



Completions and Refurbishments

by James Wynbrandt

More comfort, flexibility, productivity and utility—that’s what the completions and refurbishment (C&R) industry has long offered business aviation. With the introduction of a new-generation composite bizliner, retrofits offering the latest onboard connectivity technologies, adoption of 3-D capabilities that streamline interiors projects, and many more milestones, the past year has put an exclamation point on the progress this sector perennially leads and showcases.

Completion Centers

Amac Aerospace Switzerland has acquired France’s JCB Aero SAS, which produces interior elements such as curved honeycomb panels and composite structures and provides engineering and helicopter completion services. Located in Auch, JCB will continue operating under its own name for the present. It has 120 employees, a 54,000-sq-ft hangar and 66,000 sq ft of office space. Citing its “experienced and highly

skilled craftsmen,” Kadri Muhiddin, Amac’s group executive chairman and CEO, said the acquisition “makes the perfect complement to Amac Aerospace’s operations and core competencies.”

Meanwhile, at its Basel headquarters facility, Amac refurbished a BBJ3 737-900ER with new seats, handmade carpeting and electrically controlled high-low tables, and modified existing divans. That project followed the green completion late last year of an ACJ319.



An Amac technician at work



Bombardier interior



Airbus ACJ350 lounge

Amac has also returned a head-of-state A320 to service following heavy maintenance that included installation of a satcom system and cabin connectivity upgrade for onboard GSM (Global System for Mobiles) usage. Amac will also perform multiple cabin modifications on a Boeing 777-200 as part of a new heavy base maintenance contract, and will refurbish a BBJ 737-700.

Muhiddin noted that while green private widebody sales are down, growing demand for interior refreshment is keeping the facility busy. "If you don't have a new airplane, the next step is refurbishment; if you don't want to spend \$100 million, you spend \$20 million," Muhiddin said.

Amac is among the completion centers offering high-speed Inmarsat-Honeywell JetWave Wi-Fi systems, and recently installed and developed an STC for a BBJ3, its fourth Ka-band STC. It's also developing Ka-Band installations for BBJs, BBJ 777s, and ACJ340s.

Early this year, more than a month ahead of schedule, **Associated Air Center (AAC)** of Dallas, Texas, delivered its first BBJ 747-8 completion, to an

BBJ 787 and ACJ A350: New-gen bizliners take completions spotlight

Turf wars between BBJ and ACJ have advanced into the new generation as completions plans and projects for the composite BBJ 787 Dreamliner and ACJ A350 XWB (Xtra Wide Body) move from 3-D toward reality.

BBJ 787

Boeing Business Jets and Kestrel Aviation Management displayed the first BBJ 787 with a fully customized interior at EBACE in Geneva in May. (Only invited guests were allowed inside.) The 40-passenger cabin, finished in a palette of earth tones, was designed by Kestrel and Pierrejean Design Studio of Paris and has a forward master suite with bedroom, an expansive lounge area, and in the rear a guest cabin with first-class seating. Kestrel, based in Washington State, has driven the project from its inception (this is the 11th private widebody project it has managed) and for the 787 the company says it "explored the world for materials never before seen in corporate aircraft. The texture of our carpet offers gentle reflexology, which is wonderful for the feet and circulation. We have found and customized the best leathers, materials with silk threads and even innovative lightweight metal composites."

At the end of 2013, after the interior had been designed, Greenpoint Technologies was awarded the contract to perform the completion at its

facility in Moses Lake, Wash. The aircraft arrived there in early 2014. By the time the Dreamliner landed in Geneva for EBACE it was on the cusp of FAA certification, and Stephen Vella, Kestrel's chief executive, told **AIN** in the middle of last month that "on behalf of our principal, Kestrel is in the final closing process with [China's] HNA Aviation Group" for ownership of the aircraft.

"With this BBJ 787," said Vella, "we are launching corporate aviation into a new era of luxury, technology and style." HNA said at EBACE that the aircraft will be registered in Guernsey, one of the Channel Islands between England and France. It will be only the second aircraft to sign up with that recently established registry.

Supporting its assertion that this is the first true BBJ 787, Kestrel emphasizes that this is "the only one with an entirely bespoke interior." The airplane is slated for delivery this month, "largely on schedule, to budget and below the contracted cabin weight," according to Vella. "The degree of

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undisclosed Middle East head of state. AAC's in-house team designed the more than 5,000 sq ft interior (4,786 sq ft upper and main deck cabins, plus 393 sq ft berthing module). Purpose-specific zones accommodate resting, meeting, dining, lounging, gaming and medical services, while audio-video-on-demand (AVoD) is universally available through in-arm, personal LCD touchscreen and 55-inch bulkhead-mounted LED monitors. The passenger flight information system (PFIS) displays 3-D moving maps and external high-def cameras provide landscape viewing. Multi-region satellite TV, Internet and video conferencing are provided via Satcom Broad Band (SBB), and LED mood lighting and multi-zonal cabin humidification system. Three of the nine lavatories are equipped with showers. AAC's in-house certification

organizational designation authorization (ODA) team obtained several FAA supplemental type certificates (STCs) as well as other EASA and customer country validations.

In September, AAC will deliver an ACJ320 to another undisclosed Middle Eastern customer, its 90th head-of-state completion, said AAC president James Colleary. The interior has a bedroom, private lounge and dining, entertainment and staff areas. JetWave satcom will provide connectivity. Meanwhile a BBJ 747-8 and BBJ 787 are both nearing completion, scheduled for redelivery before year-end.

Fokker Services will convert China's Comac (Commercial Aircraft Corp. of China) ARJ21-700 regional airliner into a business jet through a Netherlands-based joint development program. Final



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BBJ 787 and ACJ A350: Continued

interaction required between Kestrel and the modification center was uncharacteristically intense." **AIN** understands that an aircraft of this opulence would carry a price tag in the region of \$350 million.

Jon Buccola, chairman of Greenpoint (a division of Zodiac Aerospace) called the completion "only the tip of the iceberg for our 787 future," noting that the company has a second BBJ 787 in completion. Associated Air Center and GDC Technics also have BBJ 787 completions in the works.

Two other BBJ 787s are currently in operation, one owned by a Middle East airline and the other by the government of Mexico, but neither has an all-VIP interior.

Meanwhile, at least one airline wants to upgrade its Dreamliner passengers to business (aviation) class. Lufthansa Technik (LHT) will soon commence a comprehensive cabin modification program on a green Boeing 787-8 for the undisclosed airline. The aircraft, accommodating about 200 passengers, will be outfitted with upgraded in-flight entertainment and communication systems, and modified galley and crew rest compartments. The 787 will arrive at LHT's completion center in early autumn, said Walter Heerdt, senior vice-president for VIP and special-missions aircraft. Installation is expected to require about two months.

ACJ A350

With green deliveries of ACJ A350 XWBs (Xtra Wide Body) scheduled to begin in 2019, completion centers are showcasing their interior design concepts for the aircraft. **Lufthansa Technik's (LHT's) "Home" concept** is designed for a new generation of private airliner buyers, said Michael Reicheneker, LHT's chief interior architect, and Home's co-designer. "Our customers are getting younger, and they will have different demands on what they want their aircraft to do." LHT answered with a flexible space that allows an owner to enjoy complete family privacy or grand entertaining, while still accommodating staff and other support needs.

Home puts the master suite area in the front of the cabin, which Reicheneker calls "the best place in the airplane, the

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Interior Visions

C&R specialists are using 3-D design tools and technologies to tackle two critical issues confronting completion and refurbishment projects: getting customized interiors to fit inside airframes properly; and getting customer approvals for design changes, work orders and other project modifications and milestones, so work can proceed on schedule. With 3-D protocols, projects can now be designed and manufactured so precisely that interior elements require only a single fitting, rather than the two and three fitting and adjusting steps previously required.

Jet Aviation Basel (JAB) has harnessed this 3-D technology to create JetVision, a web-based app that lets clients monitor their projects and provide needed feedback and approvals in real time from anywhere in the world. The app is an outgrowth of the Basel-based provider's preparations for completions on BBJ 787s and the ACJ A350s, said Matthew Woollaston, vice president of completions sales and marketing.

"The overall goal is to reduce the downtime and give the client a far greater understanding of what they're going to receive at the end of the program," Woollaston said. "We came to the realization we would probably be moving faster [on completion projects] than the principal and their representatives would be able to make decisions."

In addition to precise depictions of design and layouts for clients' approvals, JetVision provides progress reports, images and video feeds in real time. The app is smart device based, and both iOS and Android compatible. Though created for completions on new-generation aircraft, JetVision can be adapted for any completion or refurbishment project, according to Woollaston. ■

Completions and Refurbishments

completions and outfitting will be performed at Comac's Shanghai Aircraft Manufacturing division. Peter Somers, president of Fokker Services, said the company is "especially excited to be involved in the conversion of the first Chinese-built business jet." Fokker's previous regional-to-bizjet conversions are the CRJ700 and its own F28 and F70. At the end of last year, parent company Fokker Technologies was purchased by GKN for \$760 million.



Jet Aviation St. Louis

Jumpstarting its move into JetWave high-speed Wi-Fi, **GDC Technics** is investing almost \$20 million in developing STCs for Ka-band connectivity, said GDC general partner Mohammed Alzeer. By the first quarter of next year the company will offer Ka-band connectivity STCs for the BBJ 737/747/777 and similar STCs for the ACJ330/340 by the third quarter. "We're saying to the customer community, 'You don't have to pay for all the engineering and certification costs,'" said Alzeer. Having participated in the engineering of every commercial airplane that entered service within the last decade, including the 787, A380 and A350, GDC is well positioned to take on this challenge, he said.

GDC currently has two BBJ 787s and a BBJ 777ER undergoing completion. Another BBJ 787 will be inducted next year, and the company is in discussions for a widebody completion and refurbishment, Alzeer said.

Inside its facilities at San Antonio and Fort Worth, Texas, technology investments have streamlined completions, which now require only one fit check per project, reducing costs by about 30 percent in the last year, according to

Alzeer. But "there are processes you cannot speed up," he said, pointing out that craftsmen do much of the hand fabrication. "People who do the work are artists. You can have it machine made; it looks beautiful, but it doesn't have the soul."

"The most dangerous thing I see in the industry is [the possibility of] second-tier completion centers competing with each other on price," said Alzeer. "Then you'll find airplanes stuck" in those facilities, he said, should they face financial difficulties brought on by their cost cutting.

Long known for green completions and tip-to-tail refurbishments, Montreal's **Innotech Aviation** is now promoting its a la carte services to OEMs and operators. "We want to get the message out that you don't have



A350 dining area by Jet Aviation Basel

BBJ 787 and ACJ A350: Continued

most quiet, the least affected by movement." The forward section can be closed off with "huge sliding doors," transforming the space into a private suite with bedroom, and providing the opportunity to gather alone with family, "something VIPs often don't have enough time to do," Reicheneker said.

This private section joins a large guest area to its aft, and when the sliding enclosures are opened, forms "a huge cinema lounge" for entertaining. Healthy dining is also a focus, and with a galley equipped with LHT's new inductive cooking stove, "You can always have a fresh meal prepared instead of having something coming out of a microwave," said Reicheneker. The rear of the cabin has a large spa area. "We want the VIP to leave more relaxed than when he entered," Reicheneker said.

Jet Aviation Basel (JAB) recently unveiled a [private XWB cabin from JAB's Design Studio](#) taking inspiration from both high-end hotel and residential design philosophies. The proposed cabin layout features a large lounge and dining area segmented into separate spaces for eating, relaxing and socializing, and balanced by a spacious private suite with a master bedroom, bathroom and private lobby. The proposed design elements include an electrochromatic shade system and induction chargers within the nightstand in the bedroom, and a heated towel rail and walk-in shower in the bathroom. ACA Advanced Computer Art created renderings of the interior.

Airbus launched its own corporate-jet version of the A350 XWB airliner, the ACJ350 XWB, with Easyfit provisions for simplified cabin outfitting. (Simplifying all ACJ350 completions, Airbus has pre-equipped the carbon-fiber composite fuselage with 200 attachment points, easing interior design and installation work.) The -900 XWB's 2,910 sq ft (270 sq m) cabin can fly 25 passengers up to 10,800 nm/20,000 km, or some 22 hours aloft.

Like the Summit interior for the ACJ330, the ACJ350 XWB offers a more economical and faster path to completion and entry into service, with a selection of popular modules that can be mixed and matched for flexibility and individuality, without the costs of a customized completion. ACJ thus far has an order for one A350.

-J.W.

to show up with an airplane” or need major work for Innotech to take on a project, said Rob Brooks, vice president and general manager. “We’ll build you a set of cabinets, or you can send your old cabinets in for refreshment. We’ll build you a set of seats, or we can send an engineering team to manage an installation.” Innotech will “brand our cabinet shop, our upholstery and interior design capabilities as resources” for outsourcing a complete cabin, “or just monuments, upholstery work or shower installation,”

has wrapped its fourth green ACJ and ninth bizliner completion overall with the redelivery of a privately owned ACJ320. Comlux Creatives led the design team under the direction of Lauri Church in partnership with Fiona Riddle of InFlight Solutions, the customer’s design representative. The lightweight cabin outfitting optimizes range performance while maintaining a noise level in the master bedroom measuring just 45.4 dB, said Richard Gaona, Comlux chairman and CEO.

The interior motif blends



Haeco Zen interior

said Brooks. Headquartered at Dorval Airport (CYUL), the company has experience with Dassault, Gulfstream, Hawker Beechcraft and Textron/Cessna Citation, as well as its signature work on Bombardier models.

Aloft AeroArchitects (the former Pats Aircraft Systems) completed a BBJ2 for His Majesty the Sultan of Johor of Malaysia, certified by Aloft’s on-site ODA and validated through the presiding local airworthiness authority in Malaysia. Designed by Aloft in partnership with Edese Doret Industrial Designs of New York, this was the company’s 16th head-of-state BBJ completion, said John Martin, Aloft president and CEO.

Comlux America, completion center for Switzerland-based Comlux the Aviation Group,

modernism with classic European styling. A color palette of white and cream contrasting with dark veneer “allows the flow between rooms to feel natural and relaxing,” said Riddle. In addition to the master suite, the layout provides a forward lounge and staff area, and a business-class seating section.

The Indianapolis facility is now upgrading the cabin and installing security systems on a pre-owned ACJ319 for the government of Slovakia, in a purchase arranged by Comlux Transactions. This marks the fourth nation (Jordan, Kazakhstan and Malaysia the others) for which Comlux has assumed fleet renewal responsibilities.

Greenpoint Technologies’ second BBJ 787 Dreamliner completion is under way at the company’s facility in Moses

Notable projects of the past year Under Way and Planned

ACJ A320neo

UK charter operator Acropolis Aviation has tapped France’s Alberto Pinto Design (APD) for its ACJ A320neo interior design. The 19-passenger cabin will have a private master bedroom with luxury en suite bathroom, and large galley outfitted like a terrestrial kitchen. APD also designed Acropolis’s current flagship, an ACJ A319, whose features include the first shower installed in an ACJ. Yves Pickardt, who designed that interior, will head the Neo project. Delivery of the green aircraft is expected in late 2018, with entry into service in early 2020.

Globals

OHS Aviation Services has completed a highly customized interior refurbishment for a Global Express in less than eight weeks, the 15th cabin makeover the Berlin-based company has performed on the model. Designed by Tim Callies for ArcosJet Design in a palette of dark chocolate brown, light cream and nuances of green, the refreshment included new seat design, seat belts, carpet, counter tops, sidewall and ceiling coverings, divan recovering, wood veneer rework, and individualized accessories such as monogrammed towels and pillows, with fabrics from Dedar and Hermès.

Jet Aviation St. Louis and SmartSky Networks are jointly installing and plan to certify the first airborne 4G LTE-based wireless Internet network on a Global Express. The resulting STC will be available for the retrofit market. David Loso, manager for avionics sales at Jet Aviation St. Louis, called SmartSky “game-changing technology.”

Charlotte, N.C.-based SmartSky plans to roll out its air-to-ground network, SmartSky 4G, later this year, with full U.S. coverage slated for 2017.

Ruag Aviation early this year finished a total cabin refurbishment of a Global Express XRS and system upgrades, an 8C check and full aircraft repainting. The Swiss company’s design team replaced all wooden applications, veneers, varnishes, plating and soft furnishings, as well as new seats and divans, complete with leather and fabrics. Among the upgrades were full-spectrum LED mood lighting in the cabin, galley, entrance area and lavatories, dual-channel satcom SwiftBroadband with Wi-Fi and GSM connectivity, acceleration and channel bonding, Internet Television (IPTV) over satcom SwiftBroadband, and new wireless handset system, as well as transitioning from cabin IFE to high-definition standard (HD-IFE), consisting of new HD monitors, HD source equipment, 3D wireless Airshow, distributed and streamed Avod with SkyBox and Boxee integration.

Challenger 604

Istanbul’s MNG Jet refurbished the cabin and cockpit of a 17-year-old Challenger 604 with new carpet, new seat leather, sidewall and ceiling leather, complete wood veneer change, metal plating, and seat belt replacement, as well as USB data loader modification and EFB installation on the flight deck. The lavatory

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Gulfstream G600 mockup

Lake, Wash. As part of the project, Greenpoint installed the first Ku-Band antenna for in-flight connectivity on a 787-8 and is offering the STC to other 787 completion providers. The 18-month project is scheduled for delivery early next year. Also under way at Moses Lake: interior and engineering developments design work for a BBJ 777-200LR completion for an undisclosed client, scheduled for induction early next year.

Haeco Private Jet Solutions introduced Zen, a single-aisle cabin concept drawing inspiration from Buddhist ideals of harmony, balance and tranquility. The natural, free-flowing interior incorporates a symmetrical layout and colors from the four seasons. The lounge, featuring light green furniture and a cherry blossom motif, represents spring. The lotus flower and red carpet in the galley signifies summer, while the tatami area, decorated with a chrysanthemum floral pattern, is autumnal. A multi-purpose table in the tatami area can be used as a mahjong table, a tea table and a tatami bed. In the bedroom, pure white and plum blossoms provide shades of winter.

The design continues the Xiaomen, China company's signature combinations of traditional

Asian design elements with Western motifs, seen in its feng shui-inspired Xiao Yao single-aisle interior, and East Meets West cabin concept for the A330-200. Haeco also has a U.S. office in San Antonio, Texas.

Jet Aviation Basel (JAB) recently completed a head-of-state ACJ320 interior refurbishment for an undisclosed European government client "significantly ahead of schedule," said Joshua Florio, completions project manager for the Zurich-based company. Designed and engineered in house and certified under EASA STC for private use, the 57-passenger layout provides a bedroom, bathroom, lounge and office in addition to a large executive staff area.

Last fall JAB completed a new ACJ340-600 for an undisclosed client in Europe. Equipped for 121 pax, the layout features a forward galley, dining and lounge areas, a master bedroom and en suite bathroom with shower, a second bedroom with its own bathroom, an office, first-class seating and dining areas, a mid-galley complex, a staff seating area and an aft galley. Its IFE features satellite TV and a wireless LAN linked to primary and alternate satellite high-speed-data communication networks. A

Notable projects of the past year Under Way and Planned: Continued

and galley were also refurbished. The work was completed in 12 weeks during a scheduled 96-month inspection and landing-gear overhaul. MNG Jet is now preparing for its first Global Express refurbishment when the jet comes in for an 8C check.

Citations

Spectrum Aeromed has equipped the Argentine Army's (Ejército Argentino's) newly delivered pre-owned Cessna 550 Citation Bravo with a complete air medical interior providing an advanced life support system with a defibrillator, ventilator and infusion pump. The Fargo, North Dakota company worked with Textron Aviation in arranging the sale and installation of the interior, which follows the Argentine force's purchase of two Cessna 208 Grand Caravans equipped with medical interiors from Spectrum. The aircraft are intended to allow the service to provide medical transport throughout the large country's diverse and remote areas.

Legacy 650

Jet Aviation Basel delivered a major refurbishment performed on a U.S.-registered Legacy 650 in conjunction with its C-check. The project involved full carpet replacement, seat and divan re-upholstery, wood repairs, recovering of the dado panels and a new non-textile flooring installation in the galley, in addition to an avionics upgrade. Jet Aviation Basel also repainted the aircraft's exterior.

Falcon 2000

West Star Aviation has created a 13-passenger interior in the standard eight- to 10-passenger Falcon 2000. The project, performed at West Star's East Alton, Ill. facility, required fabricating a smaller galley and auxiliary galley/entertainment center, shifting the forward cabin bulkhead/door forward, and extending all the side ledges and window panels. Rearward, the addition of a new conference group in the back of the cabin necessitated modifying the aft bulkhead to accommodate a new door location. Structural modifications below and above the cabin floor were also required to support the new loading. The interior work included all new veneers, soft goods, countertops, plating, and switch panels for the new seating configuration.

West Star's in-house engineering group and on-staff DER provided engineering support, with final certification for the reconfiguration accomplished via an FAA Form 337. Interior manager James McCann said Dassault Falcon might have previously delivered one 13-passenger Falcon 2000, but called West Star's layout "a unique configuration."

Hawker 800XP

Cleveland-based Constant Aviation is installing Gogo Biz 2000 Wi-Fi systems in eight aircraft—six Beechjet 400A/XPs and two Hawker 800XPs—from Georgia Jet's owned and operated fleet. The installations began early this year. Constant has developed and owns about a dozen Wi-Fi STCs, experience that enabled the MRO to "guarantee Georgia Jet minimal downtime for each installation," said Jay Rizzo, vice president of sales. —J.W.

humidification system heightens comfort during long-haul flights.

After more than two years of work, Hamburg's **Lufthansa Technik** (LHT) has delivered the first of three head-of-state BBJ 747-8 conversions it is performing simultaneously for an undisclosed customer at its VIP & Executive Jet Solutions facility. Each interior, larger than 4,700 sq ft, is individually designed and equipped with custom hand-made parts incorporating more than 300 different finishing materials. An integrated cabin management and onboard entertainment system delivers broadband Internet, GSM, WLAN, Live TV and satcom. The first aircraft has a large conference room, lounge, bedroom and several bathrooms with showers.

LHT is also performing completions on two BBJs for Abu Dhabi-based Royal Jet, with redelivery slated for the third and fourth quarters. New York's Edese Doret designed the 34-passenger interiors, each providing a private master bedroom and master bathroom, large lounge area, and business- and economy-class areas.

LHT and Mercedes-Benz unveiled a cabin design floor plan for single-aisle private airliners. The 16-passenger interior features independent spatial zones without the typical configuration of seat and wall elements. The forward area has a foyer, galley, a private room and lavatory, while the aft cabin combines a separate entertainment zone with an en suite private area. The en suite space features an open-design bathroom and bedroom conceived around a freestanding shower with transparent sidewalls, with a king-size bed framed by an upholstered concave head wall.

Jet Aviation St. Louis is seeking to attract customers from outside the U.S. to have cabin refurbishment work done at its facility, perhaps in combination

with heavy maintenance. The company has delivered more than 200 completed aircraft, among them numerous Bombardier models. Earlier this year, it upgraded its paint facility, which now has improved environmental controls and devices that can analyze paint color tint, inspect pearl and metallic paints, and gauge the smoothness of a paint finish.

Refurbishers

Pentastar Aviation of Waterford, Mich., opened an aircraft interior design studio in September at its headquarters at Oakland County International Airport. The studio will support the company's interior work, where "clients can meet our experts and touch and feel the high-quality materials we use to bring aircraft cabin visions to life," chairman and owner Edsel B. Ford II said at the opening event.

Duncan Aviation, the Lincoln, Neb.-based MRO provider, installed the first F/List stone floor in a Falcon 2000. The 2.5-mm-thick granite (marble is also available) sits on a lightweight panel substructure, adding little weight over standard flooring, according to the Austrian manufacturer. Meeting all slip resistance and other applicable certification requirements, the stone is available in various colors and can be enhanced with customized tiling concepts, mosaics, borders, logos and other design options.

Global Aircraft Interiors of Ronkonkoma, N.Y., recently refurbished a GV and a Citation 560. The GV upgrade provides a Blu-ray DVD player and 20-inch HD monitors. Global president Robert Roth said he has seen rising demand for cabin improvement projects. He told *AIN* the company has "seen things really turn around in the last months. [Owners are] stepping up to the plate and doing complete refurbishments, instead of putting band aids on the interior."

New Products and Services

AviationGlass & Technology (AG&T) of the Netherlands received approval for the first use of lightweight glass for aircraft interiors through an EASA STC for its ultra-thin glass mirrors and panels in a Falcon 900. The glass replaced all protective inner windowpanes in the cabin and the mirrors were installed in the lavatory. AG&T's patented glass is up to 50 percent thinner and 20 percent lighter than traditional polycarbonate products, said CEO John Rietveldt. The company also received a production organization approval certificate for its manufacturing facility in the Netherlands. Since 2010, the EASA has applied more stringent requirements for use of glass inside aircraft cabins.

MSB Design's Hi-Lo conference tables are now available as a line-fit option on the Gulfstream G500/G600, the aircraft for which the latest manual versions of the table were designed. The new table features a slimmed pedestal and carpet pinch beauty ring. The Montreal company also offers an electric pedestal version that can be operated by Bluetooth, changing between dining and coffee-table modes; and an optional oval shroud converting the standard round or square shape into an elegant oval. The table can support 600 pounds of load and survive 1,400 pounds of weight in the deployed position.

Leather specialist **EcoDomo**, which introduced custom-made leather countertops for homes and luxury motor coaches, is offering similar countertops for business aircraft. Christian Nadeau, president of the Rockville, Md.-based company, said the material can be treated to meet FAA flame resistance standards. Made in the U.S., the full-hide leather features an extremely durable waterproof finish and can be used for dining surfaces or wet bars. The leather is dyed through, and thus hides scratches. EcoDomo also makes a recycled leather product more dense than red oak that performs like laminate, used for flooring in deluxe custom motor homes. Nadeau said a major business aircraft OEM has approached the company about creating leather flooring for its aircraft.

Worn or damaged countertops have an alternative to replacement or complete repainting, with repairs introduced by **Ruag**. The repairs can be performed during a scheduled maintenance event at the Switzerland-based firm's Part 145 facilities in Berne, Geneva, Lugarno or Munich, with approval guaranteed. Ruag's paint specialists can evaluate any countertop repair project free of charge and discuss various techniques and finishes, from palette knife painting to opalescent refinishing effects. The experts

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Lufthansa Technik's chair and induction cooktop

The Citation 560 refurbishment features “a modern European look with bold colors” and a black piano finish on the woodwork, LED lighting, and custom made leather from Aeristo, with multiple stitching patterns in the seats. A Wi-Fi system and new CMS were also installed.

Aeria Luxury Interiors of San Antonio, Texas, secured major refurbishment and maintenance contracts for five executive airliners early this year: three BBJs, an ACJ and a 757,

design studios and workshops outfitted with 3-D printing technology.

In San Antonio, Aeria closed 2015 with redelivery of its first green BBJ completion, said Ron Sort, vice president and general manager. The BBJ layout provides a conference room, large resting lounge and master suite, decorated throughout with 3-D printed items sporting elegant finishing touches like the application of precious stone. The cabin was outfitted with humidification



operated by customers in Asia-Pacific and the U.S. The aircraft are arriving through the first three quarters. Ang Chye Kiat, executive vice president for aircraft maintenance and modification for parent company ST Aerospace, reported seeing “a rising trend of aircraft operators requesting cabin interior refreshments to be performed concurrently with heavy maintenance.” Singapore-based ST Aerospace, meanwhile, opened a private aircraft interiors facility early this year at Seletar Aerospace Park. The 29,000-sq-ft, \$1.25 million facility comprises a hangar capable of accommodating a 757,

and zonal drying systems, and multiple high-definition monitors complement the entertainment system. Aeria’s in-house team also created a custom-designed exterior paint scheme.

West Star Aviation recently refurbished a six-year-old Falcon 900 at its East Alton, Ill. headquarters facility, for new owners who wanted an interior more reflective of their personal tastes, such as a satin finish on the woodwork, said West Star interior manager James McCann. West Star’s newest site, in Chattanooga, Tenn., has concluded its first refurbishment project with a soft goods and carpet replacement in a

New Products and Services: Continued

can also advise on which finishes provide maximum durability and beauty while conforming with owners’ individual needs.

Two years after its unveiling, **Lufthansa Technik’s** (LHT’s) “chair” seat has received European technical standard order certification and is available for business aircraft. “We now break the paradigm of designing cabins around bulky seats, to selecting the appropriate chair for any environment, just like at home,” said Oliver Thomaschewski, head of the company’s seating and structures product division. The “chair” seating uses a pedestal design that serves as the base of a core skeleton structure upon which designers can create a seat for specific applications within the aircraft, whether in the main cabin, bedroom, office or other location. This “opens up an unequaled degree of freedom for cabin interior designers and passenger wishes,” said aircraft interior designer Jacques Pierrejean of Pierrejean Design Studio. The EASA approvals can be used for FAA TSO certification.

LHT also unveiled an induction cooktop that fits in any aircraft galley, weighing less than 30 pounds and measuring less than 1 foot x 2 feet x 1 foot. The all-in-one unit incorporates an exhaust fan and a cover that keeps pots and pans in place in turbulence, and also accommodates a “special rice cooker” and toaster. The Hamburg-based completion specialist is in discussions with potential customers, flight attendants and chefs to gauge market interest in the device and refine its design.

Jinggong Global Jet (JGJ), a charter/management joint venture between Switzerland-based Global Jet and China’s Jinggong Group, has added interior design services to its portfolio. Already a staple of Global Jet’s offerings through sister company Pegasus Design, the same completion and refurbishment expertise is now available to customers of JGJ, based in Hangzhou, China (Hangzhou Xiaoshan International Airport). “The design team can really help clients rethink the interior,” said Héloïse Converset, JGJ sales and marketing executive. The Pegasus team, with offices in London and Monaco, can work on the interior of any size aircraft, and is also noted for its exterior paint project capabilities.

The 115 VAC direct replacement LED lamps from **Aircraft Lighting International** (ALI) gives BBJ and ACJ operators a new LED lighting system replacement option for existing fluorescent lights. The 115 VAC system, like ALI’s 28 VDC L-Series lamps, is designed to connect to an aircraft’s current lighting system and use existing controls, minimizing installation downtime. The LED system draws a fraction of the energy fluorescent lights require, and its plastic bulbs are more durable and resilient. The lamps are customizable and available in multi-pitch curves to fit aircraft-specific galleys, lavatories and premium cabin amenities. This marks the expansion of ALI’s product offerings into “larger business jets and the commercial aviation market,” the company said.

— J.W.

palette of gray on a Learjet 45. West Star has numerous customers from the Chattanooga area who are pleased to have a facility closer to home, according to McCann.

West Star also received “a significant investment” from Norwest Equity Partners. The amount and terms of the investment weren’t disclosed.

OEMs

In an organizational change this spring, **Gulfstream Aerospace** combined its previously separate completions and aftermarket design organizations, “to make sure we’re leveraging our strengths across all projects,” said Matthew Huhn, Gulfstream’s director of product support and business and program support. With the consolidation in place, “we’re able to take the customer all the way from the first time they buy a new aircraft through when they want to refresh, and they can use the exact same team.”

Gulfstream is seeing more demand for “natural stone and wood floors” in both completions and refurbishments, Huhn said, though these surfaces are more fragile than traditional flooring materials.

“Sometimes customers aren’t concerned; they like the aesthetic, and they’re OK with having to replace it more frequently,” said Huhn.

Gulfstream advises buyers of its pre-owned aircraft “to take it for a few months after they complete the transaction to learn it, and understand their specific wants, needs and desires,” before proceeding with refurbishment, Huhn said.

Interior spec activity for the first delivery customers of **Bombardier’s** Global 7000 is well under way. Two to three more aircraft will be specified “within the next few months,” the Canadian OEM said. Bombardier’s floor plan-selection tool is helping customers identify the cabin layout that best suits their needs, though “the customer sample size is still relatively small.” Bombardier’s Global 7000 cabin systems test rig (CSTR) is now operational; the integration test bed ensures all onboard systems for the ultra-long-range Global 7000 work properly before installation on Flight Test Vehicle 4.

Bombardier’s Wave Ka-band Wi-Fi Service, its branded Inmarsat-Honeywell Aerospace high-speed connectivity

system, has been approved for the Global 5000 and 6000 by the FAA and Transport Canada. The service supports airborne videoconferencing, content streaming and Internet browsing everywhere except the North and South Poles.

Bombardier has added AVoD to its aftermarket portfolio for Learjet, Challenger and Global operators. STCs have also been granted for

retrofits on these aircraft for SmartSky installations and Aircell 4G high-performance airborne broadband.

Pilatus introduced the 2016 PC-12 NG at EBACE in May. In addition to performance-improving aerodynamic enhancements, the updated turboprop offers six new executive interiors from BMW Group’s Designworks, with new materials and colors.

Infrastructure: New Facilities Open, Companies Expand in Past Year

West Star Aviation has completed a new paint facility at its location in Grand Junction, Colo. (GJT). The 41,000-sq-ft facility has two bays, one for strip, sand and priming, the other a downdraft bay. Each can accommodate aircraft as large as the Global 7000 and G650. The facility, which uses high-efficiency vari-drive compressors, has clean rooms, a flight-control balance room, and paint storage and mixing areas. The location already had a paint shop large enough for a Challenger 604 but “needed more capacity and the ability to paint the larger corporate aircraft,” said Dave Krogman, general manager of the MRO’s GJT facility.

Amac Aerospace Switzerland opened its fourth hangar, dedicated to maintenance, last October. The 78,000-sq-ft structure can accommodate one widebody and two single-aisle jets simultaneously. Recently a 747-8i was undergoing its first annual inspection in the new hangar. Amac handed over that aircraft—the first head-of-state completion on an -8i, according to Amac—to an undisclosed Middle Eastern customer last May.

China-based **Ameco’s** completion facility got an upgrade of its own with last year’s opening of an interior manufacturing workshop, the second such facility at its Beijing base since the MRO specialist moved into business aircraft completions in 2012. The 17,000-sq-ft workshop, created from refurbished space, complements a hangar the company is upgrading “to accommodate new aircraft types,” said Feng Bin, head of VIP and business jet services.

Comlux America in Indianapolis is expanding its 129,000-sq-ft facility into a widebody hangar, to accommodate aircraft as large as the 747.

Sierra Completions, Sierra Nevada’s cabin interiors subsidiary, has broken ground for a completions hangar at its Colorado Springs Airport headquarters. The 31,000-sq-ft facility will be capable of handling ACJs and BBJs. The company is in “active discussions with a number of customers” about performing completions at the facility, said Ed Topps, vice president of programs. Sierra Completions offers interior design, modification, integration, modernization, and aircraft maintenance and overhauls. ■



G550 refurb by Gulfstream

Conquering the Cabin Sound Barrier

OEMs and aftermarket providers are attempting to conquer the cabin sound barrier, using new technologies and materials to bring down interior decibels (dBs) and meet the rising expectations of customers. “We’ve seen soundproofing evolve more and more in recent years,” said Jarod Triplett, vice president at interior materials supplier Skandia. “Owners and operators are much more sophisticated and savvy if there’s a sound issue.”

The advent of HD IFE systems has driven the push to quieter cabins, said Triplett, as passengers have come to expect a home theater-style experience—where audio quality plays a large role—in flight. Skandia, of Davis Junction, Ill., which provides the majority of foam used in business aircraft seats, has a growing line of acoustic materials and soundproofing kits for 80 aircraft models, from Globals to piston aircraft.

“The key is the frequency band from 63 Hz to 8,000 Hz; those are ranges we need to neutralize,” said Kambiz Avval, a Skandia acoustical engineer and specialist in aerospace soundproofing. “As material scientists, we look at what material is best for which frequency range.”

The dB scale is exponential; every 3-dB reduction in sound is the equivalent of a perceived 50-percent reduction in cabin noise. Skandia’s systems reduce cabin sound levels by between three and 10 dB, Triplett said.

Soundproofing uses a matrix of different materials, each layer designed to dampen a dominant frequency harmonic wave in the aircraft. As an added bonus, a soundproofing retrofit often reduces weight. With current-generation materials, engineers can achieve an equal level of soundproofing with just two thirds the weight of the old.

All elements of a soundproofing plan must be properly certified to ensure the project doesn’t affect the aircraft’s overall certification, cautioned Aerocom Engineering of Van Nuys, Calif., makers of electronic cabin controls and interior components including acoustic noise reduction systems. For any VIP soundproofing project, Aerocom recommends using facilities with in-house design engineering staff, including an FAA designated engineering representative (DER), as well as structural, weight, stress and environmental control systems specialists.

Gulfstream has made quieting the cabin “a major focus,” said Matthew Huhn, the company’s director of product support business and program support. “We have dedicated acoustics engineers, and we do sound surveys and tune the acoustics to that individual aircraft. We have blanket STCs for insulation and noise-dampening packages.” The engineers can identify noise sources such as an engine hydraulic pump and adjust soundproofing to mitigate the offending frequency range. “That really has put a smile on our customers’ faces,” Huhn said. ■



Pilatus also offers full customization services. The cabin is also quieter with the addition of a new five-blade Hartzell propeller that reduces noise “to an absolute minimum,” according to Pilatus.

Wichita-based **Cessna Aircraft**, a division of Textron Aviation, recently displayed its new Latitude demonstrator, featuring larger, fully berthable seats and redesigned sidewalls, similar to those in the Longitude. With a flat floor and six feet of cabin height, the nine-passenger Latitude features Cessna’s wireless cabin-technology system, providing passengers connectivity and entertainment through personal electronic devices. The new cabin pressurization system maintains a 5,950-foot cabin altitude at the Latitude’s maximum operating altitude of 45,000 feet.

Boeing Business Jets (BBJ) marked its 20th anniversary this year by showcasing the first BBJ 787 with a fully custom interior at EBACE in May. “If you told the people who built this company that in 20 years they’d be landing an airplane that hadn’t been invented at an airshow that didn’t exist, they wouldn’t have believed it,” said BBJ president David Longridge, noting

initial projections estimated a total market demand for 40 private Boeing airliners.

Since EBACE last year, Longridge said, nine BBJs had been ordered, eight delivered and 10 entered service, bringing totals for the brand to 238 orders, 215 deliveries and 191 in service.

Expanding private aviation’s reach into the airline world, **Airbus Corporate Jet Centre (ACJC)** introduced Super First Class by ACJ, an interior design and completion offering for airlines. The program offers a “bridge between private jets and first class,” said Joël Frugier, ACJC general manager, allowing carriers to offer a more exclusive travel experience. ACJC can create mini-suites offering a “cozy life-space that ensures comfort and intimacy,” Frugier said, and first-class zones can incorporate soundproofing, illumination, temperature controls, and airflows previously unavailable in commercial aircraft.

For corporate jet customers, ACJC continues to offer à la carte services such as artistic design, concepts, architectures, certification, and provision and installation of cabin comfort, in-flight entertainment and connectivity systems. ■