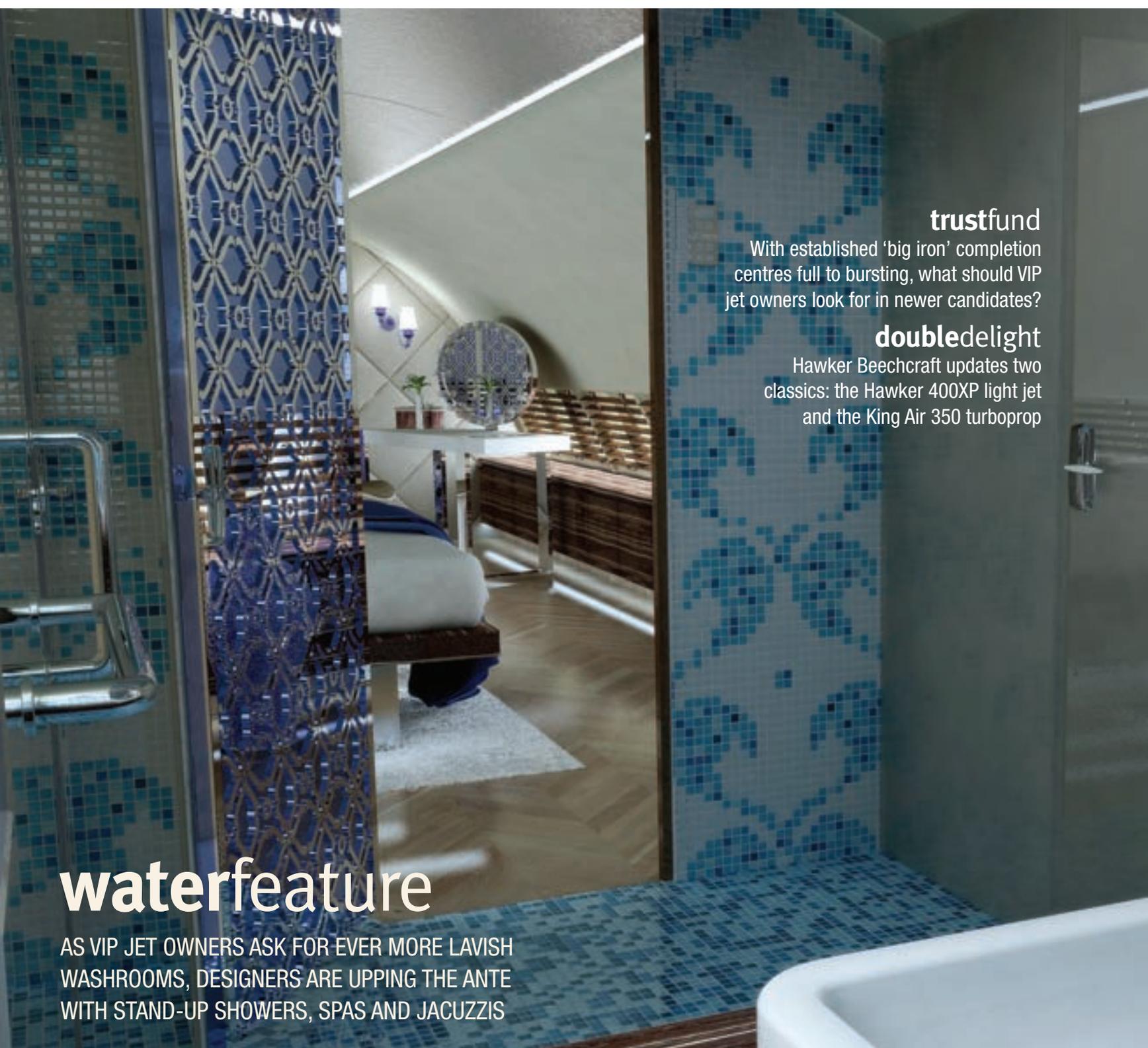


BusinessJet *interiors* INTERNATIONAL

FEBRUARY 2009

THE INTERNATIONAL REVIEW OF BUSINESS JET INTERIOR DESIGN AND COMPLETION



trustfund

With established 'big iron' completion centres full to bursting, what should VIP jet owners look for in newer candidates?

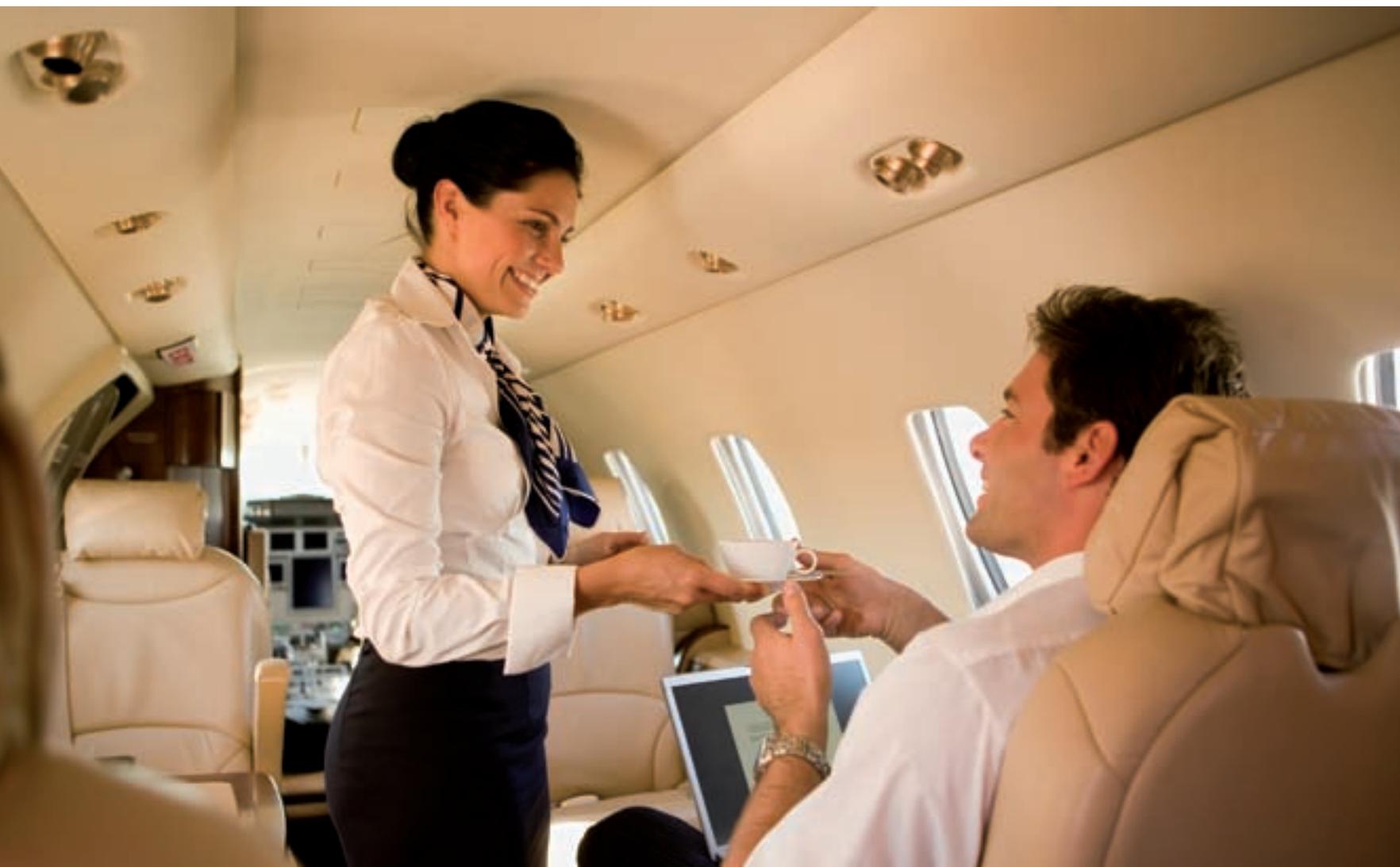
doubledelight

Hawker Beechcraft updates two classics: the Hawker 400XP light jet and the King Air 350 turboprop

waterfeature

AS VIP JET OWNERS ASK FOR EVER MORE LAVISH WASHROOMS, DESIGNERS ARE UPPING THE ANTE WITH STAND-UP SHOWERS, SPAS AND JACUZZIS

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Email: aircraftinteriors@ukintpress.com**Annual Subscriptions (4 copies)**Worldwide Rate: **£42/US\$88**

The views expressed in the articles and technical papers are those of the authors and are not endorsed by the publishers. While every care has been taken during production, the publisher does not accept any liability for errors that may have occurred.

Periodical postage paid at Dover NJ 07801
US Mail Agent: Clevett Worldwide Mailers LLC
7 Sherwood Ct., Randolph, NJ 07869.

POSTMASTER: Send address changes to Business Jet
Interiors International, 19 Route 10 East, Bldg 2, Unit 24,
Succasunna, NJ 07876

ISSN 1755-8182 Business Jet
Interiors International
February 2009. This publication is protected
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Printed by Wyndeham Grange, Butts Road, Southwick,
West Sussex BN42 4EJ, UK

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Welcome to the February issue, which includes a strong focus on the VIP completions market. Yes, there are still people in the world with the cash to buy their very own Boeing or Airbus, complete with a customised interior costing nearly half as much as the aircraft itself. "Buyers typically spend three times as much on outfitting their yachts as they do on their houses, but 10 times as much on the interior of their aircraft," writes Bernard Fitzsimons on page 35.

In fact the demand for VIP completions is such that the established centres are struggling to keep up. Mark Huber goes as far as likening their hangars to "mosh pits" on page 59, before asking: "Need an ACJ or wide-body completion? Be prepared to wait – until about 2012."

Such delays have tempted a number of new entrants into 'big iron' completions. As you'd expect, the established centres are a little sniffy about these young upstarts, warning owners to think carefully before entrusting their near priceless piece of flying real estate into the hands of a relative 'novice'.

However, the 'new' centres are fully aware of the challenges ahead: "I think there's an expectation that if there is a hangar available, then suddenly you've got a completion centre," says Altitude's Matthew Woolaston. "The reality is that the hangars don't complete your aircraft for you, it's the people, the expertise and the management of the relevant subcontractors."

This last point is the one most likely to be seized upon by the more established 'vertically integrated' centres, which offer a wide range of in-house capabilities that "lets us control our destiny better than if we relied primarily on outsourced support," – the words of Gore Design Completions' business development director, Rob Tomenendal. However, Tomenendal admits: "Gore was a new centre at one point – and somebody put a project with us, so it can happen."

There's certainly a need for more capacity – but with designers and owners dreaming up ever more sophisticated schemes, including state-of-the-art bathrooms (see page 46), it would be fair to expect a few growing pains along the way!



Anthony James, editor





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waterfeature 46

STAND-UP SHOWERS, ONCE THE PRESERVE OF VIP WIDE-BODY AIRCRAFT, ARE BEGINNING TO FILTER THEIR WAY DOWN TO SMALLER JETS SUCH AS BOMBARDIER'S GLOBAL EXPRESS

Liz Moscrop, Business Jet Interiors International



Passengers are expecting ever more of the washroom - the Global Express shower incorporates a sliding glass door, 24-carat gold plating and even a window

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WHO SAYS REFITS HAVE TO BE CONVENTIONAL AND EXPENSIVE? VOLO AVIATION'S GULFSTREAM G1 FEATURES A PSYCHEDELIC 1960s INTERIOR WHOSE FITTINGS WERE SOURCED ON EBAY

Liz Moscrop, Business Jet Interiors International

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WITH ESTABLISHED COMPLETION CENTRES FULL TO BURSTING, MANY VIP JET OWNERS ARE TURNING TO NEW COMPANIES – BUT WHAT SHOULD THEY CONSIDER BEFORE SIGNING ON THE DOTTED LINE?

Bernard Fitzsimons, Business Jet Interiors International

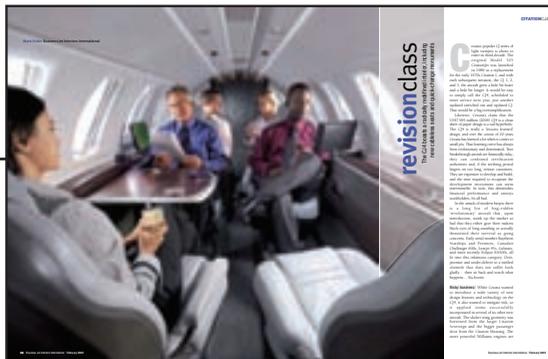


revisionclass

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THE CJ4 BOASTS A RADICALLY REDEFINED INTERIOR, INCLUDING NEW CABLELESS SEATS AND QUICK-CHANGE MONUMENTS

Mark Huber, Business Jet Interiors International



revisionclass

Who says refits have to be conventional and expensive? The new CJ4 boasts a radically redefined interior, including new cableless seats and quick-change monuments

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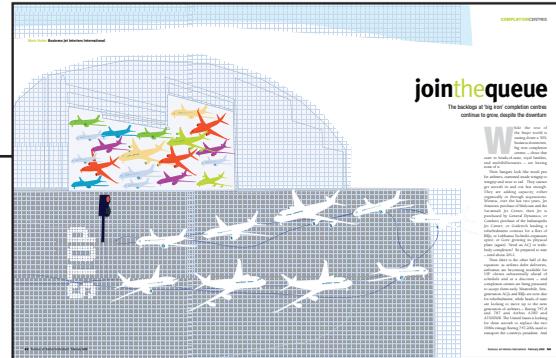
Hawker Beechcraft reveals the interior of its classic The Hawker 400XP jet and the King Air 350 turboprop

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HAWKER BEECHCRAFT REFINES THE INTERIORS OF TWO CLASSICS: THE HAWKER 400XP LIGHT JET AND THE KING AIR 350 TURBOPROP

Mark Huber, Business Jet Interiors International

jointhequeue
BACKLOGS AT 'BIG IRON' COMPLETION CENTRES CONTINUE TO GROW, DESPITE THE ECONOMIC DOWNTURN
Mark Huber, Business Jet Interiors International



jointhequeue

The backlog at big iron completion centres continues to grow, despite the downturn

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showingtheway

New lighting technologies go beyond plain illumination to help demanding business jet passengers to work and relax

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B... ..

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C... ..

64 showingtheway

NEW LIGHTING TECHNOLOGIES GO BEYOND PLAIN ILLUMINATION TO HELP DEMANDING BUSINESS JET PASSENGERS TO WORK AND RELAX

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High tea
E... ..

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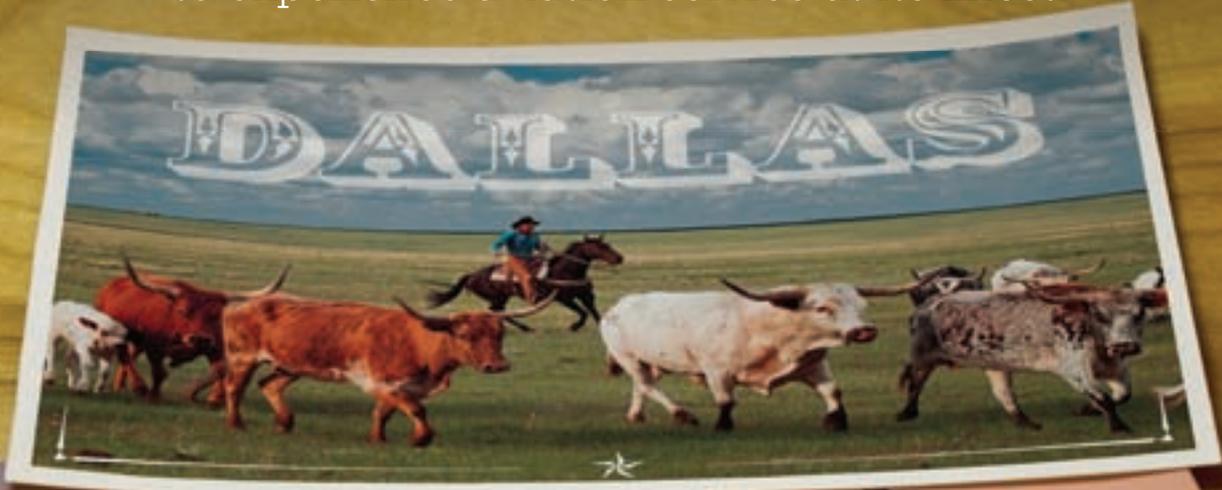
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Pascal Jallier

of ExecuJet is well placed to comment on the ups and downs of the completions market

With 14 years experience in the aircraft completions industry, I have witnessed first hand the vast expansion of the market. Currently we are experiencing some very interesting times in the business aviation sector, and in some markets we are seeing the first signs of a slowdown. The USA is saturated, European growth has slowed, but Russia and the Middle East remain reasonably strong. Asia too is a growing market and at the ExecuJet Aviation Group we follow all these sectors very closely. Generally the whole industry is preparing for a downturn, yet I feel at the same time it is a perfect opportunity to strategise – to get focused and be even more responsive to customers.

Right now ExecuJet Completion Management Consulting is in the right place at the right time and we continue to receive a steady supply of enquiries from customers looking to outfit their unfinished aircraft. ExecuJet Completions, now in its fifth year, is a key part of the ExecuJet Aviation Group, and we are now seeing clients who have worked with us in other areas also begin to show an interest in our completions business.

In this unprecedented environment, the major completion centres are still overcrowded and struggling to meet demand. This is despite the fact that we have seen more and more centres opening over the past decade. For how

long the latter will remain as independent ventures is questionable, as this sector is very susceptible to consolidation when new aircraft orders start to drop.

We are certainly noticing a shift in the customers approaching us. Not so much the nouveau riche, but more long-standing business aircraft owners who are now carefully considering investing in a newer aircraft model. They are thinking about cabin features and looking for a sensibly priced, but high-quality solution. It is definitely a buyer's market at the moment, which means there are some exceptional deals for prospectors shopping for new-build business aircraft – some of which are becoming available at very short notice.

The recent opening of our new interiors showroom located centrally in



ExecuJet has recently opened a completions showroom at its Zurich headquarters

TRENDS TODAY ARE FOR CLEAN LINES AND NEUTRAL COLOURS, WHILE SOME JUST WANT THE LATEST TECHNOLOGIES

Zurich, Switzerland, is the culmination of a successful 24 months for the division. We currently have 12 business jets in the works, all of which are new-build aircraft. Trends today are principally for clean lines and neutral colours, while some clients just want to bring the latest technologies into a more traditional looking, comfortable cabin.

We don't think it will be long before we have established formal relationships with some of the long established completions centres – dialogue has commenced with a few already. We believe this would be a terrific launch pad for the new developments we are working on, one of which includes defining the optimum ExecuJet interior, based on what our customers are asking for.

ExecuJet's completions management is also appealing to customers who are waiting to secure a 'slot' at the major outfitters, but want immediate help in determining their design. It can be a daunting process to be faced with a green aircraft to outfit and a number of completions centres to work with, but we 'troubleshoot' by finding appropriate solutions to help the customer and completion centre.

Customers can visit our showroom and choose from what really is an A to Z of interiors: from wood and wood veneers for the tables and sideboards, all grades of carpet and 500 samples of colours, to luxury inflight blankets

and stylish chinaware. Our showroom is supported by 60 design houses in Europe and beyond, all of whom share samples of their products at the facility.

Personally, I wouldn't change my job for anything. Despite the work load, long hours and occasional personal sacrifices, our industry is an exciting one that welcomes visionary attitudes and a 'go-getting' approach. We must keep on pushing the envelope as new challenges lie ahead and we must continue to embrace the fact that this business is certainly never dull!

Whois? PascalJallier

Pascal was born in France in 1973 and grew up in Africa and the Middle East. With a Masters in industrial and graphic design and an MBA in international trade and finance, he started his aviation career in 1997 at Jet Aviation in Basel, Switzerland, as manager of interior design and completion. In 2003, he relocated to Canada where he joined Bombardier Aerospace, spending the next four years as head of all VIP interiors and responsible for all new cabin options and R&D. In 2007, he returned to Switzerland as a contractor for ExecuJet Aviation Group, before being appointed head of completions. During his career so far, he has overseen over 370 aircraft completions.

ExecuJet's completions showroom allows customers to hand pick individual finishes





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The Citation XLS+ achieved FAA certification in 2008

Cessna delivers first Citation XLS+

The aircraft was delivered in December 2008 to an undisclosed customer based in the USA. Cessna's order book exceeds 200 for the XLS+, an upgrade of the mid-size XLS. The exterior and interior has been extensively restyled, including a reshaped nose and expanded seat widths, both inspired by Cessna's Citation X and Citation Sovereign models.

328 Support Services wins VVIP galley contract for two A340s

328 Support Services is broadening its activity beyond the Dornier 328 regional aircraft family. The company has been awarded the contract to produce VVIP galleys for two A340s and said it will expand its workforce at its facility in Oberpfaffenhoffen, Germany. "This work was won under competitive tender against many established interior shops and the quality of our product and the availability of skilled resources to meet the contractual deadlines was a key factor. This expansion to other aircraft types is a major strategic move for 328 Support Services and we are looking to expand even further in 2009," said Dave Jackson, chief executive of the company. 328 Support Services is currently converting a 328 Jet for Cirrus Aviation from a 32-seat airliner layout to a 12-seat VIP aircraft. The aircraft is scheduled for completion in December 2009. 328 Support Services GmbH holds the Type Certificate for the Dornier 328 Jet and Turboprop aircraft.

IWG-A4 unit now available for Dassault Falcon Jet retrofits

FAA STCs have been released for the IWG-A4 Water Treatment Unit to be installed on Dassault's Falcon Jet F2000 and F900 aircraft families. "These STCs open a substantial Dassault Falcon retrofit market for IWG equipment – a retrofit fleet of some 700 untapped aircraft," said David C. Fox, IWG's president and CEO. "Together with Dassault Falcon Jet, we are pleased to be able to offer the benefits of onboard water treatment to these existing, as well as new, aircraft." IWG equipment was already available for new Dassault aircraft. The STC is available to US operators through Dassault's factory-owned and Authorized Service Center network. IWG expects EASA approval later in 2009.



TC and STC granted for Embraer Lineage 1000

Embraer has received the Type Certificate (TC) and the Supplemental Type Certificate (STC) from the FAA for its ultra-large Lineage 1000 executive jet. The aircraft was also awarded type certification by Brazil's National Civil Aviation Agency (ANAC) and the European Aviation Safety Agency (EASA). The STC validates modifications in the customizable executive jet interior, the cargo compartment (which is accessible in flight) and the oxygen system. The cabin styling was developed by Embraer and UK-based design agency Priestman Goode, with PATS Aircraft Completions (a division of DeCrane Aerospace) selected as cabin outfitter. The Lineage 1000 offers a range of interior layouts for five different cabin zones and two lavatories. A third lavatory and a stand-up shower unit are optional. Besides the Electronic Flight Bag (EFB), other optional amenities include WiFi technology and internet access. Launched in May 2006, the Lineage 1000 is the largest executive jet in Embraer's portfolio and is based on the Embraer 190 commercial jet. The aircraft can be configured to accommodate up to 19 passengers, with a total cabin volume of 4,085ft³ (115.7m³).



The hangar 1A extension brings Jet Aviation Basel's total space up to 875,083ft² (81,300m²)

Project Phoenix CRJs to include remote medical assistance package

Project Phoenix is now offering Phoenix CRJ owners a complimentary MedAire medical package, including a one-year subscription that connects passengers and crew to doctors in MedAire's 24/7 MedLink Global Response Center. In the event of an inflight medical event, crew members can contact MedLink emergency care doctors via satellite phone or radio. Additionally, three CRJ crew members can receive first-responder medical training and have access to an aircraft first aid kit and an automated external defibrillator. The installation will be made during the interior fitting, carried out by Project Phoenix's partner Flying Colours. Project Phoenix has also secured its first customer based in the Middle East. Egyptian actor and martial arts professional Yousef Mansour signed the contract on behalf of his film production and distribution company Action Film International in November. The 12-seat VIP configured Phoenix CRJ LR is scheduled for delivery in September 2009. The aircraft will be used to fly Mansour and his film crews on location. It will also be shared with several of Mansour's business colleagues who will use it for private charters. The aircraft will be managed by ExecuJet Middle East, operating on one of its European AOCs.



Jet Aviation Basel extends hangar

The 35,520ft² (3,300m²) hangar 1A extension, together with the adjacent hangar 1, can now accommodate all the company's Dassault Falcon completions, which include Dassault Falcon F2000, F900 and F7X. "This hangar extension will not only help us to increase production, but we will also be able to raise the number of Dassault Falcon aircraft completions in the future," said André Wall from Jet Aviation Basel.

VIP orders for Cair humidification system

Associated Air Center (AAC) has placed an order for the CTT Cair System to be installed on a VIP A319 aircraft. The installation is planned for later this year. "In the recent past AAC has successfully worked with CTT in integrating its systems in other VIP aircraft platforms (B767, A319 and BBJ) and we look forward to future mutual cooperation in jointly improving cabin environment for our VIP customers," said Patricio Altuna of Associated Air Center. Cair aims to promote passenger health and comfort by providing humidification of the cabin. CTT Systems AB said that the system gives a relative humidity of 25%, compared to 3-5% without, which it said reduces dry air related problems such as fatigue, jet lag, red eyes and dry skin. Cair incorporates the company's Zonal Drying System to counter condensation problems. Lufthansa Technik has also recently placed an order for the Cair system for a VIP A330, while Gore Design Completions ordered it for a VIP A340. Both installations are scheduled for later in 2009.

New head of Aircell's business aviation services

Airborne communications provider Aircell has appointed John Wade as senior vice president and general manager for its business aviation services division. As part of Aircell's senior leadership team, Wade will also assist CEO Jack Blumenstein in developing and meeting the business aviation division's business plans, as well as interacting with the company's commercial aviation division. Wade has more than 20 years of experience in avionics and inflight communications. Prior to joining Aircell, he served as chief technical officer and general manager at inflight mobile phone and internet provider OnAir. "With two new broadband systems coming to the business aviation market and all the other opportunities that lie ahead, 2009 will be another incredible year for Aircell on an increasingly global stage," said Wade. "John's deep knowledge of inflight communications and the competitive landscape, coupled with his industry history and status make him ideally suited to lead our business aviation services division," said Blumenstein.

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The ceiling of the private office space has been enhanced with a dome of light



Cessna programmes remain on course

Cessna has stated that it is continuing its current product development projects including the Citation Columbus, the Citation CJ4 and the Model 162 SkyCatcher. "Despite the uncertainty of the world's economic environment, we believe it is critical that we do not compromise our future. Our new product development programmes are proceeding on schedule," said Jack Pelton, Cessna's chairman, president and CEO. "We remain committed to investing in these programmes, whether it is in aircraft development, facility construction or ensuring we have the people resources to meet our schedule." The Citation Columbus was formally launched about a year ago and is planned to enter service with customers in 2014. The Citation CJ4 is well into certification testing and is expected to enter service in early 2010. The SkyCatcher Light Sport Aircraft is nearing final ASTM compliance certification and deliveries are planned to begin later this year. In December Cessna reached a European fleet size of 1,000 Citations with the delivery of a Citation XLS to Turkish charter operator Bon Air (delivery pictured below). Bon Air is based in Florya, Istanbul and has operated Cessnas in its fleet for 22 years. Globally, Cessna has delivered over 5,400 Citations.



Comlux gets second A318 Elite

The aircraft is an additional asset for Comlux's charter fleet. The interior is similar to the company's first A318 Elite, but has additional VIP features. "The remarkable change on the second aircraft is the main lounge ceiling that we have enhanced to provide an outstanding VIP interior, by installing a dome." said Isabelle Bevilacqua, head of Comlux Creatives.

Restructured US executive management at Jet Aviation

Jim Ziegler, who was chief operating officer of US operations, has left Jet Aviation, but will remain an advisor to the company. Gary Dempsey and Kurt Sutterer are now responsible for US operations, reporting directly to Peter G. Edwards, president of the Jet Aviation Group. Dempsey joined Jet Aviation in 2003 and was promoted to president of Jet Aviation Flight Services, which includes FBO, aircraft management, charter and staffing services. Sutterer became part of Jet Aviation through its acquisition of Midcoast Aviation in 2006. Since then he has held the position of president, MRO & Completions, responsible for all Midcoast Aviation operations throughout the USA, including Savannah Air Center. Jim Ziegler joined Jet Aviation in 2007. "Since his arrival, the organisation has been professionalised and positioned well for the future. In addition, he played an integral role in supporting the recent transition of the company to General Dynamics," said Edwards.

Gore Design Completions names new director of quality



VIP completions centre Gore Design Completions has named John Kirby as its new director of quality. Kirby has been at the company since June 2004 serving as manager of quality. In his expanded role, which he began in January, he is responsible for overseeing the company's quality system and ensuring compliance with Federal Aviation Regulations. "I have no doubt that John will continue to do a great job for the company in his expanded role as director of quality," said Ron Soret, vice president of operations. Prior to his work at Gore Design Completions, Kirby held similar titles at Dee Howard and Dynatech Turbine Services, Inc. Gore Design Completions expects to deliver four aircraft to customers in 2009.

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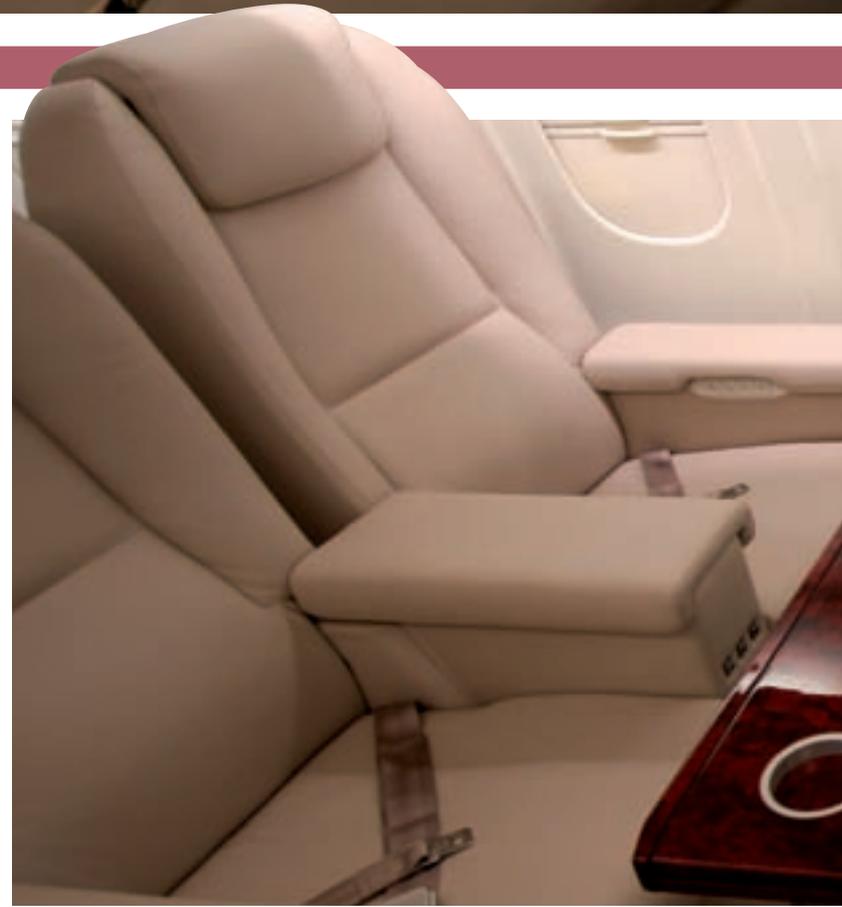


Distinctive features of Bulgaria Air's ABJ include a curved sofa, entrance bar and Bang & Olufsen entertainment system

Bulgaria Air accepts first ABJ with interior by Design Q

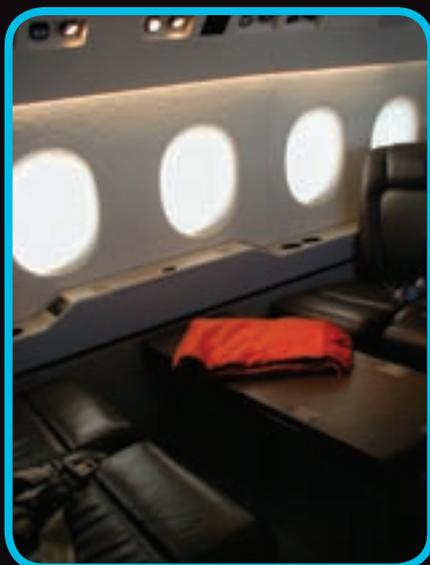
The interior of the BAe146 RJ70 was designed by Design Q in close partnership with the customer and completed by Inflight Engineering and MAC Aircraft Interior Specialists. Particular attention has been paid to the entrance of the aircraft. An entrance vestibule with a curved bar on each side of the cabin door acts as a focal point, while the main cabin is entered via electronically controlled pocket doors. Two club-four arrangements are used in the forward area of the main cabin with the principle seating located aft. A curved sofa is positioned opposite the Bang & Olufsen entertainment system, along with two articulated armchairs. The aft cabin has a first-class layout while at the rear of the aircraft there is a VIP lavatory and a large cloakroom for coats and carry-on baggage. "Unusually for an aircraft interior of this size the temptation to 'build in' the furniture has been resisted. The credenza units, seats and entertainment system have been designed as individual units allowing each part to show off its own attributes and provide a more interesting journey for the eye around the cabin," said Gary Doy, joint founder of Design Q. "The simplicity of the form language is complemented by a neutral colour pallet providing the perfect canvas to exploit the true benefits of a sophisticated mood lighting system," continued Doy. BAE Systems announced that it had teamed with Design Q to offer interior designs for the ABJ in May 2008.





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The design, development, certification and first delivery of the Phenom 100 took just over three and a half years

First Phenom 100 deliveries

Embraer made its first Phenom 100 delivery on 24 December in São José dos Campos, Brazil, to James and Elizabeth Frost, who live in Houston, Texas, USA. A second aircraft was delivered on 29 December to another customer. The Phenom 100 was introduced by Embraer in 2005 and accommodates four passengers in the club seat configuration. The interior was developed by Embraer in partnership with BMW Group DesignworksUSA.

OnAir wins first VIP contract in Middle East

OnAir has signed its first VIP contract with a government in the Middle East. OnAir will equip the A319 Airbus corporate jet with the Mobile OnAir solution, providing full voice and data connectivity services. Passengers will be able to stay connected throughout flights via voice calls, text messages and emails. "This contract marks increasing momentum for OnAir in the fast-growing VIP, corporate and government segment. VIP-level passengers are demanding customers and we are pleased to see that they have selected the same solution as the one we provide to commercial airlines," said Benoit Debains, CEO of OnAir. Commercial airlines that either currently offer OnAir inflight communications services or plan to in the near future include Air Asia, Airblue, BA, bmi, Jazeera Airways, Kingfisher, Oman Air, Royal Jordanian, Ryanair, Shenzhen Airlines, TAM, TAP and Wataniya Airways. OnAir also serves private VIP and governmental customers through partnerships with Airbus Corporate Jets, Aviation Centre Cologne and Jet Aviation.

Comlux orders second Airbus A320 prestige

Comlux Aviation said it has ordered the A320 to meet demand from the Middle East market. The aircraft complements an A318 Elite and an ACJ that the company operates on WVIP charters. Comlux has now placed orders for a total of nine aircraft – four A318 Elites, two ACJs, two A320 Prestiges and one A330-200 Prestige. Comlux Aviation has operated its first ACJ for several years, and in 2007 became the first to put the A318 Elite into service, flying it 1,200 hours in its first year of service. It has three Air Operator Certificates (AOCs) from the airworthiness authorities in Malta (EASA), Switzerland and Kazakhstan.

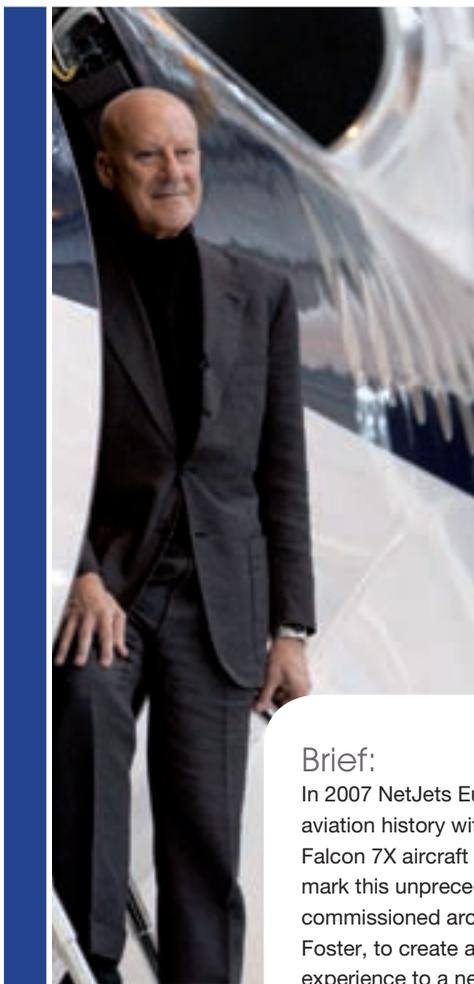


Hawker Beechcraft opens new facilities in UK and USA

The company has opened a new 25,000ft² paint facility in Chester, UK. The standalone paint facility has one paint bay and one preparation area to accommodate the Hawker 4000 and similar sized aircraft and – depending on the mix – is capable of housing four aircraft at one time. The company has also opened a new Hawker Beechcraft Services (HBS) aircraft maintenance facility at Phoenix-Mesa Gateway Airport (IWA) in Mesa, Arizona, USA. HBS will add to this 26,000ft² hangar with an additional 26,000ft² hangar in the second phase of development, along with 22,000ft² of back shops including a lobby and administrative offices. The expanded space will offer guest offices for customers to use while their aircraft are being serviced, with each workspace supplying full office amenities including computers, WiFi access, printers and telephones. The second phase is scheduled to be completed by November 2009. The Mesa facility will serve as HBS's regional service centre for south western USA, replacing the Van Nuys, California location that will close on 31 March. In addition to Mesa, the company is expanding customer service and maintenance offerings at six other US locations.



peerpressure

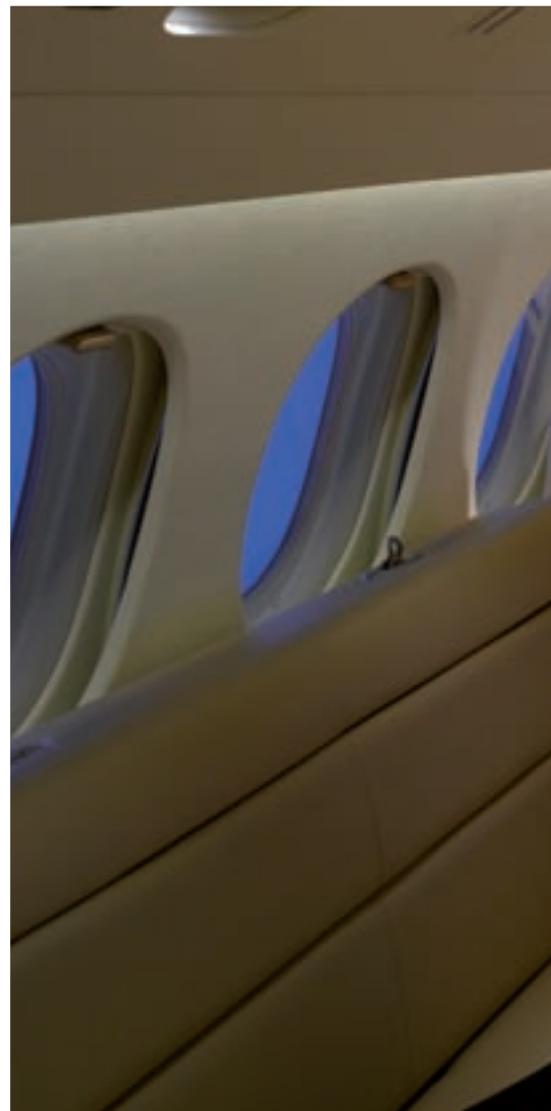


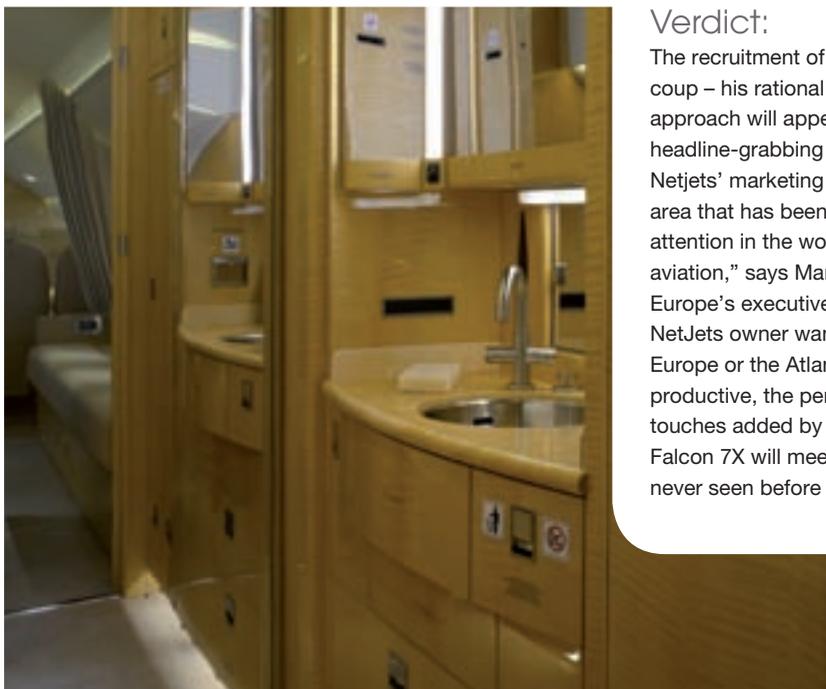
Brief:

In 2007 NetJets Europe placed the largest order in business aviation history with manufacturer Dassault, which will see 33 Falcon 7X aircraft added to its fleet over the next eight years. To mark this unprecedented US\$1.5 billion investment, NetJets commissioned architect, pilot and NetJets' customer, Lord Foster, to create a jet that takes the business aviation experience to a new level. The company believes the selection of Lord Foster will ensure that the NetJets 7X will have an enduring and lasting sensibility.

Description:

Lord Foster talked extensively to NetJets' clients and crew to get a well-rounded perspective during the crucial research stage of the project. The result is an aircraft that is serene on the inside and sleek and striking on the outside. The interior of the NetJets 7X is thematically zoned into a well-being space for customers and a work space for crew. The passenger cabin is light and tranquil featuring a cream and tan colour scheme and Fiddleback Sycamore wood fittings. Lord Foster redesigned the seating arrangements based on how NetJets owners and passengers use the aircraft, gearing it towards business meetings and an enhanced sleeping and dining experience. In contrast, the work area around the galley has an industrial feel, featuring a grey and black colour scheme, a marked contrast from generic aircraft design. Foster uses robust materials such as carbon fibre for the galley and crew areas. Although not originally commissioned to consider the exterior of the jet, Lord Foster evolved his design to include the aircraft's livery. His design of a bold, dark blue horizontal stripe unifies the windows of the cockpit and cabin, giving the aircraft a sleeker form. NetJets Europe has elected to introduce Foster's design as its new livery across its entire 160-strong fleet.





Verdict:

The recruitment of Lord Foster is a real coup – his rational and considered approach will appeal to clients, while his headline-grabbing name will please Netjets’ marketing people. “Design is an area that has been given precious little attention in the world of business aviation,” says Mark Booth, NetJets Europe’s executive chairman. “Whether a NetJets owner wants their journey across Europe or the Atlantic to be peaceful or productive, the personal and intuitive touches added by Lord Foster to the Falcon 7X will meet their needs in a way never seen before in aviation.”



CONTACT:
 Anna McMahon
 Netjets Europe
 Web: www.netjets.com

Newcomer in Executive Cabin Interiors – List components & furniture GmbH

With more than 15 years experience in turn-key engineering and production of yacht interiors, LIST components & furniture GmbH has started to expand its business in the field of executive aviation in 2002.

The aim of LIST is to provoke new values to the market by developing alternate manufacturing techniques and materials. Since 2002, LIST has established the most modern production environment for cabinet production by introducing veneer cutting and veneer jointing machinery, curing presses, 3 and 5-axis machining centres, automated edge bonding, transverse and longitudinal flow grinding robots and polishing robots in a very modern production facility.



In parallel LIST develops new light weight materials, like fire retardant wood veneers and laminates, eliminating the use of hardwood inserts and the waviness of green cabinet applied wood finishes.

ENGINEERING & AUTOMATIZATION

To maintain an efficient modular configuration management LIST is using integrated engineering solutions by combining CATIA V5 model based developments with co-processor systems. LIST is producing turn-key cabinets including complex engineering solutions and production integration (wiring, CMS, lightings, accessories and other interior components).

The combination of a highly automated production environment and the traditional skills of Austrian Cabinetmakers allow LIST to design, integrate, certify and manufacture cabinets for the following business aircraft models: Bombardier Learjet 40, Learjet 45 XR and Challenger 300. As LIST is expanding in the executive OEM market, further new business aircraft will be furnished with cabinets made in Austria, within the next years.



INNOVATIONS

LIST is focused on developing products and solutions to the highest quality standards. This can be achieved by maintaining an environment of responsible management, engineering and manufacturing which consistently focuses on highest quality and developing innovative solutions.

STONE VENEER APPLIED ON 3D SURFACES

Over the past two years, LIST and its partner GreinTec have developed a revolutionary product – named the stone veneer. The stone veneer consists of real granite stones which are sliced to a maximum thickness of 0.08” and can be applied on 3D surfaces. To protect the granite stone and ensure the depth effect, the granite stone veneers are sealed in high gloss finish. The typical applications of the stone veneer are countertops, partition or bulkhead surfaces, sidewall panels, table leafs, lids or inlays. The maximum size of one stone veneer sheet is 106 x 55 inches or 2,70m x 1,40m. The stone veneer gains major weight savings and has roughly the same weight as wood veneer. LIST



currently offers 13 different types of granite. The characteristics, depth and amazing brilliance of the finishes establish a luxury environment expected in business jet interiors and VIP cabins.

FIRE-RETARDANT WOOD VENEER

While using ultra-thin wood veneers for its cabinet production, LIST has furthermore developed advanced fire-retardant wood veneers (1-ply, 2-ply and 3-ply) and supplies the OEM and refurbishment/completion market with these products. The developed wood veneers provide a high degree of natural wood colour (not impacted by salt impregnations) and allow an improved bending condition.



ALWAYS A STEP FURTHER

Beside the revolutionary stone veneer and natural colour wood veneers, LIST continues to focus on new developments for executive cabin interiors in order to bring value to the market and provide innovative and reliable answers to executive and VIP cabin concepts.

FULL INTERIOR SYSTEM COMPETENCE

LIST is a reliable partner in executive aviation providing high quality and innovating interior solutions and will in the medium term expand its engineering and production competencies to achieve customer expectations on a higher level.



Images provided courtesy of Bombardier Inc.

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hippychic

Who says refits have to be conventional and expensive? Volo Aviation's Gulfstream G1 features a psychedelic 1960s interior whose fittings were sourced on eBay



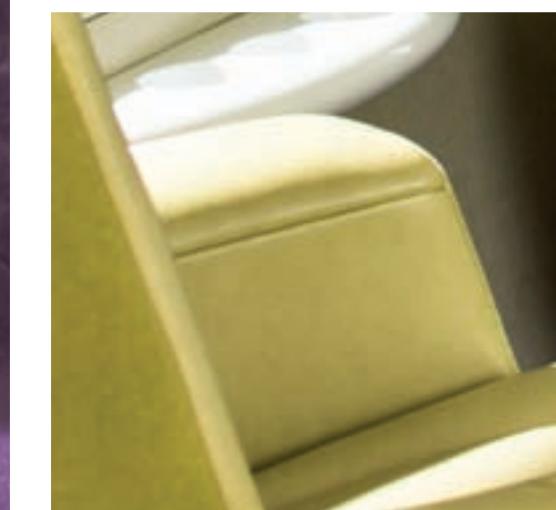
Eat your heart out Austin Powers, Volo Aviation is offering the grooviest ride in town. The gloriously pimped vintage 1969 Gulfstream GI twin-turbo-prop on its books is the creation of architect turned designer Havilande Whitcomb. The aircraft made its public debut at the NBAA convention in October 2008. Charter customers can fly high 1960s style, surrounded by a funky retro interior and pop art livery in a GI screaming 'fun' at anyone bold enough to fly it. Whitcomb says: "It is an unusual and arresting design." The owner is a real estate investor, who travels a great deal from cities in the UK to other parts of Europe and the Far East. She explains: "He is used to the coolest hotels and restaurants and exposed to that end of the

design world. His other business aircraft are very tasteful and beautiful, but this is his party plane."

Duncan Aviation in Lincoln, Nebraska completed the period interior, which Whitcomb says was a "budget refit". According to Volo, the aircraft cost less than a late-model King Air B200 to acquire, with the added benefit of greater range and speed, a stand-up large cabin with a full aft lavatory, a galley and – naturally – a bar.

"The owner loves the historic part of the GI," says Kyle Slover, Volo's COO. "He trained as an engineer and his first job was to analyse corporate aircraft using budget and mission requirements as yardsticks. At that time the GI was in service and stuck in his head as a great aircraft." Slover admits that although the acquisition costs were low, support





**WE CHANGED THE LAYOUT,
AND THE COUCHES AND
TABLES TOOK A GREAT DEAL
OF WORK WITH THE FAA...
WE HAD TO APPROVE THAT
THE ATTACH POINTS HAD THE
SAME STRENGTH**

costs are high. Powered by a brace of Rolls-Royce Darts, the aircraft is not the most cost-effective model to manage, but who cares? With hire fees of around US\$3,500 per hour, the aircraft is proving a favourite with wedding and golf parties. On the plus side revellers are getting a large cabin aircraft for the price of a mid-size cabin.

A piece of history The redo was timely. Just over 50 years ago on 14 August 1958, test pilots Carl Alber and Fred Rowley took the first Grumman GI on its maiden flight over Bethpage, New York, where Grumman Aerospace was based. The aircraft was the first model specifically designed for business travel.

The aircraft accommodates 12 passengers comfortably and has a maximum speed of 350mph at 35,000ft with a range of 2,500 miles. Customer input played an important role in its design, prompting Grumman to build a low-wing platform instead of retaining the high-wing frame of the company's previous aircraft. Customers also wanted ample visibility, which led Grumman to develop the large, 26in-wide oval window that has become the Gulfstream trademark.

Although the aircraft was designed using a 1960s' décor, Whitcomb replicated concepts without attempting a true restoration. "We wanted to mimic what was available, but with a modern feel." Her fabric choices were based on 1960s designs and the paint and interior were both created to the owner's specifications. The biggest challenge was certifying an interior previously certified under 30-year-old regulations.

"We changed the layout, and the couches and tables took a great deal of work with the FAA," says Whitcomb. The job was not a simple removal and



installation. The new seats needed re-engineering and certifying to turn the aircraft from an 18-passenger, high-utility corporate shuttle to a more traditional club seating arrangement with an aft lounge. The back incorporates two side-facing divans and two rear seats. To overcome some of the certification issues, Duncan sourced old GIV seats and cut seat tracks in the original attachment points, which were modified from high density to the new layout. Whitcomb says: "We had to prove that the attach points had the same strength."

A blaze of technicolour The acid green and purple colours on board are the owner's choice. The design team put in weeks of research time, combing through patterns and colours in nightclubs and homes in 1969. Whitcomb says: "We wanted to invoke the spirit of the era – it was not a restoration. We wanted to be more avant garde and use bold patterns on the bulkheads, for example." She points out that it was not difficult to source some of the patterns and leathers as a result of prevailing design ideas. "There is lots of interest in modernism and iconic items from the 1950s and 1960s at the moment. The two fabrics we used are actually a reintroduction of historic patterns. The Naham carpet company made this pattern years ago." She adds that fashion happens in cycles and there is a new generation of younger people whose work is influenced by the 1960s.

"I always like to use wool fabrics as they are easy to get certified," continues Whitcomb. "The bulkheads are covered in mohair." The bathroom was unchanged, other than using white Formica rather than a veneer and the same fabric on the lavatory seat as features in the rest of the cabin.

The Volo GI has a forward galley complete with microwave and coffee/espresso machine as well as a bar and full lavatory with vanity area in the aft.



1. Wow! What do you mean purple and green should never be seen!
2. Duncan Aviation sourced old GIV seats to add modern comfort

2

Cabin size comes in at a hefty 35ft 6in long and 7ft 3in wide, with a maximum height of 6ft 1in. The galley looks the same as the original, but the added espresso machine caters for the tastes of a clientele who would not appreciate the old MAPco unit dispensing substandard caffeine. “The type of client who charters this often appreciates a bracing cup of coffee,” says Slover. There is also a new ice storage drawer. Whitcomb worked with the simplicity of the cabin design and created a bar with an almost futuristic feel. The optics are made by ‘SayWhen’ and sourced by Duncan.

A Formica-topped coffee table dominates the aft section. “It was first conceived to feel like a lounge with face-to-face seating face across a cocktail table,” explains Whitcomb. “We used the Knoll Tulip table as the essential shape.” The table was engineered to be fixed, with a removable top dictated by aisle clearance. The steel pedestal has a polished chrome feel. “A real tulip table has a more slender base,” she adds.

The team used the same recessed lighting as in the original, adding LED fittings and modified the shape of the auxiliary power unit. In-Flight Entertainment (IFE) is state-of-the-art, but housed in a custom-made period TV exterior, designed and built from scratch by the team, who found the old TV knobs on eBay. The façade hides one of two new flat-panel LCD TVs. Entertainment also comes in the form of CD and DVD players and iPod connectivity. In addition, passengers benefit from Airshow 400 and cabin information systems. To cope with the greater electrical loads generated, the Duncan engineers installed new inverters.

Fun Flair Fun and comfort are pervading themes. Slover says: “It was really fun in the beginning and for most of project. However, three weeks before the delivery date when all the paperwork had to be pushed through, it became less fun.” However, the pain was worth it. He says: “Whenever people see it their faces light up.”

As well as aircraft charter and management, Volo has a seven strong fleet that includes GIVs, Learjet 45s and Falcon 900s. It also manages five FBOs in the USA. Whitcomb designed several



3

of the Volo aircraft including a Gulfstream GIV, a KingAir, and a Falcon, Slover says: “We have been involved with Havilande for a long time and enjoy an easy and close collaboration. Her style and ethics mean that she manages the whole process, thinking of future access and maintenance.” Whitcomb points out that Volo will be performing day-to-day support, so sources easy-to-maintain furniture and fabrics. She also stocks up on knick-knacks and trinkets, in case of damage or wear and tear.

Slover says that most requests for the aircraft are coming from leisure clients with an average stage length of two-and-a-half to three hours. He adds: “The flight is part of the fun on this aircraft. We see people stand at the bottom of the entry stairs, and thinking they are walking into a sterile environment. As soon as they see the colour on board they break into a smile.” He says the company received plenty of interest at NBAA for similar or even identical refits and foresees requests from Las Vegas casinos and Hollywood. **END**

Web <http://www.voloaviation.com>

3. A custom-made ‘period’ TV exterior with buttons sourced on eBay!
4. The design team worked hard to find modern finishes with a retro feel



4



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With established completion centres full to bursting, many VIP jet owners are looking to new companies – but what are the key criteria to consider before the award of a multimillion dollar contract?

Airbus was not exaggerating when it dubbed the A380 bought by Kingdom Holding chairman Prince Alwaleed, a 'flying palace'. The list price of US\$319 million quoted by chief operating officer (customers) John Leahy at the November 2007 contract signing ceremony in Dubai included four Rolls-Royce Trent 900 engines, but certainly not the interior, which is likely to cost at least half as much again.

Even at the more modest end of the VIP market, prices soon become eye-watering. Airbus lists the A318 Elite with a Lufthansa Technik standardised cabin at US\$62 million all in, but an A319-based Airbus Corporate Jet would cost US\$55 million green, plus about US\$20 million for a VIP cabin, and an A320 Prestige would total US\$80 million including the cabin. The actual price, of course, depends on what goes in, and buyers typically spend three times as much on outfitting



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THE NUMBER OF QUALIFIED PEOPLE IS GETTING SMALLER, SO START-UPS WILL FIND IT HARD TO FIND THE PEOPLE



Illustration by Lee Woodgate

their yachts as they do on their houses, but 10 times as much on the interior of their aircraft.

Customers looking to invest that sort of cash in their personal transport have a limited but gradually expanding choice of completion centres. They might start, suggests Rob Tomenendal, business development director at Gore Design Completions, with the lists of approved centres published by Boeing and Airbus on their websites. Gore is on both the Boeing list of 11 centres and the Airbus list of six, a disparity explicable by the fact that Boeing has been building airliners longer than its European rival, and there have been many more VIP versions over the years.

Airbus also lists Associated Air Center, Jet Aviation, Lufthansa Technik and Stork Fokker, plus its own joint venture with Comlux, the Airbus Corporate Jet Centre (ACJC), which occupies the former Sogerma Services facilities in Toulouse. Airbus's David Velupillai, product marketing director, executive and private aviation, says customers are free to take their aircraft where they want, but are encouraged to use one of the listed firms. "We have audited each and have a better feel for their ability to do a good job," he

explains. All except Stork Fokker have done wide-body completions in the past, and while Sogerma did several, its ACJC successor will restrict itself to single-aisle Airbuses initially.

Boeing lists the same five independent centres, plus the new AMAC Aerospace at Basel in Switzerland, AIMS International in Canada, Air France Industries at Le Bourget and US operations Greenpoint Technologies, L-3 Integrated Systems and DeCrane Aircraft.

After that, Tomenendal says, check the companies' Federal Aviation Authority (FAA) and European Aviation Safety Agency (EASA) ratings and their

capabilities. He believes that while all completion centres outsource work to some degree, Gore's vertically integrated approach is the right one: "It lets us control our destiny better than if we relied primarily on outsourced support. But on a project involving so much work, the big challenge is finding qualified people." Gore has around 500 staff after a period of rapid growth, "but the number of qualified people is getting smaller", he says, "so start-ups will find it hard to find the people".

1. Finding qualified staff is a problem for all completion centres



Accurate quote An owner typically will go to several completion centres for price quotations. "Often we are given only a very high level specification," comments Tomenendal. "There might be bullet points for a list of things like satcom and an entertainment system." The completion centre might then quote the cost of an Iridium versus an Inmarsat satcom system, for instance. "It's important for the completion centre to really define what is included in the quote, so that there can be a real apples to apples comparison," he says.

A laundry list of options might include the choice of Honeywell DirecTV or Rockwell Collins Tailwind

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IT'S A LOT QUICKER TO WALK NEXT DOOR THAN CALL IN SOMEBODY FROM OUTSIDE

television system, and a choice of standard or enhanced sound insulation. "The basic specification might quote an interior sound level in the mid-50s of decibels, with an option to reduce that to the upper 40s at an increased price."

When it comes to execution, Gore has staff with the full range of skills, including cabinetry, sheet metal work, cabin electronics and upholstery, as well as A&P mechanics and quality control experts. There is also a complete engineering department to do all the necessary approvals: "It's a timing issue," Tomenedal observes. "It's a lot quicker to walk next door than call in somebody from outside."

Some things do have to be bought in, of course: there is only a limited number of sources for 16g seat frames, for example. And project management, he adds, is key when dealing with outside suppliers.

Mature major Lufthansa Technik has been in the business longer than most – since the 1950s, in fact – so it is natural that experience should figure high on spokesman Bernd Habel's list of factors that prospective clients of completion centres should bear in mind. "The level of quality needed to match customers' demands can only be achieved by skilled experts who have developed a sense for that business and a long-lasting experience of the completion centre," he says.

Every VIP aircraft is a new challenge as it will probably have a unique interior outfit and technical equipment. That demands a comprehensive portfolio of expertise on the part of the completion centre: from customer advisors able to discover what a customer is really looking for and aware of what can be realised on board; via designers able to translate customer wishes into an aircraft design; to engineers and skilled workers who can bring the design to life by constructing and integrating the appropriate furniture and electronic equipment.

Another major challenge is the ongoing process of qualifying staff to deal with new materials or new technologies.

The boom in demand for VIP aircraft has naturally attracted start-ups, which try to enter the market by offering special prices, Habel says: "And the current waiting period of up to several years for a completion by one of the established centres could bring a potential customer to the idea of looking for alternatives." This is understandable, he accepts, but risks disappointment if a centre's expertise is not equal to the complexity of the project.

"Quality has its price and needs its time," he says, "especially in the narrow- or wide-body segment, which is more complex than the completion of smaller business aircraft because of the available floor space. Normally you won't buy a private aircraft every two or three years;

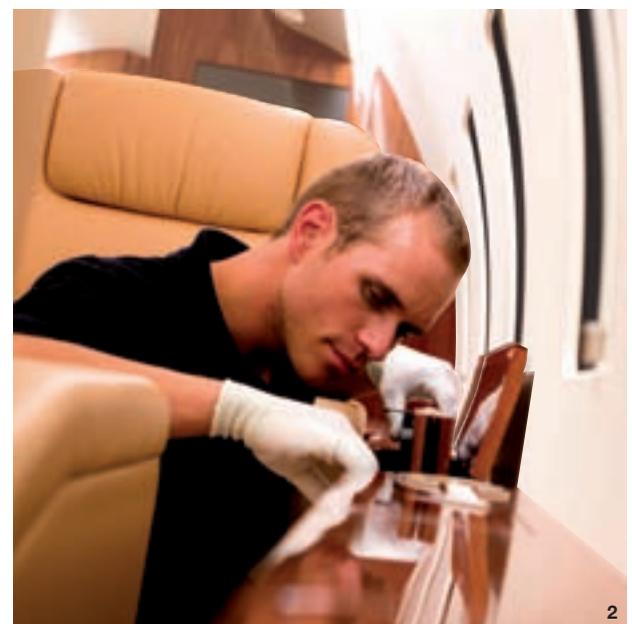
rather it will accompany you for a long period of your life. So bad quality or design in the completion work is a big and cost-intensive annoyance, one that can be avoided by looking for the right specialist in advance."

But from LHT's point of view, skills and quality during the completion are only one side of the coin. "There is a handful of companies beside Lufthansa Technik that are able to offer the appropriate level of working quality," says Habel. "LHT's extra bonus is the ability to offer comprehensive maintenance, repair and overhaul services in addition to the interior completion itself. That means the customer can benefit from LHT's worldwide maintenance network and doesn't have to care how he keeps his new aircraft flying – he can concentrate on flying."

2. A Lufthansa Technik employee fits a side ledge table

BBJ ambitions Altitude Aerospace, the airline and VIP interiors specialist owned by Air New Zealand, is working methodically towards a planned first completion of a Boeing Business Jet in 2011, says VIP aircraft commercial manager Matthew Woollaston. But despite "quite a lot of experience on all sorts of aircraft types," the company is being careful not to bite off more than it can chew as it negotiates what it sees as potential pitfalls.

The biggest pitfalls, Woollaston thinks, are the length and complexity of the supply chains, allied to the complexity of the platforms involved and



I THINK THERE'S AN EXPECTATION THAT IF THERE IS A HANGAR AVAILABLE, THEN SUDDENLY YOU'VE GOT A COMPLETION CENTRE



amplified by the fact that the owner has much more of an emotional investment in the aircraft than might be the case in the commercial aviation sector: “The supply chains in this part of the market are quite different to the supply chains we experience in the commercial part of our business,” he says.

“Everything that goes on the aircraft is unique, obviously, so you can’t just rely on your subcontractor or your supply chain to do their work. You need to get into this market eyes wide open in terms of supply chain and quality management of your subcontractor network, because inevitably you can’t do all this stuff in-house.”

The airliners typically selected by VIP and head-of-state customers are also notably complex. “The complexity of the aircraft means that the engineering is incredibly complex,” says Woollaston, who has seen competitors jump into the market without a huge engineering competency behind them. There is a big difference between refurbishing Cessnas or other small jets and doing the same for a 737 or A320, he emphasises, let alone doing completions on the bigger types.

“The leap in terms of complexity is quite substantial,” he says. “It’s not a linear effect in terms of the size of the aircraft, it’s more of an exponential effect in terms of complexity.” So having a good team of technicians doing the work

3. The latest IFE and electronics have made cabin completions even more complex

on the aircraft is crucial: “I think there’s an expectation that if there is a hangar available, then suddenly you’ve got a completion centre. The reality is that the hangars don’t complete your aircraft for you, it’s the people, the expertise and the management of those subcontractors.”

Air New Zealand and Altitude have jointly secured a hangar in Christchurch. Altitude acts as lead contractor, handling certification, supply chain management and the engineering, while the physical work is done by Air New Zealand’s technical operations team. “It’s a unique experience where Altitude subcontracts its owner to do some of the work,” Woollaston says.

Refurbishing may be even harder than building an original interior, he adds, particularly as some of the first BBJs are now due for their 10-year heavy checks. Altitude has one of the first to undergo the check booked in for next year, and “that’s going to be pretty revealing,” he predicts. “I think some of the first aircraft were possibly built with the idea of long-term maintenance quite a long way back in the minds of the design and engineering teams at the time.”

The 10-year checks are going to require substantial removal of the interior, he explains, “possibly even going right back to the ring frames to do the maintenance work on them, and then effectively rebuilding them, which is going to be interesting. It’s difficult enough building something for the first time, but rebuilding somebody’s handiwork 10 years later is always going to be a bit more challenging.”

That experience will serve Altitude well when it comes to working on its own first green aircraft. And there is certainly scope for more capacity. At Airbus, Velupillai confirms that completion capacity is limiting the supply of VIP aircraft. And even Tomenendal, while cautioning that an owner is “taking a pretty big risk if he goes to a new centre,” accepts that it could pay off: “Gore was a new centre at one point,” he says, “and somebody put a project with us, so it can happen.” **END**



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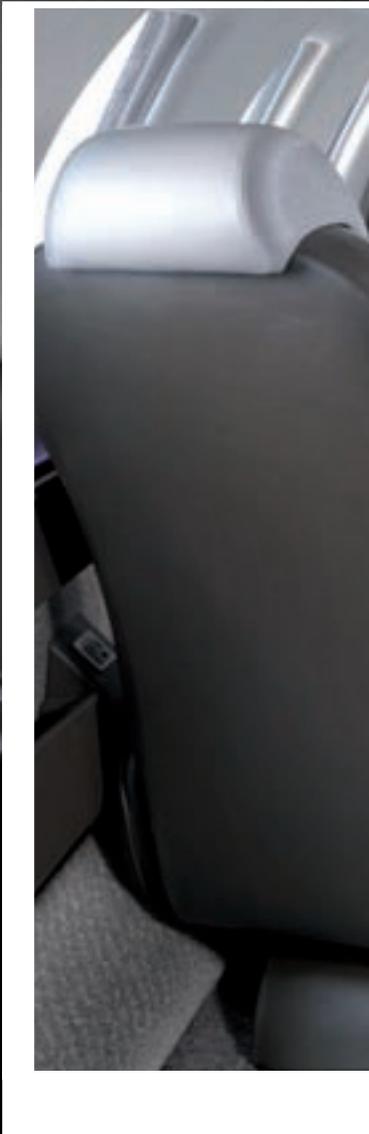
The CJ4 boasts a radically redefined interior, including new cableless seats and quick-change monuments

Cessna's popular CJ series of light twinjets is about to enter its third decade. The original Model 525 CitationJet was launched in 1989 as a replacement for the early 1970s Citation I, and with each subsequent iteration, the CJ 1, 2, and 3, the aircraft grew a little bit faster and a little bit longer. It would be easy to simply call the CJ4, scheduled to enter service next year, just another updated stretched out and updated CJ. That would be a big oversimplification.

Likewise, Cessna's claim that the US\$7.995 million (2006) CJ4 is a clean sheet of paper design is a tad hyperbolic. The CJ4 is really a 'lessons learned' design, and over the course of 20 years Cessna has learned a lot when it comes to small jets. That learning curve has always been evolutionary and determined. True breakthrough aircraft are financially risky; they can confound certification authorities and, if the teething period lingers on too long, irritate customers. They are expensive to develop and build, and the time required to recapture the development investment can seem interminable. In turn, this diminishes financial performance and annoys stockholders. It's all bad.

In the annals of modern bizjets there is a long list of bug-ridden 'revolutionary' aircraft that, upon introduction, stunk up the market so bad that they either gave their makers black eyes of long-standing or actually threatened their survival as going concerns. Early serial number Raytheon Starships and Premiers, Canadair Challenger 600s, Learjet 45s, Galaxies, and more recently Eclipse EA500s, all fit into this infamous category. Over-promise and under-deliver to a rarified clientele that does not suffer fools gladly... then sit back and watch what happens... Ka-boom.

Risky business While Cessna wanted to introduce a wide variety of new design features and technology on the CJ4, it also wanted to mitigate risk, so it applied items successfully incorporated in several of its other new aircraft. The slicker wing geometry was borrowed from the larger Citation Sovereign and the bigger passenger door from the Citation Mustang. The more powerful Williams engines are



THE CJ4 ALSO GIVES CUSTOMERS THE OPTION OF QUICK-CHANGE MONUMENTS THAT ALLOW CUSTOMERS TO QUICKLY ALTER THE AIRCRAFT CONFIGURATION TO BETTER MEET SPECIFIC MISSIONS



2



The cabin floor was lowered to provide a wider surface and more ergonomic eye reference points for window placement. Three basic floor plans provide customers wider choices for refreshment centres and seat placement. New Nordam-supplied cabinets and panels give the CJ4 interior a clean, flowing appearance. A new sculpted lower sidewall also affords more space.

The CJ4 also gives customers the option of quick-change monuments that allow customers to quickly alter the aircraft configuration to better meet specific missions. For example, the large forward refreshment centre can be swapped out for a smaller one and a side-facing seat when extra passenger capacity is needed. The change-out relies on a proprietary pin mounting system developed by Cessna that dramatically chops installation and removal times. "In the old days it used to take eight hours to remove a galley," says Halsey – now it takes four minutes. The system not only makes the CJ4 easier to reconfigure, it makes the interior come together much faster during initial manufacture. "The faster we can turn a product, the more profitable it is," says Halsey, noting that speed must always be tempered with quality and durability.

Choices, choices Although a comparatively small business jet, Cessna offers its customers a wide variety of choices when it comes to colours, fabrics, materials, and finishes that are "very high-end and very expensive," says Halsey, who estimates that there are more than 100 possible colour, material, and finish choices on the CJ4, including dozens of different embossed or patterned carpets.

If those are not enough, Cessna can work with customers to develop customer solutions.

derivatives of those already on the CJ3. The improved engines and wing allow the CJ4 to cruise along at 435kts and climb directly to 43,000ft. Range has been increased to 1,840 nautical miles and full-fuel payload has grown to 1,000 lb (maximum payload is 2,100 lb). The avionics are tried-and-true Collins Pro-Line 21. Like all CJs, the CJ4 can be flown single-pilot.

Look inside While these refinements unquestionably make the CJ4 a better bird, it is inside the cabin where you are apt to notice even more dramatic changes. "There are lots of features that you don't typically see in an aircraft of this size (16,500 lb maximum weight)," says Cindy Halsey, Cessna's vice president of interior design and engineering.

Upfront, the pilots' seats have 2in more legroom and the instrument panel

has a more logical, ergonomic layout. The fuselage has been stretched 2in, yielding more passenger legroom. Passenger capacity has grown to nine (co-pilot seat, belted aft lavatory seat, and side-facing kibitzer opposite the cabin entry door plus six standard single executive seats).

The cabin seats are a new cableless design from Goodrich and the seat pitch and foam sculpting have been changed for improved comfort. The cableless seats weigh slightly more, according to Halsey, but the weight penalty is seen as a worthwhile price to pay for seats with improved reliability. "You do not need to adjust these seats from a maintenance perspective," says Halsey.

The seats also have a unique and sturdy flip-up arm that can be stowed out-of-the-way. "This seat actually fits a big man's body," says Halsey.

1. A belted flushing toilet in the aft cabin provides an eighth passenger seat, as well as additional storage in the side cabinet
2. Six-place centre club seating with a seventh seat across from the entry door is standard for the Citation CJ4

3. The CJ4's Venue cabin management system
4. Right-hand forward closet

3



4

WHEN YOU USE CARBON IN FURNITURE, IT CAN BURST INTO FLAMES... YOU HAVE TO PUT A COPPER MESH UNDERNEATH IT TO INSULATE IT

Some custom installations do present unique challenges, Halsey notes, citing carbon accents as an example. "When you use carbon in furniture, it can burst into flames. It acts like a battery and if it is exposed to electrical current you could get a big surprise. So you have to put copper mesh underneath it to insulate it." However, Halsey says that typically these types of exotic requests are infrequent.

Controls for the Rockwell Collins Venue cabin management and entertainment system are fitted into the automotive-style side ledge with "kinematics like a car," says Halsey. "You press a door and the control panel comes out." There are control panels at each seat position and electrical power outlets at seat positions five and six and at both pilots' seats. The Venue system controls all onboard IFE, including iPod connectivity, Blu-Ray player, moving maps, and a 100GB hard-drive storage for personal media. A single XM satellite receiver and two plug-in, arm-mounted 10.6in monitors are included in the standard package. Additional receivers and monitors can be purchased and each of the six main seats is wired to accept them, allowing the monitors to be plugged and unplugged at the various seat positions around the cabin.

The LED reading lights are not dimmable, but are installed as part of an integrated light/gasper combination. The environmental system has been fortified and improved through the addition of an extra evaporator, separate controls for pilot, co-pilot, and passenger cabin, and redesigned WEMAC air valves. The new

valves can be swivelled 360°, have louvers, and a separate shut-off ring. CJ4 programme manager Norm Baker also notes that "design engineers did a great job of laying out duct work and the delivery system from the evaporators to minimize line loss."

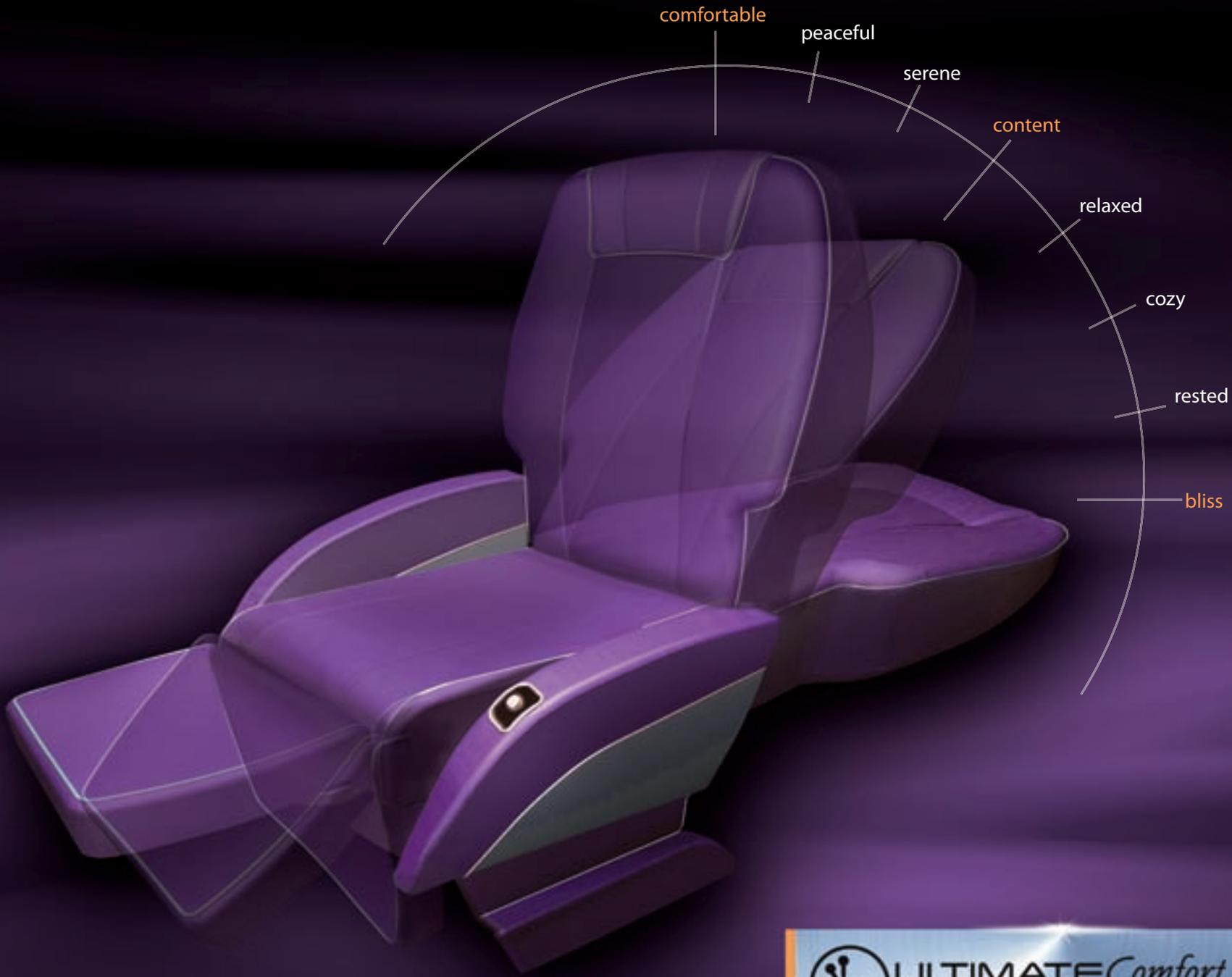
Venue also controls all indirect cabin lighting and the ATG electronic window shades. They can be set anywhere between clear, shear, and full black-out mode. Venue provides full diagnostic monitoring of every line replaceable unit in the CMS, allowing for components to be changed in the field. It also records a fault history that can be downloaded from the aircraft via cockpit USB port.

The aft lavatory features a left-hand belted potty, a small vanity, and pocket doors. Unfortunately, the lavatory cannot be externally serviced. (So when you land, the hapless line serviceman must perform the distasteful ritual of donning hazmat gloves and goggles and then unceremoniously removing the bowl, carrying it through the cabin, and out the door – a short and always perilous journey.)

Current status The CJ4 made its first flight in May 2008. Cessna plans on completing development, testing, and certification late this year, with aircraft deliveries beginning in early 2010. Three aircraft are currently in flight testing and Cessna has more than 70 orders for the aircraft. **END**

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waterfeature

Stand-up showers, once the preserve of VIP wide-body aircraft, are beginning to filter their way down to smaller jets – Bombardier is now offering a shower on board the Global Express

Last NBAA, Bombardier raised the bar for smaller long-range jets when it showed off its new shower design for the Global Express. Rather than positioning it at the back of the aircraft, creator Bruce Malek has installed the washroom in the middle of the cabin. The thinking is simple. On a 14-hour flight from Montreal to Dubai, for example, customers are likely to want to freshen up in comfort.

“There were so many aspects to the design, including the water system, the ergonomics and how to use it,” explains Malek. “I understand cabin flow and how the cabin is used, so the design challenge was to keep it in the middle, so people could stand up.”

Bombardier went through four full-sized foam mock-ups, as well as an

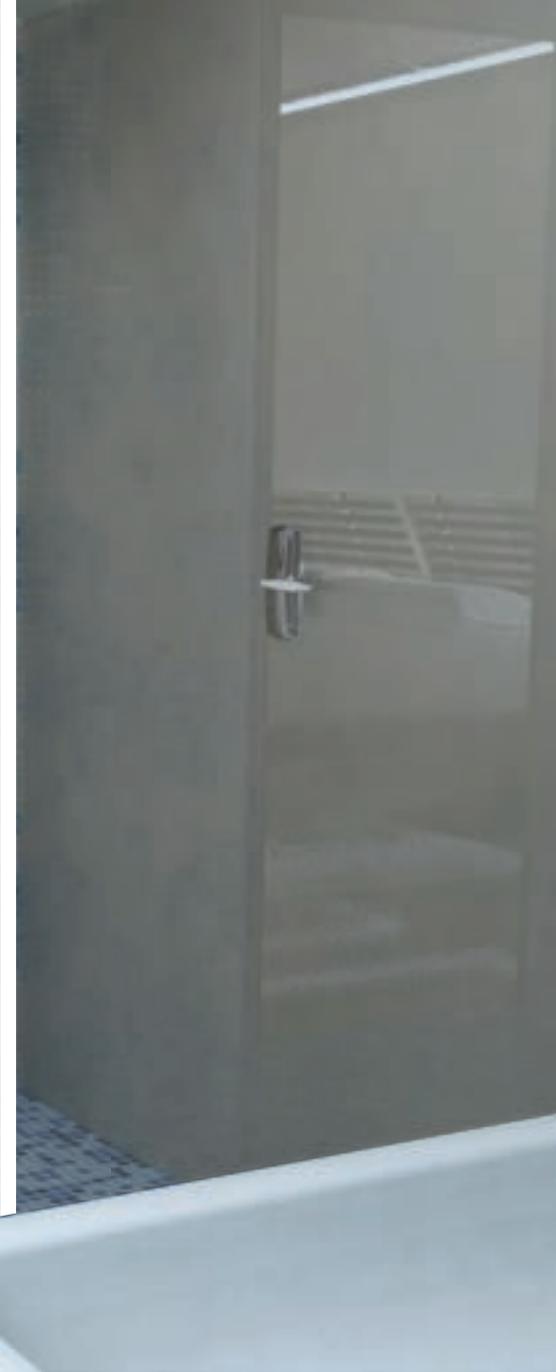
initial 3D drawing to get the space exactly right. According to Malek, the zones of an aircraft correspond to flight phases. At the start of a trip, passengers work near the galley area, which often has a double club layout suitable for meetings. As the flight progresses, the second zone becomes an eating or conference space, featuring a credenza or workstation. The third stage is all about relaxation with a double divan or single clubs or even a fully closed stateroom. For a harmonious ambience, Malek used the same veneer throughout, including inside the lavatory and shower. The shower unit incorporates the same 24-carat gold plating used in the wider aircraft cabin.

Users enter from the enclosed aft room through a sliding glass door. There is a window in the shower, giving a feeling of open space. Malek added a





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1. Upper deck master bathroom on a VIP 747-8, designed by Edese Doret
- 2-3. Bombardier is now offering a shower option for the Global Express

removable carpet, which matches the stateroom carpet and is removed when the shower is in use. The Townsend Leather bulkheads feature the same design as the toilet seat, an embossed navy blue with hand tipped gold relief. The shower itself includes a new element, which heats the water from 3°C to 43.5°C (114°F) instantaneously as it is pumped through, meaning there is no need to pre-heat the water, or use a separate water tank. Wastewater is dumped overboard in flight through a master drain. The shower can take up to 75% of the 28 gallons of water on board, which translates into 40 minutes of shower time. In case a customer eats into the remaining 25% of water (which is purely for systems use) the shower shuts down automatically. Should that happen, users press a button to get one extra minute, to rinse out shampoo, for



Illustration by karine@tundragroup.com

THE FIRST SHOWER WILL APPEAR ON BOMBARDIER'S DEMONSTRATOR IN DECEMBER 2010 AND WILL COST US\$960,000

example. The first shower will appear on Bombardier's demonstrator in December 2010 and will cost an extra US\$960,000 to install, including the aircraft modification.

Other innovations Bombardier is not alone in developing state-of-the-art bathroom technology. Jacques Pierrejean has been working on aircraft interiors for many years. He cut his teeth on small washrooms for Dassault in the Falcon 20 and 50 series and the first shower he produced was for an Airbus A340 presidential aircraft. That bathroom boasted a marble covered floor. Pierrejean says: "It was difficult to convince the engineers initially. However, today a shower on board has almost become a necessity."

Pierrejean's latest project is an onboard spa: "I want to produce steam water like



a hammam," he says. "I'm looking for the sort of well-being that you'd find in a five-star hotel." This would be a complex project to execute. To produce water for steam and create good ventilation to take the hot airflow demands a great deal of ingenuity and entails using a small diffuser inside the shower.

Meanwhile, Pierrejean, having consulted with medical experts, says it is not advisable to bring gym equipment on board. "Exercising heavily at altitude can be dangerous, whereas the ambience of a spa and a small stretching area can be soothing," he says. In addition, Pierrejean is developing a Jacuzzi, and says that the key challenge with that project is to ensure that there is a big drain to catch water as the aircraft moves.

Edese Doret is designing a Jacuzzi, too: "It is a complex item that is all enclosed like a shower," says Doret. "We

have also added an integrated 32in video monitor." Doret's Jacuzzi is connected to the flight management system, so that when the captain puts the fasten seatbelt sign on during heavy turbulence the water drains to a water tank. Naturally everything on board has to be certified and challenging new concepts, such as Jacuzzis or steam rooms, take time to develop. Pierrejean has an advantage in that he creates interiors for private and commercial jets, so is working with the same suppliers for both, including the shower supplier for Emirates' A380 fleet.

At the sharp end of engineering, Erik Vandegrift, senior completion project leader at Jet Aviation Basel, has worked on shower installations for several years. He believes that the key challenges involved are the quantity of additional water needed, as well as ascertaining where the shower will be used. Vandegrift says: "If a shower is used on the ground, the water will need to be collected in a holding tank. Other challenging elements are its location and the aircraft's structure, lighting, venting and water draining requirements. For example, if the aircraft flies slightly nose up, the water drainage needs to be sufficient to prevent the water from collecting while the passenger takes a shower." The doors also need to be sealed when closed to stop water from seeping out.

Ambience In terms of décor, Doret says that aircraft customers have moved towards the same feel in an aircraft bathroom as they have at home. He works closely with the Aircabin Company, a US polycarbonate manufacturer. Senior sales manager Angelina Reyes says: "Our polycarbonate tiles mimic stone or Italian marble, but are a lightweight cast. We have also built a cubicle that is all clear looks and looks like it is wrapped with glass."

All the designers talk about the importance of lighting. Doret uses panels that refract light well, giving a warm feeling to the cubicle. Mood lighting is a must for Pierrejean, too. He says: "In a washroom there are often no windows, so I have developed special lighting that works to recreate the outside to give a strong light that is fresher than usual in the shower."

Pierrejean points to the value of colour and texture. He says: "I like light colours in an enclosed area, with plain wood and clean marble, which is warmed with the wood. In my latest ACJ, I used small mosaic tiles, giving the impression of a swimming pool in emerald with bronze, which looks like jewellery."

Reyes says that there are distinct regional preferences: "In Europe and North America, people like sands and neutrals and robin's egg blue," she says. "In the Middle East, people prefer golds and two-tone translucent Mediterranean colours."

Customer expectations Today's business travellers expect to see a shower on board a long-range jet, especially on ACJ and BBJ types. After six to eight hours, passengers like to freshen up. Typically on an A340 there will be three or four showers, for example in three bedrooms with showers and one that is an extension of a communal lavatory. Passengers need to give crew two hours' notice should they wish to take a shower during the flight.

David Velupillai, Airbus's product marketing director, executive & private aviation, says: "Our customers want to take a shower after a long flight, which means they arrive and are ready to go straightaway, and are not obliged to go to a hotel before a meeting."

**IN MY LATEST ACJ,
I USED SMALL
MOSAIC TILES,
GIVING THE
IMPRESSION OF A
SWIMMING POOL**



4. The mosaic tiles are supplied by Air Cabin Trading Company Inc
5. Bombardier's Global shower is available in a range of finishes

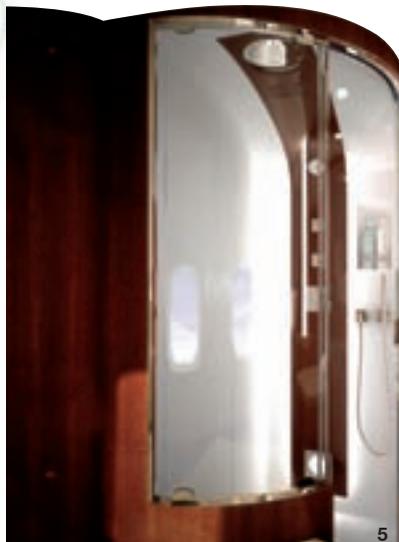
He adds: "Customer expectations are always increasing in private aviation. People used to be satisfied with a traditional cabin, now they require something more comfortable and a shower is part of that."

According to Boeing, 80% to 90% of BBJ owners install at least one shower and some owners install more than one. Boeing installs a water tank as part of its assembly process (a standard item), and completion centres may install additional tanks at the customer's request. This

adds weight, though the airframer has experimented with alternative solutions. Some years ago, Boeing set up a joint venture with the AquaJet Appliance Company, using NASA Spacelab UV filter technology to recycle used water, however, according to the company, the venture failed because of lack of customer interest.

Although it is technically possible to recycle water that has been used for showers, research indicates that VIP travellers are just not ready to accept this concept yet, fearing that this would be unhygienic. So many aircraft use two tanks, one for clean water and one for dark.

However, attitudes are evolving and people do eventually change their minds. Things have turned full circle for Pierrejean, for instance. He recently had a customer who had opted not to have a shower on board his jet, preferring extra storage space. After discussions with his friends, particularly about resale, the client changed his mind and opted for a washroom on board. Clearly bathrooms have become a standard rather than a feature. **END**



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double delight

Hawker Beechcraft updates the interiors of two classics: the Hawker 400XP light jet and the King Air 350 turboprop

Late last year, Hawker Beechcraft announced major refinements to two of its top-selling aircraft: the Hawker 400XP light jet and the King Air 350 turboprop.

The refreshed models are known as the Hawker 450XP and the King Air 350i. Both have been around for decades.

The King Air can draw its roots back to the 1930s, when Walter Beech introduced the Model 18, arguably the first cabin-class, twin-engine business aircraft. Today Model 18s continue to see service, mainly as cargo haulers. In 1958, Beech introduced the Queen Air, an aircraft that remarkably resembles today's King Air save for the square passenger windows and piston engines.

Beech delivered the first King Air in 1964. It was an immediate hit; quickly Beech commanded an amazing 77% market share of the twin turboprop market. In 1969, Beech introduced its first significant new variant of the aircraft, the Model 100. In short order came more models and all featured incremental improvements. The Model 350 Super King Air debuted in 1988. Its fuselage was 34in longer than the Model 300, and it sported winglets and a completely redesigned interior. The first 350 was delivered in 1990. Since then, more than 500 Model 350s have been manufactured, but the recent spike in fuel prices resulted in sales of 50 King Air 350s last year alone.

The Model 350 has ramp presence. Overall length is 46ft, 8in. Wingspan is 57ft, 11in. It sits high off the ground and the top of the T-tail horizontal stabilizer is 14ft, 4in off the deck. The

1. Interior rendering of new Hawker 450XP



2

aircraft has capacious baggage capacity, making it ideal for fishing, golf, hunting, or skiing trips.

You enter through a folding air stair door at the rear of the aircraft and walk past the partition for the chemical toilet. The passenger cabin measures 19ft, 6in-long and 4ft, 6in-wide. The aisle is a recessed well that runs down the centre of the fuselage, yielding 4-ft, 9in of headroom. Inside the cabin, the small cabinetry can hold a modest supply of beverages, glassware, and an ice drawer.

Moving forward, the 350 treats passengers to a cabin almost equal in size to a mid-size business jet, with room for up to nine. (Eight in the main cabin and one in the cockpit sitting next to the pilot – when operated with two pilots, passenger capacity is cut to eight.) Passenger chairs recline, track forward and back, and swivel from side to side at the touch of a button. The seats have slide-down adjustable inboard arm heights. This is particularly useful for gracefully sliding in and out of seats or to accommodate large passengers. Passengers' outboard arms are supported by the cabin's sidewall ledge.

The ledge also contains cupholders and can be equipped with controls for cabin lighting and in-flight entertainment and communications. The seats are clustered into two facing 'club four' arrangements to facilitate conversation. Folding tables retract from, and stow into, the cabin sidewalls between the seats.

Rail system For the US\$6.6 million 350i, Hawker Beechcraft maintained the interior's basic layout but updated it in terms of flexibility and options. All the interior components are new with the exception of the seat frames and seat rails. The new interior is mounted on a new cabin rail system, explains Trevor Blackmer, senior manager for Beechcraft product marketing. "There are always minor variances between each aircraft built, but the new rail system assures that all the mounting points are identical and every interior is built the same," he says.

2. The King Air 350i cabin seats eight passengers



THE NEW RAIL SYSTEM ASSURES THAT ALL THE MOUNTING POINTS ARE IDENTICAL AND EVERY INTERIOR IS BUILT THE SAME

All of the cabin furniture, the tables and cabinetry, have been completely redesigned to have a more sculpted appearance and to fit tighter against the seats. The seats themselves use an updated foam technology that is thinner and more ergonomically sculpted, allowing passengers to sit deeper into the seat frames and creating more leg and seat back space. Emteq-supplied, automotive-style seat heaters in the seat bottom and back cushions can be controlled via armrest switches and set to low, medium, or high by each individual passenger. The seat heaters are also integrated into the new Rockwell Collins Venue cabin management system, which can pre-heat all of the seats or turn off all of the seat heaters. The seats can be heated without the engines running by plugging the aircraft into a ground power unit.

The rail system enables a new 'FlexCabin' system, whereby individual seats in the aft club section can be removed and replaced with an ottoman. The ottoman has a hinged lid with extra storage underneath. Aircraft weight and balance has been pre-calculated for each permutation. The

rail system also allows seats and the ottoman to be positioned for optimum individual passenger comfort.

The windows use the same electronic darkeners from PPG that will be used on the Boeing 787. They have the flexibility to be set both darker and more transparent than current polarisers and they also can be controlled by the cabin management system either globally or for each of the two club seat groupings. The pilots can also control all of the window settings by choosing from a variety of scenes including 'movie' and 'night-time'.

Cabin lighting will be all-LED, including indirect downwash and four-adjustment, multi-intensity reading lights. The main cabin lighting can be adjusted between ten different levels to create theatre-like dimming.

The IFE components feature a standard 15.3-in monitor that swings out from the forward bulkhead and plug-in receptacles in the aft seats for 10.4in monitors. An optional aft entertainment cabinet also holds an additional 15in swing out monitor.

A midship pyramid cabinet houses the iPod dock or a wireless AirCell

telephone. Venue can also support Blu-Ray, CD, DVD, and MP3 players, gaming consoles, laptops, electronic cameras, USB data storage devices, and future HDMI devices. Cabinets also have USB charging ports.

The galley cabinets have flexible and multiple inserts that can be changed out and are designed to hold liquor minis, water bottles, wine bottles and wine glasses. Cabinet drawers and openings are LED lighted – open the drawers and the lights come on. They also feature soft automatic closing as found on high-end kitchen cabinets. A special hot carafe system, as opposed to the traditional static coffee pot, can be passed around the cabin.

FAA certification for the 350i is anticipated later this year and EASA certification by early 2010.

Hawker 450XP Hawker Beechcraft took many of the cabin interior lessons learned on the 350i and applied them to the new Hawker 450XP light jet.

The 450's story begins in Japan. Nowadays much is being made about Honda's entry into the Very Light Jet (VLJ) market, but this will not be the first time a Japanese company fielded a bizjet. Twenty-eight years ago Mitsubishi launched the MU 300 Diamond I and built 84 of the light twinjets before selling the design to Raytheon Aircraft (now Hawker Beechcraft) in 1985.

Raytheon needed to field jets to remain competitive and was able to enter the market relatively quickly by acquiring the Diamond to challenge the Cessna Citation II and the mid-size Hawker line from British Aerospace, as well as take on the

3. The 350i features seating with adjustable inboard arm heights, to improve access



3

Falcon 20, Learjet 55, Sabreliner 65, and Westwind. Raytheon re-engined the aircraft and in the ensuing years made numerous cabin improvements.

More than 500 Beechjets are currently in civilian service, while another 192 are in service as trainers with the US and Japanese militaries – in the US they are called T-1 'Jayhawks'. Raytheon gave the cabin a facelift and rebadged it as the Hawker 400XP in 2003. Prior to that, the last major factory refresh of the cabin occurred in 1996.

Beechjets are fast. They cruise at 476mph, have a service ceiling of 43,000ft, and range of 2,000 statute miles (four passengers). They seat six in the main cabin. Another two passengers can be seated on the optional side-facing, single-place kibitzer (replaces the entertainment console) and on the belted potty. Realistically, the cabin is comfortable for a maximum load of four.

The aircraft is the foundation of fractional share provider Flight Options and numerous charter operators. It is also popular with individual owners. Although the design is dated, the aircraft has few equals in terms of price, operating costs, and speed – especially speed.

As the updated US\$7.995 million 450XP, Hawker Beechcraft gave the aircraft new engines, avionics, and an interior. The new engines burn 10% less fuel and power the aircraft 10mph

faster, and the aircraft can carry an extra 350 lbs of fuel with full payload.

The new interior has two basic floor plans – the first features two aft cabin forward-facing seats, a centre-positioned club four grouping, and an aft-facing single seat in the forward cabin opposite the redesigned refreshment centre. There is also a belted potty. The second plan is similar except it replaces the refreshment centre with an additional cabin seat.

New materials are used throughout, including higher grade leathers and fabrics on the sidewalls and headliners. The seats are restyled and have optional seat warmers and waterfall headrests. LED lighting and dual-zone climate systems have been added. Like the 350i, the Rockwell Collins Venue system is the brains of the cabin with all the same attendant features as on the 350i. Because of cabin size, the monitors are a bit smaller at 10in, located in the club seating area and on the aft side of the forward cabinet.

"We basically leveraged the work Trevor and his team did on the 350i," says Dennis Childreth, senior manager for Hawker product marketing. In so doing, Hawker Beechcraft has breathed new life into two popular legacy products. **END**

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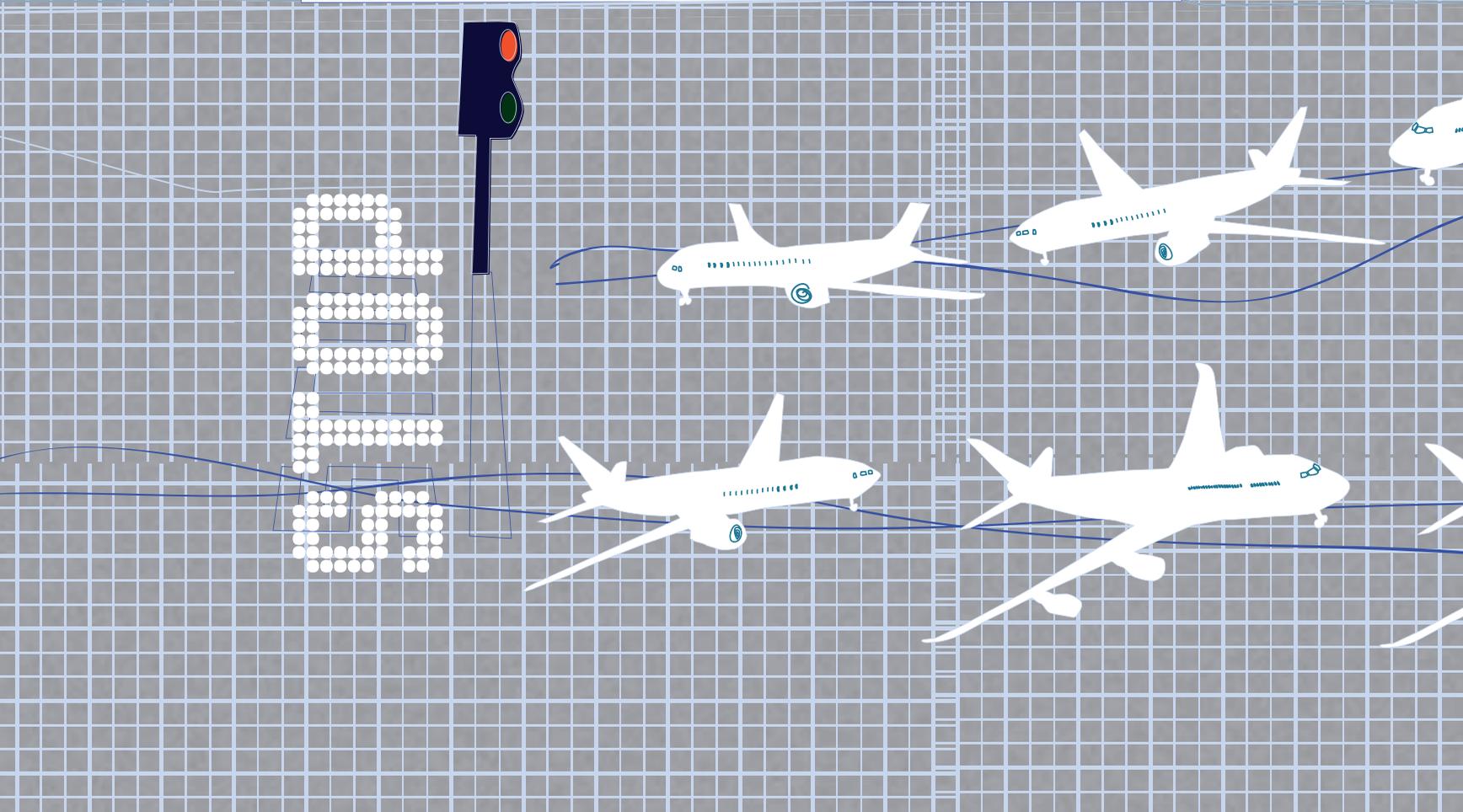
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The backlogs at 'big iron' completion centres continue to grow, despite the downturn

While the rest of the bizjet world is staring down a 30% business downturn, big iron completion centres – those that cater to heads-of-state, royal families, and multimillionaires – are having none of it.

Their hangars look like mosh pits for airliners, crammed inside wingtip to wingtip and nose to tail. They cannot get aircraft in and out fast enough. They are adding capacity, either organically or through acquisitions. Witness, over the last two years, Jet Aviation's purchase of Midcoast and the Savannah Jet Center, then Jet is purchased by General Dynamics; or Comlux's purchase of the Indianapolis Jet Center; or Goderich landing a refurbishment contract for a fleet of BBJs; or Lufthansa Technik's expansion spree; or Gore growing its physical plant (again). Need an ACJ or wide-body completion? Be prepared to wait – until about 2012.

Then there is the other half of the equation: as airlines defer deliveries, airframes are becoming available for VIP clients substantially ahead of schedule and at a discount – and completion centres are being pressured to accept them early. Meanwhile, first-generation ACJs and BBJs are now due for refurbishment, while heads of state are looking to move up to the next generation of airliners – Boeing 747-8 and 787 and Airbus A380 and A350XWB. The United States is looking for three aircraft to replace the two 1980s vintage Boeing 747-200s used to transport the country's president. And

airlines are looking to dump their regional jets, with several enterprising organizations seeing an opportunity to acquire and refurbish them in executive configurations, then offering them to customers for US\$10 million to US\$15 million less than a comparable bizjet.

Part of the consolidation is also defensive. As the bizjet market contracts, OEMs are bringing more completion work in-house, leaving less opportunity for traditional independent centres. The crush also has forced large bizjet OEMs to become more competitive and innovative to protect the business they have from predation by the Big Iron OEMs. Bombardier, for example, is now offering the Global XRS with an aft cabin media room, a feature heretofore only found on converted airliners, and more high-end interior choices, including veneer sidewall inserts and metal bullnoses on the galley and lavatory.

Who's doing what? For big iron completion centres it is a perfect storm – of opportunity. The only questions that remain are can they meet demand and meet it on time? Here is what is happening now at the big iron shops.

In Canada, Flying Colours has developed a CRJ ExecLiner conversion programme. This completion involves removing an airline interior out of a CRJ 200 and converting it into a 16-18 passenger executive jet and installing the company's own auxiliary fuel system, boosting aircraft range to 3,000 nautical miles. The converted aircraft is virtually indistinguishable from a new Bombardier Challenger 850. Concurrently, Flying Colours is actually doing green Challenger 850 completions. This type of conversion is becoming more common as airlines slash capacity and seek to curtail or offload their money-losing RJ routes.

Goderich Aircraft, in conjunction with project partner Genesis Custom Jetliners, will be refurbishing several BBJs for Abu Dhabi-based Royal Jet. The new interiors will be upgraded with the latest IFE package, including airborne Internet, adjustable LED lighting, and executive suites. Goderich previously refurbished an MD-87 for Genesis and also has done executive conversions of Dornier 328JETs.



NEW HANGAR AND SHOP SPACE IN BASEL WILL BE ABLE TO SERVICE B747 AND A380 AIRCRAFT SIMULTANEOUSLY

Meanwhile, the European-American completion axis continues to grow. Lufthansa Technik (LHT) announced late last year that it was plotting to open a ACJ/BBJ completion and refurbishment centre at its BizJet subsidiary in Tulsa, bringing its concurrent narrow-body completion capacity up to four. BizJet's typical forte is Falcons and Learjets, but it delivered three BBJs last year and will begin work on its first A319 this spring. LHT is also repositioning some additional narrow-body and RJ conversion support work to the former Swissair maintenance complex it acquired in Basel.

Overall, LHT plans to deliver 14 narrow-body completions between now and 2012. Included in the mix are Airbus A318 Elites and A319 ACJs and Boeing BBJs. Forward bookings are strong, with some next-generation wide-body customers booking deals out more than 10 years for wide-bodies, including the Boeing 747-8 and 787. A third wide-body line will open in 2010 in Hamburg.

Nearer term, the company is working on two A330s and two A340s for the German government.

Similarly, Swiss-based Jet Aviation appears to be bulging at the seams. Late last year, the company was purchased by American conglomerate General Dynamics, which owns, among other things, Gulfstream Aerospace. The deal included Jet's US subsidiaries, Midcoast Aviation and the Savannah Air Center. Both subsidiaries have had a long-standing relationship with Bombardier, providing green completions for Challenger 600 series (Midcoast) and Global 5000 and Global Express XRS (Savannah). The latter is also moving into green Challenger 850 completions.

1. Jet Aviation's Basel facility
2. Flying Colours continues to report strong demand for its CRJ Execliner conversion programme



1

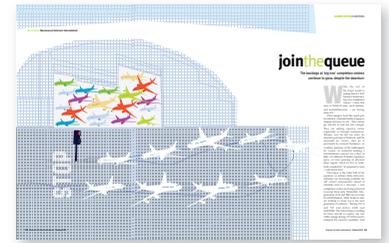


Illustration by Anna Davie

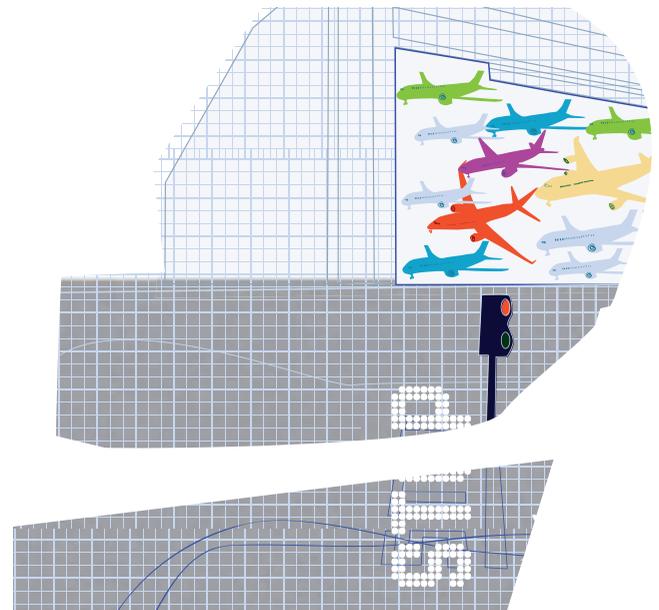


2

Jet Aviation has been adding to its physical plant over the last two years, both in the US and Europe, with major hangar expansions on both continents and the establishment of a narrow-body completion line at Midcoast. Savannah has added a 100,000 square foot hangar to handle large bizjet maintenance and completions. New hangar and shop space in Basel will be able to service B747 and A380 aircraft simultaneously. Jet has wide-body completions, including the Airbus A350 XWB, booked into 2015 and ACJ/BBJ completions booked out three years. Jet Aviation also continues to service Dassault Falcon Jet as an authorised completion centre.

Stork's Fokker Services has moved into ACJ series completions and has a two-year business backlog. The company already has one ACJ completion under its belt and two more in work. RUAG has moved into large bizjet completions and AMAC is currently building three hangars large enough to accommodate wide-body and ACJ/BBJ class aircraft in Basel.

New to the game Relative newcomers also are looking to get into the completions game. Last year, Comlux, best known as an aircraft manager and charter provider, purchased the Indianapolis Jet Center to conduct completions and refurbishments on its own and other narrow-body aircraft.



The facility will now be known as Comlux Completions USA and will be run by Associated Air veteran David Ettinger. Indianapolis Jet is another centre that has done well converting Bombardier CRJs to executive configurations. Comlux dove into the completions game when it bought into Airbus's ACJ Completions Centre in Toulouse and its Creatives division helps clients spec and manage completions projects.

Established US firms also are faring well in this environment. Seattle's Greenpoint, a veteran BBJ completion centre, has work booked into 2012 and is designing a major OEM modification kit (believed to be for BBJs). Associated (now part of Standard Aero) in Dallas, continues to be busy with both narrow- and wide-body completions.

In San Antonio, Gore Design Completion has five aircraft in work, including two Airbus A340-500s (one a green completion, the other a refurb) and three green BBJs, all to be delivered by the end of 2009. During 2009 and 2010, the company also plans to input another A340 and a Dash 200 for refurb, plus a green BBJ and two head-of-state completions, a B777-200LR and a B767-300 – the sixth B767 the company has landed.



3. Gore Design Completions' San Antonio facility has five aircraft completions projects underway

EVEN WITH THIS MYRIAD OF EXPANSION, WAIT TIMES FOR BIG IRON COMPLETION SLOTS WILL BE MEASURED IN YEARS, NOT MONTHS

The A340-200 refurb, for a Middle Eastern customer, is the company's third A340 project and will take just over one year to complete. The project includes pulling out the current interior and reconfiguring over 80% of the existing layout on the aircraft.

Gore's customers are requesting the latest in IFE technology, including iPod compatibility, 46in HDTV, Blu-Ray, and multiple-colour LED lighting. In April, it plans on delivering an all-HD BBJ with HD monitors built into every seat in the aircraft.

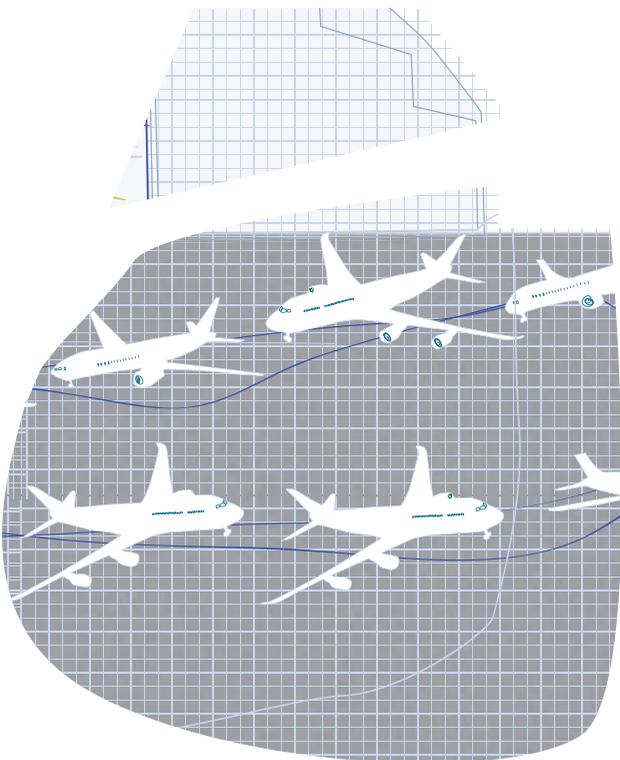
Reflecting its bullish market outlook, like many of its competitors, Gore is also expanding its physical plant. Gore is adding a 65,000 square foot office expansion and a 60,000 square foot hangar addition that will add more space for shops and storage.

A company spokeswoman summed up the outlook at Gore and the rest of the big iron market when she said:

"Business is good and we are not yet experiencing a downturn in the market – regions such as the Mid-East, Far East, and Central Asia are continually growing and we are seeing much of our future growth come from these regions."

Get in early Even with this myriad of expansion, wait times for big iron completion slots will be measured in years, not months. Clients looking to upgrade to more modern airframes would be well-advised to lock in a completion centre early. For the centres themselves, the continued demand presents a classy set of problems and most seemed to have planned well for it. Still, the inside of their hangars are going to look like aluminium mosh pits for years to come. **END**

Web www.goredesign.com;
www.comluxaviation.com





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showing the way

New lighting technologies go beyond plain illumination to help demanding business jet passengers to work and relax



pick and mix

Schott's offerings for the business jet market include LED lights and fibre optics. "These product lines allow for nearly infinite ways to customise aircraft with choices of colour, location and lighting design," says Gerhard Zwickel, manager of aviation at Schott. LEDs and fibre optics can be combined in the cabin to create stunning design features and to help the traveller to relax. Fibre optics are very versatile – they can, for example, be installed in the cabin ceiling to create a starry sky effect, or used as a frame around cabin windows. Schott says that its LED lights keep electricity consumption to a minimum and emit less heat than traditional incandescent or halogen lights. Schott is also working on a flat-panel solution for backlighting in aircraft, based on LED technology.
www.schott.com/aviation

light and shade

BE Aerospace's latest (fourth generation) indirect lighting product is called System 9000. The system allows passengers and crew to programme the colour temperature they want, providing a full-spectrum white light with a range from 2,700K (warm) to 7,000K (cool), as well as a full array of RGB colours. The system also includes step or continuous dimming regardless of the colour being displayed. It is powered from 28V aircraft power and does not require additional power supplies for operation. The product is made from extruded aluminium and has a clear lens cover to protect from particle build up and interference. Light assemblies are available in various lengths.
www.beaerospace.com





simple pleasures

Emteq's latest LED wash light for business jet cabins is ELW90, which incorporates RS485 and digital control. RS485, used for long distance and multipoint data communications, simplifies the programming and control of the ELW90 system. "Digital control and RS485 technology allow for direct interface and communication with Cabin Management Systems (CMS), eliminating the need for additional hardware to control the lights and allowing for optimal data transmission performance between multiple devices," explains Cory Wasniewski, project engineer. For aircraft without an existing CMS or RS485 bus, Emteq is developing an analogue-to-digital interface bus module. The product also boasts single command fade, near elimination of electromagnetic interference, single bus wiring to control lighting zones and multiple light setting options.

www.emteq.com



homemaker

Goodrich Lighting Systems is the supplier for interior, flight deck and exterior lighting on Bombardier's Global 5000 and Global Express XRS business aircraft. The company says that for this project it wanted to create a 'home-like' atmosphere with its cabin lighting, which is based on LED technology. The main cabin lights, side wall and ceiling wash lights offer the flexibility to create different light colours, ranging from energizing cold to relaxing warm. Goodrich says its customer feedback indicates a preference for the warmer light colours during standard flight time. "It is not only the light colour that makes an artificial light a good light, it also requires a high colour rendering," says Rolf Brölemann, segment engineering manager of lighting systems at Goodrich. "A few years ago, the business jet market was flooded with wash lights using RGB technology (combining red, green and blue LEDs to create white

light). We know today that RGB technology with its small emitted wavelength of light is not enough to provide a reasonable environment for a business jet interior. The secret behind good light is to provide a wide homogeneous bandwidth." Within the industry, the Color Rendering Index (CRI) is usually used to justify the quality of light. "The CRI is the only scientific value for the similarity of artificial light to sunlight. But this value actually describes only the similarity of energy levels of eight different wavelengths within the entire spectrum. For that reason it might also give excellent results for light that does not deem attractive or natural to the human eye," says Brölemann. The Goodrich recommendation is to verify the light quality within a team and with the various materials that you intend to use in the aircraft.

www.goodrich.com

Izzy Kington Business Jet Interiors International

caféculture

The latest gadgets and gizmos to grace your business jet's galley



multitalented

The new 28VDC Gourmet Multi-Purpose Beverage Maker from B/E Aerospace allows business jet passengers to brew Espresso, Ristretto (similar to Espresso, but with less water), Cappuccino or an 8oz cup of coffee. The insert is driven by a microprocessor, enabling precise control of temperature, pressure and volume. Passengers can use bottled water and standardised Espresso and coffee pods to create the beverage of their choice. The RTCA/DO-160E compliant unit incorporates advanced power switching techniques that eliminate the extra weight and short lifespans of some standard electromechanical components. It will also use minimal power in standby mode so that sufficient power is available to other galley inserts. B/E Aerospace intends to launch this new product at the end of 2009. www.beaerospace.com

hotspot

MGS's new product, the Inductive Hot Plate (IHOP), allows free cooking as in restaurants on the ground. It consists of a Ceran cooking top with two standard cooking zones and one extra-large cooking zone for woks. To ensure safe use on board, the IHOP has easily removable and cleanable fixtures to secure pans. All

visible surfaces are made of stainless steel, making the product robust and easy to clean. For maximum comfort and safety (and to avoid smells spreading through the cabin) the IHOP can be used with a fume hood. The IHOP is based on approved technologies, designed especially for large VIP aircraft. www.mgs-aircraft.com



ovenready

Monogram Systems – TIA Division has developed a new insert, the 1546 Convection Oven, in response to industry calls to reduce installation costs and maximise usable galley space. The product features TIA's proprietary Cool-Tek technology, which dramatically lowers the wall temperatures of the oven, allowing reduced installation clearances. The oven features a new integrated controller, with customer-programmable presets and preheating functions. The insert has a slide-mounting bracket, for easy installation using only two top-mounted screws. The company has also designed a new 1604 series Coffee Brewer, which slides on ATLAS or ARINC rails and doesn't need to be connected to the aircraft water supply system (as it has an integrated water tank using bottled water). TIA says it has engineered unnecessary complexity out of its new coffee brewer, resulting in a light, reliable machine.

www.tiaproducts.com



hightea

Iacobucci HF Electronics' Hi-Fly Americana Coffee and Tea Maker produces coffee, tea and hot or cold water, each dispensed through a separate outlet to preserve its distinct taste. Each cycle can yield 1.3 litres, while passengers can also select a single cup function. Instead of water boilers, the machine uses heat exchanger technology – which allows for instant and continuous operation without any wait time for reheating the water after each cycle. The product was developed to be interchangeable with all Iacobucci HF beverage makers (including the Espresso & Cappuccino Maker, the Water Heater and the Nespresso & Cappuccino Maker), and can also work with an external water tank providing bottled water.

www.iacobucci.aero



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grand designs

Despite its growth into other areas, Gore Design Completions says that design remains at its core

Jerry Gore and Kathy Gore-Walters set up Gore Design in 1988 as a company focused solely on aircraft design. Although the company has expanded into other complementary areas, design is still at its heart. "We built our business on design," says Gore. "Everything we have comes from that one starting point."

In 2000 the company marked its expansion into full narrow- and wide-body completions (and its name change to Gore Design Completions) with the arrival of a Boeing 767-300ER from China. Gore and Gore-Walters continued to focus on the details of design, bringing in others to oversee engineering and installation. The company now boasts a team of over 500 craftspeople, engineers and designers.

"We never take for granted that there will be an unending stream of work," says Gore-Walters. "We have seen the ups and downs in this industry and know that work can cease just as quickly as it begins." But despite the current economic uncertainty, the owners think that the aircraft completions business for narrow- and wide-body aircraft has continued to grow. GDC has grown from completing one aircraft at a time to housing a combination of five to six wide- and narrow-bodies at any given time. A strong customer base in Central Asia, the Middle East and the Far East continues to book completion slots with GDC as far out as 2011.

With this many aircraft, GDC has had to learn how to keep aircraft downtime to a minimum. The owners believe the key lies in GDC's 80,000ft² manufacturing facility, which is adjacent to its 120,000ft² hangar. In addition to housing the design and engineering studios, this space also has three platforms where interiors can be pre-fitted prior to an aircraft's arrival. By doing this, the team is able to shorten the amount of time that the aircraft spends parked at the facility, completing as much of the groundwork as possible before the aircraft arrives at the site. "No one wants an asset of this magnitude sitting in a hangar for prolonged periods of time, so we do our best to prepare before the arrival of the aircraft for an efficient re-delivery," says Gore-Walters.

Gore and Gore-Walters continue to run their business with a distinctly hands-on approach. "It is important to us as owners to maintain an active interest in the design of each interior that we do," says Gore. At a recent press conference in Dubai, Mohammed Al-Zeer (chairman of MAZ Aviation and a current GDC client) identified what makes the company so successful: "With Gore, each project is a work of art. It helps that the people who own the company are very much part of the work."

Gore Design Completions

Reader Enquiry No.501



1-2. An A320 completed by GDC for a head-of-state customer
3. A proposed A340 project



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Over the past three years EAS has dedicated its team to fulfill the aircraft interior requirements of a Royal Family member with a total of three completion projects. In each case EAS produced interior kits where the design was created, performed the engineering, fabricated all of the elements, had an EAS crew on-site performing the installations and then achieved full FAA certification. All a mass of logistics but not new territory for EAS as the team has done this many times in other countries around the world.

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form and function



Luxury dinnerware provider Dahlgren Duck credits its success to blending elegance and airworthiness

Dahlgren Duck & Associates supplies dinnerware including crystal, china, flatware and linen for aircraft. The company has been honing its offering for 25 years. Its main principle is that size, weight and stability must be balanced with style to provide the maximum in airworthiness. The company says it is this equation that has led it to success in the field of VIP private jet aviation. "We specialise in providing custom luxury accessories for the most discriminating environments around the world," explains Jim Dahlgren, who, together with Allan Duck, set up the company in 1983. "The owners of private jets expect a quality, uniqueness and functionality that are often beyond what the most high-profile retail stores offer."

As well as creating its own custom products, Dahlgren Duck is recognised as a Special Markets Distribution Company for more than 200 top dinnerware brands. This means it can market and sell products in this specialist market on behalf of companies that would not normally target the business jet market, and therefore offer its customers a wide choice of products.

This product range includes the convenient and practical (for example, microwavable gold and platinum china) as well as the luxurious (for example, natural fox-trimmed cashmere throw blankets and custom tissue boxes).

"For VIP design integrated dinner services, no firm the world over possesses the resource capabilities and expertise of Dahlgren Duck. In the shrinking world of old-world-craftsmanship and attention to detail, Dahlgren Duck has been quietly responsible for the collaborative production of VIP and head-of-state aircraft and palace dinner services as a partner to our creativity and imagination," says Rick Roseman, principal of RWR Designs, one of the many companies Dahlgren Duck has collaborated with.

Customers include the design departments of private jet aircraft manufacturers, aviation design firms and VIP modification centres. "Dahlgren Duck supports our entire design team with product expertise, sourcing and timely delivery. The time-saving convenience

of one-stop-shopping with Dahlgren Duck is an invaluable resource for us," says Lydia Pierce of Cessna's design team. "We confidently call upon Dahlgren Duck's vast knowledge of the ever-changing world of table top and accessories to match our own design vision for our aircraft interiors," says Kathy Gore of Gore Design Completions.

Dahlgren Duck cites its development of a new crystal collection and new aircraft mugs as examples of its attention to detail. The company wanted to ensure that the products would fit aircraft cup holders, which are often recessed into the table, side ledge or arm of a chair. The company obtained various commonly used cup holders and made moulds based on these to make its products with, even raising the handle of the mug to make it fit.

Many of Dahlgren Duck's crystal items and mugs are customised with royal crests, corporate logos, tail numbers or monograms. The company stocks a large amount of fine bone china, Limoges porcelain and branded crystal. As part of its custom offering, Dahlgren Duck can supply complimentary 'blank' samples of custom orders to the customer, allowing aircraft engineers to work on the exact dimensions needed for galley storage compartments while the actual dinner service is being produced.

The company has also expanded into VIP food service trolleys. These are made from durable aircraft-grade materials with swivel casters and lockable wheels. The tray inserts are made of carbon fibre. Finishes include 24 carat gold, while the face panels can also be customised, for example with a royal crest or corporate logo. When not in use, the trolleys collapse to a height of 32in and width of 5in.

"The high-flying world of private jet aircraft presents some unique challenges. Residential table settings are naturally not concerned with air turbulence. At 30,000ft, stability, size and height of fine crystal are as important as its appearance," says Duck.

Dahlgren Duck

Reader Enquiry No.502

1. Fox-trimmed cashmere blanket
2. Mugs and crystal can be made to fit aircraft cup holders exactly
3. A customised place setting

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toptips

Debi Cunningham from West Star Aviation shares her advice for picking the right vendor for an interior upgrade

Updating a business jet's interior is an opportunity for owners to modernise styling, increase comfort and integrate new technologies into aging cabins. It is a major investment, but unlike many of the costs associated with operating an aircraft, interior refurbishment can greatly increase the value of a jet. However, with so many interiors companies offering a variety of services and design options, it can be difficult to decide on a vendor.

West Star Aviation provides interior design and installation services for a wide range of business aircraft, including Falcon, Challenger, Gulfstream, Citation, Lear, Hawker and Embraer types. It also offers maintenance, repair and overhaul, paint and avionics services. Debi Cunningham, the company's marketing director, has 23 years' experience in the design of business jet interiors. She believes there are three things a customer should look for when choosing a vendor.

Reputation Cunningham says that the first thing to consider is the company's reputation. For a redesign, the owner is entrusting a multimillion-dollar asset to a vendor. Obviously, the supplier should have an outstanding record of value and performance within the industry. Reputation is most commonly supported by word of mouth. Airports are tight-knit communities and aircraft owners and operators frequently share their maintenance experiences (positive and negative) with their peers. "If a vendor does an

outstanding interior upgrade for a customer in Minneapolis [Minnesota, USA], it is not uncommon for that company to get numerous requests for bids to upgrade other aircraft based in the Twin Cities," says Cunningham.

Experience and knowledge The second criteria she gives is that the company must have proven experience and knowledge. Quality interiors companies should know the variations and floor plans for each type of aircraft they modify, and should be able to demonstrate their experience. "For example, when bidding to redo the cabin of a Dassault Falcon 900, designers may convey their experience with that particular model by asking if the potential customer's aircraft features the floor plan with two divans in the aft cabin, or the version with one divan and two seats," Cunningham notes. By selecting an experienced interiors vendor, the owner knows that the company working on the aircraft is capable and understands the nuances of each particular aircraft type.

Listening to the customer Cunningham's third tip is that the vendor should display a solid understanding of the customer's needs. Business jet owners often use their aircraft for highly specific purposes, whether for business or pleasure. The interior design plays a vital role in meeting those needs. Customers want vendors to understand how their aircraft are to be used and listen to their requests.



"If an aircraft owner tells a designer to include a jazzy material on the lower sidewalls and light brown carpeting, then the owner expects to see those items reflected on a bid. Designers who honour these types of requests show that they are listening and that they take customers' needs seriously," says Cunningham. She also notes that once the owner is presented with a bid, it should be checked to make sure it is truly comprehensive, clearly outlining all the work necessary.

The best interiors shops will meet all these attributes and demonstrate high attention to detail. They will ensure that the job is done properly and completed on time according to the owner's specifications.

West Star Aviation

Reader Enquiry No.503



3



1. Debi Cunningham
2. West Star Aviation's interior redesign of a Bombardier Challenger
3. An updated Falcon 50 cabin recently completed by the company



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showbusiness



ExecuJet has opened a new interiors showroom in Zurich to help business jet owners and completion centres in choosing materials and finishes

The ExecuJet Aviation Group has opened a new aircraft interiors showroom at its headquarters at Zurich Airport in Switzerland. The showroom, which opened on 10 December 2008, is located above the company's Fixed Based Operation. Clients can visit the showroom to select all the finishes they want for their aircraft interiors. ExecuJet can then display the proposed interior on a large plasma screen, using computer-aided design software.

The first visitor to the showroom was a new customer from the Middle East who ratified an agreement with ExecuJet to design the interior of a Bombardier Global Express aircraft.

"This facility is a true A to Z of interiors with 60 of the biggest luxury material houses in Europe and beyond showcasing their materials here," says Pascal Jallier, ExecuJet's head of completions management. "We are thrilled at the great support they have each given us, providing us with a terrific sample range of products all under one roof." Participating brands include Aeristo, Scott Group, Kalogridis, Edelman Leather, Townsend Leather, Maison Lipari, A.I.P. and Techno Coatings. On show is a large range of wood veneers, a wide selection of leather qualities (such as calf, lamb and buffalo) as well as countless other fabrics including silk, cotton and velour. The showroom boasts an extensive selection of plating in various shades of gold and platinum, as well as all grades of carpet including hand-tufted cashmere, silk and

some 500 samples of coloured wool balls. The showroom also features accessories including cashmere blankets, towels and chinaware – all part of VIP amenity packages.

"We have invested in this facility for our clients to give them a one-stop shop when planning their aircraft interiors. Everything can be planned on site from wood for the tables and sideboards to the colour and feel of luxury inflight blankets," says Gerrit Basson, ExecuJet Aviation Group's managing director. "Previously our representatives have been travelling to clients all over the world carrying large cases of samples, but this showroom offers a far wider variety, enabling the interiors to be planned on-site in comfort using our computers and state-of-the-art design software. Zurich's location in the heart of Europe makes this facility very accessible and we foresee that OEMs and completion centres will choose to visit us too."

ExecuJet's showroom was designed in-house by the company's interiors specialist Pavina Papé. She has used neutral stone and slate colours to create a minimalist look that does not detract from the products and materials on show. Back lighting is complemented by glass, with furniture sourced from designer Ron Arad.

ExecuJet's Completions Division works with the OEMs as soon an aircraft deal, new or pre-owned, is concluded with a customer. Complementing its interiors expertise, the company has accreditations in MRO and technical services operating over 150 private jets on management contracts on eight Aircraft Operators Certificates around the world.

ExecuJet works primarily with Bombardier, but with this new showroom the company says it is confident of drawing more work from other manufacturers. It has already worked on Falcon, Gulfstream and Citation families.

"We don't go for the cookie cutter approach. This investment in our new showroom underlines this," says Jallier.

ExecuJet

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1-3 The showroom boasts product samples from 60 companies

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inthebag



BJAC Services has been granted EASA/JAA certification for its PilotsEdge Electronic Flight Bag (EFB) for the Bombardier Global aircraft platform. This follows the product gaining an FAA STC earlier in 2008 and a Canadian STC in 2007.

The company is the exclusive distributor of the product (which is made by Goodrich) in the business jet market. "We teamed with Goodrich because of the simplicity of its EFB's pilot-to-aircraft interface," says Bryan Landry, president of BJAC.

BJAC says that several aircraft are operating the new EFB and in-service feedback is positive, with installations currently being engineered for the Bombardier Challenger series aircraft, as well as other OEM aircraft types.

The Class III EFB is built to commercial airline avionics standards, tested to DO-160E,

and capable of running many different Type A and B software applications from its One-Touch menu page on a Windows XP platform. It also features ARINC 429 and MIL-1553 communications for reading data from the aircraft and uploading to the EFB applications, as well as an integrated video server that can accept up to eight video inputs. Several options are available, including electronic charts, battery back-up, wireless LAN access and satellite worldwide weather reports.

BJAC Services is a privately owned corporation that provides extensive completion management services, and is a distributor for aviation products. BJAC serves an international customer base with a Canadian office in Montreal, and US offices in St Louis, Missouri and Dallas, Texas.

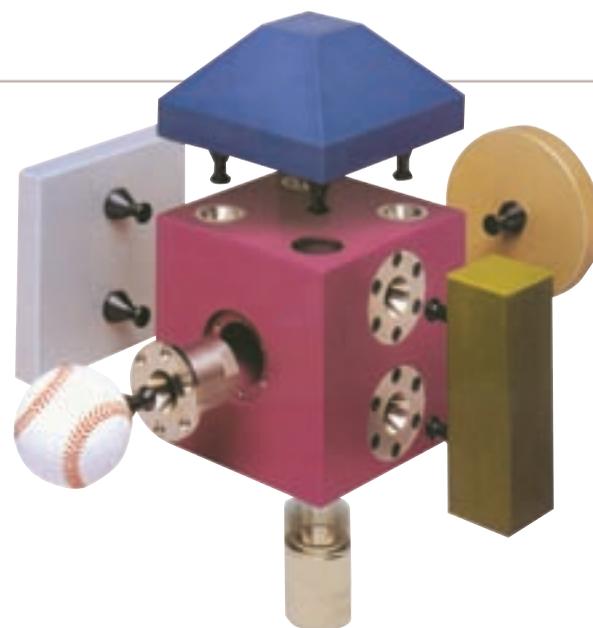
BJAC Services

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tooltime

Established in 1982 as The Sidney Casting Company, Tooling Technology LLC has grown to become one of the largest suppliers of thermoform tooling and components in North America. Located in Fort Loramie, Ohio, USA, Tooling Technology has over 65,000ft² of manufacturing space. It specialises in high-quality tooling for a variety of material forming processes, including single- and twin-sheet thermoforming, rotational moulding, blow moulding, pressure form tooling, resin transfer moulding, compression moulding and carpet and metal stamping moulds. It also designs and manufactures assembly fixtures, check fixtures and gauges. The company has full in-house CAD, an aluminium foundry capable of casting stainless steel lines into moulds for temperature control, a full finish and fabrication shop and also covers pattern and model making and CNC machining. It ensures the accuracy of its work with a Coordinate Measuring Machine (CMM).

Tooling Technology LLC's subsidiary, The Edward D. Segen Company, was founded in 1965 in Connecticut, USA, primarily as a manufacturer of tools for the in-line plastics packaging industry. Its founders



recognised the need to reduce machine downtime at the point of tooling and mould changes, which led to the development of the quick-change cylinder lock system. Since then, the product line has evolved into a broad range of precision quick-change systems.

The company was purchased by the Tooling Tech Group in the late 1990s and relocated to Ohio, USA, where its manufacturing activity remains today.

Tooling Tech Group

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holdfast

MSB Design announced in January that it has been awarded the status of approved subcontractor by Bombardier Aerospace for the design and manufacture of galley inserts to hold glassware and china in place.

The inserts are custom-made to hold in place and protect each customer's fine porcelain and crystal as well as anything else that needs to be secured in the galley, from wine bottles to tea pots, caviar bowls, decanters and so on.

Drawer inserts can be manufactured for permanent installation in the drawer or to be used as removable trays.

The company creates 3D models of everything that needs to be stored and devises an optimal layout based on a 3D model of the galley and the galley drawers supplied by the customer. The inserts are cut from aerospace-grade materials on a computer-controlled routing table that is programmed based on the 3D models, thus ensuring a perfect fit.

Dishware and flatware inserts are hand finished with felt material (supplied by the customer to match the aircraft's interior colour scheme), while glass racks, made of clear or tinted Lexan, are polished. The inserts are then delivered to the completion centre or the aircraft owner for installation.

Mario Sévigny, co-president of MSB Design, says that the company is facing 2009 and current economic conditions with caution and confidence: "During the last four months, we have completed our AS quality certification,



increased by about 30% our personnel to above 100 employees and have been recognized as approved subcontractor by Bombardier. We closely monitor how the state of the business aviation industry evolves and remain confident that the quality of our services and products will allow us to weather the storm."

MSB Design

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