

by James Wynbrandt

An Ameco Beijing-designed multifunctional area



The battle for the high ground

It's designed to be the most comfortable and serene interior man-made environment on or above the planet. But today's contemporary business aircraft cabin is a raging battleground, as OEMs vie to one-up each other with their interior features, completion centers compete to create ever more customized private airliner projects and MROs market expanding cabin refurbishment options. Ammunition comes from an arsenal of new products and services

developed in-house or pouring in from a widening network of sophisticated system and component suppliers around the globe, as more resources are devoted to this theater of engagement. Fortunately there are no battlefield casualties. In fact, passengers, flight crews and maintainers can all operate more effectively and comfortably thanks to the results of this contest.

This past year has seen major advances on several fronts: OEMs

introduced the cabins of several new business aircraft; new companies and partnerships were established to pursue growing opportunities in the completion and refurb arena; completion centers began accepting green 787s, heralding the next generation of private aircraft interior design; while new comforts from self-contained steam showers to wireless electric seats entered the marketplace. Here's our "inside" look at the biggest C&R developments of the period.

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OEMs boost interior options for today's discerning client

Interior possibilities evolve at a breathtaking pace, customers' expectations climb continually, and competitors regularly raise the bar. Here's what OEMs are doing to keep their cabins at the cutting edge of style and functionality and their customers satisfied.

Bombardier

Dorval-based Bombardier is developing new interiors for the Learjet 70 and 75, the Learjet 85, Challenger 350 and the Global 7000 and 8000. "All will be created on two principles: Attention to detail, and style and design," said Brad Nolen, director of product strategy and marketing for the Canadian aircraft manufacturer. The first principle represents the functionality of the interior, and customer input is essential in determining what should be on board and where it should be positioned. Bombardier convenes "steering groups" of three stakeholders: customers, flight crews and maintainers. "Style and design" encompasses the interface created to make that functionality as comfortable, eye pleasing or invisible as

possible. "It's what you see, the emotion that you feel when you enter the cabin," Nolen said.

Challenger, Learjet and Global each have their own engineering teams responsible for interior design, and Nolen ensures all reflect their common heritage. "The keystone, the critical success factor we're trying to reach, is a customer gets on board and immediately knows he's on a Bombardier aircraft."

Nonetheless, each has its own personality. Having something of a racy and sporty image, Learjets take inspiration from the automotive world. "There's an element of F1 racing in the brand," Nolen said. Challengers also borrow from the automotive world, but here Nolen invokes Bentleys and Rolls-Royces. In a Global 7000, where an owner might fly for 15 hours, "We look for inspiration in a luxury home," Nolen said. "The galley looks like a high-end kitchen, and monuments are built away from sidewall and bulkheads, so a credenza looks like a credenza."

Much of Bombardier's design style and craftsmanship comes

from the Global team and migrates down to the Challenger and Learjet lines. All three offer considerable customization and options, though the level varies by brand. Learjet customers select color trim and soft goods. Challenger buyers also have several floor plans to choose from. With the Globals, "almost every interior is different," Nolen said.

The number of interior furnishings and structures Bombardier makes in-house also varies by brand, but is limited. All interior components for Learjets and Challengers are provided by outside suppliers. For the Global 5000 and 6000, Bombardier builds only the cabinetry. For the Global 7000 and 8000, Bombardier will create all facets of the interiors in-house.

The Bombardier Global Completion Center in Montreal maintains samples of materials, colors and components and other furnishings, along with high-tech tools to show buyers customization options. (Bombardier can also bring materials to a location of the customer's choice.) Buyers are welcome to see their aircraft as it's being built, examine the interior components, and try out the seats that will be on the aircraft.

Cessna/Textron Aviation

When it comes to designing the interior of a new model of Cessna Citation, "We design it hand in hand with engineers and developers from day one," said Cindy Halsey, v-p of interior design and engineering at Textron Aviation/Cessna Interiors. "We have integrated our processes to optimize the interior with the aircraft."

In the wake of Textron's acquisition of Beechcraft, Halsey has responsibility for Beechcraft interiors and aftermarket interior offerings for the shuttered Hawker business jet line, as well. "We're in the early stages of our

acquisition, and we're looking at all the product lines and where investment makes sense," Halsey said about plans for those products. "We're not in a position right now to talk about things."

For Textron Aviation products in general, "Our competition is the luxury automobile," Halsey said, citing the fit and finish of Bugattis, Rolls-Royces and Audis as influences. "You need that same experience in an airplane, not seams that don't line up."

Because Textron has an international customer base, the aesthetics of the company's interiors must also transcend regional tastes. "I want diversity on the team so we don't get stuck on domestic group think," said Halsey. Several nationalities are represented in Textron's Advanced Design Group. "We are in the heartland of the U.S., but we think it's important to bring in influences from other cultures."

Today's cabins have "less clutter" than business jets of yore, but "fashion still drives a lot of the choices in fabrics and color trends, and make no bones about it, the spouses have a lot of say," Halsey said. Yet the jets "are still business tools, so most customers still opt to do pleasing and rather quiet interiors."

Cessna offers a high level of interior customization in its CitationJets but has simplified the selection process. "We used to lay out a lot of fabrics and materials, but that's time consuming. Our customers are time sensitive, so we show them some finished product that has a distinctive look. They will immediately select the look they want. Others say, 'I love this, but can I change the carpet to this?'"

Cessna carefully tracks all interior option selections, and at the rate of about one aircraft model per year, revamps the

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Passengers could spend the better part of the day in a long-range aircraft such as the Global 7000, so Bombardier is looking to the luxury home as inspiration for the cabin.

Interior possibilities

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completion choices, eliminating the least popular and adding new selections. Cessna—and likely Beechcraft—plans to increase its aftermarket interiors business. “We are getting into refurbishments more now,” said Halsey. “It’s not something we talk about a lot, but we’ve got great facilities and we’ve added new ones in Europe. We’re ready and poised.”

Dassault Falcon

Dassault Falcon introduced two aircraft programs—the clean-sheet Falcon 5X and the 7X-derived Falcon 8X—within the past year, a company first. The proposed interior designs for both aircraft are the result of the company’s analysis of “every use that can be made during the flight, whether with ten passengers for a short flight or four passengers for a ten-hour flight,” said Olivier Villa, Dassault Falcon’s senior v-p for civil aircraft. The interior styling requires only “a limited number of people. The majority of people are working on ergonomics,” Villa said.

The company prides itself on the level of cabin customization it offers, “but it’s quite challenging when you design a brand-new aircraft” for Dassault to meet its own standards, and customer expectations are higher now than ever. “Twenty or 30 years ago you tried to make the cabin comfortable, but that was about it,” Villa said, while today a galley must be that of “a top level restaurant,” the sleeping accommodations like a five-star hotel and the working space like a modern office. That’s why the first 50 Falcon 5Xs were offered with standard configurations at an introductory price of \$45 million.

To accommodate buyers more keen on quick delivery than customization, “we have a Limited Edition for every model of aircraft, with defined floor plans that according to our experience are most in demand,” said Villa. But

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Customers expect more from a business aircraft cabin today than they did 20 years ago, and manufacturers are keeping that in mind as they develop new aircraft such as the Falcon 8X.

NEW CABINS IN THE SKY

Over the past year OEMs have introduced new aircraft, unveiled design details of previously announced programs, and refreshed the cabins of aircraft in production. Here’s a look at the interiors you’ll find aboard some of these aircraft:

Falcon 5X—The 5X, introduced by Dassault Falcon at the NBAA Convention last fall, features the widest (8 ft 6 in) and tallest (6 ft 6 in) cabin of any purpose-built business jet (not including bizliners). The Dassault Interior Design Studio concentrated on “de-cluttering” the cabin, allotting more space for individual seating and widening the aisle five inches for easier movement between cabin sections. Enlarged windows create an open, spacious feeling, augmented by a skylight—an industry first—over the galley at the cabin entrance. Hidden compartments for electronic devices and electrical chargers maintain the clean cabin look, as does LED signage that’s invisible when not illuminated. The Falcon-CabinHD+ CMS, developed in cooperation with Rockwell Collins, uses the latest fiber-optic network to distribute crisp, high-definition audio and video content throughout the cabin. Cabin sound levels will be as low as in the Falcon 7X, one of the quietest in aviation. At 41,000 feet the pressurization system can keep the cabin at a comfortable 3,900-foot pressure altitude.

Falcon 8X—A stretched version of the 7X, the 8X has both the longest range and the longest cabin (42 ft. 8 in.) of any Falcon. As with the 7X, cabin height is 6 ft. 2 in. and width is 7 ft. 8 in. Dassault Falcon chairman and CEO Eric Trappier says the airplane will have “the highest level of customization of any business aircraft on the market.” More than 30 cabin configuration layouts are available. Customers can also select from three galley sizes, two with crew rest areas. An extensive choice of passenger seating areas of various lengths can support a variety of lavatory layouts, including a lavatory with shower.

Bombardier Global 7000—Bombardier debuted a full-scale cabin mockup of its Global 7000 at EBACE. Extending 59 ft 7 in long, 6 ft 2 high and 8 ft 2 in wide, the cabin features four distinct living spaces graced by new, ergonomically advanced seats. The most forward zone features four single seats for quiet gatherings, while Zone Two provides six-person seating for dining or meetings. Zone Three, a “family room” space, features a three-place divan facing a finely styled credenza. Zone Four, the aft stateroom, offers a permanent bed option, and the aft lavatory can accommodate a standup shower. Additionally, a dedicated office area can be closed off from the rest of the cabin, and the galley has been made larger. New window design optimizes the natural light at each seating position. At 43,000 feet, the pressurization system maintains a cabin altitude of about 4,300 feet, while at 51,000 feet the cabin altitude is just under 6,000 feet.

Embraer Legacy 500—At 6 feet tall and 6 ft 10 in wide, the cabin of Embraer’s clean-sheet Legacy 500 midsize jet features the largest volume, the best pressurization system, the only standup/flat floor combination, and the only wet galley in its class. It also has the largest windows in a midsize jet, and its vacuum flush toilet is standard. The interior, with four fully flat berthable seat positions, was developed in partnership with BMW DesignWorksUSA, incorporating “simplicity, transparency, light and serenity to convey a feeling of sensual elegance,” Embraer says.

Embraer Lineage 1000E—Flagship of the Embraer Executive Jets fleet, the Lineage 1000E features an “adjusted” interior (as Embraer refers to its periodic cabin updates) with a five-zone layout with dozens of modules that can be combined throughout the zones, creating hundreds of possible floor plans. The enhanced interior features new seats, electric doors and automatic tables, refreshed galley and cabinetry, and improved soundproofing. A Honeywell Ovation Select IFE/CMS provides media content and global wireless connectivity from anywhere in the aircraft. The Lineage 1000 is the only model in its product line that Embraer will deliver green, though the quality and customization Embraer offers in its completions should be sufficient to satisfy most customers. However, to showcase the possibilities of ultra customization, Embraer partnered with SottoDesign Studios to create Skyacht One, a Lineage with an interior that suggests the elegance, refinement and spaciousness of an oceangoing yacht.

Citation M2—Cessna’s new entry-level Citation, deliveries of which began in December, the M2 reflects the company’s philosophy of treating the aircraft interior as one unified space, without a formal barrier between cabin and cockpit. Buyers can choose from six standard palette schemes of leathers, fabrics, carpeting, interior paint and wood veneers. The constant circular cross-section (57 inches high and 58 inches wide) fuselage includes a dropped aisle, adding five inches of headroom. New seats provide a more comfortable ride and the new headliner and valance design maximize available headroom for passengers while seated. The M2 is the launch airframe for Cessna’s wireless Clarity CMS, providing in-flight entertainment and global connectivity options. Other popular cabin upgrades include the refreshment center and an entry airstair in place of the standard ladder. ■

Interior possibilities

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whether Limited Edition or fully customized, every Falcon interior is bespoke. “We purchase all the raw materials, and then everything” from making the seats to the sidewalls “is done in house,” Villa said.

Constructing the interior requires a combination of “craftsmanship and technology,” for example working with the finest leathers, and using 3-D software to plan the cuts and lasers to execute them. Dassault is currently expanding the capacity of its Little Rock, Ark. completion facility to handle expected demand.

Planning the custom interior with buyers is “an interactive selection process,” Villa said. “I think the most important [thing] to our customers is that we listen to them and say yes; we never say no.” But while the design team is accommodating by nature, sometimes they must be firm in the face of client demands. “We work hard to keep the noise level low, and you will have customers wanting lacquered things and mirrors, and six months later they come back and say it’s not good,” said Villa. “It’s almost a personal relationship with a friend who says they’re going to do something you know is a mistake.”

Embraer

Brazil’s Embraer Executive Jets has three distinct product lines in its Lineage, Legacy and Phenom fleets, but the interior designs all begin the same way: with “a focus on the ergonomics of the people in the space,” said Jay Beever, Embraer’s v-p of interior design. That



Embraer recently refreshed the interior of its Lineage 1000, adding new seats and functionalities and incorporating the Honeywell Ovation Select CMS.

helps design teams, which include both designers and engineers, maximize every available cubic inch of cabin. “I like to blend the team, so structural elements become beauty elements,” Beever said. They work with the new product development team from project inception to ensure the cabin interior is integrated with the aircraft design.

Based on the ergonomic studies, “We slowly start moving interior trim back toward the passenger, if necessary,” said Beever. After details such as seat positions and their amount of rotation and the location of switches are determined, industrial designers are brought in, and sketches are produced and translated into CAD designs. Environmentally friendly materials are incorporated where feasible. The process takes six months, during which the form and feeling of the interior is defined. “At the end, we have a 3-D CAD model of that new design that already has a material application guideline along with it,” he explained.

As for interior design differences among Embraer’s three product lines, “in reality

there aren’t a lot between an \$8 million and an \$80 million airplane,” Beever said adding that customers are interested in “personalization more than customization. Customization feels long and tedious, and it takes a lot of energy. Many [customers] are happy with a well engineered product, but want it personalized.” In response, Embraer has created what Beever calls “sandboxes” of opportunities for personalization, for example in the choice of countertops, “without going through the soul-sucking experience of customization.”

At the entry-level Phenom 100, Embraer offers 11 predefined interior collections of colors, fabrics and finishings, and the personalization opportunities grow as one moves up the product lines. Cabin layouts are basically static. “We don’t move seats and monuments fore and aft,” Beever said. “They’re certified to be attached in their location.”

Like all OEMs, Embraer surveys customers, but Beever notes limitations in the results. “If we constantly ask customers what they want, we’re asking them to do our job. They’ll always tell us what they know, which means we won’t move

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QUICK TAKES

Kalogridis Carpet Goes High Tech

Noted for high quality, carpets from Kalogridis International can henceforth be noted for their high technology as well, as the company can weave fiber optics, fluorescent yarn and LED fibers into the fine wool, wool/linen blends and silks of its carpets. The embedded lighting can be used for practical purposes—such as for pointing toward aircraft exits—or purely aesthetic displays, such as logos, real-life images or abstract patterns. Fiber optic and LED technology carpets can be programmed in different colors and lighting sequences, while carpets with fluorescent fibers emit a form of luminescence in the dark from absorbed light. The Dallas-based company is currently designing a carpet with a stylized fiber-optic spider web for a G650 owner.

Yasava Offers 3-D Cabin Tour

Calling it aviation’s first immersive 3-D interactive design tool, Swiss aircraft interior design company Yasava Solutions introduced its Astral Design Visualization System (ADVS) at EBACE, developed to showcase the company’s Astral Design interior solutions. Using Oculus Rift technology, the ADVS enables its wearer to “tour” an aircraft interior in 3-D. At its EBACE debut the ADVS showcased a Bombardier Global 6000 interior incorporating design features such as a dedicated principal zone with a day lounge that converts into a private bedroom with a full double bed and full-size shower. Yasava CEO Christopher Mbanefo said the device enhances communication with clients, resulting in a better designed and completed interior project.

Dutch Companies Collaborate on One-stop Interiors Shopping

Four Dutch companies specializing in business jet and superyacht interiors have formalized their collaborative partnership to offer one-stop shopping for aircraft interior design and refurbishment. MRO JetSupport, cabineteer Struik & Hamerslag Aviation, interior architects Wetzels Brown Partners and upholsterer Zijlstra International Decoration are teaming to offer “a new concept” in the fabrication and installation of interior veneers, said Ton van Deursen, director of JetSupport, which spearheads the alliance. Using precise interior measurements, designers can create plans and begin fabricating the veneers for customer approval before aircraft arrive for refurbishment. The process will enable installation of a new interior while an aircraft is undergoing a three- or four-week C check, or about one-third the downtime of traditional veneer installations, according to van Deursen. ■

Interior possibilities

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forward. We've got to be able to show innovations, to create the new normal, and get excited about things we might want to offer them."

Gulfstream

No OEM takes more ownership of its interiors, from manufacture to refurbishment, than Gulfstream Aerospace. Gulfstream eschews outside suppliers of finished goods and builds all its interior furnishings, produces the fabrics, and even creates the CMS that controls the cabin, media content and the Wi-Fi connectivity. "We strive to ensure the brand DNA is evident in all our models," said Trey Grow, Gulfstream's director for interior design. "While interiors [of the company's various models] are different, we do like to do common 'theming.'" The recent theme, as seen across all OEMs' current fleets, is to "streamline and clean up the visual" look of interiors, as evidenced in the cabins of the G650 and G280. Individual seat controls, for example, are

unseen when passengers board, but readily available and visible once seated.

Gulfstream created its CMS, launched on the G280 and now on the G650 and G650ER as well, "so we can make absolutely sure the cabin functions as intended," said William Gay, Gulfstream's director of completions sales. "It's beneficial to the customer if the OEM knows how to design and maintain the relevance of the system. We wanted to have complete control over our destiny."

Gulfstream regularly surveys operators, soliciting their thoughts on interiors. Preference for contemporary design style is "on the rise," said Grow. "Light, bright interiors are important to our customers. They spend ten hours, possibly longer," in the aircraft and it's important to create a "serene environment that doesn't distract or overly stimulate." Classic grained wood doesn't have the sleek look more customers want today. Requests for composite veneers are on the rise. The composites are manufactured from real wood and reconstituted to mimic veneer

of a specific tree species, creating a more consistent and "more calming" appearance.

Gulfstream affords buyers a "tailored approach" to interior configuration, assigning an outfitting definition team, which consists of interior design group members and a completion sales executive, to each completion. As with customers of other OEMs, some buyers bring their own designers, and the Gulfstream team works with them. Together they define the outfitting for the airplane, from covering materials and communication gear to exterior paint. Gulfstream offers a number of floor plans, including choice of forward or aft galley, for the G450, G550, G650 and G650ER. Standard seating positions can be moved to different locations, and custom cabinetry is available.

The company is equally attentive to operators of legacy Gulfstreams. "We take a proactive approach in obtaining refurbishment contracts," Gay says. "We want to retain control over that product. Who better to control quality and supportability than the manufacturer?" □

QUICK TAKES

Italian Firm Offers Andrew Winch Collection

Foglizzo Leather of Torino, Italy, a frequent collaborator with Andrew Winch Design, introduced the Andrew Winch Collection of leathers. The leather collection features an exclusive selection of colors, customized grains and unique embossing inspired by land, sea and air. "We have worked with [Andrew Winch Design] on yacht projects and airplane projects, so we thought, why don't we do something more together?" said Marco Foglizzo. Designed with aircraft, superyachts and luxury land-based residences in mind, the collection is available to architectural firms and designers for use in their projects.

Italian Designs Gain Traction in China

Delta Interior Design's "Italian-flavored brands" of aircraft furnishings have been gaining interest in Asia, according to company founder and general director Matteo Bulletti. "We are happily surprised that Chinese customers are really liking our Italian design." Delta offers interior design and turnkey completion and refurbishment services. The company has refurbished an ACJ330 and converted an airliner into a medical aircraft that follows the private jet of a Middle Eastern customer, Bulletti said. Located in Brianza, an industrial hub north of Milan, Delta takes advantage of the region's styling and craftsmanship expertise, fabrication know-how and high-tech engineering capabilities and can "assist the customer from A to Z" with design, completion and refurbishment needs.

Consultant Outlines Pillars for Effective Completions Projects

Aircraft completion consultancy Addo Virtus Advisors of Little Rock, Ark., has circulated its "Three Pillars of Quality" guidelines for interior completions, intended to help customers and providers define the elements of a successful completion project. According to the company, "Real, expected and perceived quality" are the tent poles of "a truly high-quality and enjoyable aircraft interior." "Real" quality is the actual design, materials and manufacturing; "expected" quality is what the customer anticipates receiving, based on price and the reputation of the provider. "Perceived" quality is the difference between the actual experience and the expectation.

The company's services—such as cabin/systems competitive analysis, OEM options analysis and completion and refurbishment management—are aimed at ensuring customers get the highest quality for all three pillars possible within their budgets. ■

KINDLY TAKE A SEAT

"The seat is the central interface between the human body and the aircraft," said Walter Heerdt, **Lufthansa Technik's** senior v-p of marketing and sales, at EBACE this May. He had just introduced "chair," a new line of seats for private and business jets "offer[ing] designers completely new possibilities to select the perfect chair configuration for every cabin floor plan." Designers can adapt the seat to specific purposes and interior requirements, from basic working chairs, to lounge and dining chairs, to full-flat sleeping beds. Lufthansa Technik was not alone in addressing this critical segment of interior completions over the past year.

UTC Aerospace Systems of Charlotte, N.C., introduced its Model 1 VIP seat, featuring an environmental control system with heating and cooling, and an extensible electronic control system for motorized seat function, including electric recline, leg rest and headrest, lumbar support and swiveling. The wireless system can be controlled with any smart device.

Iacobucci HF Aerospace of Ferentino, Italy, announced its selection to create custom flat-bed seats for the new Four Seasons 757 scheduled for the hospitality company's 2015 Around the World Private Jet Experience.

PAC Seating Systems of Palm City, Fla., is supplying the seats for the first head-of-state 787 Dreamliner completion, the company announced in earlier this year. The motorized and manual seats will attach directly to the 787 seat tracks, using PAC's Harper fittings. ■



Comlux America develops customized and innovative VIP cabins.

Completion centers boom

Hangars and order books filled with next-generation private airliners made this a banner year for the independent large-aircraft completion centers. Widebody completer Gore Design Completions of San Antonio, Texas, officially changed its name to **GDC Technics** in May, reflecting a new corporate strategy of expanding beyond private airliner completions and into a broader range of aircraft modification services. The announcement was made by Mohammed Alzeer, general partner of the investment group that bought Gore Design one year ago. Since the purchase, the company has completed delayed projects that were in the hangar, restructured the business internally and undertaken a refurbishment of the company's business direction, as exemplified by the renaming.

Alzeer said the company also spent time preparing for

the arrival this past February of its first 787 for completion. The project is scheduled to take 36 months, which Alzeer conceded is "a bit long" but necessary to become acquainted with the composite aircraft.

"We look at the 787 as a gate to the future, with the challenges of a composite fuselage and digitized systems, and being on the forefront to that change is extremely exciting to us." The new owners of Gore have invested \$20 million toward preparing for that challenge. A second 787 is scheduled to arrive at the completion center in this year's third quarter.

GDC Technics, currently managed by MAZ Aviation, plans to open satellite facilities in Europe, the Middle East and Africa to maintain closer contact with customers. "San Antonio is a wonderful city, but way off the beaten path when it comes to VIP aircraft,"

Alzeer said. "Supporting our clients daily has always been a challenge," which the satellite facilities will help address, but he said "San Antonio will continue as the permanent home." The company will also offer engineering solutions, STC development and customized modifications for civilian and special-mission aircraft.

Pending 787 completion projects are the current focus of several completion centers. **Associated Air Center (AAC)** of Tempe, Ariz., received its first contract for the interior completion of a private 787-8 Dreamliner in late December. The contract capped months of discussions and work with Boeing engineers, as completions for the 787's composite structure require special training and unique tooling, said AAC CEO Jack Lawless. He calls the project "a game changer in the world of custom interior completions," stating, "not only is this a major milestone for AAC, but it also represents a

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QUICK TAKES

ACJ320s Silk Road-inspired Design

Aircraft Maintenance and Engineering Corporation (Ameco Beijing) introduced its "Silk Road" interior design for ACJ320s. The design uses cultural elements taken from different regions along the Silk Road of ancient China, conveying the fabled route's cultural spirit and meaning. The design motifs, inspired by Han Dynasty influences, include auspicious clouds and lotus and dragon patterns. Ameco, a joint venture between Air China and Lufthansa, provides completion and maintenance services for private airliners and business jets.

Florida Refurb Center Opens Service Facility in Singapore

The Allen Groupe of Orlando, Fla., which provides what company founder David Allen calls "niche refurbishment," announced it opened a service facility in Singapore on June 1, joining overseas locations in the UK, France, Switzerland, France and the Czech Republic, along with locations and mobile service offered in the U.S. The company cleans aircraft and performs minor repairs and modifications, paint touch-ups and other on-the-spot refurbishment. The Allen Groupe's facility at Paris Le Bourget Airport recently received its Part 145 repair station certificate. "It's my goal to have [our facility in] each country have its own repair certificate," Allen said.

List Brings Real Wood to Flooring

Classic grained wood trim may be losing favor in cabin interiors, but one place it's making a sudden, dramatic appearance is in aircraft flooring. List Components & Furniture of Edlitz, Austria, introduced real wood flooring for business aircraft this year. Available in a variety of veneers, the wood, approximately 10 mm thick, can be used in the entry, shower and toilet area, and parts of the main cabin. The material is slip-, scratch- and abrasion-resistant and easy to clean, said Andreas Aigner, List's director for R&D. A floating installation and locking system makes the lightweight wood flooring easy to install and handle during aircraft maintenance. The wood flooring follows on the recent introduction of List's real stone flooring and stone veneer.

Sabena Technics To Complete BBJ

MRO provider Sabena Technics is handling the design and interior integration for a BBJ at its facility in Bordeaux, France. The completion contract, announced in January, also bestowed BBJ Completion Center status on the Paris-based company. BBJ president Steve Taylor said Sabena's backshops, including "in-house engineering office, cabin completion, maintenance and painting, make it a key player in the completion industry."

Completion Center

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monumental leap forward for the entire custom interiors completions industry. This aircraft is unlike any other in the world.”

The Dreamliner interior was designed in-house by AAC, which said at press time that delivery of the green aircraft from Boeing was imminent. Work will be performed at AAC parent company StandardAero's Transport Category VIP completion center in Dallas. The 787-8 offers 2,404 sq ft of cabin floor area and a range of 9,590 nm.

Greenpoint Technologies of Kirkland, Wash., has booked two Dreamliner completions, one contract signed in December and one in January. Like AAC's personnel, Greenpoint's 200 engineers embarked on a “major corporate initiative” to prepare for the 787 completion projects,

according to the company, “working in close collaboration with Boeing as [the 787's] systems are uniquely modified during completions.” Weekly engineering and interior design meetings were held “to define the technical integration of each discipline and work through details such as ceiling design, sidewall attachments, window integration, IFE integration, plumbing systems, electrical load analysis, rapid decompression and structural substantiation.”

Meanwhile, **Greenpoint Aerospace Co** subsidiary **Odyssey Aerospace Components**, a manufacturer of interior components for Airbus, Boeing, Bombardier and Gulfstream, has been contracted to provide cabinetry and interiors for two private 787s. The Denton, Texas-based company will handle monument engineering, systems

integration, manufacturing and installation.

Focus Shifts East

Lufthansa Technik has unveiled new offerings for bizliner cabin completions and a corporate reorganization aimed at keeping its pipeline filled with innovative ideas, products and services. At EBACE the Hamburg-based company introduced a modular “pre-customized” cabin for single-aisle aircraft, available immediately for the ACJ and BBJ series. “The new modular cabin concept allows a customer many possibilities to combine different cabin elements that are close to an individual cabin layout,” said Walter Heerdt, senior vice president of marketing and sales.

With an ACJ 319, for example, Lufthansa Technik can offer 96 variations on the cabin layout, and even more

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QUICK TAKES

TAG Acquires Burnet Interiors

TAG Aviation bolstered its services portfolio in January by acquiring fellow Swiss company Burnet Interiors, Geneva Airport-based specialists in aircraft cabin refurbishment and modifications. Franck Madignier, president of engineering and FBO services for TAG Aviation Europe, said the two companies' longstanding relationship had grown closer “as demand for cabin refurbishment and aircraft maintenance has expanded.” The acquisition adds an experienced refurbishment team and a Part 21 department to TAG's resources, and Madignier expects the interiors work will complement TAG's current maintenance business.

North Carolina Interiors Shop Refurbs King Air, Navajo

Carolina Avionics & Aircraft Interiors of Salisbury, N.C., has completed main cabin refurbishments of a King Air B100 and a Piper Navajo. Both aircraft had new custom-formed seat foam installed and covered in leather, with matching leather sidewall panels, a 100-percent wool carpet installed, and all wood cabinetry and trim repaired and refinished in high gloss. The King Air's cockpit was updated with a full restoration of crew seats, matching leather sidewall panels and storage pouches, along with the repair and matching dye-painting of all plastic interior components. ■



Aeria Luxury Interiors
specializes in cabin design for
Airbus and Boeing aircraft.

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Completion Center

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choices in a longer aircraft such as the BBJ2. Among the options that can be installed: a self-contained steam shower that Lufthansa Technik also introduced this past year. Prices for the modular interior start at about \$20 million, and offer a turnaround time of about six months for the completion. The work will be performed by Lufthansa Technik single-aisle ACJ and BBJ completion subsidiary Bizjet International of Tulsa, Okla.

Bizjet International has been particularly busy in the Asian market recently. The company delivered its first green BBJ to a customer in China, said Brian Barber, Bizjet International's v-p for sales and marketing. He pointed out that the company has previously delivered refurbished BBJs and completed green ACJs for Chinese customers, showcasing not only its completions capability but also its "knowledge of working with Chinese culture and the CAAC [Civil Aviation Administration of China]."

Looking ahead, Bizjet International is expanding its facilities to meet expected demand for refurbishment of legacy BBJs and ACJs. "We're at the beginning of the curve for the heavy checks and the lifecycle upgrades of these airplanes, so we need to have the capacity for operators to have a place to take them," Barber said.

Lufthansa Technik itself recently delivered completions of a green ACJ and BBJ2, and is currently completing three Boeing widebodies: two 747-8s and a 767. To maintain its edge, Lufthansa has boosted its R&D budget and instituted organizational changes. Under its Innovation Boost program, Lufthansa is quadrupling its R&D spending, committing

more than \$270 million (€200 million) through 2017.

The company is also reorganizing to create a better environment for innovation and new product development. A newly established corporate innovation management and product development department will promote, coordinate and control company-wide technology and product-development projects and manage the innovation budget. Meanwhile, a new production division will have charge of all products offered by Lufthansa Technik as an original equipment manufacturer.

The company also unveiled **Inairvation** (see article on page 10), a joint venture with interior specialists List Components and Furniture, and a new interior concept the joint venture has produced called "Technology Meets Cabin." Billed as an integrated solution, one of the cabin's key features is "a new seat family called 'chair,' [which is] a new innovation in VIP seating," Heerdt said.

Business in Asia has given a boost to **Flying Colours** of Ontario, Canada, which specializes in completions and refurbishments of Bombardier aircraft. Over the past three years Flying Colours has delivered numerous Challenger 850 completions to China under its Preferred Completion Center agreement with Bombardier. The company is currently involved in green Challenger completions for several Asia-based clients, along with numerous refurbishments, including a Challenger 604 for a Chinese operator.

"We also just recently completed for a Hong Kong-based client a full pre-owned Challenger 850 completion that included a complete carbon fiber interior, with seats and divans finished in exotic leathers and fabrics, IFE upgrades and Wi-Fi Internet,"



Flying Colours recently completed a carbon fiber interior for a Challenger 850, to appeal to the customer's aesthetic sensibilities.

said Sean Gillespie, executive v-p for sales and marketing. "This is the first time we've worked so extensively with carbon fiber on the interior of an aircraft," he said. "The client chose the material for purely aesthetic reasons, and where you would normally only use wood veneer—for example the tables, galleys, bulkheads, hand rails, lavatory vanities and toilet enclosures—we've used carbon fiber."

Flying Colours' CRJ ExecLiner program, which converts a standard CRJ into a private jet, is also active in China, and the first conversion for a China-based client, which will include CAAC certification of the ExecLiner interior and auxiliary fuel system, is near completion. The 15-passenger cabin will have three sections, IFE system, dual lavatories and long-range fuel tanks.

Flying Colours also recently announced a partnership with Bombardier to provide interior support and refurbishment at the new Bombardier service center at Seletar Airport in Singapore, and is in the process of setting up and staffing the facility. Flying Colours will offer preliminary interior inspection, interior removal and installation, interior repair work, interior modification work and interior

refurbishment work for all Learjets, Challengers and Globals.

Flying Colours recently completed the first of a three-phase, 65,000-sq-ft expansion at its Peterborough, Ontario headquarters, opening a \$3.5 million, 20,000-sq-ft hangar expansion in March and upgrading its paint facility with a \$750,000 investment in April.

Modular Single-aisle Cabin

Zurich-based completion and refurbishment specialists **SR Technics** introduced at EBACE a single-aisle modular cabin design concept that offers "advanced smart solutions that reconsider traditional layouts," says Eric Jan, the company's head of VIP interior design. "It's time to rethink [single-aisle] interiors, as they are not suited to today's needs. We are therefore rewriting the rules for completions of these aircraft." The concept gives owners "100-percent use of the usable space 100 percent of the time," he said, while making the galley and kitchen areas the heart of onboard life, accessible to crew and passengers.

Developed for individually owned and government/head-of-state single-aisle ACJs and BBJs, the design package is offered

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in three styles: Classic, Elegant and Modern. SR promises customers “highly competitive pricing” and a green completion time up to a third less than industry norms. All interior aspects are freestanding, allowing any subsequent changes to be made at a lower cost, thereby boosting resale value.

Following its recent cabin refurbishment of a Boeing 767-200, **Aeria Luxury Interiors** of San Antonio, Texas, an ST Aerospace division, is preparing for its first BBJ green cabin completion, which will include a dedicated forward crew lounge, efficient galley, dining suite, conference room, large resting lounge and master suite. Adigital entertainment system with multiple HD screens will provide an “indulgent” onboard theater experience, said Ron Soret, v-p and general manager of completions. Global high-speed Wi-Fi via Inmarsat and Iridium connectivity, and humidification and zonal drying systems will enhance passenger communication and comfort. The BBJ is scheduled to arrive at Aeria in December, with completion anticipated by October next year.

Aeria, which does interiors for both Airbus and Boeing bizliners, has been circulating renderings prepared by its interior



SR Technics embraces the notion of a modular cabin design, introducing such a concept—with three versions for various client demands—to speed green completion and enhance efficiency from traditional layouts.

design team of Boeing single-aisle and widebody interiors, and over the past two years has remodeled its 100,000-sq-foot hangar, shop areas and offices to meet anticipated demand for completions and refurbishment.

The company recently acquired 3-D printing capability for prototyping, proof-of-design concept modeling and fabrication of complex decorative pieces and non-structural parts. Aeria is adding another 14,000 sq ft of space this year for a cabinetry and upholstery shop, as well as a stand-alone sales and interior design building.

Comlux Creatives, cabin design department of **Comlux America**, the bizliner completion and service center for Zurich's Comlux the Aviation Group, introduced its “Five Senses Concept” for custom cabin design.

Each sense is stimulated and customer preferences revealed during the five key phases of the project: definition, concept, material, detail and completion. Lauri Church, head of the design department at the Indianapolis complex, said the Five Senses approach “is the most personalized way to discover and understand our client’s distinctive tastes, ideas and expectations to bring them to life in a one-of-a-kind cabin interior.”

The process starts with hearing, Church says, when the team listens to the client. Designers then convert the client’s “taste” into the interior styling, while materials selection brings in the sense of touch. These elements are combined into dimensionally correct and detailed colored layouts clients can “see” before the project proceeds to the completion phase with its fabrication and installation, when clients can actually experience the project’s “smell.” “The interior will continue to grow as our designers oversee every last detail until it is finally born into its elegant and exclusive home above the clouds,” said Church.

The latest application for its technologies is the green completion of an ACJ320 expected at Comlux America by the end of last month. The cabin will include a forward lounge, master

suite, dining room and two galleys. A “business class” area will use SwiftBroadband for Wi-Fi connectivity, along with surround sound and mood lighting throughout, and an upgraded insulation package.

Meanwhile Fly Comlux, the group’s air charter arm, reports that cabin upgrades to its 767BBJ are complete and the aircraft is back in charter service. Interior enhancements for the Bahrain-based jet include reupholstered seats in the executive cabin and entourage section and new in-flight entertainment system, humidification system and carpeting. SwiftBroadband satcom for high-speed Wi-Fi and a GSM onboard system has been installed throughout the cabin.

The 63-passenger 767 has been one of the company’s most successful large charter aircraft since it joined the fleet two years ago, said Fly Comlux CEO Andrea Zanetto. “Its cabin arrangement makes it the perfect aircraft for world leaders and royal families,” he added.

Fokker Services of the Netherlands, an ACJ and BBJ completion and refurbishment specialist, recently completed “the only ACJ320 that can carry 26 passengers and be operated for commercial use,” said James Aspell, Fokker’s v-p for technical



Acknowledging that some customers would rather not take on the work of a truly customized interior, Lufthansa Technik is offering pre-customized designs for the Airbus ACJ and BBJ (shown).

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services and aircraft completions and conversions. “To have this completion certified, the cabin of this aircraft had to comply with heat release requirements, something we achieved in a relatively short time thanks to employing our own compliance verification engineers and our close relationship with the EASA and FAA.” (The company’s refurbishment capabilities include IFE and CMS upgrades.)

Currently, Fokker is completing a green ACJ319 scheduled for delivery in next year’s first

quarter. Fokker’s four hangars can host up to five single-aisle and five regional aircraft, and one hangar will be extended this year to accommodate another single-aisle aircraft.

Aircraft brokerage **Jetcraft** of Raleigh, N.C., introduced its JetCoast completions program, a refreshed facet of its new aircraft acquisition services. Under an alliance with Jet Aviation and Bombardier Aerospace, JetCoast offers buyers customized completions on new Challengers and the Globals. Jetcraft buys the green aircraft from Bombardier and oversees the completions, which

are performed at Jet Aviation’s facility in St. Louis, Mo. The prices are about the same through either channel (Jetcraft is asking \$44 million for a JetCoast Global 5000 and \$54 million for a JetCoast Global 6000) but Jetcraft says it can offer customers more customization and faster delivery than is available through Bombardier.

“We’re in our first two JetCoast Globals,” said Jetcraft president Chad Anderson. “The OEM already has a strong backlog of aircraft and lots of institutional buyers” that don’t need or want customization, he said. “It’s easier for the OEM to complete those aircraft on order rather than do near-term delivery with frequent changes to the specs,” as often happens with custom completions.

The program began early this century, Anderson said, as an alternative completion channel for Challenger 604s. Jetcraft eventually completed and sold 30 new 604s before moving into Challenger 605s and selling close to another 20. “Here we are in 2014, and now Jetcraft clients have evolved into more and more global aircraft, so we’re moving into the Global 5000 and Global 6000,” he said. “It’s the natural next step from the earlier days.”

Pats Aircraft Systems of Georgetown, Del., reported in April delivery of a refurbished BBJ2 to the government of Indonesia for presidential transport. The head-of-state project is Pats’s 15th completion. Configured to hold up to 67 passengers, the aircraft is the first BBJ to incorporate the Boeing Sky interior, which features sculpted sidewalls and window reveals. The project, which required 18 months, was certified through Pats’s on-site organization designation authorization (ODA) on behalf

of the FAA.

In addition to interior completions for private airliners, Pats supplies auxiliary fuel systems, including those on all green single-aisle BBJs, that can extend aircraft range by up to 50 percent. Pats’s ODA and Engineering Services are available to support the design and certification requirements of each in-house project, or additional project work on behalf of customers.

Pats is preparing for interior completion of a new BBJ2 for an undisclosed Asia-Pacific customer. The green BBJ is scheduled for delivery to Pats in October, with completion anticipated toward the latter part of next year.

The interior will make the aircraft “among the most elegant and well equipped in operation,” said John Eichten, Pats senior v-p of sales. Pats’s news for the year was capped by New York City-based Moelis Capital Partners’ announcement last month that it has acquired the company.

Switzerland’s **Jet Aviation Management** recently signed a completion contract for an ACJ320 for an undisclosed head of state, which will join completions for an A340, BBJ and other single-aisle and widebody projects under way at its Jet Aviation Basel Completions Center, according to Ruedi Kraft, v-p for market development and completions sales.

The ACJ320 interior will include a bedroom, lounge and office area in addition to a large staff area. This is the second completion Jet Aviation Basel will perform for the client. Delivery of the green ACJ is scheduled for this year’s third quarter, and the interior is slated to be completed by the end of next year.

Jet Aviation Basel is also

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INAIRVATION

Inairvation, Lufthansa’s joint venture with List Components and Furniture, aims to become a turnkey provider of interiors for business jet OEMs, under the guidance of the manufacturers’ design teams. To that end, the company is close to reaching an agreement with an OEM to take over responsibility for the interiors for an existing product line, according to CEO Dr. Philip von Schroeter. The company’s integrated cabin approach will enable Inairvation to develop cutting-edge solutions while improving quality and lowering costs of the interiors, he said. Schroeter said Inairvation’s timeline for developing a turnkey interior is two years from a first meeting with an OEM to delivery of the first interior.

In a mockup based on a Challenger 605-size airframe displayed at EBACE, the fit, finish and philosophy of the integrated approach was seen in touches such as a wood floor from List outfitted with flush strip lighting from Schott.

Inairvation is an independent company based in Edlitz, Austria, allied with preferred partners Schott and Design Q. ■



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readying itself for Boeing 787 interior completions, ensuring its teams are prepared for new procedures required for work on the composite aircraft.

Jet Aviation has also been reducing cycle time for its completions, implementing new business practices and making investments in engineering capabilities (including 3-D engineering) and production shops and bringing full systems integration into the cabinet shop.

L-3 Platform Integration of Waco, Texas reports making “significant progress” on completing two 747-8s for undisclosed customers. Installation of high-bandwidth ViaSat satcom systems on both aircraft has been completed.

The systems feature 36-inch Ku-band antennas on the upper fuselage, each installed under a low-profile radome, providing speeds of up to 4 Mbps on the forward link and 1 Mbps on the return link. Ken McAlpin, v-p of VIP/head-of-state programs, notes L-3 has extensive experience with private 747 completions, having performed the very first.

He said that distinction has proved invaluable with the current projects, particularly in the decompression modeling needed for aircraft certification. The 747-8 has higher decompression pressure requirements than previous models, which affects flight-critical systems and loads on the structure and thus interior design and completions work.

The first completed 747-8 is scheduled for delivery in the second half of this year.

In addition to its interiors solutions, the company offers private airliner customers its L-3 aircraft elevator and the L-3 Aircraft Threat Countermeasures Solution (ATCS). □



The Bell 429 MAGnificent interior is designed for VIP comfort, with premium leather seats and the Silens noise- and vibration-abatement system.

Helicopter interiors go luxe

Luxury interiors and redefined cabins are getting more attention in the rotary-wing segment. Italian helicopter OEM AgustaWestland showcased at EBACE a four-passenger interior concept for its in-development AW169. In a bold move, the airframer looked outside its usual collaborators in the high-fashion world and sought designers with no aviation background or experience, sponsoring a “Flydeas for the City” contest with contemporary design magazine *Interni*. The winning interior was created by furniture design firm **Lanzavecchia + Wai** and features earth

tones and swiveling seats, each cocooned in a translucent shell.

At EBACE, AgustaWestland displayed artist’s renderings, color samples and a scaled-down mockup.

“The interior gives the people inhabiting the aircraft the right to adjust it depending on their needs,” said designer Francesca Lanzavecchia. “Everyone has his own chair to live in, with a table, light and recharging socket. It’s private, but it becomes public the moment you decide to [position the seats] in conference seating.”

The leather sidewalls feature long rows of pockets for storing iPads or other personal

belongings, or for tucking photos to display during flight.

No timetable for completion of the AW169 interior design has been set, but the helicopter is scheduled for certification next year.

MAG and Bell Partnership

MAG and its **MAG Design Studio** expanded their collaboration with Bell Helicopter this past year, introducing the Bell 429 MAGnificent interior at February’s Heli-Expo, bringing “Italian style and exquisite craftsmanship” to the interior styling, from hand-stitched premium leather seats to state-of-the-art IFE systems, according to Armando Sassoli, co-general manager of MAG. The MAGnificent cabin also features Silens, MAG’s proprietary noise- and vibration-abatement system.

MAG was previously selected by Bell for the oil and gas producers interior of the 525 Relentless, and has extensive experience in oil and gas, search-and-rescue and emergency medical service (EMS) completions.

Sassoli says MAG is seeing an increase in demand for fleet commonality and standardization. “Fixed-wing operators want to incorporate interior designs from their jet fleet to their new helicopters,” Sassoli said, including in-flight entertainment and optional equipment such as electro-chromic windows and external camera integration. MAG has developed its in-flight entertainment enhanced lounge (iFeel) IFE system for rotorcraft cabins, incorporating Wi-Fi connectivity.

MAG’s Cabin Comfort Systems division is expanding its capabilities to include customizing, refurbishment and maintenance services for third-party operators. MAG plans to certify more luxury interiors with the EASA and the FAA. □

Super Puma Refurbished by Vector

Luxury cabins don’t get all the attention in the rotorcraft refurb world. Vector Aerospace Helicopter Services North America, of Richmond, British Columbia, refurbished an AS332L-1 Super Puma damaged during the tsunami that struck Japan in 2011. The Super Puma was purchased by Ranier Heli-Lift (RHI) shortly after the incident, and engaged Vector for the project because of “Vector’s new AS332L-1 capabilities” and the “outstanding support they have provided other operators,” said RHI executive v-p Richard “Lash” Lerew. The refurbishment included a complete airframe re-wire, requiring more than 62 miles (100 km) of wire; a complete 7,500-hour airframe inspection; and internal and external paint. The refurbishment was completed in December and the aircraft is now in service. ■

Systems behind the scenes

A host of system and component providers stand behind almost every successful completion and refurbishment, supplying the communication and IFE systems, lighting, interior structures and other elements that underlie a VIP interior. Though often in the background, several system providers stepped into the spotlight with news of their own this past year.

Seeking to expand beyond the private airliner market, **Custom Control Concepts** of Kent, Wash., provider of custom IFE and CMS solutions, introduced at Heli-Expo in February its SkyOne IFE/CMS solution and Sky-Fi wireless Internet connection sharing (ICS) systems for business jets and helicopters. The SkyOne system is an all-in-one IFE and CMS solution that offers high-definition audio and video on demand, CCC's proprietary SkyShow flight information system, PA integration, and cabin shades and other CMS controls, along with camera integration and wireless iPad connectivity for IFE and CMS remotes. SkyOne's next-generation 4K backbones provide four times the resolution of current 1080p HD.

The Sky-Fi Wireless ICS is designed to enhance in-flight communications and entertainment on business jets and helicopters. Both systems are scheduled for certification and release for OEM production early next year, said Jason Danforth, CCC's v-p for business development.

During the past year CCC has also invested heavily in developing its 3-D printing capability, and can create parts from materials certified for aerospace applications.

The former **Yankee Pacific Aerospace** of Rye, N.H., which makes custom structures, components and systems for private

airliners, was renamed Advent Aerospace last December. The change reflects a more global focus and a corporate restructuring that enhances the company's relationship with its **Jormac Aerospace** and **Cabin Innovations** divisions.

Jormac has produced custom VIP cabin lining systems, monument installation attachments, Environmental Control System Integration kits, VIP showers, and toilet and bidet shrouds for several 747-8s and BBJs, as well as an A340-600. Jormac also designs and manufactures cabin floor modification kits.

Over the past year, Cabin Innovations' deliveries have included a complete ship set of BBJ interior monuments; turnkey galleys and major cabinetry monuments for four 747-8s to a major U.S. completions center; and A320 and BBJ turnkey galleys.

Universal Display Corporation of Ewing, N.J., and partner **IDD Aerospace/Zodiac Lighting Solutions** of Redmond, Wash., are developing a white organic light emitting diode (Oled) lighting system for aircraft interiors. (Zodiac Lighting parent company Zodiac Aerospace announced last month it had acquired completions house Greenpoint Technologies.) Universal Display president and CEO Steven Abramson says Oled lighting offers several advantages over current fluorescent, incandescent and LED lighting technologies, including reducing an aircraft's carbon footprint, lowering fuel consumption and opening up the design restrictions of current lighting solutions.

The companies said the prototype may have application in larger-scale Oled projects, including cabin applications for interior furniture, galley and interior structure enhancements. ■

WINDOW TECH



The cabin of the future might not have windows if Spike Aerospace's plan to eliminate windows to reduce weight and lower drag in its supersonic jet gains traction in the larger market.

In February **Spike Aerospace** of Boston unveiled interior design plans for a proposed supersonic jet, Spike S-512, grabbing attention in part for its windowless cabin. Instead of containing windows, its full-length sidewall screens would display content such as movies, PowerPoint presentations or views of the outside world generated by external cameras. Spike says it expects to fly a prototype in four to six years.

For now, however, every passenger aircraft has cabin windows, and innovation was on display at EBACE this year.

Vision Systems Aeronautics of Lyon, France, unveiled what it says is the first self-powered dimmable window, *Energia*, providing a green solution for solar protection in the cabin. Using WysipsGlass technology, transparent photovoltaic cells integrated in the window glazing harvest solar energy on the ground or in flight. The energy is used directly or stored in a battery incorporated into the window, independent of the aircraft's electrical system, to power the dimming technology. The undimmed window transmits 90 percent of light and can dim to opaque in five seconds or anywhere between to regulate light, glare and heat entering the cabin. The level of dimming can be controlled by a button at the window, or from a control panel or smart device.

In what's being called "an exploratory collaboration" with Boeing Business Jets, **Fokker Services** introduced what it calls a panoramic window at EBACE, measuring 54.5 inches wide, slightly more than three conventional window bays, and 19.5 inches high, some 40 percent taller than current airliner windows. On track to be the first developed and certified for a business aircraft, the jumbo window is designed for the 737 BBJ. It would also be available for the BBJ Max. "This is a real game changer that offers owners, operators and passengers a distinctively new way to experience air travel," said James Aspell, v-p for technical services and aircraft completions and conversions at Fokker Services.

Window treatment specialist **Lou Martin & Associates** of San Antonio introduced its new *Cassette* window shade, designed to fit behind an existing airliner side panel. "It's for customers who want to use their current side panels while 'jazzing up' their interior with a new window shade," said company president Lou Martin. The *Cassette* is available in both mechanically and electrically operated models with manual override. ■

Independents keep pace

To the tune of “Everything Old is New Again,” refurbishment specialists unveiled new products, processes, services and projects over the past year. Among the highlights:

Constant Aviation of Cleveland, Ohio, completed Learjet 45, Hawker 800 XP and Beechjet 400XP custom design and refurbishment projects. The Learjet 45 refurb included cabin reconfiguration, addition of beveled windowline reveal, modified lower sidewalls, fabrication of a new galley, additional countertop and cabinets in the lav and custom plating and seat design. The 800XP project included redesigned seats, reupholstered headliners, windowliners and lower sidewalls, wood accents added to the upper windowliners and a forward closet door. The 400XP cabin reconfiguration included a new three-person divan, redesigned galley, and installation of new carpeting, seats and plating.

Primarily known as a seaplane float manufacturer, **Wipaire** of South St. Paul, Minn., is enhancing its luxury custom interior completions, refurbishment and finishings work for the Cessna Caravan and Grand Caravan (including EX) and the Twin Otter. Recent projects have included a Caravan interior with carpet, cabinets and seats, and a partial executive configuration for a new Viking Air Twin Otter 400. Wipaire recently opened another float and interiors manufacturing facility and is adding cabinet-making to its in-house interior shop.

Bushplane operators have another source for luxe interiors: **Quest Aircraft** of Sandpoint, Idaho, introduced the Summit Executive interior for its Kodiak turboprop single at the Sun ‘n’ Fun Fly-In in Lakeland, Fla. The

interior features club-four seating, folding tables and forward cabinets, and improved sound-proofing is among the other enhancements. The Summit Executive interior is available on new Kodiaks and as a retrofit.

India-based MRO **Air Works** signed an agreement in March with Wisconsin’s Emteq to make the latter company’s cabin electronic products more readily available to operators in the subcontinent. Air Works will make Emteq’s cabin upgrades for business jets available at its recently completed refurbishment center in Mumbai and its 15 maintenance facilities around India.

Emteq’s products include lighting and eConnect, a wireless CMS and IFE control system. The eConnect system enables control of cabin lighting, window shades and IFEs from personal smart devices; wireless hi-def streaming of IFE system content; and easy satcom system access throughout an aircraft. The systems have been installed on aircraft ranging from single-engine turboprops to private widebody airliners. Wireless IFE by eConnect is available as an option on production Pilatus PC-12NGs with executive interiors, and Emteq Routers by eConnect were recently installed on an Embraer Legacy 600 and Bombardier Global Express.

Lincoln, Neb.-based **Duncan Aviation** has created a mobile team of interior service specialists to provide scheduled, unscheduled and road-trip interior service. “Some customers need interior service that doesn’t disrupt their aircraft’s daily schedule,” said Nate Darlington, completions sales representative at Duncan Aviation’s facility in Battle Creek, Mich. The mobile team can provide services such

Wipaire is offering luxury interiors for the Caravan, Grand Caravan and Twin Otter.



as cleaning, functional improvements, interior removal and installation, cabinet refurbishment and seat reupholstery.

Operators and interior specialists have placed increasing emphasis on “green” practices, and Duncan notes that this year marks the third year that nearly all aircraft painted at its Lincoln and Battle Creek facilities have been completed using FAA-approved, chrome-free paint processes.

In another online outreach effort, in January, following installation of the new Rockwell Collins Venue Cabin Management Systems aboard two Dassault Falcon 900Bs, Duncan released a video showcasing the results, to “help customers better visualize how the system would integrate in their aircraft,” said Duncan senior avionics/installation sales rep Steve Elofson. The concise video walks viewers through the entire cabin, showcasing the intuitive user interface on the high-definition CMS, demonstrating touchscreen and wireless iPad cabin controls.

Switzerland’s **Ruag Aviation** reported in March completing a paint project on a private A320 at the company’s paint shop in Munich-Oberpfaffenhofen, Germany. Given operators’ concerns about downtime, Ruag is highlighting the speed of

the “comprehensive and detailed” paint project, accomplished in about 1,500 man hours in 15 days, including stripping of the original livery. “The success of this project demonstrates Ruag Aviation’s ability to deliver premium paint solutions even for large VIP aircraft such as the Airbus A320,” said Carsten Matthiesen, Ruag’s director of exterior services.

Spirit Aeronautics of Columbus, Ohio, announced in January the addition of 17,860 sq ft of hangar space to its Port Columbus International Airport campus to support expanding refurbishment services. “Demand in the area for high-quality interior refurbishment service on business aircraft is growing, and we are expanding to meet the need,” said president Tony Bailey. “The space allows us to lay out full Challenger-, Global- and Gulfstream-sized interiors and work concurrently on different elements of a project, which ultimately reduces aircraft down time.”

Nordam Group, the aircraft parts OEM, consolidated its business jet design and production facility in Wichita into the Interiors & Structures division at its Tulsa, Okla. headquarters. CEO Meredith Siegfried attributed the move to retrenchment in the light to midsize business jet market.