rotating servant; a Swarovski chandelier; a helipad; and a spa pool.



OTHER EYE-CATCHING DESIGNS FROM VARIOUS INDUSTRIES...



Inspired By Design created these 6.5m crystal dragons for the Buddha Bar in London, UK



Pierrejean Design Studio's Ghost Ship yacht concept



Inside the all-new Range Rover from Jaguar Land Rover



A stateroom cabin designed by Priestmangoode for Norwegian Cruise Line's Norwegian Breakaway ship, launched in New York in May 2013



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