



Completions & Refurbishment

Next-gen cabins redefine the heights of comfort and capability

by James Wynbrandt

With business jet speeds already brushing against the sound barrier and endurance that puts almost any spot on earth within range, the cabin remains the last frontier for dramatically and efficiently improving performance. Here are highlights of what designers, engineers, OEMs, and aftermarket product and service providers are doing to create ever more comfort and capability within these rarefied chambers.

New Cabins

Dassault looks high and wide for comfort

“The industry has been moving toward ever wider and higher interiors, and customers told us what they wanted most in our new Falcons was more space,” Eric Trappier, chairman



and CEO of Dassault Aviation, said in unveiling the Falcon 6X in February. Claiming the mantle of “the world’s first ultra-wide business jet,” the 6X features the tallest and widest cabin (6’ 6” x 8’ 6” unfinished) of any purpose-built business jet.

Replacing the cancelled 5X, shelved due to development issues with the Safran Silvercrest engines chosen as its powerplants, the 6X borrows many of its interior features, while taking advantage of the new Pratt & Whitney Canada PurePower PW800 engines to provide a longer cabin (an additional 20”; more than 40’ 6”) and greater range (5,500 nm). Designed “from the cabin out,” in Trappier’s words, the 6X is “passenger-centric” without compromising performance.

“Every element of cabin style and design has been totally rethought,” according to Dassault, the result of an extensive survey of customer tastes and inputs from Dassault Aviation’s in-house Design Studio, incorporating flowing uninterrupted lines that “declutter” the cabin and enhance the feeling of space. Accommodating up to 16 passengers in three distinct lounge areas, multiple configurations and options for maximizing the space of the rear lounge and entry way/crew rest area are available.





The skylight over the entrance area, inherited from the 5X's design, will be business aviation's first. The windows are 10 percent larger than the 7X's, and the 29 portals enhance the cabin's expansive feeling. The noise-suppression system, based on the package developed for the Falcon 8X, and the pressurization system, which maintains a 3,900-foot cabin at 41,000 feet, further add to comfort, as does the ventilation system, refreshing cabin air in as little as two to three minutes.

First flight of the Mach 0.90 6X is expected in 2021, with deliveries commencing the following year.

Bombardier's Global expansion

David Coleal, president of Bombardier Business Aircraft, cited an "unrelenting commitment to innovation" as the foundation of the Global 5500 and Global 6500 he introduced at EBACE in May, replacements for the 5000/6000. In addition to updated engines, the new models incorporate "a fully reimagined cabin."

Current Globals feature the Premier cabin introduced at EBACE 2017, and the new cabins build on those refinements and borrow from the Global 7500 (the rebranded 7000), whose cabin mockup has been seen at airshows around the globe. The Global 5500/6500 will have Nuage seats developed for the Global 7500 (see *box on this page*), and also the Nuage "chaise"—something not even available on the 7500. Chaise is a three-person, side-facing bench seat that converts into a chaise lounge, as the surface articulates, the back and knees rising under the passenger's control. At night it serves as a full-length bed. The area below the bench serves as storage space.

The galley will include the double ovens from the 7500 designed exclusively for Bombardier, and appliances are exposed rather than hidden as in most business jets, "inspired by a high-end home kitchen," said Tim Fagan, manager, industrial design at Bombardier. "We're not calling it a galley anymore; we're calling it a kitchen."

Bombardier is also refocusing on fabric seats, which have fallen from favor as "leather has taken the forefront," Fagan said. Fabric offers advantages including greater comfort across a range of temperatures, better sound dampening qualities, and for their interior decorating use "to create different looks, another design element." The fabrics include a wool-felt material, "like a business suit" that blends well with the cabins' woods and metal.

Fagan heads a 16-person industrial design team, and as with teams at other OEMs, they seek inspiration for tomorrow's cabins from the fashion, automotive design, and yachting worlds their customers inhabit. "Our mandate is the customer experience," said Fagan. "We're more and more getting plugged in to the global design community."

The Global 5500 and 6500 are slated for service entry in late 2019.



The G-whiz factor

Gulfstream Aerospace continues refining the cabins of the G500 and G600, unveiling new interiors for both jets at the NBAA Convention in Las Vegas last fall. The revamp of the G500's three-zone cabin was based on "extensive feedback" from changes in the G600 shown at the prior year's convention, combined with additional customer insights, Gulfstream president Mark Burns said. A new seat, incorporating "innovative design techniques and ergonomic enhancements" improves comfort and reduces fatigue, according to the company, and makes a design statement with diamond-quilted inserts.

A full-size galley features an optional steam oven, an interchangeable beverage maker, and a refrigerator that can be placed above or below the counter. The galley itself can be located in the forward or aft cabin.

The G600 interior can be configured with up to four living areas, with three new standard mission-focused seating styles, options for a fixed bed, and divans that convert into beds. Furniture, bulkheads, and other interior elements are customizable. The gourmet galley can be positioned fore or aft, and stone, wood, and other flooring options are available for the entry, vestibule, galley and two lavs. The \$56.2 million jet is to enter service this year.





Embraer earns “E” for enhancement

“People ask, ‘Why do anything to the best selling business jet?’” said Michael Amalfitano, president and CEO, Embraer Executive Jets, in unveiling plans for the Phenom 300E at NBAA last October. “Because we can,” he said, expressing an impulse and a confidence seen across the OEMs today in their customer- and cabin-centric focus.

An upgraded version of the Phenom 300 light jet, the 300E (for “Enhanced”) features a completely redesigned interior anchored by new seats, incorporating extendable headrests with bolsters, extendable leg rests and retractable armrest, and broadened seatback for greater support. Designed and engineered in house and manufactured at Embraer Aero Seating Technologies in Titusville, Florida, customization and personalization options include a wide choice of leathers and stitching.

The cabin’s table, side ledge, side wall and valence designs are also new, while the aisle is three inches wider and there’s an additional inch of headroom compared to the 300. An upper technology, or “tech” panel along the centerline of the cabin ceiling hosts the now-standard Lufthansa Technik nice HD CMS/IFE (high-definition cabin management system/in-flight entertainment) system.

DAVID MCINTOSH



Bombardier Nuage Seats

Yielding to the chair

With aircraft flying longer distances and ergonomic sciences advancing, the seat is receiving renewed focus, elevated to throne-like status. Several OEMs have made seats the centerpiece of recent upgrades. These are among the developments worth sitting down for.

In April Bombardier unveiled the Nuage (“cloud” in French) seat, “the first new seat architecture in business aviation in three decades,” according to the company. In developing the seat, designers researched the literature of seating, and the ergonomics of working, reading, and reclining while seated, seeking to answer, “What does the body need in those different positions?” Nuage is their answer. It features a patented tilt link system that supports the entire body at every angle of incline, and is equipped with a tilting headrest and a moving seat pan that raises to provide support as the tilt angle increases. Nuage features the first-ever fully floating base, allowing the seat to track forward and back and swivel almost effortlessly, controlled by a pair of levers in the left armrest. Pull up on one and the seat can slide forward and back on foot power; pull the other and it pivots laterally. Let go of the respective levers to lock the seat into the desired position.

Embraer Executive Jets showcased a new seat design for the Legacy 450 and 500, displayed onboard a Legacy 450 on static display at EBACE this May, where the optional seat debuted. Providing “better ergonomics” and improved passenger comfort, the seat offers enhanced backrest and new headrest support, and gives customers greater flexibility in personalization options via stitching, leather material textures, and color applications. The new seating options became available to customers receiving aircraft in the second quarter.

Swiss design firm Yasava has been selected to provide its Wave interiors for ZED Aerospace’s refurbished CRJ700s, which will be used for its planned Aura air service linking New York, Miami, Chicago, Atlanta, Denver, Los Angeles, and other key cities, slated to bow in 2019. Yasava’s Wave cabin is based around its Aiana Wave seat, and will incorporate design elements and solutions from its Astral cabin design collection, the company said. ■



Much of the rest of the cabin technology remains hidden, discretely tucked into side ledges, for example, keeping the interior sleek and stylish.

“When we design the interior, to protect ourselves and the customer, we design for maintainability,” said Jay Beever, the company’s v-p, interior design. In the 300E, “we moved critical components away from windows, so that anything that fails can be fixed in 30 minutes or less,” he said. Beever noted that with its easily replaceable and updateable interior, “the 300E is especially set up to handle the marketplace in the shared ownership space,” a role it fills as a popular platform for several fractional programs.



Textron’s Quiet Cabins

Textron Aviation’s current flagships, the soon-to-be certified Longitude and the in-production Latitude, are proof that the company’s focus on performance and passenger comfort is paying off.

With 54 Latitudes delivered in 2017 and 12 in the first quarter of this year, the newest jet in the company’s stable is off to a good start. Bulk buyer NetJets reports that the Latitude is its customers’ most popular jet. The fractional-share provider has already taken delivery of 60 Latitudes, and expects to receive another 24 by the end of 2018.

Among the Latitude’s—and the Longitude’s—attributes are an extremely quiet cabin and



the widest and tallest cabin the Citation lineup, at 72 inches tall by 77 inches wide. The extra cabin size translates into more legroom—30 inches between club seats—and room for a lavatory that Textron Aviation says is 60 percent larger than the Latitude's closest competitor.

At the maximum operating altitude of 45,000 feet, the Latitude's cabin altitude is a comfortable 5,950 feet, another factor that distinguishes it from the competition.

The Longitude shares the same cabin cross-section as the Latitude with, naturally, a longer cabin that accommodates more seats while retaining the 30-inch spread between club seats.

Textron Aviation engineers and interior designers have spent an extraordinary amount of time quieting the cabins of the Latitude and Longitude. "We're introducing one of the most thoroughly researched passenger experiences," said Brad Thress, senior vice president of engineering, "one that will revolutionize the super-midsize category with its low cabin altitude, class-leading legroom, and low decibel cabin sound levels that are half [those] of its nearest competitor."

Max and Neo

The completions world awaits deliveries of the next-gen Boeing BBJ Max and Airbus ACJneo like the arrival of a glamorous couple sure to shake up the social scene.



Jet Aviation signs another 787 customer for VIP interior

Jet Aviation has claimed another Boeing 787 completion contract, its second, a 787-9 for an undisclosed customer, the Zurich-based company announced at EBACE. Jet Aviation has dedicated "significant research and development" into carbon fiber composite airframes since 2013, and can integrate a cabin onto a 787 "without modifying the fuselage, avoiding time-consuming and costly repairs," the company said. The research "places us in an excellent position to create a finished interior that is truly VVIP, and represents the latest in aviation technology for business aircraft," said Neil Boyle, senior v-p, global completions. The interior will be installed at Jet Aviation Basel, the company's completions and maintenance center, which has performed completions on 28 Boeings since 1998.

Jet Aviation won its first BBJ completion contract in 1999, and recently the company redelivered that same BBJ, following a complete refurbishment and exterior repainting performed after the aircraft had been out of service for several years. All the seats, sidewalls and carpets were replaced, as was some of the wood marquetry. Additionally, a low cabin altitude modification was performed, and improved soundproofing installed using Jet Aviation's new, targeted sound prediction technology. A C-1 check and general defect rectifications were performed simultaneously on the Boeing.

Distinct from its completions team, Jet Aviation has an interior design refurbishment team that handles about 20 major after-market projects a year, like the BBJ makeover, said Simon Koenig, director of interior design refurbishment. Jet Aviation is currently performing complete refurbishments on two 747s, each requiring about six months.

"We are free at the design studio in Basel to let our inspiration push boundaries for our customers," said Koenig, "because we are supported by all of Jet's workshops and craftsmen who help breathe life into our designs."

In a branding video introduced at EBACE, Jet Aviation showcased its global refurbishment/retrofit/modification and upgrade (RMU) capabilities, highlighting its completion and maintenance centers in Basel, Geneva, and Singapore. The video captures what motivates its designers, and how they translate customers' visions into reality, said Tommi Krell, the company's head of global RMU/MRO marketing. ■



Jet Aviation
A380 lounge dining area

Comlux Completion USA last October claimed the contract for the first BBJ Max 8 completion, while AMAC Aerospace of Switzerland will perform the interior installation on the first VIP neo (new engine option, to reflect more efficient, upgraded turbofans), an ACJ320, for launch customer Acropolis Aviation, the UK charter operator.

The first BBJ Max 8 will arrive at Comlux America in Indianapolis, Indiana, in Q4, with redelivery to the undisclosed customer scheduled for fall 2019, said Comlux Aviation president and CEO Richard Gaona. Four design firms—Alberto Pinto Design, DesignQ, Unique Aircraft, and Winch Design—have been invited to submit design concepts to the customer, with final design selection expected in Q3.

In Basel, AMAC Aerospace awaits the Q4 induction of the first ACJ320neo. The project's design phase (by Alberto Pinto) is complete, as is more than half the engineering work, while construction of cabinets and furniture has commenced, AMAC CEO Kadri Muhiddin said at EBACE in May. Redelivery is scheduled for Q4 2019.



Addressing BBJ Max completion opportunities, AMAC Group COO Bernd Schramm said the company is “in dialog” with five purchasers of Boeing’s next-gen offering, who are “now entering the phase of decision making” on selecting a completion partner.

Meanwhile, Comlux has been tapped to perform the completion on an ACJ320neo for an undisclosed Asian customer, with the green jet to arrive at the facility in September 2019 for the 10-month project. Scott Meyer, CEO Comlux Completion, said the Max and neo projects “are paving the way for establishing Comlux as a leader in the VIP completion market.”

The Netherlands’ Fokker Techniek will perform the first VIP completion on an ACJ-319neo, under contract to long-term customer K5-Aviation, with induction scheduled for May 2019 and redelivery in early 2020. “Can you imagine how proud we are?” asked Jeff Armitage, Fokker’s managing director. “This will be the first ever ACJ319neo offered for VIP cabin outfitting worldwide.”

The ACJ319neo cabin will include the latest communication, IFE, and other technologies, while a focus on weight reduction will enhance the aircraft’s range and payload, Armitage said. Luca Madone of K5-Aviation called the contract award “a logical continuation of the existing relationship both companies have from previous projects.”





Up ahead, the Airbus ACJ350 XWB (extra-widebody) is in the wings. Like Boeing's 787, the ACJ350 has a composite airframe, and to ease and accelerate completions, Airbus offers its proprietary Easyfit concept, which allows cabin integration without airframe modifications. AMAC Aerospace and Jet Aviation completion centers in Basel have both received recent authorization from Airbus for cabin completions on the ACJ350 airframe. Neil Boyle, Jet Aviation senior v-p, global completions, proclaimed his company "ready and pleased to welcome ACJ350 XWB owners and operators" for completions.

New Cabin Concepts

Inner Harmony

Airbus Corporate Jets (ACJ) unveiled Harmony, a widebody cabin concept proposed initially for the new ACJ330neo, but adaptable to other ACJ widebodies, including the forthcoming ACJ350 XWB, which can reach virtually any location on Earth nonstop. In place of the angular lines of most VIP interiors, concentric circles, "like ripples on a pond," are a feature of the Harmony cabin layout, said ACJ.

"Long-haul flights provide time for productive work and socializing, as well as rest, and ACJ's Harmony cabin concept is wonderfully well designed to enable all of these, while bringing the world with a single flight," said Benoit Defforge, ACJ president, at the concept's introduction at EBACE.

Described as "timeless and elegant" by Sylvain Mariat, ACJ head of creative design, the Harmony interior includes a globe in the entrance area that holistically displays the aircraft's position, a master bedroom suite and office, and a spacious lounge with round table seating areas. Four VIP guest suites, each with an office that converts to a bedroom, plus an en suite bathroom with shower are farther aft, with seating for support staff and galley in the rear. Harmony can be adapted for both private and government customers.

Automotive Inspiration

Lufthansa Technik (LHT) introduced at EBACE "Inspired by AMG" with Mercedes-Benz, a second variant of its M-B Style VIP cabin. The interior combines the dynamic DNA helix architecture of the Style interior and Sensual Purity formula design language "to reach new customer groups with a strong affinity for a unique sportive design," said Wieland Timm, senior director sales, VIP and special mission aircraft, at LHT. Adapting Mercedes's new gray/black color scheme for the line, the interior "now radiates the powerful dynamic of the latest AMG cars," LHT said. The design also incorporates the so-called black panels from the Executive variant of autos, integrating displays and touch screens into the sleek black surfaces.



Velvet fist

Last fall LHT's VIP & Special Mission Aircraft division unveiled four cabin concepts for the brawny Airbus A330-200 Multi Role Tank Transport (MRTT), two of them—The State and Governor—giving the military platform a deluxe makeover for transporting heads-of-state, government members, and delegations. The State cabin, designed as a flying government office, incorporates all necessary equipment to enable governmental authorities or military staffs to work productively on board. The Governor configuration, which already has an undisclosed customer, can transport larger delegations of varying functions and statuses. All four cabin variants, which include Trooper and Rescue configurations, were developed in cooperation with military services and meet NATO TEMPEST requirements for signal emanation levels. Some 30 A330 MRTT aircraft have been ordered or are already in service with various air forces.

Done in VVIP manor

Jet Aviation, the UK's Winch Design, and Geneva's Sparfell & Partners have joined to develop a VVIP interior for the ACJ380, which would be the first such completion on this, the world's largest commercial jet.

"We've been excited about this project since Sparfell first approached us with their concept to pool all of our collective expertise to bring a completions solution for the ACJ380 to market," said Matt Woollaston, Jet Aviation v-p completions sales and design. Winch designs bespoke interiors for homes, yachts, and executive-configured aircraft, and Sparfell & Partners is a consultancy specializing in business aviation sales, acquisitions, and services.

Four A380s are coming out of lease, and the partners hope to convert at least one to VVIP configuration. Winch has created a concept embracing its "signature design philosophy, centered on the importance of creating dynamic spaces that are balanced, beautiful, and uplifting," according to the company. The half VIP/half-entourage layout features a forward bedroom on the upper deck for the principal, as well as a guest bedroom, with mini suites on the main deck. If more space is desired, "we have looked into going into the cargo area," said Mike Sutton, senior project manager at Winch. "The scale of it is exciting—the fact that you've got a double deck, plus the staircase," he added, noting its size makes the A380 "much like a yacht."

Under the agreement, Jet Aviation will engineer, manage, manufacture, install, and certify a VVIP cabin interior for this aircraft. Its Basel facility is "one of the few completions centers in the industry that can accommodate aircraft the size of the ACJ380 for VIP platforms," the company said.



“A lot of the design is already proven,” said Sutton. “It’s just nobody’s done it on that airframe,” he said. But given the scale, completion will require an estimated 2.5 years.

At the Completion Centers & MROs

Boeing Business Jets has contracted **Fokker Techniek** to design and perform the interior completion of a BBJ ordered by the Dutch government for transporting government officials and the Dutch Royal family. Configured in a two-cabin layout for 24 passengers (12 VIP, 12 staff), it will include a crew rest area and lavatory. The current state transport, a Fokker 70, has been in service for more than 20 years. Interior design activities are under way and the aircraft is scheduled for delivery to the Dutch government in 2019. Boeing and the Netherlands’ Fokker, a GKN subsidiary, have worked together on previous BBJ conversion and completion projects.

Completions and MRO specialist **AMAC Aerospace** has landed a completion contract for a head-of-state 747-8i, the company’s second completion on the platform. The 747-8i was inducted in AMAC’s Basel completion center in February for the 20-month project, the company’s second 747-8i completion, and will feature “a unique design,” said AMAC CEO Kadri Muhiddin. Company engineers will install an overhead AeroLoft in the wide-body for the undisclosed repeat customer.

Last year AMAC re-delivered a Boeing B777-200LR following a head-of-state completion incorporating “state-of-the-art technology systems, high-end in-flight entertainment systems including large monitors, the latest generation of soundproofing, and RGB mood lighting as well as customized artwork, custom furniture, monuments, and exotic material,” the Swiss company reported. The 20-month project marked its third green completion on the platform.

Lufthansa Technik (LHT) has received a VIP cabin completion contract for a Boeing 787-8 from an undisclosed customer, its first for a Dreamliner, the order “closing the final gap in our expertise for the Boeing 787,” said Wieland Timm, LHT’s senior director sales, VIP and special mission aircraft. Timm noted that Hamburg-based LHT has provided technical services to more than 100 Boeing 787s from various commercial and VIP 787 operators. The cabin will include an office area, bedroom and bathroom in the forward section, a mid-cabin dining and conference area, with delegation seating of different classes aft.

Boeing widebody completion specialist **Greenpoint Technologies**, this year celebrating its 30th anniversary, inducted its fourth 787-8 in April for an executive cabin completion. The interior, by Greenpoint’s in-house design team in partnership with the undisclosed



client, is scheduled for a 2019 redelivery from its Kirkland, Washington completion center. The third 787-8 is scheduled for redelivery this summer. Later this year, Greenpoint's first 787-9 arrives for an executive cabin installation. In addition to green completions, the company is also performing narrow- and widebody head-of-state refurbishments, said Bret Neely, Greenpoint executive v-p.

Greenpoint also received a patent this year for a 787-flooring system, utilized on all its completions, that provides customizable attach locations for aircraft monuments and furnishings. By standardizing modifications to the 787's unique floor structure, the system minimizes parts and reduces installation time, while still supporting custom interior configurations, Neely said.

A complete refurbishment **West Star Aviation** recently performed on a Falcon 2000XL at its Alton, Illinois headquarters facility included custom entry floors designed in house, and USB covers that light up with the customer's logo. The Falcon also got an FAA-certified aft baggage mod (available for the 2000 and 2000EX models), developed and STC'd by West Star, which adds 73.5 cubic feet of usable storage and an additional 185 to 275 pounds of baggage or equipment. The baggage compartment installation does not compromise access to common service and maintenance items, and no additional fire detection or suppression is necessary.



In other refurb projects, West Star created embossed headrests and contrasting red stitching for a Citation 560, and performed woodwork during the complete interior refinishing of a GIV-SP.

On its painting projects, West Star recently began using the Top Flight Supplies titanium paint protection system at its Alton and Grand Junction, Colorado facilities. The two-part coating process prolongs longevity of an aircraft paint job by fusing the paint pores and can even improve fuel efficiency by providing a slicker surface, reducing overall drag, West Star said.

GDC Technics has been contracted for four green head-of-state widebody completions, two each for a pair of undisclosed customers, the Fort Worth, Texas-based completion and MRO company announced in May. General partner Mohammed Alzeer said the contracts have “confirmed the confidence this industry has in GDC Technics,” adding “We have the resources, knowledge, and capacity to take on many projects of this magnitude and more.”

The company declined to disclose the aircraft types or schedules for the projects.

GDC has put an emphasis on the all-composite 787 airframe, and last year accomplished external penetrations on multiple models for connectivity installations including Ka-band, Inmarsat, satcom, and Live TV.

Current projects include “twin VVIP 787-8s,” and the interior elements of the first slated for re-delivery weigh 20 percent less than industry average for a VVIP cabin in the airframe, “providing our clients with an operational advantage and fuel savings throughout the life of their aircraft,” said Alzeer. This year the company will deliver three widebody head-of-state completions.

Ruag’s Munich paint shop repainted SBK Holding’s Bombardier Global Express XRS with a unique and complex “Carboneum” honeycomb scheme created by France’s Happy Design Studios. SBK Holding, sovereign investment fund of the United Arab Emirates, chose a full repaint of its eight-year-old aircraft “to express its own dynamic and innovative image,” according to Ruag. The design aims to evoke a sense of elegance, technology, and power, said Studios owner Didier Wolff. Reproducing the design patterns on the nacelles required the digital creation of “extraordinarily detailed” templates for the honeycomb effect. To optimize downtime, Switzerland’s Ruag performed a 15-month inspection simultaneously with the paint project.

Aeria Luxury Interiors announced a BBJ completion contract—the company’s third since its 2014 founding—at the Singapore Airshow in February. The green 737-700 is scheduled for arrival at the company’s San Antonio, Texas completion facility in Q1 next



year. The Aeria-designed interior, executed in a light color palette, will feature a VIP stateroom complemented by an en-suite lavatory with shower; an office/meeting room; staff seating; and separate passenger and crew galleys. Luxury touches include generous use of gold plating, wood, fine fabrics and ornate detailing, said Ron Soret, Aeria's vice president and general manager for completions.

Formerly a division of ST Engineering's VT San Antonio Aerospace—a major airline MRO—the VIP completion and refurbishment business has been rebranded as Aeria Luxury Interiors, a standalone subsidiary. The restructuring will enable Aeria to “tailor its processes to be focused on the completion business, thereby increasing its competitiveness,” said ST Engineering. Aeria will operate under its own Part 145 Repair Station certificate, allowing the company “to streamline its completion process and expedite its maintenance, refurbishment and completion contracts in the most efficient way possible,” the company said.

Flying Colours refurbished a Bombardier Global Express using essentially the same design the customer ordered for his Challenger 850 in 2013. Several “engineering and style adjustments” were made to the original plans, said Eric Gillespie, executive v-p of the Canadian company. “We had to take into consideration the larger cabin, the different type of usage, and the high standards of the Global to re-create the same look and feel.”

The Global's floor plan was modified to accommodate a new configuration in the mid-section, and two seats opposite the central divan were replaced with a four-seat conference group. All seats were upholstered in white leather and the armrests burnished with carbon fiber accents.

New Products & Services

In response to a spike in preowned Falcon transactions, **Dassault Aircraft Services** (DAS) launched Falcon Pre-Purchase Services, offering an array of capabilities ranging from paint and interior refreshes to new avionics and CMS installation, and propriety modifications and “engineered solutions” designed to keep the legacy fleet on par with new production aircraft. General manager Gary Schiff noted DAS has access to all the original drawings, engineering, and STCs that will lower the cost and time of any requisite, and many desired updates.

The Netherlands' Stahl and Switzerland's Maritime-Aerospace have combined forces under the **AeroVisto** banner with the aim of providing innovative interior trim materials and cabin interior solutions. Officially launched at EBACE in May, Stahl produces surface treatments and coatings for flexible materials, and Maritime Aerospace specializes in



aircraft interiors. The partnership provides Stahl, already established in several mobility markets, an accelerated path into the aviation interiors section, the company said. “With boundaries between mobility segments blurring, we see an opportunity to leverage our automotive core capabilities and actively drive the seamless integration of brand experiences across the different mobility modes.” Stefan Buri, global marketing director mobility at Stahl.

AeroVisto offers innovative materials for aviation interiors, starting with the introduction of a wide range of leather products. The aviation industry faces the challenge of elevating the customer experience while reducing operating costs. The AeroVisto portfolio aims to meet these demands and consists of high-quality, environmentally conscious solutions. The company said the introduction of Stahl Stay Clean lifetime+ products into the aviation interior segment will offer compelling and unique value-add to the marketplace.

The partnership gives Maritime “access to best-in-class surface technology and innovation leadership in interior trim solutions in automotive and other mobility segments,” said Hermann Bauer, Maritime managing director aerospace.

Duncan Aviation has expanded its 3D design capabilities, adding a multimedia artist specializing in 3D illustrations to its in-house aircraft interior and paint design team.



Computer generated 3D renderings “save a great deal of time and money, so they’re popular with all of our clients, internal sales and production people,” said Ken Reita, who heads the Lincoln, Nebraska-based MRO’s 3D conceptual illustration services. “Unlike with 2D drawings, we can draw from our extensive engineering database and generate accurate 3D models of the entire interior that are specific to the actual measurements of an aircraft,” said Reita. Additionally, “clients appreciate being able to see exactly what they’re getting,” he said.

Celebrating its 10th anniversary, Austrian charter operator **GlobeAir** is entering the refurbishment business. Two years ago, with its Citation Mustang fleet needing an interior refreshment, GlobeAir took on the refurbishment itself, designing and installing four different interiors. After receiving inquiries from other operators, GlobeAir is now offering upgrades as a stand-alone service.

“The entire fleet is aging,” said CEO Bernhard Fragner, seeing opportunity in the graying Mustang corral. In addition to its four designs, the company can provide customization for seat coverings and embroidered logos. Most of the work can be done without the customer’s aircraft, and the tear out and installation require only six days. Its first refurb job has been completed.

In January, GlobeAir, which owns and operates 16 Mustangs, moved into a larger hangar at its home base at Genoa Cristoforo Colombo Airport, capable of accommodating five of its aircraft at a time.

JetSet Interiors of Dallas, Texas, offers a new line of seats and a rapid finish process for wood veneer. The Signature Seating Series for Bombardier Global and Challenger jets can be built on the existing BE seat frames, and features wider headrests and armrests, a USB charging port, and iPad holder arm. Meanwhile, its quick-drying Rapid Finish Process for wood veneers cuts downtime 40 to 45 percent, saves about 10 percent in weight, and provides a stronger and more scratch-resistant finish than polyurethane, said company president Ron Larabie.

Elliott Aviation has launched a custom maintenance tracking app, Elliott Connect, enabling customers to manage aircraft maintenance online through a website or mobile app. They can apply change orders and get quotes, review invoices and work orders, and manage warranty program information, as well as communicate with Elliott team members. Greg Sahr, president of the Moline, Illinois-based company, called the new tool “especially valuable in the cases of large work scopes.” The app has already been successfully tested with a customer on a Citation 650 Doc 8 inspection.

Part 145 repair station **Infinity Aircraft Services** has launched Prestige Interiors,



Jet Aviation Singapore

an aircraft completions division offering interior soft and hard good refurbishments and replacement retrofits. Housed in a new 16,000-sq-ft facility that includes a 100 percent climate-controlled holding area for materials at its West Palm Beach, Florida location, Prestige offers custom handcrafted cabinets and solid surface countertops, and in-house-made seat coverings and cabin soft goods. With a full dye room, Prestige can create new colors or match custom hues. Refurbishment specialties include wood refinishing; full upholstery and seat foam replacements; leather repairs and replacement; headliners and baggage panels; and carpet extraction and replacement, according to Infinity.

Edelman Leather has re-organized all its collections by color, creating a Master Palette of 36 color families and laying “the foundation for our color theory and thoughtful transitions moving forward,” the Connecticut company said. Highlighting the change, Edelman is showcasing three popular embossed leather collections: Shagreen, Sulky, and Wagon Lit, all having wide application by designers in business jet interiors.



The 15 shades of the new palette of Shagreen, the irregular, pebbled surfaced leather, include shimmering colors and saturated hues that create dramatic interior effects. The burnished texture of the Sulky palette has been given five new colors, creating an even gradient from light to dark, and bringing an added level of sophistication to the overall palette, the company said. Wagon Lit's palette of "highly usable colors" represent "a hidden gem" for designers, and "demonstrates the chromatic logic and continuity of the Edelman palette as a whole," according to the company.

Edese Doret Industrial Designs (EDID) of New York City has appointed aviation management company GI Aviation of Abu Dhabi as its sole representative for the Middle East/North Africa region. GI Aviation will be responsible for providing initial meetings and discussions regarding aircraft owners' interior design requirements, and the coordination of subsequent technical meetings between the owners and EDID. In addition to executive aircraft, Edese Doret designs interiors for yachts and estates.

Aviation Fabricators (AvFab), provider of aftermarket seats and interior components for turboprops and light jets, received TSO approval in April for Beech 1900 seats. "We've been repairing them for years, but we can't get the parts" for the out-of-production seats, said G.R. Lowe III, company co-founder. The Clinton, Missouri-based company also provides components for Beech 1900 executive interior reconfigurations that feature club seating, tables, and an aft lav. The company just sold some 40 executive seats for U.S. military-operated 1900s that will be outfitted in combi executive forward/high-density aft seating configurations, according to Lowe.

AvFab provides aftermarket interior furnishings for several OEM products, including divans for Citation 500/550/560 models, Hawkers, and Beechjets, and the Nextant 400XTi (a remanufactured version of the Hawker 400), but "by virtue of the numbers" in operation, Beechcraft models represent the company's primary market. Customers include Part 135 operators seeking to give their airplanes more appeal in the market, and sellers "trying to market against newer" preowned aircraft, said Lowe.

Capping "several years of research and development," **UTC Aerospace Systems** launched the Flite series, a new product line from its Booth Veneers division. The new veneers, which include FliteFlex and AlumiFlite, were developed to meet customer requests for veneers that are lighter, more flexible, and less flammable, according to the company, lowering aircraft weight and improving performance. The products build on the company's existing three-ply veneers that use a poplar substrate first introduced by Carl Booth in 1976. The veneers provide weight savings of up to 40 to 60 percent compared to the company's current offerings, representing as much as 500 pounds in total, depending



on the airframe, said Joshua Florio, Booth Veneers general manager.

FliteFlex is a two-ply product that provides greater balance of thermal and electrical properties through its proprietary, patent-pending combination of face veneer and synthetic substrate. The burn-resistant substrate is thinner and more durable than its current veneers, and also offers increased flexibility, able to bend around radii that traditional veneers cannot. AlumiFlite is a three-ply product consisting of a face veneer with an aluminum core and poplar backer.

The face veneer is chemical-free, requiring no fire-retardant chemical, and the aluminum core is offered in two thickness options. FliteFlex and AlumiFlite are available in the same wood product varieties as Booth's legacy veneers.

Primadonna Lux of Tucson, Arizona, introduced the Diep Sleep System at EBACE, a lightweight, fold up bed frame with memory foam mattress that can fit between facing single or double club seats and in other cabin configurations to create a bed when needed. Diep Sleep unfolds in 30 seconds to form a single or double bed and stows into a compact package in one minute. The size, color, and finish of the sleep unit can be customized to match the cabin.

Infrastructure

Robinson Aerospace (formerly Robinson Aircraft Interiors), the Coppell-Texas based completion and refurbishment provider, is relocating to Alliance Airport in Fort Worth. "Now with the ability to serve our customers from a major airport location, we can truly realize our longstanding goal of becoming a turnkey U.S. completion and MRO center," said company president Jeff Robinson. The new facility has more than 217,000 sq ft of offices, conference suites, design showrooms, climate-controlled hangars, and integrated back-shops. The 14 hangar bays accommodate large-cabin business jets, and the new airport location will allow direct fly-ins by customers. The first project undertaken at the new location, a limited interior refresh and 12/24-month inspection on a Challenger 604, was completed and re-delivered at the beginning of September.

MRO and completion specialist **Jet Aviation** opened a hangar at Singapore's Seletar



UTC Aerospace Systems



Aerospace Park and is building another at its Basel headquarters. The company's third hangar at Seletar, opened during the biennial Singapore Airshow in February, includes an upgraded interior shop, drying rooms, a new soft goods area, and woodshop. Recently approved as an upholsterer of Rockwell Collins (formerly B/E Aerospace) 16G seating, the facility is the only approved 16G seating center in Asia, according to Jet Aviation, authorized to re-foam and re-style 16G seats, including those of China-registered aircraft. The 41,000-sq-ft hangar can accommodate up to two BBJs or ACJs, or five Gulfstream G550s.

Jet Aviation's 94,000-sq-ft widebody hangar in Basel, now under construction, will replace two older hangars, adding a total of 49,000-sq-ft of hangar space and 21,500 sq ft of shops and offices to its headquarters facility. Built to meet increased demand for widebody completions and refurbishments, the hangar is expected to be in service for Q4.

Flying Colours has added 40,300 sq ft of floor space and about 70 more employees—a 30 percent increase in staff—at its St. Louis, Missouri facility. The expanded facility commenced work in Q1 with several cabinetry projects.

In May, Austria's **F/List** opened F.List Canada, its new production facility in the Montreal aerospace cluster, offering a range of the company's high-end interior components and services, including stone and leather cabin flooring. Designated as F/List's Veneer Competence Centre for flame retardant wood veneers, which are key components of its interior finishing business, the 59,200-sq-ft facility will provide wood veneers for business jet interiors; finishing and assembly of interior components; refurbishment of interiors; and product and customer support for the North American market. Henceforth, its veneers—specifically, special three-layer fireproof wood veneers—and business jet equipment for North America will be produced here, allowing more flexible and faster service, the company said. Sean Johnson has been named CEO of the division. The facility also houses a showroom and veneer selection area.

F/List also has subsidiaries in Brazil, Germany, and the U.S., and has delivered more than 1,200 interiors for OEMs including Bombardier, Embraer, and Pilatus.

Medical Interiors

The vital signs of the medical interiors niche are strong. "We're seeing a spike in the global medevac market," said Sean Gillespie, executive v-p of Canada's Flying Colours, after delivering the first Bombardier Challenger 650 outfitted with a medevac interior, now in service with Swiss air ambulance operator Air-Rescue Rega. Two more medevac CL650s are set for delivery by year's end under contract to Bombardier Specialized Aircraft.



Flying Colours design engineers developed the interior in conjunction with Bombardier and medical equipment specialist AeroLite, which supplied the intensive care unit (ICU), and interior re-configuration adaption plates.

The cabin operates as a fully functional ICU for up to two patients with attending critical care experts, or can be easily reconfigured to transport up to four patients with an accompanying medical team. The layout ensures easy egress and access for the patients and medical teams, while soundproofing has been strengthened to improve the patient, passenger, and attending clinician experience. An additional four to six seats, depending on configuration, can be included for accompanying travelers.

Two aft galleys incorporate Enflite ovens, coffee makers, and customized double-width fridges that provide extra space to store medical supplies. Just aft of the cockpit, two bunks provide a crew rest area.

Flying Colours designed and built the majority of non-medical monuments, furnishings,



Flying Colours medevac interior



and interior components, and secured the STC for the installation from Transport Canada Civil Aviation and EASA.

The paintwork was completed in Flying Colours's dedicated paint shop at its Peterborough headquarters. The livery features a red tail fin with a white cross, and a red design spanning the front portion of the fuselage.

Jet Aviation designed and installed medevac conversions on two Embraer Legacy aircraft at its Basel facility: a Legacy 600 for an Asian customer and Legacy 650 for a Middle East client. Both are intended to serve dual duty, also flying VIP charters. Jet Aviation has developed STCs for modifications to switch out the two interiors in a matter of hours.

Gillespie sees demand coming from the charter market, with operators seeking a VIP interior that can be partially removed to make room for a stretcher.

Aviation Fabricators (AvFab), provider of aftermarket seats and interior components for turboprops and light jets, recently received an STC for a medical stretcher for the Pilatus PC-12, and earned EASA and Transport Canada approval for a medical stretcher for Cessna Citation 500 series jets. A stretcher for the Beech 1900 is under development, said AvFab co-founder G.R. Lowe III.

"That spike will continue as the population ages," Gillespie predicts of demand for medical interiors and components.

The Complete View

Spec-ing and outfitting a cabin today is more than just choosing the configuration, fabrics, and colors. With high-tech IFE/CMS, galley equipment, and the like, the completion of any business aircraft is a complex undertaking, and a growing number of companies offer completion management services, shepherding the process from contract to delivery.

Texas-based **Mente Group** and New Mexico's **Richard Roseman Airborne Designs** have partnered in E-First/White Glove, a completions management service providing predictive program oversight for head-of-state executive airliner completion projects. The service is focused on "creating stability in what is often a destabilized setting," said Vince Restivo, Mente Group's v-p of program management. The E-First (engineering first) portion offers preliminary engineering reviews of early design concepts, while the White Glove component provides advanced technical services during the project.

SR Technics has added VIP consulting services for completions and refurbishment of wide- and narrow-body VIP aircraft, and business jets to its offerings. The C&R assistance is augmented by new maintenance and lifetime support programs covering aircraft during and between scheduled downtimes. All are available worldwide in both full-service



and customized packages, and can be provided at the customer's base, a modification center, or remotely, the company said. The C&R services cover areas including design concept, proposal and contract, engineering, production, and testing and redelivery, capped by "downstream" services that manage the aircraft from completion to operation. In addition to marshaling internal resources to meet client needs, SR Technics said it will use its "unique and rapid access to a range of experts in related fields" to advance projects "without the need of hiring third parties."

The Zurich-based company counts its "Swissness"—encompassing customer focus, a structured way of working, and attention to detail—among the consultancy's competitive advantages.

In February, Montreal's **AP Completion Services** celebrated its 100th business jet completion management engagement, after shepherding a Gulfstream 650ER through production at Gulfstream's Long Beach, California facility. The interior is "non-standard





and highly customized; the owner is a very design-savvy individual,” said AP founder Andrew Broccoli.

AP typically works with clients post-purchase, “from specification to delivery,” said Broccoli, a former production executive at Bombardier. He’s currently working with six Global 7500 buyers to “specify interior elements and accelerate the completion process.”

New models coming into service will create more need for completion management services, as well as for refurbishments and oversight of those projects. “All our Global 7500 customers are repeat customers, so they’re going to be trading in airplanes,” said Broccoli.

Broccoli counts seat leather, stitching, finishing, veneers, monument finish, and paint among the areas where completions issues can arise. He estimates about one in eight new aircraft buyers seek completions management services.

“I tell customers all the time, if you don’t want to hire us, we don’t take it personally, but send somebody—anybody,” he says before back-tracking, noting that buyers sometimes send a chief pilot or director of aviation. “They can’t help,” Broccoli said of these flight department personnel. “They might be involved in one [completion] every four or five years. This is what we do daily.”

Meanwhile AP oversaw delivery of a CL350, its 101st project, in March. ■

Gone West

In late 2017 completionist pioneer Associated Air Center (AAC) ceased operations and closed its large transport category VIP completion center at Dallas Love Field. Parent company StandardAero concluded after analysis that AAC’s “business case” was “no longer an economically viable option for the company and its investors” given that: “Current and future work volumes do not support the fixed costs necessary to operate the facility. In addition, the limited pipeline for new business opportunities, excess industry capacity, and slowing demands in the VVIP aircraft marketplace have all contributed to this decision.”

AAC would have celebrated its 70th anniversary this year. It performed its first executive liner completions in 1978, on two Boeings for the president of Mexico. ■



MARK WAGNER

The ACH corporate cabin collection

A year after bowing as a bespoke, standalone division, Airbus Corporate Helicopters (ACH) was back at EBACE, scene of its launch, showcasing the first ACH130, the turbine light single with its branded interior; the company also announced news of its progress. The complement to the Airbus Corporate Jets fixed-wing fleet, ACH aims to underscore Airbus's value proposition as the only manufacturer to offer both executive airliners and executive helicopters.

The first ACH130 is outfitted with the racing-inspired "Stylence by ACH" luxury configuration, which "combines unique passenger-focused design, exceptional single-engine performance, and first-class-quality and comfort," said ACH head Frederic Lemos.

Monaco-based VIP charter operator Monacair, which has eight ACH130s in its fleet, will operate the ACH130 for the undisclosed customer. Japan's Auto Panther, the country's first operator of the platform, ordered an ACH130 in Q1, slated for corporate VIP transport in Kagoshima.

ACH offers VIP versions of half a dozen Airbus Helicopters models including the ACH125, ACH135, ACH145, ACH160 (in development), and ACH175, each available in the company's three design offerings: Stylence by ACH; Exclusive by ACH; and ACH Editions.

"Stylence by ACH" represents off-the-shelf luxury, with details and appointments aimed at the corporate market, featuring fashionable yet rugged, high-quality interiors. Numerous choices in outfittings and options are available. "Exclusive by ACH" represents the ultimate in customization, for example matching the helicopter's interior to the décor of the yacht it will service, or reconfiguring the interior to meet an owner's unique needs or desires. In addition to fine woods, cabins may be finished in materials including crocodile or manta ray skin, said Christine Fraud, head of interiors sales and marketing, global business at ACH.

"ACH Editions" are interiors created with partners such as Hermes and Mercedes-Benz, "paramount luxury companies that have exceptional savoir faire, and have brought it to us in the helicopter industry," said Lemos.

Looking ahead, the ACH160, the next-generation super-medium helicopter, is on track for certification in 2019. Stylence by ACH for the ACH160 will be available in 2020, and the Exclusive by ACH in 2021. The Exclusive cabin for the 160 includes electric footsteps, a sponson to hold flotation devices, double-glazed windows, and an interior cocoon to lower cabin sound level.

Orders for five ACH160s are in hand; the launch customer, an unidentified U.S. operator, will take four, the first with a Stylence interior.

Lemos noted onboard entertainment and communication systems aboard rotorcraft are of less concern than on fixed-wing platforms as passengers spend relatively little time onboard. However, the trend is to support individual personal devices, rather than feature a large-screen monitor popping out of a credenza, for example, he said. As for communication systems, corporate helicopters, unlike fixed-wing aircraft, often operate at altitudes at which cellular ground networks are available to passengers, though such use can contravene telecommunication rules.

Going forward, ACH has developed a checklist of up to 2,000 items, depending on the model, where improvements can be made, and is developing ways to quantify and "objectivize" quality. "People say, 'It's nice,' or 'This is very good,' but it's not tangible, and people in engineering do need to understand how we measure quality," as do ACH's subcontractors, said Lemos. "It's a continuous process," he added. "The points of control were not existing as much in the past."

Since its launch a year ago, ACH has accounted for 58 of the total of 335 aircraft sold by Airbus Helicopters, and Lemos said that ratio (about 17 percent) is consistent with the sales share the division expects going forward. ■

For news on cabin entertainment, communication and management systems, see **AIN's** annual Cabin Electronics Special Report in our August issue.