

# BusinessJet *interiors* INTERNATIONAL

APRIL 2011

THE INTERNATIONAL REVIEW OF BUSINESS JET INTERIOR DESIGN AND COMPLETION

## greateight

Boeing's 747-8 Intercontinental has picked up eight VIP orders

## insidestory

Meet the in-house designers at some of Europe's major completion centres

## oceanlines

A SAND AND SEA INSPIRED A320 IS THE FIRST  
FRUIT OF COMLUX'S FORAY INTO COMPLETIONS

## TECHNOLOGY

mgs



P/N: MR4AA1-01  
Model: microwave



P/N: HFES0028-20  
Model: Nespresso maker



P/N: HFA2000-10  
Model: beverage maker



P/N: HFWF2003-01  
Model: trash compactor



P/N: FT048  
Model: folding trolley



P/N: HFE2007-01  
Model: espresso maker



P/N: MK190  
Model: full size trolley

mgs



P/N: R4AD2-01  
Model: induction oven

## INNOVATION

mgs



P/N: IHP4  
Model: induction hot plate



P/N: HFA2007-01  
Model: beverage maker

IACOBUCCI HF



P/N: HFE95-20D10  
Model: Nespresso maker



P/N: HFAWB2005-01  
Model: water heater



P/N: MB0000750  
Model: trash compactor box



P/N: HFWH2003-02  
Model: trash compactor



P/N: 9501D  
Model: espresso maker

mgs



P/N: AAD4-07  
Model: induction oven



P/N: HFN2007  
Model: beverage maker



P/N: HFA28V  
Model: beverage maker

## CARE



P/N: HFE95-20D  
Model: espresso maker



P/N: SHF2010-002  
Model: vip seat



P/N: HFWH0028-02  
Model: trash compactor



P/N: MK279-00  
Model: half-size trolley



P/N: HFEJ2008-10  
Model: Nespresso maker

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P/N: HFAWB2007-01  
Model: water heater

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# renaissanceart

Leonardo da Vinci would have had a rather impressive business card. Just how would you fit scientist, inventor, mathematician, engineer, architect, musician, painter, sculptor, and many more besides, on to a tiny rectangle of card? Likewise, he'd have needed his genius to do the corresponding tax return. But all joking aside, the original polymath is a worthy hero for many because he did what everyone wants to do – excel at everything.

And this is exactly what is going on today in the completion centres of Europe. In a bid to better serve customers who want an integrated design and completion service, centres such as Lufthansa Technik, Jet Aviation Basel and Airbus Corporate Jet Centre (ACJC) have invested in talented in-house designers. These centres can now navigate the customer through the entire process, from concept drawings to final delivery.

The benefits of this all-singing all-dancing approach are many – one of which being the strong relationship between design and engineering. “This in-house position allows me to work very closely with engineers, ensuring that the cabin is safe, certifiable, ergonomic and technically feasible,” says Sylvain Mariat, head of ACJC's creative design studio, in our feature on European completion centres on page 68.

Another company to strive towards self-sufficiency is Comlux, which in 2008 expanded its empire beyond design, outfitting management, charter and sales to incorporate cabin completions. The newly formed Comlux America has just finished its first cabin – and it was a family affair, an A320 Prestige designed by Comlux's Creatives division, and to be managed and chartered by another arm of the company. As you can see from the cover, and the feature on page 52, the results are stunning. Perhaps this is because Tim Callies, who headed up the design, was given plenty of rein to let his imagination run riot. The in-house approach also enabled him to produce the design in a very short timeframe.

Of course, trying to do everything doesn't always turn out so well (as many pop stars' acting careers testify), and sometimes it is best to specialise. As you can see on pages 14, 17 and 18, this is exactly what we are doing with our exciting new show, Business Jet Interiors World Expo, which will be completely devoted to the business jet interiors market. So save the date (22-23 February 2012), and I'll see you in Cannes!



Izzy Kington, editor









BOEING BUSINESS JETS

747-8 VIP [boeing.com/commercial/bbj](http://boeing.com/commercial/bbj)





## goldenjubilee 52

IT HAD TO BUILD A COMPANY AT THE SAME TIME AS  
ITS FIRST CABIN INTERIOR, BUT KEEPING IT IN THE  
FAMILY HAS PAID OFF FOR COMLUX AMERICA  
*Izzy Kington, Business Jet Interiors International*



"If we can deliver three or four narrow-bodies  
a year with perfect quality and on time then  
we have a very valid business case"



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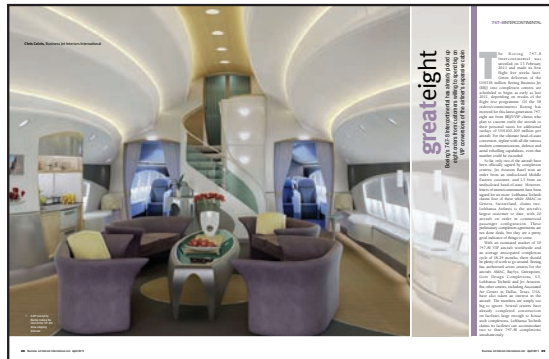
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Chris Colvin, Business Jet Interiors International

magnumopus

THE HONDAJET, WHICH SHOULD ACHIEVE CERTIFICATION IN 2012, IS THE PERSONAL MASTERPIECE OF HONDA AIRCRAFT'S CEO, WHO HAS SPENT THE PAST 20 YEARS WORKING ON IT

Mark Huber, Business Jet Interiors International

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neworder

COMPANIES SUCH AS ALSALAM AND TAECO ARE POSING A CHALLENGE TO THE ESTABLISHED CORPORATE AND VIP COMPLETIONS ORDER, CURRENTLY DOMINATED BY EUROPE AND THE USA

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'BIG IRON' AIRFRAMERS – WITH NEW MODELS  
HAILING FROM RUSSIA, CHINA, JAPAN AND CANADA  
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## 68 insidestory

MORE AND MORE EUROPEAN COMPLETION  
CENTRES ARE OFFERING THE SERVICES OF  
IN-HOUSE DESIGNERS  
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US\$3 MILLION OF INVESTMENT AT BIZJET  
INTERNATIONAL HAS ENABLED THE COMPANY TO  
EXPAND AND SPECIALISE IN NARROW-BODY VIP  
JETS SUCH AS THE A318 ELITE  
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THREE OEMS ARE CURRENTLY ENGAGED IN THE  
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Cessna plans to begin delivery of the Corvalis TTX in 2012



## Flying Colours delivers Challenger 850 to China

Flying Colours Corp delivered its first Chinese registered aircraft – a Bombardier Challenger 850 business jet – to BAA Jet Management based in Shenzhen on 22 March 2011. The aircraft is to be used for third-party charter.

“This is our first delivered factory-new 850 on the Chinese register and it was a positive experience working on the STC validation and delivery in close partnership with CAAC, Bombardier and BAA Jet Management to achieve overall certification,” said Sean Gillespie, director of completion sales and management at Flying Colours Corp.

The 15-seat VIP-configured aircraft features a digital CMS, custom touchscreen cabin controls and large LCD displays. The aircraft was designed and outfitted in an array of leathers and fabrics complemented by a dark mahogany stained Makore veneer.

This latest delivery follows hard on the heels of a similar Challenger 850, which was delivered to Hong Kong-based private jet company Metrojet at the end of 2010. Flying Colours Corp has a total of five 850s that will leave its facility officially Chinese registered and certified, including a second 850 to BAA Jet Management. “China is proving to be a strong and growing market and the Challenger 850 is especially attractive to clients,” said Gillespie.



## Corvalis TTX launched with four interiors

Cessna has unveiled its new Corvalis TTX single-engine piston aircraft, which features new standard and optional equipment, new interior and paint scheme options, and the Intrinziec flight deck powered by the Garmin G2000. There are four new interior schemes – Stealth, Tranquility, Classic and Twilight – featuring Citation-grade leather. Responding to customer input, the Corvalis TTX is approved for operation with the rear seats removed for more carrying capacity. Cessna is offering two new exterior paint designs and will feature a DuPont Clearcoat application. The four-seat composite aircraft has a range of 1,250 nautical miles (2,315km).

## Fatal crash suspends G650 flight testing

A G650 crashed on 2 April 2011 during take-off performance tests in Roswell, New Mexico, USA. Experimental test pilots Kent Crenshaw and Vivan Ragusa and technical specialists David McCollum and Reece Ollenburg died in the accident.

Immediately afterwards, Gulfstream temporarily suspended the flight activities of its four remaining G650 flight-test aircraft as the NTSB, the FAA, the company and suppliers work to analyse the accident. All other certification and production work on the G650 continues, and all other activities at the company are proceeding normally.

“We are participating fully in the aircraft investigation and will only resume flying the G650 when we and the FAA are satisfied it is safe to do so,” said Pres Henne, senior vice president, programmes, engineering and test, Gulfstream. “Our sorrow from the loss of these four great men is very deep,” said Jay L Johnson, General Dynamics’ chairman and CEO. “I am confident that as Gulfstream assists aviation authorities in the accident investigation, the cause of this terrible tragedy will be determined.”

## LHT delivers VIP A340 to German military

Lufthansa Technik (LHT) has handed over the first of two A340s for the German Federal Ministry of Defense’s Special Air Mission Wing. Over a period of about 21 months the aircraft underwent a full overhaul, was fitted with a VIP cabin and supplementary military equipment and had its exterior repainted.

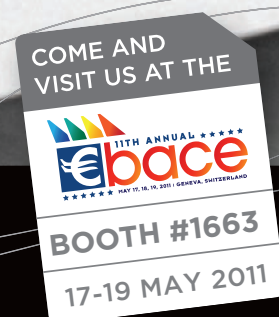
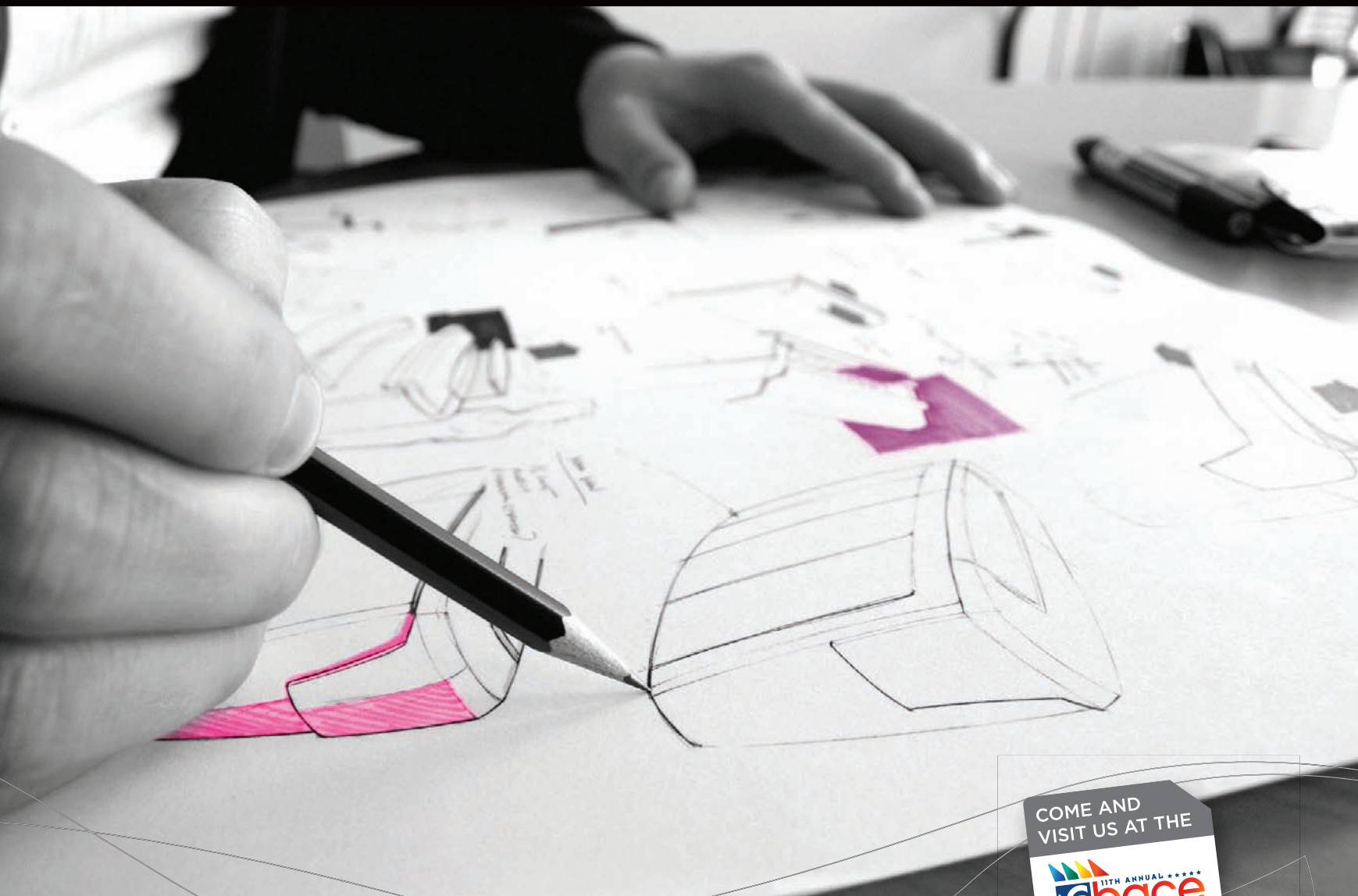
The cabin is divided into a conference area with 12 seats, a private area with 15 seats and a delegation area seating 116. The aircraft boasts a total of 143 passenger seats plus 19 crew positions. LHT’s nice digital CMS has also been installed. For medevac operations, the delegation area can be converted into a flying intensive care unit complete with facilities such as extra oxygen and a separate power supply. A secure system comprising wireless LAN, telephony, fax and internet/email connection has also been installed.

Two new A319CJs with VIP cabins were already handed over to the Bundeswehr by LHT in March and May 2010. The second A340-300 is due to be delivered in the summer of 2011.



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The aircraft is due to enter charter service at the end of the summer

## DAS wins fast reconfiguration contract

Diversified Aviation Services (DAS) is reconfiguring a Boeing 737-500 for Transaero Airlines, with an 18-passenger VIP section at the front and mixed seating for 38 in the remainder. The VIP area will have a private lounge area and meeting room, with high-definition IFE system, custom cabinetry and internet access. The work is scheduled to be accomplished in Miami, Florida, USA, within 90 days. The key enhancement is the removal of baggage bins in the forward section while still utilising the aircraft PSUs in a custom valance panel. The approach is designed to give the appearance of a full VIP interior while cutting time and cost.

## EC 145 helicopter delivered with Select CMS

Eurocopter has installed and delivered the first EC 145 helicopter with a Select CMS. Passengers can now control XM radio, Blu-ray video, cabin lighting, air conditioning and moving map from their seats. Flight Display Systems delivered 4.3in VIP touchscreen control panels, a Blu-ray and DVD player, Flight Display Moving Map, a 10.2in widescreen LCD with ceiling mount and a six-genre music player for the helicopter.

"Helicopter passengers expect the same comforts during flight that they have in their automobiles, such as live flight tracking and IFE," said David Gray, president of Flight Display Systems.



## Two VIP orders for Cair humidification system

Comlux America has ordered CTT Systems' Cair humidification system for installation during summer/autumn 2011 on a VIP A319 aircraft.

The Cair system is based on evaporative cooling technology and uses a method designed to preclude the transfer of bacteria within the aircraft. The dual-purpose system increases humidity to around 20% (compared with 3-5% without) and incorporates the Zonal Drying System to counter condensation problems.

"We have already installed the Cair system in a recently completed A320 VIP cabin and we are thoroughly convinced of the added value of the Cair system for Comlux's VIP clientele," said David Edinger, CEO of Comlux America.

Another order for the system was announced in March 2011, for retrofit in autumn 2011 on a VIP Boeing 777.

"Our Cair system is doing very well in this segment and the VIP market continues to be very strong," commented Ulf Liljenberg, vice president of sales and marketing at CTT Systems.

## New Iridium products and e-Phone from ICG

International Communications Group (ICG) has introduced two derivatives of its NxtLink series ICS-120A and 220A satellite-based communications products. The new 120B single-channel and 220B dual-channel devices operate over the Iridium satellite network and offer global voice, fax and data services. They may be installed as standalone units or tailored to fit the aircraft.

The 120B and 220B are primarily voice systems but their architecture permits the connection of a variety of user devices including cordless or corded and retractor reel handset phone models, which ICG also produces. The units' design also offers optional fax capabilities as well as available upgrades for future flight deck Datalink services such as FANS1/A, CPDLC and ADS-C messaging. Designed into an Arinc 600, 2 modular concept unit (MCU) size line replaceable unit, a 120B or 220B can be installed on any size aircraft.

ICG has also introduced a new cordless cabin telephone system, e-Phone (pictured), designed specifically for the business aircraft market. Based on Digital Enhanced Cordless Telephone technology, the e-Phone system provides telecom features including intercom calling, conferencing and call hold. It also incorporates features such as active cabin noise reduction, Bluetooth compatibility, and advanced power control with an automatic shut-off feature.





The iPad includes customised content documenting the completion of the owner's aircraft, as well as apps such as Fore Flight and My Radar Pro



## Jeff Bonner R&D wins shower contracts

Composites, sheet metal and machine part manufacturer Jeff Bonner R&D (JBRND) has so far won two shower contracts from US completion centres in 2011.

Comlux Aviation asked JBRND to develop an oval shower for an A319. JBRND had previously fabricated a square shower for the centre, for an A320. Meanwhile Greenpoint Technologies ordered a customised round shower for a BBJ. JBRND has fabricated five of its round showers (for three A340s and one BBJ2) for other US centres.

"The original round shower design was a concept I created in 1990 to provide a self-standing seat-track-mounted shower weighing no more than 120 lb finished for the US completions market," said Ed Harris, vice president of sales and marketing at JBRND. "Since coming on board to JBRND in January 2009 we have refined and made significant changes to improve the weight, reduce parts and create more functionality."



## Pilatus uses iPad for PC-12 NG deliveries

On the delivery of their Pilatus PC-12 NG turboprop, new owners now also receive an iPad, containing interactive content customised to each aircraft, as well as delivery documents, owners' manuals and a variety of aviation apps. Each iPad comes preloaded with the pilots' information manual (PIM), an introduction to the company and the PC-12 NG, and key delivery documents. "Not only does the new programme simplify the delivery process for our owners, it also reflects their affinity for leading-edge technology," said Thomas Bosshard, president and CEO of Pilatus Business Aircraft.

## Broker adds interior design consulting service

Freesteam Aircraft, a pre-owned business jet broker, has appointed Sarah Mespelt as design coordinator to manage the Freesteam Interior Room. Based at Teterboro Airport in New York, USA, Mespelt will provide clients with complete interior consulting and specification services for both pre-owned aircraft refurbishment and new completions. She will serve as liaison between Freesteam and the completion centres, keeping clients updated throughout the process.

"She is already involved in a US\$3 million G IV-SP refurbishment, to be followed immediately with work on the BBJ2 interior project with Lufthansa Technik and world-renowned designer Marc Newson," said Alireza Ittihadieh, Freesteam's CEO.

Mespelt previously served as an interior designer with Gulfstream Aerospace and Jet Aviation, managing more than 25 new aircraft completions and pre-owned refurbishments on GIV, GV, Globals XRS and 5000 aircraft as well as Challenger 850 and various Falcon models.

## Phenom 300 earns premium IFE certification

Embraer has received certification for the Phenom 300 premium IFE system. This version enhances the current IFE option by adding 7in individual seat monitors and an exclusively designed CMS installed in the VIP seat.

The new CMS complements the Phenom 300's IFE capabilities by allowing passengers to control cabin lighting, temperature and speaker volume, as well as to select audio and video sources, like XM radio stations, flight information data, and other digital media, all through an LCD screen interface.

In addition to the new CMS and individual seat monitors, this package also includes the Rosenvue VX worldwide moving map, region-free DVD, XM radio, portable media player interface, wireless headsets and a 10.4in ceiling-mounted fold-down monitor.

"The new IFE and CMS will provide Phenom 300 passengers with a superior travel experience," said Claudio Galdo Camelier, Embraer's vice president, marketing – executive jets.

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Only the attachment plate needs to be changed – and therefore certified – for installation on each aircraft type

## Lufthansa Technik qualifies exercise bike for cabin integration

Responding to interest from VIP customers, Lufthansa Technik has certified an exercise bike for permanent integration in an aircraft cabin. Exercise equipment has found its way onto aircraft before, but only as loose equipment that then has to be stored for take-off and landing. The goals of this project were to design an attachment structure that would enable the bike to be fitted on a large variety of aircraft without any positioning constraints; and to modify and qualify an off-the-shelf exercise bike and the attachment structure to comply with EASA airworthiness regulations.

The Recline Excite 700iSP from Technogym was chosen to be qualified in accordance with the aviation regulations. This self-powered model boasts 23 training programmes, 25 difficulty levels, an adjustable seat and backrest and heart rate monitoring via hand sensors. It measures 1,600mm x 1,294mm x 600mm and weighs 91kg.

To qualify the product, Lufthansa Technik had to select and test new materials for seat cushions and trim covers, to fulfil the flammability requirements. Furthermore, electrical components had to be shielded to eliminate electromagnetic interferences. Finally, with a total mass of 105kg for the bike and attachment structure, the equipment is tested to withstand a 12g force as required for aviation standards.

The modified bike and its attachment structure is now fully qualified for aviation, complying with the requirements of EASA CS-25 for cabin interiors. It can be installed on the seat tracks of any long-range aircraft, with the attachment structure and provisions invisible under the floor covering. The bike can also be customised in terms of colours and logos.

In terms of the health implications of exercising at altitude, the company says that there should be no problem as long as the person is in good general health. In fact it is offering a medical check-up as part of the package!





# pictureperfect



30 years of photographing more than 800 private aircraft – ranging from the Lear 20 series to Boeing 747-400s – has given Nick Gleis a unique perspective on the market

## What are the challenges involved?

From a photographic standpoint, lighting is always the most challenging part. After three decades of photographing aircraft I have a rather large bag of tricks – and on some aircraft I definitely dig deep into that bag. I'm constantly asked to make a fairly small space look very comfortable and spacious. To accomplish that, a person needs highly specialised equipment and a lot of experience. Equipment is also a challenge. It's extremely important that my equipment doesn't damage or dirty the aircraft in any way. We keep all of our cords, tripods, lights and cameras very stable and clean so as not to scratch or mar any expensive surfaces. Timing is always a challenge. When is the aircraft available – and for how long? Also, clients need to understand that the photographs aren't just snap shots, time is required. Then, too, the end of a completion is always hectic. The client is eager to get the aircraft. The completion centre is finishing up all the last-minute squawks. Key elements like window panels and ceiling panels may still be missing, and all that adds up to a definite lack of available photographic time.

## How long do you get to take the photos?

An interior photograph takes me anywhere from 30 minutes to an hour. A lot depends on the styling,

the colour of the aircraft and the difficulty of the shot. What slows a shoot down is when the aircraft isn't ready to be photographed. In other words, it needs to be cleaned, or all the protective tape and temporary material (such as seat covers) needs to be removed. Amenities such as china and crystal may not be unpacked or in the right place – and electronics, such as lights and switches, may not be functioning. Plus it's extremely hard to photograph high-gloss finishes on woodwork and mirrored surfaces. So that also increases the difficulty – and the time necessary – to take a shot. I am typically asked to get one cockpit shot, one exterior, and eight to ten interior photographs. That type of assignment takes me about six to eight hours.

## Is it daunting meeting aircraft owners?

With the corporate operators, as with any group of people, you meet the good, the bad and the ugly. They might be the nicest people you've ever met – or they might think you're nothing but a vendor taking up their time. Heads of state are all politicians in one way or another. I've never come across one who was rude or impolite, they're always on display and are well aware of that fact. They're also very busy people and rarely chit chat. As for royalty, in the USA we are brought up to believe that all men are created equal. Not so. Royal family members are taught from the very first moment they're born that they're special. They can be quite spoiled and pampered. It's not a bad gig if you can get it. Also, when working with royalty, the customs of their country need to be well known and observed. For example, if a royal family member wants to speak with you or requires your attention, he'll let you know. With royalty you must always be very polite, respectful and reverent. It's their world, you just live in it.

## What's coming up for you this year?

Gore Design Completions is delivering five really exciting aircraft this year. What makes that company so unique is it's able to combine really terrific design with a completion centre that makes the vision a reality. Also, two other designers I greatly respect and admire have some larger aircraft completions due this year. But, aside from aircraft, a Middle Eastern client whom I've worked with quite a bit has asked me to photograph his new yacht this year. I think that should be very interesting.



For the full interview and more stunning photos visit  
[www.BusinessJetInteriorsInternational.com](http://www.BusinessJetInteriorsInternational.com)



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An aerial photograph of a coastal city. In the foreground, a large marina is filled with numerous white yachts and sailboats. A prominent circular building with a grey roof is situated on a peninsula. To the right of the building is a sandy beach and a rocky breakwater. The background shows a dense urban area with various buildings and a large white hotel complex.

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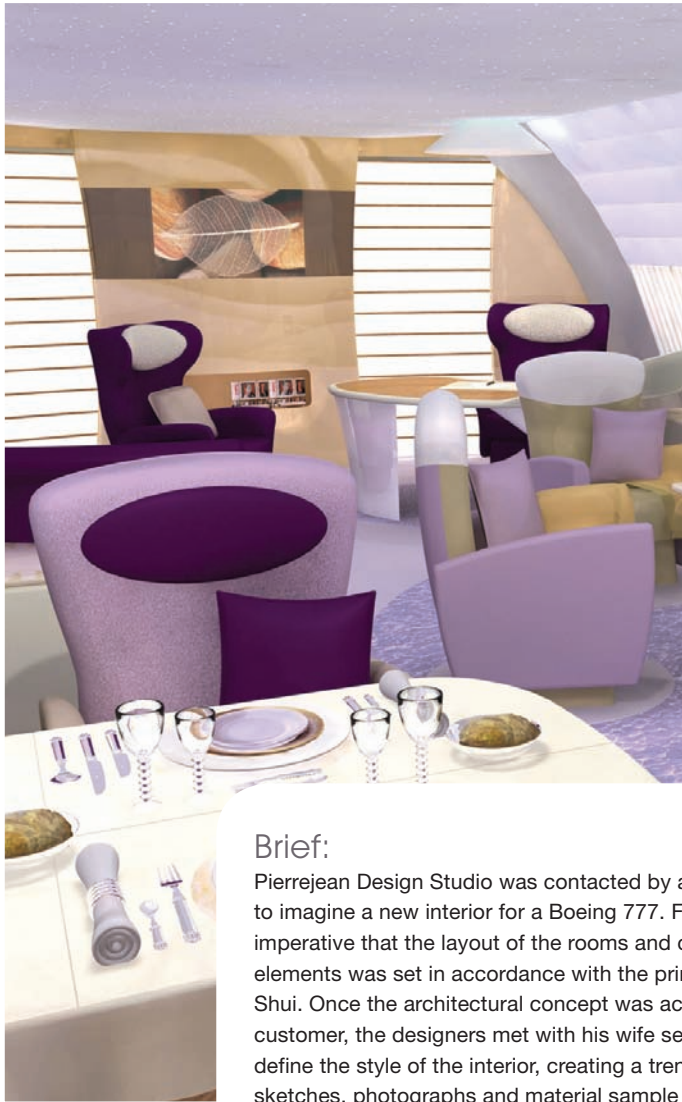
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# natural order



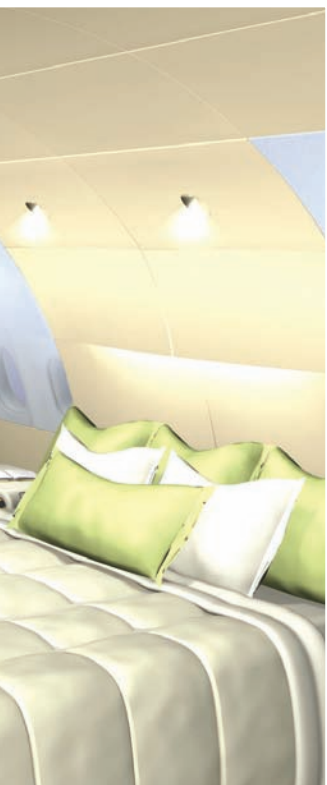
## Brief:

Pierrejean Design Studio was contacted by an Asian individual to imagine a new interior for a Boeing 777. For the client it was imperative that the layout of the rooms and certain decorative elements was set in accordance with the principles of Feng Shui. Once the architectural concept was accepted by the customer, the designers met with his wife several times to define the style of the interior, creating a trend book full of sketches, photographs and material sample boards mixing vicuna, raw silk, lacquer, sanded wood and natural stone. Asian artworks (acrylics and sculptures) were also selected to add a personal touch to the decor.

## Description:

The layout includes two bedrooms with washrooms (one for the client and the other for his wife) finished in their personal choice of colours – almond green and salmon pink. The main lounge was conceived so as to combine various configurations – a conference room, a lounge, a dining room and/or a home cinema. Located in a neutral position between the owner's area and the guest area, this room will be used by the customer to conduct meetings during business trips, or for meals and relaxing on personal journeys with the family. The first-class area, equipped with Sogerma's Ultimate seat, offers a private suite for each passenger, while a spa/changing room with large shower should also enable each guest to arrive nice and fresh. There is also a softly shaped but futuristic bar/club area for relaxation. Meanwhile a business-class section features Sogerma's Solstys full-flat seat, which offers integrated massage. The section also incorporates a cloakroom and stowage space, plus large video screens for entertainment. In the aft area, four rows of premium seats will be dedicated to other travelling companions.





### Verdict:

Designing an aircraft according to Feng Shui was a new challenge for Pierrejean Design Studio, and necessitated many revisions to the design. However, the company says it was pleased to “do something exceptional from a cultural and design point of view”. The unusual colour scheme was also a break from the more common neutral tones. The next test is to help bring the design to fruition. The company anticipates that the biggest challenges for the engineers will be installing a large shower and providing the water supply for it, as well as redefining lining with new window shades.



### CONTACT:

Pierrejean Design Studio  
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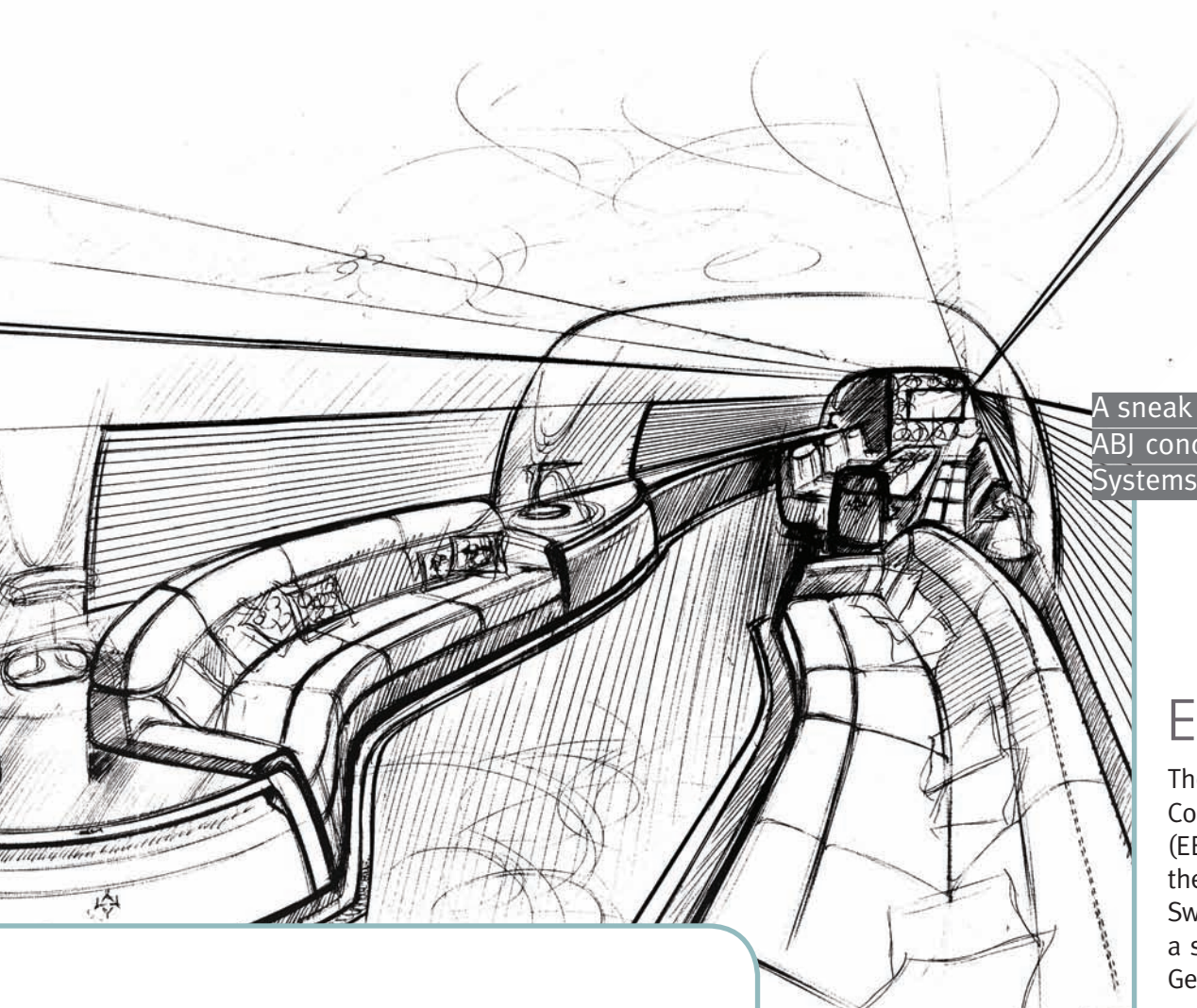
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VIP CONVERSION | INTERIOR | AVIONICS | MAINTENANCE | EXTERIOR



A sneak peak at the fourth ABJ concept from BAE Systems and Design Q

## EBACE 2011

The European Business Aviation Convention & Exhibition (EBACE) will again be held at the Geneva Palexpo in Switzerland, on 17-19 May, with a static display at nearby Geneva International Airport.

## Four thought

**B**AE Systems will unveil a new interior concept (teaser sketch pictured above) for the Avro Business Jet (ABJ). The design is the fourth of five to be developed with design consultancy Design Q for the ABJ. Two variants of the ABJ Explorer concept were launched at EBACE 2010, followed by the third concept – ABJ Fusion – at NBAA 2010.

The ABJ is the brand name for either BAe 146s and or Avro RJ jetliners that are in corporate/VIP use. BAE Systems says the ABJ is a compelling proposition for those seeking a pre-owned aircraft platform into which a state-of-the-art interior can be installed, at a fraction of the cost of a new aircraft. The aircraft also features the ability to access unpaved runways in difficult locations.

Some 25 ABJs are in service worldwide with a variety of operators such as governmental and VIP flight organisations including the Royal Air Force, Bahrain Defence Force, Dubai Air Wing, Presidential Flight of Abu Dhabi and the governments of Uzbekistan and Indonesia. Private companies also operate the aircraft in a variety of roles including full VIP or executive charter and corporate shuttle. Customers include Formula 1, Cello Aviation, Casino Rodos, Bulgaria Air, Moncrief Oil and Airfast of Indonesia. BAE Systems also uses the aircraft for its own shuttle operations.

## Fine display

Embraer will display a mock-up and full fly-by-wire flight simulator of the new Legacy 500 executive jet. It will also feature the Legacy 650, Lineage 1000, Phenom 100 and Phenom 300 on static display. Based on the Legacy 600 platform, the large Legacy 650 entered operation in 2010, and is designed to provide longer trips for up to 14 passengers. Meanwhile the ultra-large Lineage 1000 is Embraer's biggest executive jet and can carry 19 passengers in five cabin zones. The interior design was created in conjunction with Priestmangoode. Both the entry-level Phenom 100 and the light Phenom 300 have interiors designed in partnership with BMW Group DesignworksUSA. The 100 can accommodate up to eight and has seven interior options and a private aft lavatory; while the 300 seats up to 11 occupants.



## Nice device

Lufthansa Technik will showcase its new nicemate LRU, designed to provide aircraft operators with a powerful hardware platform to support their daily operations, maintenance processes and enable the latest features in IFE and cabin management. nicemate is a multi-tasking unit with a cellular GSM/3G connection that allows secured data exchange with the nice system on board aircraft. nicemate also provides WLAN/WiFi and several other useful interfaces. It can host multiple IFE and CMS applications on the nice network simultaneously, including automated cabin diagnostics, fleet tracking, remote support and an iPhone wireless gateway.





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The 328DBJ's stretched main cabin is 10m long, 2.2m wide and 1.8m high

### Recent convert

328 Support Services will showcase its 328DBJ interior, a 12-seat VIP design that has been awarded full FAA certification. The new style 328DBJ has already been delivered to a South American customer and the company is working on a further two for Nigeria-based SkyBird Air. The company also produces non-328 monuments and interiors, and has completed VVIP galleys for two A340s.

At the booth 328 Support Services will invite visitors to experience luxurious interior seats designed by ctm design using DeCrane VIP seat frames. The seats on display are the same model that features on the conversions for SkyBird Air.

Special features in the new VVIP 328DBJ interior include a galley concept designed to maximise space in the forward cabin, and a WiFi phone system from Aircell. The main cabin can accommodate both a lounge and conference area. The interior also features redesigned ceiling and sidewall panels with electric window blinds and slim-line PSUs.

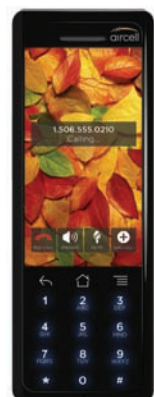
"Customers who choose to purchase a 328DBJ can save up to a third of the price of purchasing a new aircraft with the equivalent luxury interior," says Ray Mosses, head of sales for 328 Support Services.



### Skin wins

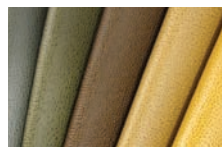
Foglizzo Leather will present its new first-class collection – non-flammable bovine leather, non-flammable crocodile skin and non-flammable crystal leather made with

Swarovski elements, which are all treated to comply with the main international fireproof standards (UNI 8456/FAR a, FAR b; Jar 25853; UNI VF 9175; IMO 653; DIN 5510; BS 6853; etc). The bovine leather is fully customisable – the client can select from a variety of colours and effects (including antique, shine and matt finishes), a collection of over 500 embossing patterns, and oil and water repellence treatments. Meanwhile, the crocodile skin is customisable in many colours by Pantone code, and the crystal collection is available in both nubuck and suede.



### Get connected

Aircell will feature its entire range of connectivity systems, and in particular, its global SwiftBroadband solutions, which include the Aviator 200 and Aviator 300. In addition to voice service through cabin handsets, the systems allow passengers and crew to use laptops and smartphones to send and receive email, use the internet, access a corporate VPN and more. Customers can choose wired or WiFi connections. Aircell also recently unveiled the Aircell Smartphone (pictured), a cabin handset designed specifically for business aircraft.



### Cast in stone

Towsend Leather will launch Perfectly Pebbled, an aniline-dyed cowhide that has been embossed with a small pebbled grain embossing. Perfectly Pebbled is

available in whole cowhides averaging from 55-60ft<sup>2</sup>, and is 1.0-1.2mm thick. The finish of this leather is applied by hand; resulting in naturally inspired variance in design and colour. It is offered in 15 standard earth-tone colours, as well as custom colours.

### Ask an expert

Altitude VIP Completions will exhibit with representatives from its commercial, procurement and supply chain and engineering support teams, along with general manager Michael Pervan. This team will be able to provide BBJ owners and operators advice on any maintenance, refurbishment and green completion requirements they may have. Altitude is an independent provider of VIP jet and commercial airline interior services based in Auckland and Christchurch, New Zealand.

### Talk is cheap

Cobham Satcom will show a range of Inmarsat satcom systems including the latest SB200 system, which weighs 4.5kg and will be available at the show for US\$32,000. Debbie de Goveia, sales executive for the European market, and Willem Kasselman, marketing director, will be present to discuss specific requirements. Cobham says the SB200 system drops broadband communication into a price range that was previously only achievable with Iridium.





Flight Display Systems' new Apple iPad mount

### Bearing fruit

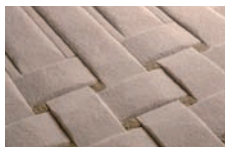
Flight Display Systems has fully embraced the Apple revolution by introducing a complete line of accessories for portable Apple products. The iPod and iPhone are supported with the aircraft iPod docking station; a new aircraft iPad arm mount allows passengers to watch movies and enjoy games during flight; and the Apple cable adapter from Flight Display Systems connects to any iPod, iPhone, or iPad to charge batteries and share music during flight.



### Go global

Bombardier will showcase its new large Global 7000 and 8000 jets, which it introduced at NBAA 2010. The Global 7000 will feature a four-zone 2,637ft<sup>3</sup>

cabin and is scheduled to enter service in 2016. The Global 8000 will feature a three-zone 2,236ft<sup>3</sup> cabin and should enter service in 2017. Cabin features common to both aircraft include enlarged windows; a generous baggage suite that is accessible during flight; a crew rest area equipped with berthable seating; a new approach to cabin zones, giving customers more flexibility when defining their floorplan; and design options that the company promises will "bring the comforts of home to the aircraft environment".



### Soft sell

Tisca Tiara mobility textiles will display a selection from every product category it manufactures – hand-tufted and hand-woven carpets, embroidered carpets,

machine-woven and tufted carpets, as well as upholstery, curtain and decorative fabrics. Also on display will be the company's steam-pleated, ready-to-install curtains, and a new collection of carefully harmonised carpets, upholstery, decorative and curtain fabrics. This new collection is designed to reflect the latest global trends in terms of designs, textures and colour combinations. Tisca Tiara manufactures its carpets and fabrics exactly according to customers' design requirements. In addition, the company maintains a huge stock programme for immediate shipment.

### Going up

Greenpoint Technologies will feature its Boeing 747-8 VIP products and BBJ VIP and head-of-state completion services. Greenpoint's Aerolift is a patent-pending, ground-to-main deck lift (elevator) for the 747-8 Intercontinental VIP aircraft. It is designed to provide a safe and secure boarding system capable of transporting four passengers or a passenger in a wheelchair with attendant from the ground to the main deck. Meanwhile, the Boeing 747-8 Aerolift is in the production phase supporting aircraft deliveries later in 2011. The Aerolift consists of sleeping berths located between doors four and five above the main deck and is accessed via a spiral staircase from the main deck. The Aerolift will provide a private sanctuary for passengers to escape noise and activity on the main deck.



### Widen the net

ViaSat will promote its Yonder high-speed internet service. The company recently expanded the service's coverage over Brazil

and the surrounding region. The StarOne C1 satellite is providing the bandwidth and a ViaSat regional teleport has been installed and commissioned in Rio de Janeiro. "The added coverage in South America automatically becomes available to our Yonder service customers, so all aviation and maritime customers can now benefit from this expansion," says Don Buchman, ViaSat director of mobile broadband. "We continue to expand our Yonder network, region by region, and remain on target to complete the full deployment of the network by the end of 2012."



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Chris Colvin, Business Jet Interiors International



1. A VIP concept by Boeing making the most of the 747-8i's show-stopping staircase



# greateight

Boeing's 747-8 Intercontinental has already picked up eight orders from customers willing to spend big on VIP conversions of the airliner's expansive cabin

The Boeing 747-8 Intercontinental was unveiled on 13 February 2011 and made its first flight five weeks later. Green deliveries of the US\$318 million Boeing Business Jet (BBJ) into completion centres are scheduled to begin as early as late 2011, depending on results of the flight test programme. Of the 38 orders/commitments Boeing has received for this latest-generation 747, eight are from BBJ/VVIP clients who plan to custom outfit the aircraft to their personal tastes for additional outlays of US\$100-200 million per aircraft. For the ultimate head-of-state conversion, replete with all the various modern communications, defence and aerial refuelling capabilities, even that number could be exceeded.

So far, only two of the aircraft have been officially signed by completion centres; Jet Aviation Basel won an order from an undisclosed Middle Eastern customer, and L3 from an undisclosed head-of-state. However, letters of intent/commitment have been signed for six more. Lufthansa Technik claims four of these while AMAC in Geneva, Switzerland, claims two. Lufthansa Airlines is the aircraft's largest customer to date, with 20 aircraft on order in commercial passenger configuration. These preliminary completion agreements are not done deals, but they are a pretty good indicator of things to come.

With an estimated market of 30 747-8I VIP aircraft worldwide and an average anticipated completion cycle of 18-24 months, there should be plenty of work to go around. Boeing has authorised seven centres for the aircraft: AMAC, BaySys, Greenpoint, Gore Design Completions, L3, Lufthansa Technik and Jet Aviation. But other centres, including Associated Air Center in Dallas, Texas, USA, have also taken an interest in the aircraft. The numbers are simply too big to ignore. Several centres have already completed construction on facilities large enough to house such completions. Lufthansa Technik claims its facilities can accommodate two to three 747-8I completions simultaneously.





2



3

## COMPLETION CENTRES NEED AT LEAST AN 18-MONTH JUMP ON THE DESIGN PRIOR TO AIRCRAFT INPUT

- 2-4. VIP cabin concepts drawn up by Greenpoint for the 747-8  
5. A concept by L3

Likewise, Gore is currently pursuing contracts for three 747-8I completions and the company's new hangar in San Antonio, Texas, was built with the aircraft type in mind. "We would love to pull up to that table and start eating that supper," says Rob Tomenendal, executive vice president at Gore.

**Natural progression** Most actual or prospective 747-8I VIP customers, including the US Air Force on behalf of the President of the USA, already operate an older version of the aircraft, and that is believed to have played a strong role in its selection by these entities over the A380, which has fetched only one VIP customer to date. However, the new 747 is significantly different from those earlier versions in terms of performance, construction, space and systems. It is more efficient,



quieter, longer, faster and flies further than its forerunners; in VIP livery it can fly 9,260 nautical miles non-stop with up to 100 passengers at dash speeds of up to 614mph. The 4,786ft<sup>2</sup> cabin provides ample room for design mayhem and mischief – including ground-to-main-deck elevator, lofts over the rear cabin for loft suites, and even balconies.

"The designs that you are capable of doing on this aircraft as a BBJ are fabulous. You would never know you are on an aircraft – absolutely fabulous," says Boeing vice president Elizabeth Lund, the aircraft's deputy programme manager.

**Design time** Completion centres and designers are sharing concepts for the interior, and some of those remain under development. Gore's Tomenendal notes that, because of the sheer size of the aircraft, completion centres need at least an 18-month jump on the design prior to aircraft input, mandating the need to come up with preliminary designs very early in the completion sales process.

"One of the things we have been stressing all along with Boeing to the customers is that you have to get a completion centre signed up sooner rather than later. You need to have the time to get the design done so that you

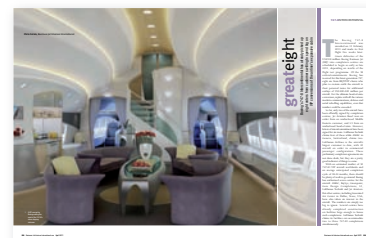




4



5



can start building the interior components long before the aircraft arrives," Tomenendal says.

The optional tarmac-to-cabin elevators being developed for this aircraft are also going to present special challenges and could be the cause of additional completion time. Currently, L3 and Greenpoint are working on separate lift (elevator) designs and Tomenendal says there are other potential vendors in the hunt as well.

"The lift presents a time issue because of the time it takes to install it and do all the pressure vessel checks you have to do to make sure the fuselage integrity remains intact. It is a very involved process to put in that lift," says Tomenendal. He adds that some lift providers want to install it before the completion at their facilities while others are talking about providing kits to do the installation at centres as part of the completion. "It comes down to who will work with our schedule the best," he says.

Tomenendal also believes that the 747-81's new IFE and cabin management systems will challenge completion centres, but less so than the systems on Boeing's new all-composite 787 Dreamliner. However, Boeing executives say completions on the 747-81 should actually be easier than on its progenitors.

**Fair share** All the drawings for the new aircraft are digitised CATIA models that will be updated as required as the aircraft proceeds through flight test, to facilitate faster interior design. Kevin Roundhill, Boeing's regional director of product marketing, says that Boeing's IFE vendors have already held discussions and shared data with the completion centres, and Boeing is doing likewise.





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Image courtesy of Heim Aircraft Interior Designs



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## Jet Aviation Basel and L-3 first to land contracts

Jet Aviation Basel announced the contract for its first VVIP Boeing 747-8 interior completion in December 2010. The company's in-house interior design studio was also awarded with the design of the cabin interior. Following its expected arrival in Basel, Switzerland, in early 2012, the aircraft is scheduled to be completed within 24 months.

"Jet Aviation Basel's selection as the first-ever completions centre to be contracted to complete the cabin interior of a VVIP B747-8 aircraft is a validation of the investments we have made in technology and training to build the in-depth know-how of the Boeing 747-8 aircraft," says Peter G. Edwards, president of the Jet Aviation group.

Catia and Smarteam (3D design software) will be used for the engineering, production and data management requirements for the entire completion process. The software was introduced at Jet Aviation Basel in 2010. The completions centre will also build a full-size mock-up of the aircraft so the client can experience a 1:1 view of the cabin interior for the final decision-making process.

L-3 announced its VVIP 747-8 aircraft completion contract in February 2011. Both interior and exterior work will be performed at its VIP and Head of State Completion Center in Waco, Texas, USA. The company says the interior will feature the latest technologies in entertainment systems, lighting and sound elimination/dampening. The contract also includes work on the customer's livery and other major aircraft systems.

Tomenendal concurs that Boeing has done a good job with sharing the data needed for initial design presentations. "They are actively engaged in providing the necessary data," he says. "I'm sure as we get into it deeper there will be more things we need to know."

**Performance gains** A new wing, more fuel-efficient engines and an increased use of composites will improve the 747-8I's performance over the 747-400 by approximately 16%. Chevrons on the engine exhaust nozzles and the nacelles help to reduce engine noise by up to 30%. An 18ft fuselage stretch makes the aircraft almost 3ft longer than the A380. And revised construction techniques will enable the 747-8I to come together faster, says Boeing's Roundhill.

"We can charge more for an aircraft that delivers more performance and we can leverage our costs by choosing the right suppliers at the rate and quality we need," Roundhill says. "We have gone through such a journey in the last five years with regards to lean manufacturing, including bringing lots of things to the new 747 we learned from the 737 and 777 programmes. We have better visibility now. We can get engineering out there right away to fix any problems."



6. Greenpoint's concept for an office on the 747-8

7. Greenpoint has also designed an elevator for the aircraft

By way of example, Roundhill cites the 747-8F freighter variant, expected to be certified in summer 2011. "The 12th freighter rolled off the line and left the factory with zero travel work. No extra work needed to be done," he says. "We have more challenges with the Intercontinental, but we expect to see similar gains with that aircraft and be

## BOEING HAS DONE A GOOD JOB SHARING THE DATA NEEDED FOR INITIAL DESIGN PRESENTATIONS

able to build them efficiently with a high-quality end product. We've had really good quality coming out of our factory already on this aircraft. For as much as we have changed it with new wings, new engines, new systems, it is coming together very well. The delays we have had so far in the programme are from things we have discovered in flight test."

These included a buffeting issue that was resolved by reconfiguring the forward Krueger flaps and designing a new outboard/aileron spoiler system to improve handling. These and a few





## COULD A POST-DELIVERY MODIFICATION BE DONE? PROBABLY

other issues have put the programme roughly 18 months behind schedule. To meet its end of 2011 certification goal, the Intercontinental will be playing catch-up. Boeing's Lund calls the schedule "achievable, but aggressive". The programme will fly only two aircraft approximately 600 hours, in part because much of the flight test data gleaned from the freighter programme – which is flying five aircraft – can also be applied to the Intercontinental.

As the aircraft continues in flight test, the competition for completions remains fierce, given the relative few slated for VIP input and the large amount of money each job represents.

Roundhill thinks the requirements for those aircraft may grow even more eclectic. While Boeing does not have

8-9. VIP 747-8  
concepts by  
Lufthansa Technik



plans to offer a 747-8I in a combi role – "there would probably be only one or two and the business case would never close," Roundhill says – there are options for a potentate who prefers to fly with his polo ponies. Roundhill does not rule out third-party aftermarket modifications. "Could a post-delivery modification be done? Probably," he says.

**Mod squads** Several firms already have experience making significant structural modifications to the aircraft. That list includes elevator builder and 747 completion centre L3. It recently modified an older 747SP with a huge

aft fuselage door to carry an aerial telescope for NASA.

With this new crop of 747 VIP completions, the sky does not appear to be the limit. For the aircraft's super-rich clientele, extreme customisation is not a question of budget, but rather the limits of engineering. The first of these 'gang of eight' completions should be ready by 2014. **END**

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Mark Huber, Business Jet Interiors International

# magnumopus

The HondaJet, which should achieve certification in 2012, is the personal masterpiece of Honda Aircraft's CEO, who has spent the past 20 years working on it





**H**onda is now assembling its second conforming HondaJet at its campus in North Carolina, USA. A prototype had been flying for many years, but the first conforming aircraft took to the skies in late 2010. In March 2011 it validated its top speed by achieving 425kts at 30,000ft with a weight equivalent to that of an aircraft fitted out with a finished interior and passengers.

The company expects to certify the aircraft in 2012 and claims an order book “well over 100” with the first two years of production sold out. Order one of the US\$4.5 million aircraft now and you won’t be able to take delivery until 2014. More than 500 employees currently work on the programme, and that number is likely to increase as production ramps up.

The five-to-six passenger aircraft spawned from a research programme that began back in 1986. A young aeronautical engineer working on that programme, Michimasa Fujino, is now president and CEO of Honda Aircraft. Perhaps not since Bill Lear launched the Learjet has a CEO had a bigger impact on a business jet. However, unlike the colourful Lear, who often operated on a tight budget, the HondaJet has benefited from the patient Yen of its large parent corporation: the same people who build Acura and Honda automobiles and just about anything else you can think of that comes with an engine,

1. The HondaJet’s distinctive exterior, featuring over-wing engines and thin NLF wings



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# inspired vision





from portable generators to motorcycles and outboard boat motors. Fujino and his team had the resources to proceed at a more leisurely pace, building several technology demonstration aircraft and then flying the prototype since 2003.

The production aircraft looks almost indistinguishable from the prototype and is unconventional to say the least, with its over-wing engine pylons, thin natural laminar flow (NLF) wings, porpoise-like nose and raked cockpit side windows.

But there is method behind it all. The design yields more cabin and luggage space, a quieter cabin and more speed. Meanwhile, Honda – in partnership with GE – concurrently developed an engine for the aircraft, the HF120 turbofan. Honda Aircraft received its first production engine in November 2010.

The rest of the HondaJet's supply chain also appears to be coming together now. "Aircraft design and development requires many suppliers," Fujino notes. "Of course there are many challenges." But after delaying

2. The latest HondaJet cabin design
3. The cockpit, which is almost finalised



## IDEALLY YOU WANT A CABIN WITH AMPLE LEG SPACE AND NO FOOT OVERLAP

the programme for a year to deal with supplier issues, Fujino praised the aircraft's suppliers for "working very hard" to get back to schedule.

**Room at the top** In March 2011, Fujino talked about the luxury of being able to develop a "clean sheet of paper" design around the passenger, in addition to integrating the automotive and aeronautical disciplines that are at the heart of the HondaJet. It began with the cabin of the aircraft's all-composite fuselage.

"We took three steps," Fujino says. "First I conducted a very basic study of space availability for passengers. Especially for a small jet, space is very limited so we had to consider what minimum volume is required for each passenger and in each configuration." Fujino determined that number to be

60ft<sup>3</sup> per passenger, so that is what he designed the fuselage for.

The second big item on his list was seat pitch. "Some manufacturers stress cabin height or cabin cross-section. Of course, that is important, but the more important thing for a small jet is the pitch of the seat," says Fujino.

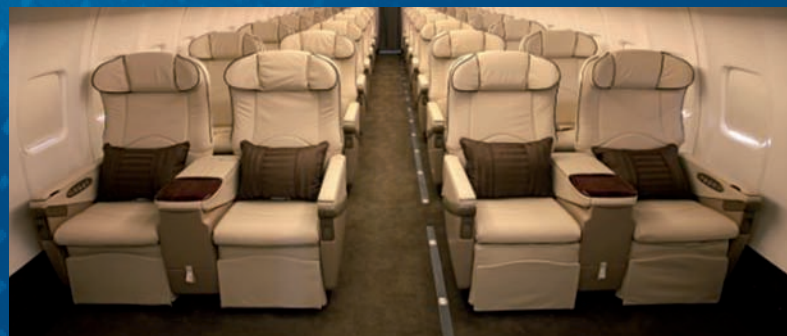
In a club configuration with facing seats the passengers' feet can overlap. "Ideally you want a cabin with ample leg space and no foot overlap," Fujino says. The HondaJet has achieved this with a seat pitch of 43-44in that accommodates passengers through the 97.5 percentile. "That is very different from other business jets," Fujino says.

The HondaJet's cabin measures 4ft 11in tall, 17ft 10in long (forward to aft pressure bulkhead), and 5ft wide. Overall baggage capacity is 66ft<sup>3</sup> – 57ft<sup>3</sup> of that in the aft compartment



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4. The configuration currently being shown by Honda – others are likely to follow



Michimasa Fujino

Michimasa Fujino became the founding president and CEO of Honda Aircraft Company in October 2006. Before that he was a vice president with Honda R&D Americas, and the large project leader for the HondaJet programme based in Greensboro, North Carolina, USA. He led all engineering tasks from design through experimental verification, fabrication and flight testing.

Fujino joined Honda R&D in Japan in 1984 after graduating from Tokyo University with a degree in aeronautical engineering. He spent the first two years of his career in the automobile research division working on the development of a new electrical control steering system. He was then assigned to a research project in the field of aviation.

Over the past 20 years, he has participated in several aircraft projects, including major responsibilities in the design and development of two experimental aircraft – the MHo1, a single-engine composite turboprop, and the MHo2, an all-composite business jet. He has also performed research in the fields of configuration design, advanced aerodynamics including natural laminar flow (NLF) and transonic aeroelasticity. He has developed theoretical techniques for the aerodynamic and aeroelastic design of the HondaJet. In addition, he has conducted wind-tunnel and flight tests at research facilities around the world.

(accessed from the exterior) and 9ft<sup>3</sup> in the nose.

Fujino credits the over-wing engine pylons with freeing up more fuselage space for passengers and making it unnecessary to taper the fuselage as it proceeds to the tail. The over-wing engine mounting allows Honda to maximise passenger legroom without increasing the length of the aircraft's fuselage, yielding 280-290ft<sup>3</sup> of cabin space (depending on configuration), an amount that is 17-20% more than other entry-level jets.

Having over-wing engines should also produce a quieter cabin. "Engine noise and vibration transmit to the wing first, then to the fuselage," says Fujino. "Compared to fuselage-mounted engines, the noise and vibration is much lower than a conventional business jet. I flew in it a few weeks ago and I am convinced the cabin will be very quiet." Fujino thinks the HondaJet's interior will be quieter than comparable business jets: "A very quiet jet is 74-75dB SIL. My expectation (for the HondaJet) is much lower than those numbers."

**Interior mock-up** GKN Aerospace, which is building the fuselage, aims to deliver fuselage sections to Honda in Q2 2012. For now, Honda is checking interior production parts for fit and finish in an engineering mock-up and refining the cockpit interior. "The cockpit is almost finalised. The flight test aircraft has an almost identical interior. It is important for the pilots to assess the ergonomics," says Fujino.

Presently Honda is displaying just one executive cabin configuration – a single-place, side-facing kibitzer opposite the entry door followed by a club-four seating arrangement and an aft-cabin lavatory. However, Fujino says that other configurations are "under study". Possibilities include substituting a small refreshment area, cabinets and a closet in place of the single, side-facing seat, or an all forward-facing seating layout for air taxi operations.

Honda is now working on a colour/fabric palette for the interior that initially is likely to consist of four or five possible combinations, as well as an overall cabin option list. The company is producing virtual reality, high-resolution pictures of the cabin in various colours and fabrics and continuing to collect customer preference data. The refreshed interior currently being publicised by the company features a high degree of upscale automotive accents, including a plated bullnose that runs the length of the cabin.

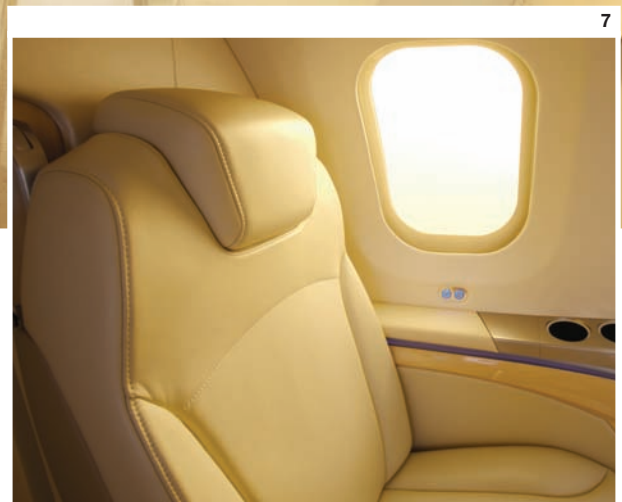
Honda has finalised most of the jet's vendors but remains mum on who most of them are for "competitive reasons". However, we know Garmin is providing its touchscreen G3000 avionics system and Emteq was tapped to provide its SkyPro HD IFE and CMS complete with touchscreen monitors, AVOD, interactive 3D moving map, exterior camera and cabin control. Touchscreen monitors will be available at each seat and function as IFE, CMS and lighting controls. With the XM

## THE NOISE AND VIBRATION IS MUCH LOWER THAN A CONVENTIONAL BUSINESS JET





5-7. Earlier cockpit and cabin engineering mock-ups



## AUTOMOBILES HAVE A SHORT DEVELOPMENT CYCLE; AN AIRCRAFT'S DESIGN NEEDS TO BE MORE TIMELESS

satellite radio option, passengers can select their own station presets at individual seats.

**Automotive influence** In 2010, Honda displayed combination touchscreen monitors deployed from the ceiling at each passenger position, inspired by automotive design. "We showed that at NBAA and EBACE to get customer feedback and many customers like the concept," says Fujino.

However, he is well aware of the lifecycle differences between automotive and aeronautical product development and the need to build expandability into any onboard system. "Automobiles have a short development cycle; an aircraft's design needs to be more timeless," Fujino says. "An

aircraft's life can be 20 years and it needs to align with a technology roadmap. Electronics change very rapidly and many customers are using their own iPad or DVD player for IFE. A fixed screen may not be so important for a business jet user now. Any interface should be carefully evaluated based on the long-term technology map, and screens need to be used for many functions."

It is not surprising that someone who has been working, in one form or another, on an aircraft development programme for over 20 years takes the long view. Even since the prototype first flew, numerous actual and potential competitors have come and gone. Fujino and Honda are clearly in this for the long haul. It is said that

aviation requires 'patient capital'. Honda clearly has plenty of patience and capital and the slow-down of the programme may actually have been fortuitous, according to company spokesman Stephen Keeney, who notes "an uptick in interest in the HondaJet despite all the troubles with the worldwide economy over the last few years". Keeney states that the jet – with its 15-20% greater fuel efficiency and impressive speed – has a natural appeal for those "looking for a more efficient and economical way to travel".

Barring any unforeseen glitches, customers will begin flying on Fujino's opus sometime next year. **END**

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# neworder

Companies such as Alsalam and TAEKO are posing a challenge to the established corporate and VIP completions order, currently dominated by Europe and the USA

In winter Dubai's climate can be very similar to California's, and the chalet facing the static park at December 2010's Middle East Business Aviation (MEBA) show was pleasantly warm. But then MAZ Aviation chairman Mohammed Al Zeer rose to speak, and his words must have created a chill of apprehension among the big names of the corporate/VIP cabin completions industry.

Announcing an alliance between his interiors consultancy and Saudi engineering firm Alsalam Aircraft, Al Zeer declared: "We design interiors for VIP customers and have achieved a high level of penetration in that market. Alsalam's range of capabilities is unique in this region. From now on we will strongly recommend its services."

In short, the partners were setting out to win a share of a market hitherto dominated by European and US completion centres. And the Saudi alliance isn't alone in its *lèse majesté*: Hong Kong-based Taikoo (Xiamen) Aircraft Engineering (TAEKO) has just announced similar ambitions, while two established regional providers –

Canada's Flying Colours and Altitude of New Zealand – are casting their nets wider. All of a sudden, the completions kitchen is getting hotter.

**Beginnings** Riyadh-based Alsalam Aircraft started life 20 years ago, providing MRO services as part of the offsets for the Peace Shield defence programme with the USA. The military still provides a large part of its revenues – the company performs heavy checks on the Royal Saudi Air Force's big fleet of F-15 combat aircraft, for instance – but civil work is steadily looming larger, with VIP completions at the forefront of that growth.

"We realised right from the start that VIP interiors was an area we had to get into," says chief executive Mohammed Fallatah. "We did our first, a Lockheed TriStar, in 2001/2 and since then we have completed seven or eight major projects for Saudi customers. They include a pair of luxury conversions of Lockheed C-130 ex-military transports, just delivered."

Like the Saudi company, TAEKO cut its teeth on MRO. Formed in 1993 by

Cathay Pacific MRO provider Hong Kong Aircraft Engineering (HAECO), TAEKO is based in mainland China and specialises in heavy and line maintenance, freighter conversions, component overhaul, engineering design, parts manufacturing and training. Earlier this year Airbus announced that it had appointed TAEKO as its first approved Corporate Jet cabin outfitter in Asia-Pacific, and eighth worldwide, and the company is now gearing up to launch its interiors operation this spring.

Alsalam and TAEKO can both boast a solid platform from which to advance towards the highest reaches of the completions business.

The Saudi company's MRO activity means that it already has plenty of experience of high-level work – D-checks, modifications, design, installation and certification – on aircraft ranging in size up to the Boeing 747. Interior projects are supported by three different computer-aided design systems that can work from renderings down to the smallest bracket and attach point. The company lays great stress on using

1. A bathroom on an ACJ mock-up completed by TAEKO
2. The bedroom on TAEKO's ACJ mock-up



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### Where will Phoenix rise next?

With a business built originally on sourcing ex-airline Bombardier CRJ200s for conversion to VIP and corporate shuttle configuration, Dubai-based Project Phoenix regularly commissions completions services, notably from preferred partner Flying Colours. Once the company has acquired an aircraft, it is transformed with a very high-quality interior with IFE and cabin management network, and upgraded avionics, navigation and communications to reflect its change of role from short-range commuter operations to long-range business aircraft.

President Mike Cappuccitti has some observations on what it takes to successfully enter new markets. "Though we have always been geared up for worldwide sales our present focus is on the Middle East, India, Africa and the Far East," he says. "Our most recent targets have been India and China, which exactly match our criteria for potential Phoenix CRJ markets."

Factors sought by Cappuccitti and his team include an emerging aviation infrastructure, especially new airports, and major population centres that are far apart and not linked by efficient ground transport. "We're also looking for a culture that wants value from acquisitions, reasonably located maintenance and support facilities, and a healthy aircraft charter market," he says.

Potential pitfalls for anyone entering a new national or regional market include the regulatory regime. "A knowledge of local regulations is critical," Cappuccitti advises. "Do they comply with FAA or EASA or something else? Are there restrictions on the age of aircraft that can be imported?" Local attitudes matter too: "Is there a prejudice against buying second-hand aircraft? The Russians, for example, tend to be interested only in new aircraft," he says.

3-4. Examples of completions work by Alsalam



this capability to get a clear sense of the customer's wishes and then produce designs to match. "The more you try to understand the customer's desires, the more successful the project will be," says Fallatah.

Vivid 3D computer renderings of the designs allow the customer to walk through a virtual interior, and a showroom of materials – carpets, fabrics, leathers and metals such as brass and gold – provides hands-on samples of the real thing.

**In-house skills** No serious VIP completions contender can afford not to have a high level of in-house craft skills – subcontracting tends to cost more, and makes quality and schedule harder to control. So just over two years ago it was decided that Alsalam would develop its own comprehensive back-shop capability. "Our aim is to make as much as we possibly can for each interior that we install," says Fallatah.

Located in one of the company's three 5,300m<sup>2</sup> hangars, Alsalam's workshops can handle fine wood veneers, leather and fabrics; a range of structural materials including fibreglass and composites; seating; as well as the manufacture of large interior units

including headliners, sidewalls, lavatories and galleys. The preparation of wood veneers is carried out by an all-Saudi team that learned the craft from an Austrian company brought in to execute the first C-130 shipset and provide on-the-job training. "Customers and visitors are very often surprised that we have that expertise," says Fallatah.

The core metal structure for seats is bought in from a US supplier, then Alsalam does all the rest: shaping foam cushions, fabricating armrests from sheet metal and other outer structure from composites and fibreglass, and covering the whole with fabric and leather cut and sewn in the tailors' shop. Other capabilities include the design of water and waste systems, and IFE integration and installation.

The central theme is a drive for independence. "We've already brought design, engineering and production in-house by developing local talent – we look at every opportunity to be self-sufficient," says Fallatah.

Meanwhile TEACO boasts an extensive background in line and heavy maintenance on airliners such as the A320-family types on which the Airbus Corporate Jets (ACJs) are based. "We have also converted passenger



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aircraft into freighters, and we're an approved design authority and parts manufacturer," says Patrick Healy, chief executive at TAECO. "So we know how to look after aircraft, which is an important part of a cabin outfitters' business, because customers typically go back to the completion centre for subsequent work on the cabin, and often take advantage of this downtime to have maintenance done as well."

The TAECO interiors operation is housed in its sixth hangar, which is scheduled to open shortly. "Capable of housing several A320-family aircraft simultaneously, it is located well away from the others and will offer greater privacy and security to our business and VIP customers," says Healy.

As well as the physical infrastructure, Healy has 200 staff ready to start working on cabins. "That's in addition to the 3,600 or so on the maintenance side," he says. "So we already have most of the skills that we need in house, and are well placed to grow the business."

Both providers plan to focus initially on single-aisle airliner types. "We can accommodate wide-bodies as big as the Boeing 747-400 in our hangars," says Fallatah. "But for now we want to concentrate on the narrow-bodies. Our market research shows a substantial

5. A lounge on TAECO's ACJ mock-up
6. With 200 interiors staff on standby, TAECO believes it will be able to do most work in house

growth in this sector and it's in line with our current commercial licences."

TAECO will start with one of the types from the ACJ family. "If that goes well, and we will be working hard to make it happen, we would like to build on our Airbus experience," says Healy. "That said, we are also open to doing other corporate jets."

**Local knowledge** At present Riyadh and Xiamen are not locations that readily spring to mind when contemplating the interiors industry. What are the advantages of offering completions from these locations?

"Our in-house designers and our Saudi-based partner MAZ understand the unique requirements of clients in this region," says Fallatah. "When it comes to costs, we have an advantage over our European competitors and are probably on par with the US companies. But for a Middle Eastern client, our location yields big savings on things like travel for the customer's staff carrying out on-site supervision."

Healy also sees the value of being close to local clients. "We have a good understanding of Chinese culture, speak the language and are located in the same time zone as potential customers in the country. Being based in China will also help us to control our costs," he says. "The relatively undeveloped and fast-growing Chinese market is a natural opportunity for us, and we are the logical solution for a customer who wants his aircraft outfitted on home territory. But we are also looking to the world market, where we will be competing mainly on the basis of the quality of our work and our extensive MRO experience."

When it comes to securing business, the longer-established Alsalam has a head start on TAECO. "We have several promising candidates on the horizon," says Fallatah. "We are about to receive an aircraft for a complete refurbishment, and look forward to getting another for a full completion in early summer. With all the indicators pointing to a robust VIP requirement in the Middle East and North Africa, we can currently base our business case on this market. But if the European and US markets also grow as projected, there will be capacity issues in those shops that we believe will work to our advantage."

However sophisticated their in-house capabilities are, completions providers inevitably depend on large

**WHEN IT COMES TO COSTS, WE HAVE AN ADVANTAGE OVER OUR EUROPEAN COMPETITORS AND ARE PROBABLY ON PAR WITH THE USA**





7-8. Altitude's 'Pounamu' VIP interior mock-up, built to showcase its BBJ capabilities

## Striking out

Altitude Aerospace Interiors and Flying Colours Corp are two established completion providers with healthy regional practices that are now spreading their wings while not necessarily looking to go beak-to-beak with the industry leaders at the highest end of the market.

Located in Christchurch and Auckland, New Zealand, Altitude set up shop in 2008, specialising in BBJ completions for customers from Pacific Rim countries. "We address territories like China, Korea, the US West Coast and Indonesia," says Baden Smith, Altitude's commercial head. "We always knew we'd have to look further afield to develop our customer base, so when we first got started our target was to build the brand across the region."

Altitude is the only recognised BBJ completion centre in the southern hemisphere. Its main facility in Christchurch includes a single-bay hangar, a paint shop, manufacturing and support capacity, and a retired Boeing 737 fitted out with a typical VIP interior that is made available for inspection by customers.

"If you're static in this industry you'll be overtaken in no time by incumbent and emerging competitors," Smith says. "We intend to continue developing engineering designs, building our employee capabilities and facilities, and securing a bigger share of the market for VIP maintenance, refurbs and green completions. Our focus so far has been on the Pacific Rim – now we're looking to develop in areas like the Middle East and South America."

Meanwhile, Ontario, Canada-headquartered Flying Colours Corp has 20 years of experience in completing mid-large-sized business jets for a primarily North American clientele. "Over the last five years we have seen a great deal of growth in China, India, Russia, Europe and the Middle East, and we continue to expand our customer base in these regions," says Sean Gillespie, director of completion sales and management for the company.

Flying Colours Corp has a total of 180,000ft<sup>2</sup> of hangar and shop space at its two locations and is in the process of adding more. "We're also negotiating a joint venture outside North America to help us serve our international clients," says Gillespie. "We currently specialise in Bombardier, Dassault Falcon, Gulfstream and Hawker business jets. But we have had customer requests for Airbus and Boeing completions and are evaluating how that might fit with our expansion plans."

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7

8

can add value and keep costs low," comments Fallatah.

TAECO's primary shareholder is the Hong Kong-listed HAECO group, which in turn is part of Swire Pacific. "But the local government has an interest through its aviation investment vehicle the Xiamen Aviation Industry Company," Healy explains. "TAECO is also a significant domestic employer, with nearly 5,000 staff on its books. These two factors alone mean that the company gets good local support."

**Thinking big** Until recently airliner manufacture was for all practical purposes a two-horse race, with Airbuses and Boeings flowing perennially from the West to the rest. That's all changing as credible new designs emerge from Canada, Brazil, China and Russia. The same is true of MRO and most recently, corporate and VIP completions. Capable new providers have hung out their shingles and there's no limit to their ambitions.

"As a newcomer to the industry we have to prove we are among the best," says TAECO's Healy. "We absolutely aspire to becoming a leading completion centre, initially in Asia, but also worldwide." And Alsalam's Mohammed Fallatah, does he also hope ultimately to match and exceed the biggest names? "Why wouldn't we? The completions business caters to the dreams and whims of the owner, so why shouldn't Alsalam dream big as well? Our goal is to be a world-class global player." **END**

networks of outside suppliers for materials, components and services. Are the two companies happy that their supply chains are sufficiently robust to face the challenges to come?

"At the moment the only significant supply chain issue we face is the additional lead time we must allow for shipping from US or European vendors," says Fallatah. "If the market expands rapidly in the future we may have to seek alternative suppliers."

TAECO has come to the same conclusion and is acting on it. "We're broadening our local and overseas supplier network and are in the process of developing a number of joint-venture agreements," says Healy. "As far as our supply chain is concerned, we can see a clear path ahead."

Both companies consider themselves fortunate in having governments that are well disposed to what they do. "We have won a reasonable amount of completions business from the Saudi government by bidding competitively and showing how a local company

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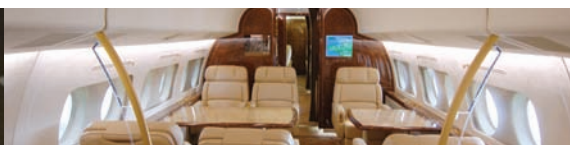
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# goldenjubilee

It had to build a company at the same time as its first cabin interior, but keeping it in the family has paid off for Comlux America







Having conquered the world of VIP charter, aircraft management and sales, cabin design and outfitting management, the Comlux group made the perhaps natural progression into actual cabin completions in late 2008. It did so by acquiring the Indianapolis Jet Center (IndyJet) at Indianapolis International Airport, USA, and renaming it Comlux America.

The new company has just finished its first project – an A320 Prestige named Jubilee. It was truly a family affair. Comlux purchased the brand new aircraft for the client (who is based in central Asia); its Creatives division in Zurich, Switzerland, designed the interior; and now its cabin has been completed by Comlux America it will be managed and chartered by another branch of the company.

In preparation for its charter role, the interior is both versatile and designed to appeal to a broad range of passengers. “It’s made for transporting government or normal charter clients, perhaps a big family; it actually complies with any request,” says Ettore Rodaro, president of Comlux America. “We wanted to cater to many possible tastes around the world. It’s a mix of classical and contemporary.”

Heading up the design was Tim Callies, head of Comlux Creatives. His plan for the entrance area includes a sliding screen finished with artwork to hide the galley, along with a magazine rack and a smart credenza.

From the entrance, passengers enter the executive cabin, which is divided in two. The forward area has two club seats with an L-shaped divan on the opposite side, so passengers can either watch a film or work using the fold-out table. The seats convert to beds, so there is a single bed on each side of the aircraft cabin.

Following on from this is the dining area, featuring a three-place divan and



1

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ESPECIALLY TO  
ATTRACT PEOPLE IN  
THE MIDDLE EAST, SO  
WE TRIED TO USE  
COLOURS WHICH ARE  
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1. An L-shaped divan in the private lounge converts into a bed
2. Seating in the forward, executive section
3. The executive cabin features areas for seating and dining

four seats around a table. There is also a bar with a Hi-Lo top, and a buffet area with plenty of storage space for all the crockery, cutlery and so on.

A narrow corridor on the left-hand side leads to the aft section (which features a 12-seat first-class section and economy seating). A door in the hallway opens into the private lounge. This incorporates another L-shaped divan that can be converted to a 1.3 x 2m bed, as well as coffee table and a 42in TV that is independent of the others throughout the aircraft. There is also a private bathroom with shower. "Providing a shower is a must have in the charter business, even though most of the customers don't use it," says Callies. "We decided from the beginning we needed to have it, especially for the Middle East, where it can be very hot outside and people would like to take a fresh shower before going into their next meeting."



Callies says design inspiration came from a magazine picture showing a man in a suit on a beach with the sea behind him. "Our goal was especially to attract people in the Middle East, so we tried to use colours which are very welcome in those countries, for example beige colours like the sand and blue colours for the ocean," he says. The picture also reflected the aircraft's dual role – business and pleasure. "This was the guiding idea, the guiding slogan for us to develop the design," he says.

**Sand and sea** The beach/ocean theme is carried through with the colours. Three main schemes are used – blue for the dining-area seats, private lounge walls and aft-area seats; beige sand tones for the carpets and forward-area seating; and dark brown accents achieved through the use of two wood veneers, Wenge and Zebrano. A rippled

carpet in the private lounge gives way to a blue carpet in the private bathroom, to give the idea of going from the beach into water.

Using the Wenge veneer, which has a very distinctive open grain, presented a challenge for the team at Indianapolis tasked with applying a finish to it. "With the open grain, the lacquer goes inside and appears white when it dries. So it took us some time to find the correct lacquer," says Callies.

It was decided that all the veneers would be finished in satin rather than high gloss, because the aircraft is to be used for charter flights. "With high gloss you always see fingerprints or scratches easily," says Callies. "For a charter aircraft, it's more durable to have a satin finish."

This isn't the only aspect to be designed for resilience. For example the walls are lined with artificial leather from Majilite instead of silk or woollen fabric. "It's much more cleanable, especially in the hallway where it's narrow and it's easier to scratch or to damage something," says Callies.

**Lounging around** Other leathers in the aircraft come from Edelman, Townsend and Spinneybeck. There are fabrics from Anya Larkin, Warwick, Lelievre and Tapis, and carpets by Tiping. Aft seats use fabric, while the forward-area club seats are covered with leather, with Zebrano on the arm and leg rests. Velvet is used for the dining room divan, and in conjunction with leather for the dining room chairs. "I'm kind of proud that our people in Indianapolis were able to develop what I designed in my sketches," says Callies. "Especially with the dining seats, they look more like real lounge seats than aircraft seats and we still have all the functions we need like recline and swivelling."

Another material of interest is Bisazza, a mosaic stone used on the







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# I WAS ABLE TO DO WHAT I LIKED AND OF COURSE THIS IS ALWAYS VERY EASY FOR A DESIGNER

## Silence is golden

One of the goals with the A320 completion was minimising noise levels in the cabin to below 55dB speech interference level (SIL). This has been achieved, with preliminary test results clocking approximately 49.7dB in the forward lounge/dining area, 48.9dB in the private lounge, and 53dB in the first-class area.

Rodaro credits this success to the team's holistic approach: "You can put as much isolation material as you want into an aircraft, and you add a lot of weight but you might end up with zero results, the same noise level as before. So you really need to attack the problem from different angles to get the end result."

One of these angles was to use a lot of fabric in the cabin. Although comfort was also a factor in the decision to cover many of the seats in fabric rather than leather ("leather is usually a very cool material, it takes time before it gets warm and fabric is usually a little bit more cosy," says Callies), fabric's noise absorption properties were also attractive.

Meanwhile the engineering team completely remade and tested a new riser duct for the environmental control system, reducing noise (particularly in the VIP area) by at least 8-10dB compared to the OEM systems.



careful supply chain management. On this front Comlux America says it hires "one of the best purchasing managers in the business". He holds purchasing agents responsible to track purchased items. Any outsourced items are managed by the shops themselves – they are responsible for on-time delivery and quality whether it is outsourced or not.

Cabin component suppliers for this project included MSA (window shades), CTT Systems (humidification system), Jormac (interior lining system), PAC (seats and divan), CCC (IFE), Cabin Innovations (galley), Teklam (laminated panels), Carl Booth (veneer) and Jeff Bonner R&D (the shower).

Of course there were certain challenges for Comlux America in performing its first completion. "We had to build up the staff and team at the same time we were completing the aircraft. This on top of developing over 600 procedures, processes and design standards, and developing a relationship and trust with the FAA," says Séverine Cosma, vice president of marketing at Comlux.

Although IndyJet had over 30 years of experience in corporate aircraft refurbishment, the takeover involved more than a simple change of name. Comlux had bigger plans. "We didn't just build a cabin, we built a company," says Ettore Rodaro, president of Comlux America. "IndyJet specialised in small business jets, refurbishments and maintenance. The first thing we

washroom walls. "It's about 3mm thick but because we had it only on a small part of the bulkhead it's not too much weight," says Callies.

**Record time** Looking at how well it turned out, it's surprising to find out how little time Callies had. After getting the contract in June 2009, Callies had just two and a half months to develop the design, then another eight to produce technical drawings for the completion centre and select colours and materials.

The company also eschewed mock-ups in favour of a three-and-a-half minute movie created by Callies and ACA, which was shown to the customer and the engineers after the design had been completed.

Callies acknowledges that he had more freedom than on a conventional project. "Usually with other customers it's the opposite way, you first show the renderings and then you produce the design," he says. "With this project it was very quickly defined what we needed. I was able to do what I liked and of course this is always very easy for a designer. It's always a bit more complicated if you have a customer who wants a very traditional interior design and you need much more time to research and to find out if the design direction you're developing is the one the customer would like."

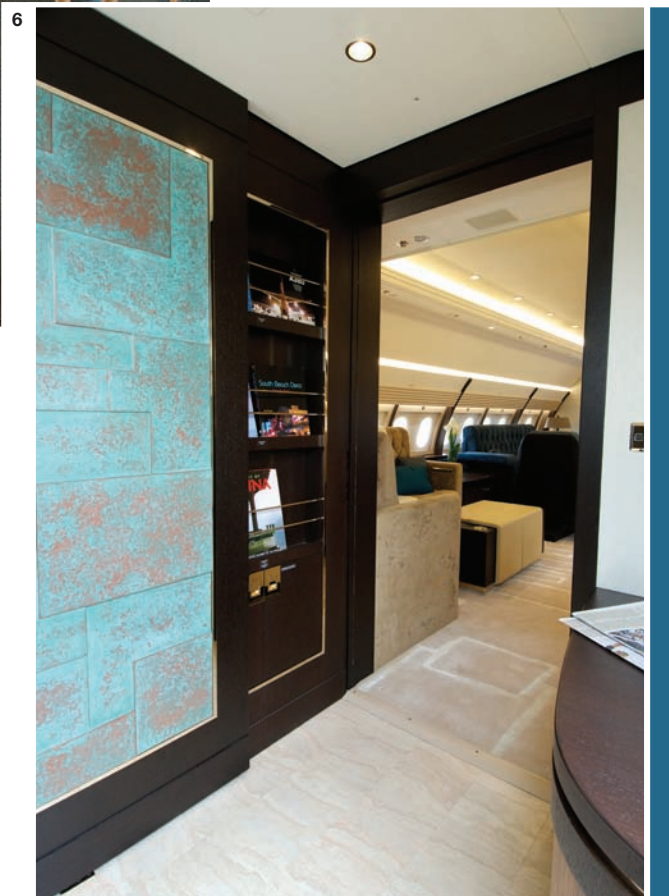
The aircraft arrived at Indianapolis in March 2010 and is due to go into service (on time) on 3 May 2011. One of the keys to an on-time delivery is

4. The dining table is served by a three-place divan and four single seats





5. The aft of the aircraft incorporates a 12-seat first-class section
6. The entrance area, with galley hidden by a sliding pane



### Entertainment options

Comlux specified an IFE system especially for this A320, provided by CCC. "We went through each room and decided what kind of functions customers needed," says Callies. "I wanted to have a very easy, understandable system, especially for the charter business, where you have many customers."

One consequence of this is the use of words rather than pictograms on the IFE controls. "Today, more or less everyone speaks English and some customers interpret pictures differently. Also on small buttons it's more difficult to show a nice pictogram than only a word," says Callies.

There is a cabin management system, which can be controlled from the principal's seat via a touchscreen. There are also touchscreens on the walls going from the main entrance into the executive area, offering control over IFE, lighting scenarios, heating and window shades (which are electrical and can be controlled individually).

The executive area boasts two monitors (42in in the dining area and 37in in the lounge); while the rear seating area has 10in in-arm seat monitors.

did was to re-qualify the centre as a Bombardier-approved service facility. But in order to build narrow-body aircraft we had to find a lot of new manpower, specialised manpower coming from outside the state."

In practise this means the facility has two divisions – with the IndyJet staff (all of whom were retained) performing engineering and maintenance on Bombardier Learjet, Challenger and Global aircraft under the Comlux Aviation Services banner; and a new team for Comlux America's Airbus Corporate Jet and Boeing Business Jet completions. The completions team is led by CEO David Edinger, whose 30 years in the business have incorporated stints at the Dee Howard company, Reese Design, Associated Air Centre and Airbus. Rodaro, who co-founded Comlux in

2003, was the only Comlux alumni to make the transatlantic move. Around 300 new jobs were created.

As well as the A320, the company has also completed several partial refurbishment projects – including a Global 5000, redelivered at the end of February 2011. A VIP Boeing 767 is to be delivered in July 2011; and a Challenger 850 demonstrator is to be delivered in May 2011.

Currently in the hangar are a BBJ3 (which arrived in January 2011) and an A319 (arrived March 2011), for full completion. In July 2011 the company will begin building a new hangar, which should be ready by mid 2012, and will be able to accommodate four narrow-bodies. The expansion will also mean taking on a further 200 staff.

Rodaro does not envisage the company expanding into wide-body

completions in the near future: "If we can deliver three or four narrow-bodies a year with perfect quality and on time then we have a very valid business case. In the long run you never know, but it's not on the agenda today," he says. He also believes the company will benefit from other completion centres being too full and busy with wide-bodies to accommodate narrow-bodies.

"A wide-body absorbs a big number of employees for about two years and it means that they will obviously reduce their capacity on the narrow-body side," Rodaro says. "So traditionally this frees up more narrow-body positions for many completion centres. That was actually our reason to build up the business." **END**

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# freshair

Competition is looming for established 'big iron' airframers – with new models hailing from Russia, China, Japan and Canada

1. The Bombardier C Series 300

Long before modern super computers and the internet, business school professors came up with a five-dollar phrase for a five-cent phenomenon. They called it 'the international product life cycle'. The idea is that technology flows from more developed counties, typically where it is invented, to lesser-developed ones with cheaper labour forces. First it was colour TVs. Now it's jet aircraft.

Fifteen years after the first serialised 'uber barge' – the Boeing Business Jet (BBJ) – was announced, we are seeing the first hints that a new generation of narrow-aisle twinjets being developed in Canada, China, Japan and Russia could see VIP duty within the next 5-8 years. Unlike previous forays into the commercial jet market by some of these countries, most notably China and Russia, this new crop of aircraft will likely achieve some commercial success – even outside their home markets – thanks to Western-origin avionics, engines and systems. These guts make them more likely to achieve international certification approvals, predictable operating costs and reliable product support. Besides having lower acquisition price points, some of these aircraft promise to be even more efficient to operate than the

legacy narrow-aisle offerings from the Airbus-Boeing duopoly, and perhaps even relative newcomer Embraer.

However, these aircraft are unlikely to be problem-free, initially at any rate. Already there are rumblings about weight issues on the Chinese COMAC C919, and the semi-indigenous engine technology on the Russian Sukhoi SuperJet (a joint venture with Finmeccanica's Alenia unit of Italy). Coupled with notorious programme delays, these have given the market pause on that aircraft.

Meanwhile it is unlikely that Airbus and Boeing will give up this cherished market without a fight. Their most immediate tactic appears to be deep price slashing, even before pursuing increased efficiencies with modifications to their legacy products. If the new kids want to play in the sandbox, they better have pockets deep enough to endure years of discounting. State-owned firms can channel orders to the national airlines in China and Russia and perhaps provide concessionary financing to upstart carriers in foreign markets such as Mexico. But firms with perhaps more capitalist risk on the line, specifically Bombardier and Mitsubishi, may have a tougher go of it.

And the big boys have more in mind than playing 'how low can you











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# YOU WILL BE ABLE TO GET BIZJETS WITH NEAR MACH 1 DASH SPEEDS OR AIRLINER FUSELAGES BIG ENOUGH FOR BALLROOM DANCING – BUT YOU STILL CAN'T HAVE BOTH



go'. While Boeing remains non-committal about modernisation plans for its most ubiquitous model – the venerable, although often revised, 737 – Airbus recently launched, and has had some early order success, with its prospective, re-engined A320.

Dubbed the NEO (for New Engine Option). The NEO is to be outfitted with new-generation Pratt & Whitney geared turbofan (GTF) or CFM Leap-X engines that are expected to chop fuel burn by up to 15%. In January 2011, Indian discount airline Indigo signed a memorandum of understanding for up to 150 NEOs, ensuring a successful launch for the model.

2. The Bombardier C Series 100
- 3-4. The C Series' commercial interior



While an orgy of airframe price chopping may make customers take a second look at outfitting these new airliners with executive interiors, it may not offer significant initial price savings. As Boeing proved in the 1990s and Embraer later learned with the Lineage 1000, converting an airliner into an executive aircraft is no small task. There are cabin pitfalls aplenty when the open checkbook crowd confronts the 16g world, and customers and completion centres can fall down the mineshaft.

Then there is the small matter of fresh competition from established bizjet makers such as Gulfstream with the G650 and Bombardier with its newly announced Global 7000 and 8000 models, which are due to hit the market late in the decade. While neither maker can offer the cabin space of the single-aisles models, they trounce them when it comes to speed and range.

You will be able to get bizjets with near Mach 1 dash speeds or airliner fuselages big enough for ballroom dancing – but you still can't have both. However, there will be more choices, several with wider and taller cabins than legacy offerings.

**Russian revolution** Development on the SuperJet began in 2003 and in 2007 Italy's Alenia and Russia's Sukhoi formed a joint venture to shepherd the aircraft through European certification and market and support it worldwide. The programme has suffered numerous



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delays, most relating to the SaM146 engines, being developed jointly by France's Snecma and Russia's Saturn. However, Sukhoi recently received type certification from Russian certification authority IAC AR for the SuperJet 100, and deliveries are scheduled for 2011. Approximately 200 of the aircraft are currently on order, mostly in Russia and Asia. The aircraft will come in two variants, with an estimated range of 1,600-2,200 nautical miles and high-speed cruise of 511mph. At 56ft 3in long, 6ft 11in tall and 10ft 8in wide, the cabin will seat 75-95 in an all-economy configuration. It will cost US\$31.7 million.

The SuperJet not only benefits from Western systems including fly-by-wire, but also European styling, outside and in. The Italian design house Pininfarina is designing optional interiors. In 2010 SuperJet left no doubt that an executive version of the aircraft will be offered. Well-known Western suppliers on the project include B/E Aerospace, Boeing, Goodrich, Hamilton Sundstrand, Honeywell and Thales.

Meanwhile the Irkut MS-21 is without doubt the most ambitious civil aviation project to come out of Russia and takes square aim at both the Airbus and Boeing single-aisle offerings. Three models will be offered, all utilising different lengths of the same fuselage cross-section.

Airline configurations will seat 150-230 people. The longest variant, the MS-21-400, will be 6ft longer than the A321 and 12ft longer than the Boeing 737-900ER. Deliveries are still five years off at least and not all of the design work is done, so precise cabin dimensions and not all performance parameters are not available yet. Export

5-6. Inside the Sukhoi SuperJet



7-8. The Irkut MS-21, with interior by C&D Zodiac



models will be fitted with the Pratt & Whitney GTF engine. The base model price is US\$35 million, and 40% of the programme's US\$8 billion development cost is being underwritten directly by the Russian government.

**Canadian craft** Bombardier's on-again/off-again chase after the Embraer 190 was turned back on in 2008 with the help of some hefty Canadian and UK government subsidies tallying US\$700 million and the deep pockets of some large risk-sharing partners.

Two models are envisioned for the C Series. In airline configuration, the CS100 will seat 110-125 and the longer CS300 will seat 120-145, both with a cabin height of 7ft and width of 10ft 9in. Plans called for the aircraft to be powered by a Pratt & Whitney GTF engine.

Much like Bombardier's Challenger 300 business jet, the C series will largely be built in large pieces elsewhere and then assembled on the factory floor in Mirabel. China's state-



# COMAC THINKS IT WILL BE BUILDING 2,000 C919S ANNUALLY BY 2030



10



owned Shenyang Aircraft has invested US\$400 million in the programme and will build the fuselage. The aircraft will rely heavily on composites.

Deliveries of the short-body CS100 are likely to begin in 2014. The US\$51 million price tag secures an aircraft with a likely range of 2,200-2,950 nautical miles, high-speed cruise of 514mph and 41,000ft ceiling.

**Eastern promise** The Mitsubishi Regional Jet, a Mitsubishi-Toyota joint venture, is the first Japanese-designed airliner since the 1960s. It is intended to go head-to-head with the Embraer 190 and the Bombardier C Series but offer a more spacious cabin (6ft 8in tall and 9ft 0.5in wide) and better fuel efficiency. Two variants are planned with airline seating for 70-90.

Mitsubishi announced in 2010 that it had begun metal cutting on a conformal prototype of the aircraft that is scheduled to fly in 2012, with customer deliveries beginning in 2014. It will feature the Pratt & Whitney GTF engine.

Priced at US\$40 million, the aircraft will offer an estimated range of 860-1,820 nautical miles.

9-10. The ARJ21  
11. The Mitsubishi  
Regional Jet

Finally, Chinese manufacturer COMAC is currently working on not one but two new airliners. If you think you've seen the ARJ21 before, it's because you have. The fuselage was the 1990s vintage of the venerable Douglas DC-9, then called the MD-95. Before it sold out to Boeing, McDonnell-Douglas had plans to build a number of MD-95s in China and even sent the tooling on ahead. The deal fell through but the tooling remained. Boeing resurrected the aircraft as the 717, but it had limited commercial appeal in the new regional jet world and was soon

cancelled. However, the Chinese viewed the aircraft's rugged design and short-field capability with favour. More fuel-efficient GE engines were hung on it and the aircraft got winglets for better performance, but essentially this is a 717.

COMAC plans on offering a dedicated business jet model of the aircraft called the ARJ21B. The Chinese call the aircraft the Xiangfeng, which translates, rather appropriately, to Soaring Phoenix. Deliveries should start in 2011, with a price tag of US\$29 million each. With a cabin 6ft 8in tall, 10ft 5in wide and 56ft long, the aircraft should offer a range of 1,200-2,000 nautical miles, high-speed cruise of 515mph and 39,000ft ceiling.

Meanwhile the COMAC C919, like Russia's MS-21, is aimed straight at the gut of Airbus and Boeing single-aisle aircraft and is by far China's biggest civil aviation gamble. In airline configuration the contemplated variants will seat 168-190. First flight is anticipated in 2014 with deliveries to begin in 2016. COMAC thinks it will be building 2,000 C919s annually by 2030. The C919 is replete with Western engines and systems and a special business jet version will be offered. Performance-wise, the aircraft is targeting a range of 2,200-3,000 nautical miles, high-speed cruise of 515mph and 39,800ft ceiling. It'll set you back US\$42 million. **END**



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**Q**uietly, without much fanfare, a handful of talented designers are shaping the VIP cabins of Europe. Completion centres including Lufthansa Technik (LHT), Airbus Corporate Jet Centre (ACJC) and Jet Aviation Basel all employ in-house designers, offering perhaps a cheaper alternative to independent designers, while also helping to liaise with external agencies to ensure a smooth realisation of clients' ideas. Meanwhile centres such as 328 Support Services (328SSG) are partnering with an external design firm to offer a pre-designed option for faster turnaround.

Michael Reichenecker is an aircraft interior architect for VIP and executive jet solutions at LHT. "I am proud to say that we offer world-class design quality to begin with," he says. "On top of that there are indeed advantages to having the engineering and craft shops of the completion centre right next door. I come from a carpenter family, in the third generation, so I learned early on how working closely with everybody in the value creation chain benefits a project in terms of efficiency, economics and quality."

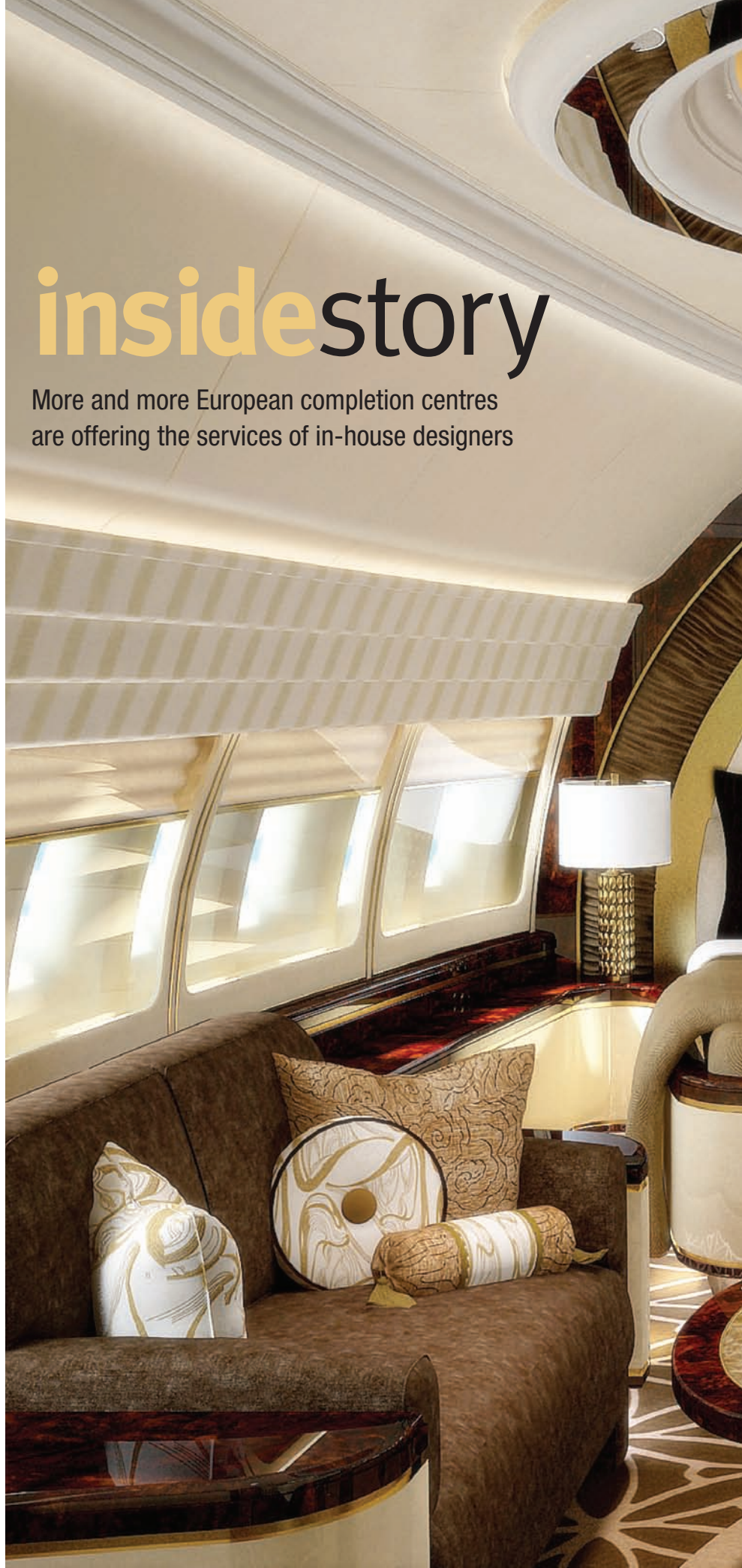
The result for the client is an integrated design and completion process. "That means not just a more viable and quicker way to realise design, it means certainty," says Reichenecker. "What we present can actually be built and certified."

The company is currently working on projects including a green A319 and a BBJ. Reichenecker says the A319 is a "highly individual" VIP project for a client from the Far East, for private and business use. The completion should be finalised mid-2012. "It has a classical feel with highly individual elements, including custom artwork also being designed by us," he says.

The centre is also now offering a quick-change VIP cabin kit for Airbus and Boeing narrow-bodies – launched in May 2010. This allows customers to convert a commercial cabin into a VIP interior overnight. LHT can design and implement a one-time modification of the aircraft and provide the customer

## insidestory

More and more European completion centres are offering the services of in-house designers



1. A 747-8 concept by Lufthansa Technik







2



Michael Reicheneker, LHT

Reicheneker was born in Toronto, Canada, and raised in New York City, USA. After mastering in architecture he started his own practice in Berlin, Germany. Returning to New York in the late 1990s, he worked with JP Molyneux and Peter Marino on projects such as ocean liner apartments and a Versailles-style castle built from the ground up and fitted with all the interiors.

Reicheneker's first contact with Lufthansa was when his firm was contracted to design a hotel close to Munich. As well as aircraft interiors, Reicheneker says, "I would be happy to make my experience beyond aviation available to Lufthansa's VIP clients."

New design trends catching his eye include "light-emitting material or translucent glass turning into a mirror at the press of a button, even screens imitating material allow for useful applications in the future".

2. A 747-8 lounge imagined by Lufthansa Technik
3. ACJC's VIP A319 design for a Chinese VIP charter company
4. The traditional Chinese pattern designed for the latest ACJC cabin
5. A bathroom on the ACJC A319

with an individual conversion kit. A variety of layouts, seating options, colours and surfaces are available.

Another company to boast in-house design as part of its offering is France's ACJC. Sylvain Mariat is head of the company's creative design studio. For each project he is involved in he works closely with the customer, listening to their wishes, making sure suppliers comply with their requests and generally ensuring that the overall design is in line with the initial specification. Each completion also has a dedicated programme manager who liaises with the customer, supported by

3





## Sylvain Mariat, ACJC

The head of ACJC's creative design studio holds a trio of qualifications – a design diploma from the Ecole Nationale Supérieure des Arts Appliqués et des Métiers d'Art in Paris, France; a Bachelor of Arts from the UK's Birmingham University; and a post diploma in engineering and art and craft from ENISE and Ecole des Beaux Arts de Saint Etienne, France.

He first dealt with a VIP aircraft during a stint of work experience in 2000 at IDEI in Paris, a design agency specialised in Dassault and Eurocopter cabins. Four years later, he joined Airbus in Toulouse as a designer, focusing on cabin trim and finish. During his time there he participated in sale campaigns, creating new concepts for various aircraft (including the A380 and a future single-aisle).

In 2008, he chose to help found ACJC, implementing the creative design studio. Since then, he has led all the company's in-house design projects.

"When I look back to my initial childhood dreams, I wanted to be a pilot or an architect. Today, I can say I have succeeded in mixing both these passions," he says.

Mariat clearly relishes his work at ACJC, where he says he uses "probably the best tools a designer could dream of". For each project led by the creative design studio, engineers build a full 3D digital mock-up with Catia software and combine it with 3DS Max. "For those who have never experienced this kind of tool, I can say it is always a deep emotion when we show the customer an advanced preview of what his 'flying house' will be, several months before we start the completion," says Mariat.

ACJC's creative design studio also uses a lighting system to play around with the temperature and intensity of light, to ensure they get lighting and materials right.

a technical project manager from the design office and an aircraft manager from the production department.

**Around the block** "An advantage of my position is that I am part of the company and I have the necessary experience to limit possible technical blocking points," Mariat says. "This in-house position allows me to work very closely with engineers, ensuring that the cabin is safe, certifiable, ergonomic and technically feasible."

As the company specialises in Airbus single-aisle family aircraft, he has also accumulated impressive experience on these aircraft types. "Practically speaking, being in-house is also a plus in terms of availability and reactivity during a project," he continues. "My duty consists in answering directly to the engineers where a design choice is to be made, to save precious time."

Mariat has managed four green aircraft completions at ACJC, and designed a VIP conversion kit, which enables the conversion of ACJs from a commercial transport layout into a VIP one in less than eight hours.

The company is just about to deliver an A319 to a VIP charter company based in China. The design, like all ACJC's, is tailor-made.



"Having travelled a lot across Asia, I can say without a doubt that I love this region and its fresh vision of architecture. I have drawn a lot of inspiration from this civilization and lifestyle in order to design an elegant interior," says Mariat. "I designed a contemporary minimalist architecture, assembling materials such as dark and bright leather and chrome-nickel metal plating. I designed curtains and decor film featuring a delicate traditional Chinese pattern, only visible to passengers when they come up to the sides of the cabin. I also used contrasting colour materials to create an environment that brings spiritual peace and tranquillity. These materials reflect the traditional Chinese characteristics of luxury and simplicity." ACJC actually has a new material department, which recently obtained certification for what Mariat calls "the first real Chinese lacquer".

The cabin features a forward private office with en-suite bathroom and shower; a private office that can be configured as a bedroom via a fold-out sofa; a conference area with two club-four seats; and an aft cabin with 20 flat-bed cocoon seats.

Mariat is understandably secretive about other projects in the pipeline, but says the company has "interesting projects on track for undisclosed customers in the coming years" and is "permanently working on new concepts". Intriguingly he also hints at a "close relationship with various designers in the automotive sector".

Meanwhile, Jet Aviation Basel boasts a team of 17 interior designers, headed by Elisabeth Harvey. Every project is supported by a dedicated interior designer, who is responsible for the early concept and design development, and also follows the aircraft through the engineering, production and installation phases, ensuring that the design concept is respected.







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### Jet Aviation Basel's interior design studio

Elisabeth Harvey, head of the team, has formal interior design training and a background in high-end residential interior design. She has been involved in aviation interior design for the last four years.

The other members of the team are either specifically trained in interior design, interior architecture or interior engineering, or come to the department with many years' experience in one of these fields. Between them, the team has a total of 100 years' experience at Jet Aviation.

The design studio is divided into three areas – interior designers, who lead each project from an interior design perspective, making sure that the clients' vision is turned into reality; interior design drafters, who translate concept sketches into detailed drawings; and a team of specialists, who are some of the most experienced team members and whose responsibility is to ensure that concepts are well developed, that innovative design materials are sourced, and technical solutions are applied.

In May 2010, the company shifted to using Catia 3D design technology and Smarteam engineering software, so cabin designs can be done virtually.

"Over the years, Jet Aviation has of course built up a strong network of external designers, many of whom have been in the industry for a long time. While this network provides an extremely high level of detail in design information, it is unrealistic to expect that this is fully verified from an engineering or certification perspective," says Harvey. "Essential to creating a well-designed product is the early consultation of in-house engineering and production expertise. At Jet Aviation, Interior Design collaborates with Advanced Design, a team made up of engineering and production experts, which means that the solutions proposed are certifiable and technically feasible as well as being well designed and aesthetically pleasing."

This holds true whether the design is developed in-house, or by an external designer. "One of the benefits of designing a project in-house is that we become fully engaged with the client's team from a very early stage, and so are much better placed not only to understand the client's wishes, but also to offer recommendations of a design or technical nature," says Harvey. "We also are much better aware of their primary requirements, and so we can represent them much better internally, ensuring that the interior completion continues to be designed with their specific needs in mind."

Currently the company is outfitting a Boeing 747-400, two A340s, three ACJs and two BBJs, all fully customised projects, for private individuals and

heads of state. Each project is run by a core team under the leadership of one project manager.

In December 2010, the company launched Jet Falcon, a cabin refurbishment programme for Dassault Falcon 2000 aircraft, incorporating three designs – Classic, Style and Fashion. The programme is based on standardised pre-production of a defined set of designs, with the aim of achieving short turnaround times and cost-effectiveness. The company is also preparing for its first Boeing 747-8 and Boeing 787 projects. The Boeing 747-8 interior will be designed in-house. "Aircraft are getting bigger!" says Eugen Hartl, vice president of sales, customer services and market development.

**Best of both** Jet Aviation Basel is also aiming to get the best of both worlds (in-house expertise and the big name draw of an exterior design agency) through its collaboration with Porsche

- 6-8. An A319 designed and outfitted by Jet Aviation Basel for Boutsen Aviation, delivered in 2010
9. Elisabeth Harvey, head of Jet Aviation Basel's interior design studio





10. Robin Dunlop, design director at CTM Design  
11-12. The 328DBJ cabin, the result of collaboration between 328SSG and CTM Design

Design Studio, announced in May 2010. The Austrian firm will work with Jet Aviation Basel's in-house design department on VVIP cabin interiors.

Another European completion centre to market its design offering is Fokker Aircraft Services (FAS), which is based in the Netherlands. The company says its completion, conversion and refurbishment services span initial design to full support.

FAS's recent VIP completion projects have included an A318 and an A320, for clients that are based in Africa and the Middle East.

Among the centres to offer design services via a dedicated partnership is Germany's 328 Support Services (328SSG), which is enjoying early success with its VIP 328DBJ conversion

package. Designed by UK-based CTM Design, the FAA-certified, 12-seat interior replaces 328SSG's Envoy product as its standard for VIP conversions of the 328 airliner.

Despite only officially launching it in December 2010, the company has already delivered one to a South American customer and is working on a further two for Nigerian airline SkyBird Air, for delivery in late summer 2011. The SkyBird Air conversion and maintenance order, which is worth €14 million, also includes a 32-seat airliner version, which was delivered at the end of February 2011.

Special features in the VIP 328DBJ interior include a galley concept designed to maximise space in the forward cabin, redesigned ceiling and sidewall panels featuring electric window blinds, and Aircell WiFi. The main cabin can accommodate both a lounge and conference area.

Meanwhile, 328SSG is extending its capabilities to other aircraft types, and has completed VIP galleys for two A340s. "328SSG shops already have a relationship with a company outfitting VIP Airbus aircraft as an outsource for manufacturing. As the word spreads

then customers alike can see no reason for not placing an aircraft such as a Falcon or Challenger for completion at 328," says Robin Dunlop, design director at CTM Design.

328SSG also recently expanded its monument shops and added a new upholstery shop with a 'master saddler'. It has three new VIP interior concepts on the drawing board and has signed a special missions contract with an undisclosed customer.

**Equal partnership** So what are the benefits to the client of using a completion centre that regularly partners with one particular designer?

"We understand the aircraft and its limitations, we understand the in-house engineering process, we regularly discuss manufacturing processes with the various shops. We have a solid relationship with all parties and we all understand the importance of each others' roles in delivering what the customer is looking for," comments Dunlop. "Each project needs a slightly different harmony and balance depending on each customer and their requirements. Working together as equals rather than having a dominating discipline allows for truly inspired results. Designers can act as visionaries, a conduit between client and completion centre. All too often though they become over dominant and then relationships and respect between disciplines breaks down."

Dunlop says the arrangement is also more cost-effective. **END**

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# going large

US\$3 million of investment at BizJet International has enabled the company to expand and specialise in narrow-body VIP jets such as the A318 Elite

**B**ased in Tulsa, Oklahoma, BizJet International is the MRO and FBO arm of Lufthansa Technik for VIP and executive aircraft in the USA.

Covering a total area of 85,000m<sup>2</sup>, the company's vast base has provided a wide range of services to VIP and business customers for over two decades. BizJet became a fully owned subsidiary of Lufthansa Technik in 2000 and currently employs a workforce of over 250.

As well as interior completions and refurbishments, services also provided at the Tulsa centre include maintenance for narrow-body aircraft and Rolls Royce Tay and Spey engines.

In recent years, BizJet has invested around US\$3 million into infrastructure expansion at Tulsa. Hangar space has increased to 32,000m<sup>2</sup>, workshops have been extended, new woodworking machines have been purchased and new training has been provided to the company's employees.

**Expansion** Prior to these improvements, BizJet's portfolio of completions mainly included smaller business aircraft such as the Gulfstream, Challenger, Falcon and Lear Jet. The company now specialises in narrow-body VIP jets and has three dedicated completion lines that cater for Airbus Corporate Jet (ACJ) and Boeing Business Jet (BBJ) aircraft. Two A318s and two BBJs have been completed and delivered within the last year. The company's current client base includes VIP, VVIP, government and business users from the Middle East, China, India and North and South America.

Kai Roepke, president and CEO of BizJet International, believes the recent expansion is a very important

<sup>1</sup> A BBJ completed by BizJet

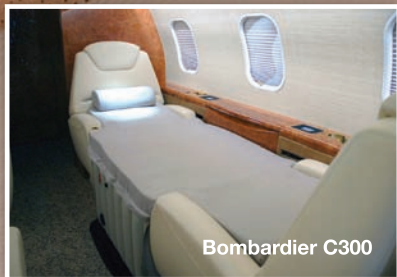




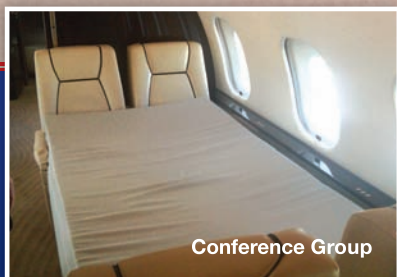


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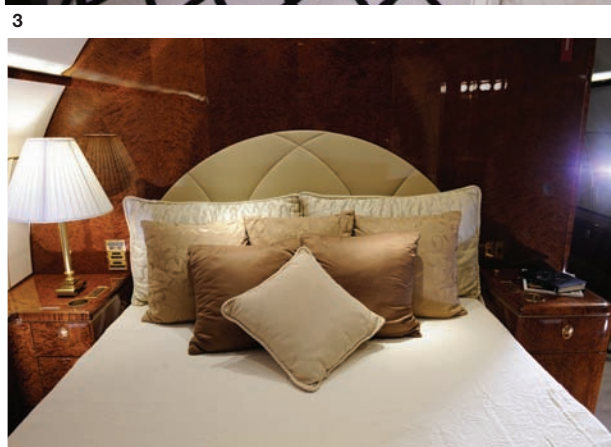
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investment in the company's future. "Our company now has a good basis for further expansion of the VIP business," he comments. "At BizJet we can now also offer the completion capacities and competences that the market demands."

BizJet specialises in custom projects for individual clients. The company offers a number of interior options for ACJ and BBJ interiors, dealing with requests ranging from installing heated seats to sourcing rare and exotic woods. "Each customer is different," says Brian Barber, BizJet's vice president of sales

2-3. A washroom and bedroom on a BBJ completed at BizJet

4. The luxurious washroom on a BizJet-outfitted A318 Elite

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and marketing. "We offer solutions for retrofit, full refurbishment and fully customised completion interiors with a broad range of elegance ranging from very moderate to high-end VVIP. From custom layouts to minor refurbishments, BizJet handles each customer in the way they want to be taken care of."

The cornerstone of BizJet's approach is understanding how customers will actually use their aircraft. "We work very carefully to ensure that customers' aircraft not only meet their needs, but also carefully consult the customer on budget spending, how marketable their aircraft will be in later years, and its applicability and functionality," says Barber. "What we mean by applicability is that we make sure that the aircraft is equipped with the right equipment for its intended use. Over the years we

have seen many instances where other completion centres have recommended interior designs that won't meet the customer's needs and when the customer finds out, it's too late. For example, we are dealing with a customer right now where the competition never asked how many meals they wanted to serve and what the possible longest flight would be. Therefore, they didn't have enough galleys to handle enough meals."

**Finish options** To speed up the interior refurbishment process, BizJet now employs decorative film coating (DFC). The company claims that "any printable design imaginable" can be converted to the polymer-based film, which can be applied to any interior surface such as cabinets or lining panels. Apart from being a cost-effective and a flexible material for designers, DFC is also said to have a long service life.

A range of interior finishes and clear top coats are available including high-gloss mirror clear-coat finishes, satin and semi-gloss topcoats, decorative and textured colours, faux suede finishes and metallics.

BizJet has the ability to build a variety of interior components such as credenzas with or without pull-out tables, conference tables, Hi-Lo tables, pull-out divan tables, storage cabinets, vanity units and flatware inserts.

Seating can be installed or recovered for the cabin or cockpit, cabinet interiors can be refurbished and protective coverings for the baggage interior can also be installed. Flooring options include carpets with custom inlay designs and non-textile flooring of all types. A number of custom-made VIP upholstery options are also





5-6. One of two BBJs completed by BizJet over the last year

### Elite transfer

In 2008, Lufthansa Technik (LHT) found its Hamburg centre was no longer able to cope with increasing demand for VIP completions. It attributed this in particular to the success of the A318 Elite programme, of which LHT is Airbus' contracted completion partner. LHT decided to transfer all A318 Elite completion work to BizJet, so that LHT's HQ could concentrate on providing customised MRO services to individual narrow- and wide-body VIP aircraft. By mid 2010 the transfer from Hamburg to Tulsa was complete and a dedicated line for the aircraft was established.

Based on the A318, the Elite comes with a tailored interior created by LHT in cooperation with Airbus. Customers get a choice of colours and fabrics and also have some options, such as a single or double bed in the private office/bedroom and a mid-cabin washroom or stowage area in the middle of the aircraft.

All other Airbus Corporate Jets are fully customisable. "The A318 Elite offers the same unequalled comfort and space as the Airbus Corporate Jetliner, but in a package that appeals to a broader market, making the largest business jet cabin available to more customers," says David Velupillai, product marketing director, executive and private aviation at Airbus.

The Elites arrive at Tulsa in a green configuration. "Airbus does all the communication and design with the user and then delivers to us the specification of the completion project," says Barber. BizJet says the standardised modular Elite cabin with optional configurations for 14 or 19 passengers allows for the creation of a "very individualised" interior and speeds up completion times to an average of five to six months. "The advantage of modular completions is that the majority of the engineering is already completed," Barber says. "When you pick up from a floorplan that has been created and built before, the customer saves on engineering costs – thus lowering down time."

The company's most recent completion was an Elite that had its floorplan slightly customised to the customer's personal taste. The entire interior was manufactured and managed by BizJet.

available for interior components such as pillows and bedding, lampshades and curtains. Bathroom options include showers, bidets and washbowls with hands-free taps.

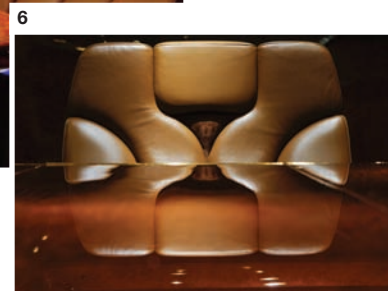
A choice of traditional and LED lighting installation options are available for cabins. LED lighting systems come with customisable colour, lens style and plating finishes. Accent lighting is also provided as a more discreet option that can be installed around seat bases and dropped aisles.

**Plug and play** BizJet has noticed a shift in IFE trends during recent completions. "The biggest trend that we have seen recently is moving away from DVD and Blu-ray devices to individual plug and play equipment to support iPads and portable video equipment," says Barber. "Passengers want to use their own equipment, with their own memory devices, to be able to view their movies or entertainment of choice."

The company also installs various types of communication equipment on board such as wired/wireless LAN and satellite telephones.

Recently, the industry has seen the customer become even more involved in the completion process. Completion centres are rolling back the hangar doors and allowing customers inside to oversee the work on their own aircraft. BizJet provides customers with their very own office space to use during long-term visits or in some cases the entire project.

Far from being a hindrance, BizJet believes the customer's presence during



the completion is a key element of the projects success. "It's always very helpful to have customers on site because there are always items of discussion arising that the customers want and need to take part in," says Barber. "As you can imagine, this always decreases unwanted surprises later during the project where cost implications become applicable."

Overall, Barber believes the narrow-body market is strong and that BizJet is well-placed to reap the benefits of specialising in a growing sector. "The market is still very full of narrow-body customers and thus the reason why reputable completion centres are full without available slots for several years," he says. "BizJet is operating at full capacity for the next two years and is very pleased with the activity in the marketplace."

The company's dedicated Elite line will cater for a contracted six Elites starting in the third quarter of this year with deliveries expected in 2013. "We have taken great pride in growing our business slowly, but ensuring we deliver each aircraft on time while meeting the customers' expectations," says Barber. "We have the ability to add more capacity and additional production lines in the near future and will do so when the time is right." **END**

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CABIN  
STATS

#### BBJ

**Cabin width:** 11ft 7in  
**Cabin height:** 7ft 1in  
**Cabin length:** 79ft 4in  
**Seats:** 2 + 1 crew + 8 passengers  
**Range:** 6,235 nautical miles with NBAA reserves  
**High-speed cruise:** 470kts  
**Max altitude:** 41,000ft  
**Price:** US\$55 million (2013 delivery)

CABIN  
STATS

#### BBJ 2

**Cabin width:** 11ft 7in  
**Cabin height:** 7ft 1in  
**Cabin length:** 98ft 6in  
**Seats:** 2 + 1 crew + 8 passengers  
**Range:** 5,620 nautical miles with NBAA reserves  
**High-speed cruise:** 470kts  
**Max altitude:** 41,000ft  
**Price:** US\$65.6 million (2013 delivery)



# bigironreport

Three OEMs are currently engaged in the serial production of executive/VIP/VVIP single-aisle aircraft with fuselages derived from commercial airliners

## Boeing Business Jet

Boeing was first on scene with the Boeing Business Jet (BBJ). The BBJ spawned in 1996 from a partnership between Boeing and General Electric, maker of the CFM-56 series of engines for newer-generation Boeing 737s. Now entering its fifth decade of production, the 737 is the most successful and ubiquitous jetliner ever produced.

In 1996, customers could buy the BBJ green (unfinished) for around US\$36 million and then spend whatever they wanted on custom paint and interiors. And spend they did, with the average finished price heading well north of US\$50 million. Before the advent of the BBJ, the top-end market for corporate jets ran in the US\$40 million range.

The original BBJ took components of two 737 models, the 737-700 series airframe and the larger 737-800 series' wing, landing gear and centre fuselage section. Anywhere from 3-10 auxiliary fuel tanks can be installed in the belly of the aircraft, giving it a maximum range of 6,235 nautical miles (with eight passengers), equating to 14 hours in the air. The BBJ's spacious cabin has 7ft 1in of headroom and is 11ft 7in wide, yielding 807ft<sup>2</sup> overall. With that kind of space there is room to install staterooms with real beds, showers, luxury lavs, capacious potable water systems, elaborate galleys, bars, conference tables with seating for eight, lounges and offices. Typical cabins are configured to carry 16-25 passengers.

A stretched version called the BBJ 2 boasts 25% more cabin capacity, but at the price of slightly reduced range. The BBJ 2 came about in part because the BBJ doesn't have much room for baggage in the cargo hold with all those extra fuel tanks in the belly.

In 2005, Boeing announced the even larger BBJ 3, based on the Next-Generation 737-900ER (which has been in commercial service since 2001). The BBJ 3 has 1,120ft<sup>2</sup> of cabin space and can fly 5,200 miles without refuelling with 25 on board at speeds up to 470kts. Range lightly loaded is 5,435 nautical miles.

More than 140 737-based BBJs have been sold. To date Boeing has sold seven BBJ 3s and delivered three to completion centres. All BBJs now offer a pressurisation system that maintains cabin altitude at 6,500ft, as opposed to the old system's 8,500ft, as the aircraft cruises at 41,000ft. The new system is designed to ensure that passengers arrive at their destination more alert and refreshed.

For those who want to travel in luxury with their supercar or thoroughbred, the BBJ-C, introduced in 2009, can be converted from all-passenger to all-cargo in less than eight hours. The aircraft features a massive cargo door forward of the left wing and strengthened cargo beams that allow the loading of 10,000 lb-cargo pallets. The aircraft can also be converted to a Combi (half cargo, half passenger) version via STC by an independent completion centre.



### BBJ-C

**Cabin width:** 11ft 7in  
**Cabin height:** 7ft 1in  
**Cabin length:** 79ft 4in  
**Seats:** 2 + 1 crew + 8 passengers  
**Range:** 5,925 nautical miles with NBAA reserves  
**High-speed cruise:** 469kts  
**Max altitude:** 41,000ft  
**Price:** US\$63 million (2013 delivery)



### BBJ 3

**Cabin width:** 11ft 7in  
**Cabin height:** 7ft 1in  
**Cabin length:** 107ft 2in  
**Seats:** 2 + 1 crew + 8 passengers  
**Range:** 5,495 nautical miles with NBAA reserves  
**High-speed cruise:** 470kts  
**Max altitude:** 41,000ft  
**Price:** US\$71.5 million (2013 delivery)



## Airbus Corporate Jet

Airbus followed Boeing into the pre-packaged bizliner market in 1997 when it announced the Airbus Corporate Jet (ACJ), a then US\$35 million executive version of its A319 airliner. At first, ACJ sales lagged behind those of Boeing's 737 airliner variant. But in recent years, ACJ sales have surpassed Boeing's on an annual basis, thanks largely to orders from the Middle East and Asia-Pacific regions. In 2006, Airbus established a beachhead in Miami, USA, to market the ACJ more aggressively to the North American market and added a second US authorised completion centre to finish the aircraft's custom interiors.

There are three aircraft types (A318, A319 and A320) marketed as ACJs (a corporate version of the A321 is possible, but not actively offered at the moment). The US\$65 million A318 Elite is promoted by the company as a more spacious alternative to Gulfstreams and Bombardier Globals. More than 2,600 A320 family aircraft are flying, mostly for commercial airlines. More than 800 are based in the USA with airlines including Delta, United and US Airways. Airbus claims that the fleet has accumulated more than 40 million flight hours.

The A319 ACJ fuselage measures 111ft long, 6in longer than a BBJ. The passenger compartment is 78ft long and up to 12ft 1in wide and

offers 7ft 4in of headroom. By way of comparison, the cabin on a Gulfstream G550 is 50ft 1in long and on a Bombardier Global Express it measures 48ft 4in. The ACJ cabin is nearly twice as wide as those of a Gulfstream G450 or a Falcon 900EX. However, all of those aircraft are slightly faster than the ACJ, which typically cruises at 460kts.

The ACJ's impressive cabin dimensions translate into 850ft<sup>2</sup> of floor space and 5,900ft<sup>3</sup> of volume – more than ample space for any designer to run amok. Showers, master suites, media rooms with humungous plasma screens, gourmet galleys – if you can think of it, it will probably fit. For the A319 ACJ, US\$55 million buys you the basic airframe and a no-frills 18-seat cabin. Anything more comes down to a question of how long you want to wait and how much you can spend.

Typically, ACJ cabins are outfitted to seat 18-50 passengers. The baggage hold is cavernous and accessible through two giant belly doors that swing open and up. A built-in airstair allows the aircraft to be used even at airports that lack appropriate ground handling equipment. Optional auxiliary belly tanks can increase full fuel capacity from 6,300 to 10,740 gallons, allowing the ACJ to carry 18 passengers 6,100 nautical miles without refuelling.



**CABIN STATS**

**ACJ (A319)**

**Cabin width:** 12ft 1in

**Cabin height:** 7ft 4in

**Cabin length:** 77ft 7in

**Seats:** 2 + 2 crew + 8 passengers

**Range:** 6,000 nautical miles with NBAA IFR

**High-speed cruise:** 485kts

**Max altitude:** 41,000ft

**Price:** US\$80 million





### A318 Elite

**Cabin width:** 12ft 1in  
**Cabin height:** 7ft 4in  
**Cabin length:** 69ft 9in  
**Seats:** 2 + 2 crew + 8 passengers  
**Range:** 4,200 nautical miles with NBAA IFR  
**High-speed cruise:** 485kts  
**Max altitude:** 41,000ft  
**Price:** US\$65 million



### A320 Prestige

**Cabin width:** 12ft 1in  
**Cabin height:** 7ft 4in  
**Cabin length:** 89ft 10in  
**Seats:** 2 + 2 crew + 8 passengers  
**Range:** 4,300 nautical miles with NBAA IFR  
**High-speed cruise:** 485kts  
**Max altitude:** 39,000ft  
**Price:** US\$85 million





**CABIN  
STATS**



**Embraer Lineage 1000**

**Cabin width:** 8ft 9in

**Cabin height:** 6ft 7in

**Cabin length:** 84ft 4in

**Seats:** 2 + 1 crew + 19 passengers

**Range:** 4,400 nautical miles with 8 passengers and NBAA reserves

**High-speed cruise:** 542kts

**Max altitude:** 41,000ft

**Price:** US\$50.48 million



## Embraer Lineage

Embraer launched its single-aisle entrant, the Lineage, into this market in 2006. The Lineage is based on the E190 large regional airliner. Smaller than the ACJ and the BBJ, slower than the Global and the Gulfstream G550, and shorter-legged than all four of them, the Lineage is a product of compromise. It aims a new set of variables squarely at the middle of the ultralux jet market.

The Lineage has an NBAA-IFR range of 3,967 nautical miles with 19 passengers, 622ft<sup>2</sup> of passenger cabin floor area and 4,085ft<sup>3</sup> of cabin volume. That is more than twice the volume of both the Gulfstream G550 (1,669ft<sup>3</sup>) and the Global (2,022ft<sup>3</sup>), but about 75% that of the ACJ (5,300ft<sup>3</sup>) and the BBJ (5,390ft<sup>3</sup>). Yet the Lineage can still carry eight passengers directly from New York to Moscow at speeds up to 542kts. And with its low noise signature, steep approach capability and shorter wingspan, it can operate at airports some other big iron business jets cannot.

When it comes to interior layouts, Lineage customers have a wealth of choices, thanks to a modular scheme that divides the main cabin into five zones plus the lavatory and walk-in baggage

compartment. The modules are designed to keep completion costs under control and avoid the early outfitting stumbles that initially plagued the ACJ and BBJ. It is the key to the Lineage's future commercial success. Mindful of this, Embraer hired London's Priestman Goode to develop a modular interior scheme that divides the main cabin into five zones to maximise flexibility and utility, simplify installation and hold down costs. Customer-specified interiors are available for an additional charge.

Entering the Lineage, the flowing foyer area will be more reminiscent of an outer office or reception lobby. Adjacent to the main forward entry door, this space can be configured with a curved sidewall divan that doubles as a crew rest area, as well as storage drawers and countertops. A forward crew lav is located on the right wall between this area and the cockpit. Finished in light-coloured Ultraleather and metallic laminates, the effect is open and inviting. Conversely this area can also be fitted with an enclosed crew rest area with oversized single reclining seat for privacy, keeping the curved monument to the right of the entry door.





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# tastingmenu

A selection of new products designed for the rigours of the business jet galley

## wheelsoffortune

**D**riessen Zodiac Aerospace's new range of trolleys, Hybrite, is designed to be an eye catcher in the cabin, with sleek curves, a scratch-free finish and branding opportunities. The product line is fully certified for aircraft use, and is made from a combination of aluminium and composites for a light weight. It is also designed for user comfort and safety, with an ergonomic push bar, easy-grip corners and a new wheel design for stability. It also has a modular design that the company says makes it easy to maintain and gives flexibility.

[www.driessen.com](http://www.driessen.com)



## supercool

**B**&W Engineering has launched a complementary product to its successful BA-LogEqu 'Magic-Box' product, the Cold-Box. Both are used to store food and drink without any connection to the aircraft, making them particularly suitable for business jets lacking a fully equipped galley. The Magic-Box can maintain temperatures ranging from -90°C to 120°C, for everything from dry ice to hot meals. For example, with certain models hot meals can be kept at a servable temperature for over 12 hours, and ice cream for up to 24 hours. The Cold-Box has a more limited range, designed for those who only need to store cold and frozen food. It boasts around 65-85% of the performance of the Magic-Box, but is available for a third of the price. Operators can also opt for a tracking and logging device, which can track temperature, send the data wirelessly to a handheld device, and features a display that makes it clear if the food/drink is servable. B&W is also now cooperating with Muehlenberg Interiors – using the Magic-Box and Cold-Box products Muehlenberg has created a dry galley that requires no electric or water connections.

[www.bw-forschung.de](http://www.bw-forschung.de)

## fastfood

**M**odular Galley System (MGS), a wholly owned subsidiary of Iacobucci HF Group, is offering a new microwave, the MR4AA1, for heating small quantities of food quickly. It features predefined heating programmes such as for popcorn, defrosting and baby bottle heating, and further programmes can be added to fit specific customer needs.

The microwave meets the ARINC 810 and 812 standards, and the company says it will also successfully work with future galley inserts for the new Boeing 787 and A350 aircraft. A newly developed central control unit enables all communication-based applications, such as power and content management, remote control and central maintenance.

The company says this product is the perfect complement to its induction series, which includes the Multifunctional Heating Unit (MFU) and Cooking Station. The MFU combines both induction heat and steam to speed up cooking while conserving vitamins and colour. Meanwhile the Cooking Station includes a Ceran cooking surface with two hot plates and one extra-large wok plate. A new half-size induction plate, based on the cooking station, is currently under development to enable restaurant-style cooking on medium and large private jets.

[www.mgs-aircraft.com](http://www.mgs-aircraft.com)





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# leadinglights

The latest crop of products designed to show the business jet cabin in its best light



## highstandard

**S**chott has developed a range of five modular reading lights based on a single electronic light module – Zenith, Horizon, Cobra, Discus and Polaris. This standardisation is designed to make life easier in a number of ways – for example by offering quick and customised options within one pre-approved technical standard. Customers can select from various lighting heads, angles of reflection, swivel arms, lengths, colours, materials and surfaces. The platform also suits various technical requirements. For instance, the lights are compatible with mandatory electrical supply voltage and cover the full normal range of 5-28V.

[www.schott.com](http://www.schott.com)

## overandabove

**E**mteq has developed a new high-intensity LED dome light, the ELD30. Developed for the corporate and VIP aviation markets, the Emt eq says the ELD30 is brighter than the 20W MR16 commonly used today. Its compact size is designed to make it especially suitable for overhead lighting in wide- or narrow-body fixed-wing and rotary-wing aircraft.

The dome light contains a front-removable bezel that is thermally isolated, preventing it from being hot to the touch; a patent is pending for this design feature. The ELD30's front-mountable design was developed with the aim of enabling easy installation. Dimming modes are selectable in the field for full variable or step dimming control.

Emteq is currently filling large orders for the ELD30 for both business aircraft upgrades and VIP completions.

[www.emteq.com](http://www.emteq.com)



## nowincolour

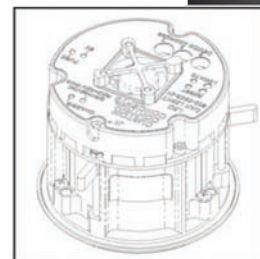
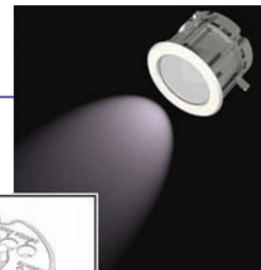
**G**oodrich Lighting Systems is now offering WAWB Wash Lights (pictured on a Bombardier Global 5000). These use a new mixture of white, amber and blue LEDs to produce a light that can be changed from blue to a very homogeneous cool white to warm white and yellow. The company says that having a high colour rendering index, the neutral white light makes the high-class materials of the cabin appear as natural as possible. This effect is also supported by the full-spectrum amber LEDs.

Available in 13 lengths, the lights are completely dimmable and can be managed by an interior lighting system director as a simple interface to different CMSs. This adjustable device enables various presets, including the popular moodlight setting with a blue ceiling and amber sidewall illumination. WAWB Wash Lights also provide the full colour spectrum of natural daylight to create sunrise or sunset effects.

[www.goodrich.com](http://www.goodrich.com)



## firstlight



**I**FE/CMS system supplier Custom Control Concepts (CCC) has forayed into lighting with a new concept that integrates the lighting controller directly into the light. The company says this approach reduces box count, weight and wiring. The new 'intelligent' lights communicate through CCC's proprietary C-stream network, allowing for independent control of each light in the network. As the new light contains its own controller and is part of the network, it can be configured through the custom graphic user interface (GUI) on a touchscreen, iPad or CCC remote, at any time.

The lights are available in either white or SpeCCtrum Color. The SpeCCtrum Color RGB LED lights enable the user to choose from the entire spectrum of colours including variations of white. Sunrise, sunset or any other dynamic mood can be set, and any number of colour pre-sets or moods can be defined.

[www.custom-control.com](http://www.custom-control.com)



# texmechs

With over 130 technicians specialising in everything from interior completions to maintenance, avionics and paint work, Texas-based Jet Works Air Center offers a one-stop shop for clients

Jet Works Air Center (JWAC) is a large MRO company based 35 miles northwest of Dallas/Fort Worth International Airport in Texas, USA. The company offers interior refurbishment, VIP completion, maintenance, avionics and paint work on Gulfstream, Lear, Boeing, Global, Challenger, Citation, Piaggio and Pilatus business aircraft. All work is done under FAA certificate CRS: JW0R647N.

While JWAC as a brand has only been in existence since 2004, the components merged to create it have 15 years of interior, paint, maintenance and avionics experience. The company currently operates out of over 100,000ft<sup>2</sup> of hangar and office space at Denton Municipal Airport and employs approximately 175 people, including more than 130 technicians.

During 2010, JWAC delivered – following extensive interior refurbishment – four Boeing airliner business jets (one Boeing 737, three BBJs) to owners headquartered in the Middle East. And in December 2010, the company announced it had been awarded a contract by a Saudi businessman to convert an MD-87 airliner into a private jet that will accommodate 24 passengers.

JWAC says the MD-87 will feature a luxurious and contemporary cabin with a leading-edge entertainment system. Trey Bryson, president and CEO at JWAC, adds that one of the major features of the interior will be its capabilities in terms of WiFi, internet access and communications, with virtually all contemporary formats included.

Bryson also says that the large VIP cabin interiors completion business was very strong over the past 12 months. "In tight economic conditions, aircraft owners have come to realise that a cabin refurbishment with new lighting, audio and video system, internet access system, fabrics, leathers, carpet, window treatments and expanded

galley capability instantly make their aircraft like a factory-new aircraft, without having to invest many millions more in a new airframe," says Bryson. "JWAC's reputation for quality work at a reasonable price and delivered on time has caused the company's revenues to double in just less than five years."

JWAC's resources include a custom cabinetry facility, a finishing and upholstery facility and in-house design and engineering services. For instance, the company holds in excess of 300 STCs for cabin interior installation and refurbishment work.

As the company also offers extensive maintenance, avionics and paint capability, it can be a 'one-stop shop' for clients, with maintenance inspections (including Boeing C checks) carried out at the same time as the interior is completed.

"For avionics, if you don't offer WiFi, internet, cabin communications, premium-quality entertainment systems and 'just like my office' capabilities, you are no longer in the avionics business," says Bryson. "Fortunately, we have some geeks who are really good at that. We still do glass cockpit upgrades, but virtually every upgrade we do now incorporates cabin electronics."

JWAC's paint facility is probably its best-known asset. The EPA-approved hangar features climate control to create the ideal humidity and temperature during paint prep, application and finishing. The 14,000ft<sup>2</sup> facility can accommodate aircraft as large as a Gulfstream IV.

Accompanying Bryson to host JWAC's booth at EBACE 2011 will be Marc Johnson, JWAC's new director of VIP completions, who recently joined the company after eight years of managing VIP completions for various clients.

Jet Works Air Center

Reader Enquiry No. 501



1. Exterior paint is a speciality
2. The company boasts a custom cabinetry facility
3. JWAC employs more than 130 technicians
4. This MD-87 will be converted into a private jet
5. The company operates from over 100,000ft<sup>2</sup> of hangar and office space





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# culinary heights

A design by Loher Raumexklusiv proves that galleys can be beautiful as well as functional



One of the highlights of the Aircraft Interiors Expo 2011 was the impressive appearance of Loher Raumexklusiv in conjunction with Loher Engineering. With a new VVIP lounge galley concept, integrated in a mock-up A340 fuselage specially made for the expo, Loher Raumexklusiv proved that galleys in the VVIP segment do not have to be restricted to serving functionality alone – they can be a creative design highlight of any VVIP interior.

The design goal behind the art deco-style galley and bar was “understated luxury”. This was pursued through the combination of a subtle lighting concept with precious materials including Onyx Fantastico, high-gloss Macassar veneer, gold dust and mother of pearl.

The company has not neglected functionality and ergonomics in the pursuit of a stylish finish. The galley is designed to enable culinary delicacies to be freshly prepared to the highest standards. Ultramodern functional elements such as a teppanyaki grill and induction cookers have been incorporated. After use, the cooker and the extractor hood can be concealed by the sliding red onyx marble worktop. Specially made pull-out cooling units were built in under the bar top. Professional kitchen appliances have been

integrated in the multifunctional back wall, subtly fitting in with the overall homogenous design. A coffee machine, microwave and induction oven vanish when necessary behind flexible glass light panels finished in an onyx look, while an extractor hood has been added next to the cooker.

Loher Raumexklusiv – run today by Alfred Loher and his sons Alfred Loher Junior and Roland Loher – was founded in 1931 and specialises in creating individual, high-end interior fittings and one-off pieces of furniture. The company has over 75 years’ experience in developing, planning and manufacturing exclusive interiors and furnishings for villas, boardrooms, yachts and private aircraft, and prides itself on its dedication to quality. Managed now by the third generation of the founding family, the enterprise has continually developed into a forward-looking and internationally oriented firm of craftsmen, with a workforce of about 215 employees.

In April 2006, the company was licensed by the German FAA as a manufacturing firm for aircraft interiors under Part 21 Main section A Section G for C1/C2 Ratings, and can therefore operate in the market as an independent supplier. In December 2007, Loher Raumexklusiv obtained authorisation as an approved maintenance company under Part 145. The company is currently pursuing certification under DIN EN 9100 (Aerospace series – Quality Management).

Loher Engineering was set up in 2009 and certified as a development company by EASA under Part 21, Main section A, Section J, enabling the company to offer expertise from a single source, even with complex projects.

Now the company is planning another production site (40,000m<sup>2</sup> in size) specifically for its aviation and yacht divisions. Completion is scheduled for 2013.

Loher Raumexklusiv

Reader Enquiry No. 502



1. Materials include Macassar veneer, gold dust, Onyx Fantastico and mother of pearl
2. The concept makes the galley a visual centrepiece, not just a functional space



# secondskin

Fokker Aircraft Services says re-skinning is a more cost-effective approach to interior refurbishments

- 1-2. FAS's new vacuum applicator
3. A luggage bin given fresh life through re-skinning



"Re-skinning is a much more economical solution for older aircraft than installing a complete new interior," says Robert Koolen, sales manager, airframe MRO at Fokker Aircraft Services (FAS). "With so many cost-conscious operators actively seeking ways to prolong the life of their investment, they quickly recognise that re-skinning offers an easy, effective and affordable alternative."

That's why FAS recently invested in having a brand-new vacuum applicator installed in its interior shop. The tool enables FAS to easily re-skin the side panels, luggage bins and ceiling panels of aircraft interiors, no matter the size or type of aircraft. Any print of certified material can be applied. FAS says it is now one of only a few MRO providers in Europe able to offer this important service.

Regularly used to facilitate FAS's VIP completions activities in its aircraft conversions and completion centre, the vacuum applicator is part of the company's overall strategy to increase backshop capabilities and enhance its one-stop-shop philosophy. And because the machine is not type-specific, it is already being used at FAS to refurbish Fokker 100s, as well as Boeing, Airbus, Bombardier, Embraer and other mid-to-large business aircraft.

FAS prides itself on being a reliable one-stop-shop for completions, conversions and refurbishments, as well as all manner of maintenance, repair and overhaul. And, as an integral part of the Fokker Technologies Group,

FAS can, when needed, benefit from the expertise of its sister companies – Fokker Aerostructures, which designs and produces lightweight structures for the aerospace industry; Fokker Elmo, which specialises in electrical systems and electronics; Fokker Landing Gear, which delivers landing gear systems for helicopters and aircraft; and Fokker Services, which provides OEM support for in-service Fokker aircraft.

FAS's new re-skinning service is well aligned with the company's 'aircrafting' methodology, which means its engineers approach an aircraft for outfitting, modifications and/or repairs through the critical yet inventive eyes of an OEM. The aircraft is viewed in its entirety, focusing on how all systems will ultimately interact with each other to achieve optimum performance in a cost-efficient way. Moreover, if there is no specific product or solution available on the market, FAS will simply engineer and build it itself.

"Aircrafting is a new word that's greater than the sum of its parts. Combining 'aircraft' and 'crafting', it makes a powerful and unique statement about the Fokker identity," says Stephen Hands, vice president of sales and marketing at FAS.

FAS has five hangars spanning 16,000m<sup>2</sup>, plus backshops. Its extensive range of services includes maintenance, modification, painting, working parties, damage assessment, fleet management support, CAMO, AOG support and turnkey solutions for severe repair and ferry flight preparation.

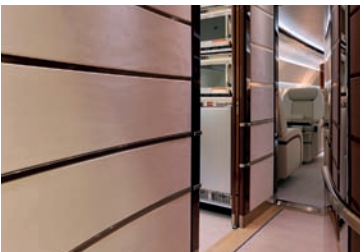
Its 'aircrafting' capabilities are increasingly used for the VIP market, including a range of Airbus, Boeing, Bombardier, Fokker and Gulfstream aircraft. An EASA, GCAA and FAA Part 145-approved service facility, FAS is also fully experienced in high-tech military aircraft programmes for maritime patrol aircraft, transport platforms and helicopters.

**Fokker Aircraft Services**

Reader Enquiry No. 503

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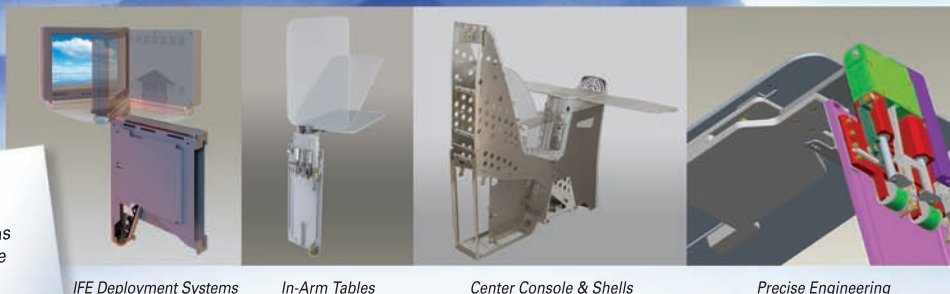
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# guidinghand

Lukas Weiss outlines the highlights of the past and upcoming year for ExecuJet's in-demand completions management division

- 1 Lukas Weiss
- 2 ExecuJet guides customers from design to delivery
- 3 The recently refurbished Global Express

Over the course of 2010, ExecuJet's completions management division oversaw five aircraft completions, primarily on larger cabin aircraft including Global Express and Challenger 605s. It has worked with completions centres in the USA, Canada and Europe. The team also oversaw two refurbishments on pre-owned aircraft.

ExecuJet has provided completions management for over a decade, supervising over 60 completion and refurbishment projects. Its experts boast vast experience on Dassault, Gulfstream, Bombardier, Hawker, Embraer, Boeing and Airbus aircraft. "We manage everything from specification and options selection support, green aircraft inspection and acceptance to the final inspection, ensuring the completion of the aircraft is finished to the last detail," says Lukas Weiss, who heads up the team.

Weiss's most recent project was a Global Express, which was refurbished with new cabinetry surfaces and soft goods, and had its exterior paint renewed. Design and specification meetings started in late 2009, and the aircraft was inducted in July 2010. Lufthansa Bombardier Aviation Services in Berlin, Germany, installed Lufthansa Technik (LHT)'s nice entertainment system and carried out the refurbishment, partnering with LHT and OHS. "It was the first aircraft of its type to receive this entertainment system as a retrofit, so it was quite a challenging but exciting project," says Weiss.

Finished in December 2010, the aircraft is now based in Zurich, Switzerland. It is used privately by the owner and also available on ExecuJet's charter fleet.

However, for Weiss, there is always plenty more work to be done! Upcoming or in-progress projects include a Falcon 900LX completion, interior refurbishment and IFE replacement on a Falcon 900, a Falcon 7X, Learjet 60XR and a Learjet 45XR final acceptance. "The pipeline is busy as you can tell but it is great that we are being contracted to so many new projects," says Weiss.

Design wise, the company has been working a lot with M&R Associates, and with Tanna Aviation for North American projects. "We work very closely with M&R

Associates Design and the customer to bring the design to life," says Weiss.

"Once the design has been decided they will then arrange everything from the fabric of the curtains to the cutlery and plates, it truly is a full package that each customer receives and we commit ourselves to the project from start to finish."

However, ExecuJet is not tied to working with these design firms alone. "Although we have trusted partners that we work with we are not contracted to work with specific companies for all of our projects," says Weiss.

Through his work Weiss is certainly well placed to notice completion trends. For him, the most notable is the amount of onboard technology expected from clients. "Most aircraft now need to have iPad/iPhone compatibility, HD video, Blu-ray and real high-speed WiFi," he says.

In terms of aircraft types, Weiss says the Global Express XRS, Challenger 605, Falcon 7X and 900 are the most popular projects right now. "Large business aircraft such as the Global Express XRS are in high demand," he says. "We plan to increase our workforce as demand increases."

The company is also working to maximise its existing efficiency. "ExecuJet is using a progressive approach working closely with the completion centres to spread the inspections over an extended period of time in order to ensure high quality from the onset and minimise the time required for the final inspection and acceptance," says Weiss.

ExecuJet

Reader Enquiry No. 504







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Bud Shannon Photography

# branching out

As well as continued success with 328 conversions, 328 Support Services is diversifying into other aircraft types

Now in its sixth year, 328 Support Services (328SSG) is applying the capabilities honed on Dornier 328 interior conversions to other aircraft types and projects. It is looking at working hand-in-hand with other conversion centres or OEM completion centres, to work on VIP conversions or other bespoke applications. It has already completed VIP galleys for two A340s.

The company's parts manufacturing expertise incorporates aircraft such as the A340 and Boeing 737 in addition to the Dornier 228 and 328. As well as manufacturing monuments, wire bundles, structural components, control cables, prototypes and extended-range fuel tanks, it also boasts an upholstery shop, veneer application expertise and monument pull-test facilities.

However, 328SSG's core business will remain TC support, maintenance and conversions for the 328. The airliner went out of production in 2002, and 328SSG has found custom with those looking for renovations, conversion and special mission changes for interiors that may be 10-15 years old.

The company says airliner conversions are also popular with those who want for a more cost-effective way to purchase a VIP cabin. "With the 328DBJ having a low unit cost price per airframe of around US\$3-6 million

(unconverted or modified) and a refurbishment of US\$4-6 million (dependent on customer requirements) you have an aircraft that looks brand new," says Dave Jackson, managing director of 328SSG. "Many of the 328 jets flying today are low time aircraft and are competitively priced."

"It's a value proposition we call 'affordable luxury'," says Ray Mosses, head of sales for 328SSG. "It is proving attractive to people who do not wish to purchase a green VIP jet from the traditional aircraft manufacturers."

In December 2010 the company launched its new VIP product for the 328, the 328DBJ, which replaced its Envoy design as its standard for all future VIP conversions. Developed in cooperation with CTM Design, the DBJ interior is designed to maximise space by bringing the galley forward. The washroom also makes maximum utilisation of the aft space. On the OEM version of the 328, the toilet is a simple cubicle with a rear storage cupboard. On the DBJ this is now a generous dressing room with a veneer door.

The DBJ offering also features bespoke IFE – 328SSG can install high-definition IFE systems, satcom and WiFi internet. Cabin noise has been reduced by 40% by using new one-piece wall liners with window panels incorporating electric window blinds. An extra sound kit reduces noise by a further 3dB.

The company has delivered a 328 DBJ to a South American customer and has a contract for two more for Nigerian airline SkyBird Air, due for delivery in late summer 2011. The €14 million SkyBird Air conversion and maintenance contract also includes a 32-seat airline version of the 328, which was delivered at the end of February 2011.

328SSG is also registering growing interest in Special Missions versions of the 328 – from European, US and Australian air ambulance and coast watch divisions. "This is proving a promising new area of business for 328 SSG," says Mosses. "We plan to team up with a variety of suppliers to ensure the special missions interiors are of the same technical standard as the VVIP conversions."

1-2. The 328DBJ interior



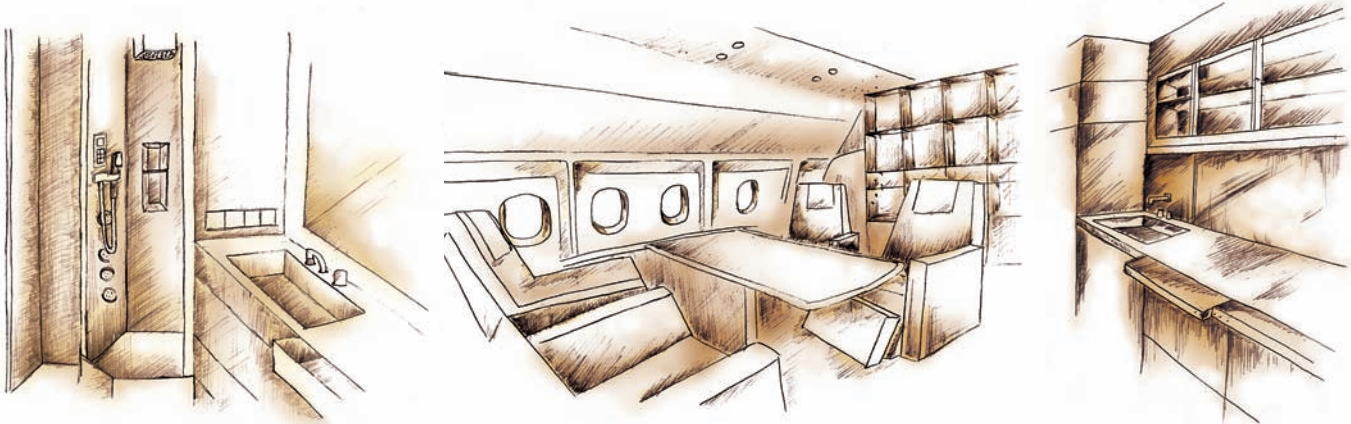
328 Support Services

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# feel the force

Iacobucci HF Electronics offers an impressive line of trash compactors for the business jet market

1. The half-size 115V compactor
2. The compact new 28V model

In 2005, in order to meet an increasing aviation market demand, Iacobucci HF Electronics launched the Hi-Fly trash compactor. Developed for functionality and ergonomics, in 2006 the trash compactor won both the Italian Award Innovalazio and the Confindustria Award for Excellence. But the company continued to invest in product research and development to widen the WastePak range, with the objective of providing high-tech, reliable and space-saving solutions for waste on board both commercial and business aircraft.

Today, the Iacobucci HF WastePak line comprises a full-size 115V trash compactor, a half-size 115V trash compactor, along with the newest member of the family, a compact 28V trash compactor.

This new trash compactor was developed specifically to resolve the problem of disposing extra waste on board during long business flights, and was designed to combine two tonnes of compacting force with low-level power consumption. Iacobucci HF Electronics says that the compactor's low weight and reduced dimensions make it a compelling product for medium- and long-range business aircraft. Made of high-resistance aluminium and using water-proof foldable cartons, it can easily compact paper, plastic dishes, cutlery, aluminium cans, glass and even champagne bottles in a single box with a 3:1 ratio. In addition, a new retro-

illuminated control panel enables crew to operate the WastePak in complete darkness. These details make the design both functional and attractive and it can be personalised to fit the galley's design and layout.

This new compact trash compactor has met with immediate success in the business jet market with a great number of loyal customers who have already chosen to install Iacobucci WastePak products on board their jets.

The WastePak 115V line, available in half-size and full-size units, provides two tonnes of force to compact up to 36kg of waste. The 115V models use patented cartons made out of a recyclable material (two boxes in the full-size model and one in the half-size unit). A touch control panel with animated display is designed to make the units extremely simple to use. With a power consumption of only 390VA, Iacobucci HF Electronics says the WastePak uses a durable and reliable electromechanical system and has a removable drawer for easy cleaning without removing the entire unit out of the aircraft. Units are also equipped with RS232 interface for communications and tracking maintenance, and a removable front/panel electronic module for easy onboard replacement or maintenance.

In collaboration with all major manufacturers and with a market driven/customer-centric approach, Iacobucci HF Electronics says it will keep investing in this business jet product line. A smaller WastePak 115V derivative of the compact 28V trash compactor will soon be added to the range.

Iacobucci HF Electronics is a worldwide leader, manufacturer and supplier of galley inserts, with over 30 years of experience. The company makes espresso machines, coffee makers, water heaters, trash compactors, food and beverage trolleys and standard units for both commercial and business aviation. Its headquarters are in Ferentino, Italy, halfway between Rome and Naples, where it employs experienced Catia industrial designers, highly skilled engineers and qualified craftsman.

Iacobucci HF Electronics

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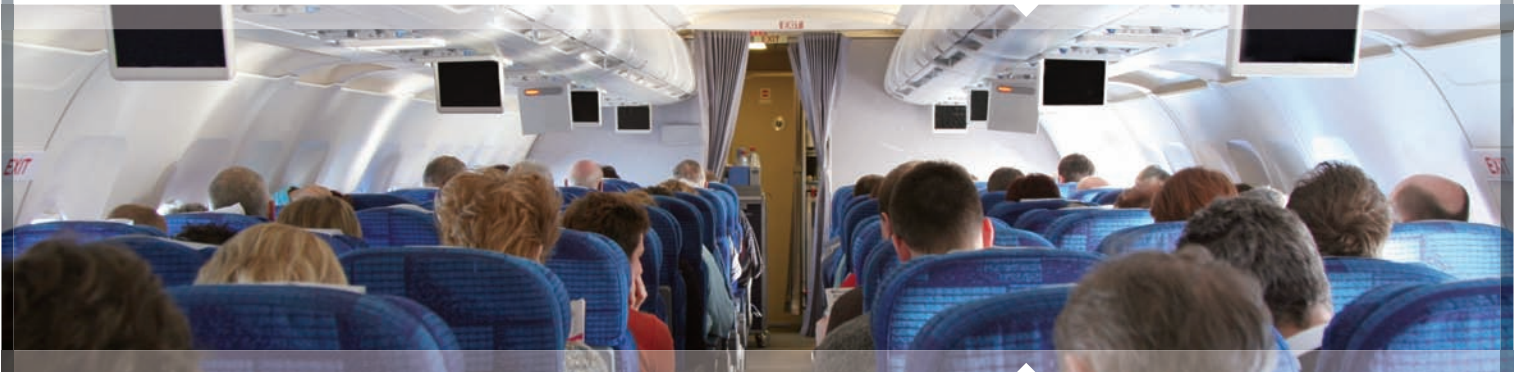


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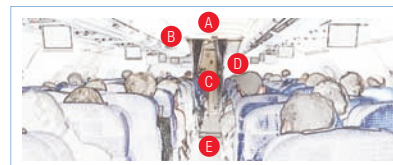
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# fasttrack

A new system uses the seat rails to transmit IFE data, affording operators greater freedom to reconfigure the aircraft

What is possible in every living room and every car, namely to modify the seating arrangement depending on the situation, is still a hugely complex process for aircraft. The work can entail not only costly engineering and tailored manufacturing processes, but can also be hugely time-consuming and as a consequence highly inflexible in practise.

While there are many studies today based on wireless solutions, PFW has taken an entirely new approach to this problem. Coming historically from the structural side of aircraft manufacturing, its strategy was to enhance airframe structure functions with system functionalities.

As one of the main seatrail suppliers for the aerospace industry – with an annual production volume coming close to 100km of rails – PFW has extensive hardware experience. In conjunction with its affiliate GCT (which incorporates more than 400 aerospace engineers) it can also boast access to know-how gained from multiple years of working in this field.

To PFW, the solution was to integrate the transmission of entertainment data into the seatrail, which by definition connects all the seats. The company says this would also avoid adding weight, cost or complexity.

This gave birth to the Speaking Seatrail, one of this years' finalists in the Crystal Cabin Awards. Through the integration of a rectangular channel into a conventional seatrail, PFW aimed to prove that an RF 'waveguide' could be used for data transmission, allowing fully flexible data reception in every seat position.

While the transmitting power (1mW) is 100 times lower than any wireless system, PFW says more than 400 high-definition video channels can be transmitted in parallel on demand – jointly with any data from email, internet or telephone.

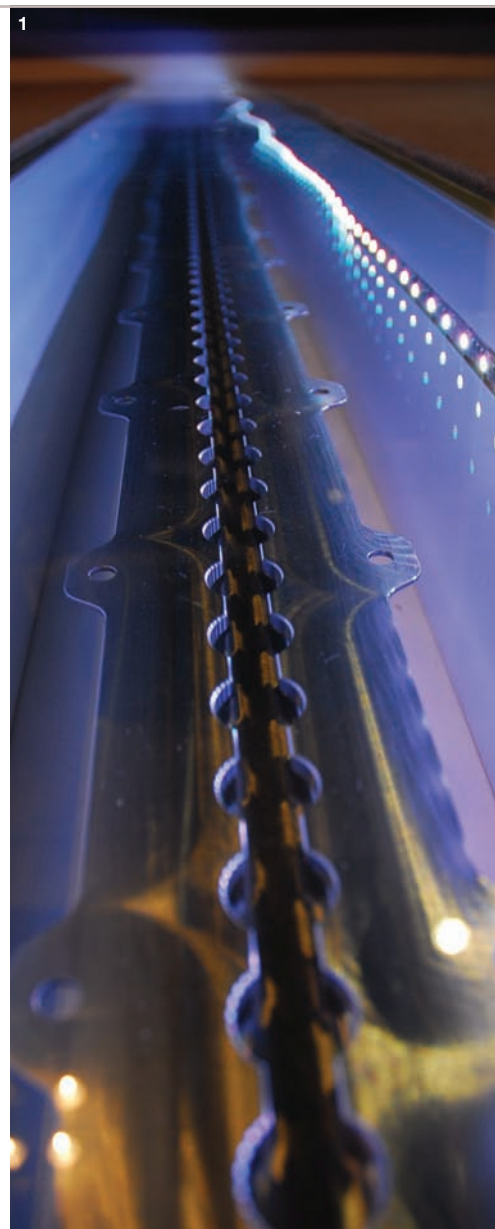
It also says that interference with aircraft systems is eliminated as even in a failed system, the radiation registers at normal ambient levels in less than 0.5m from the rail.

Following two years of research with the University of Applied Science in Offenburg, Germany, a fully functional prototype was presented at this years' Aircraft Interiors Expo in Hamburg, Germany (5-7 April 2011).

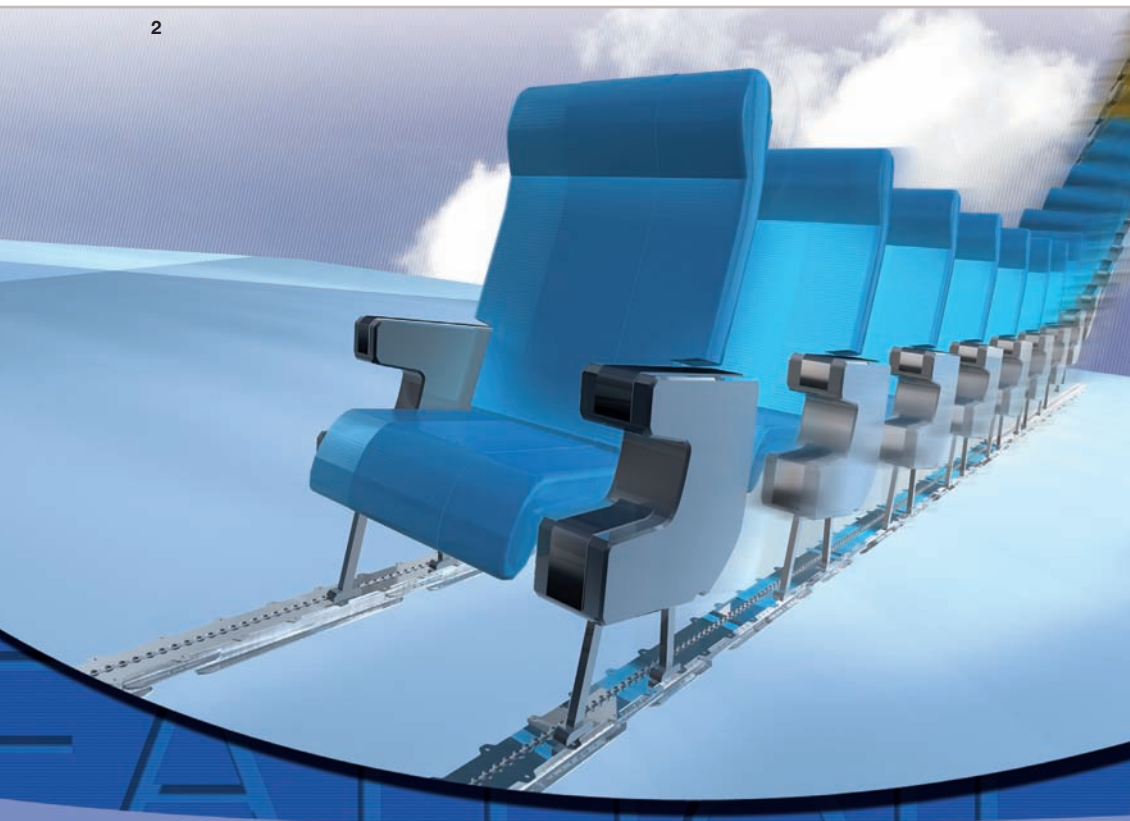
PFW hopes that its invention will give operators much more freedom to change aircraft seat configurations without worrying about IFE cabling.

GCT

Reader Enquiry No. 507



2



- 1 The Speaking Seatrail concept uses the seatrails to transmit IFE content
2. PFW envisages that the concept will enable operators to change seating more easily



# Skylounge

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The Skylounge™ is lightweight and can be rolled up into a customised equipment bag and stored in a fraction of the space of a conventional sleeping unit. The underside is custom contoured to match the top surface of the users preferred seat configuration which ensures a flat top surface for sleeping. We design and manufacture for single, double and divan units.

To operate, open the valves, the mattress will self inflate in minutes. By closing the valves, the air is trapped inside the foam maintaining structural integrity. An electric pump can be provided as an accessory to assist with inflation and deflation.

## Skylounge benefits:

- Compatibility → customised design to fit any aircraft model
- Flexibility → mattress can be armrest height
- Security → ability to use seat belts
- Stow ability → minimal volume when deflated
- Lightweight → approx weight (single = 8.0lbs - double = 13.0lbs)
- Easy to use → user friendly set up and packaging
- Comfort → self regulated comfort
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# sleepeasy

## Cascade Designs explains how it developed a self-inflating mattress that converts aircraft seating for a good night's sleep

In 1997, Cascade Designs developed the Skylounge aircraft mattress for executive jets. It is a customised, self-inflating mattress that can be designed to fit any seat configurations for any aircraft model. To date there are in excess of 12,000 units in service.

Cascade Designs says that traditionally, foam mattresses are bulky, heavy and difficult to store – but the Skylounge is lightweight and can be deflated and rolled up into a neat customised equipment bag and stored in a fraction of the space of a conventional unit.

The mattress consists of a uniquely designed, shaped core. The underside is

custom contoured to match the surface profile of a set of seats. This ensures the top surface is flat for sleeping. It can be designed for any single, double or divan units.

The Skylounge is made up of a foam and air interior and bonded with a highly specified water-repellent fabric. It has a series of four valves, one of these being a decompression valve, the other three allow for self-regulated comfort. By opening the valve system, the mattress will self-inflate in minutes to the required size and when the valves are closed the air is trapped inside the foam, which Cascade Designs says ensures a disciplined structure and a comfortable and reliable sleeping surface.

Many extra design features can be added to the mattress, for example the width can be increased by at least 5in for a single or a double mattress by designing the mattress to come up over the armrests.

The Skylounge is also designed to address equipment weight and space challenges for aircraft crew. For example, a typical single mattress is 1.9m (75in) long and 0.5m (20in) wide, and when deflated could be rolled up and packed to a volume of 0.05m<sup>3</sup> (1.7ft<sup>3</sup>) and a weight of 3.6kg (8 lb).

Cascade Designs was founded 30 years ago by two ex-Boeing engineers driven by their desire for comfort. Comfort in this case took the form of a self-inflating camping mattress, suitable for sleeping on all terrain and in all weathers. They called it the Therm-a-Rest.

In 1995, Cascade Designs in Cork, Ireland, created an aviation department that developed a range of seating products using this Therm-a-Rest self-inflating technology, which eventually led to the Skylounge product.

1. The Skylounge mattress fits over aircraft seats



Cascade Designs

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# floridakeys



Assembling the key ingredients to establish a wide-body completion centre is a bit more complicated than baking a cake, but in its simplest form, it is not far off. The nucleus for an operation has existed in central Florida, USA, for some time, but has just been assembled under the new name of M&D Aviation.

The ingredients in this case are a qualified management team, an experienced engineering group, an MRO and a skilled wood and upholstery shop. "These units all existed but needed to be orchestrated," explains Dr Doyle Sisson, CEO of M&D. "Once we found the participants, it all fell into place."

Having spent much of his career at Boeing and two major completion centres, Sisson decided it was time to pull together with his partners on their own venture. M&D approached Avocet Aviation, an MRO with a 145 certificate and a focus on dismantling older airframes. "When the concept was put before us we were quite interested," says Patrick Arellano of Avocet. "It was a nice fit for our operation

and expansion that includes a new 72,000ft<sup>2</sup> paint hangar."

A skilled woodshop and upholstery facility were the other two key ingredients. M&D then approached DNA, an Orlando-based cabinet supplier whose focus was also wide-body completions. "We had already worked with Doyle on other wide-body programmes," says Alan Cook, president of DNA. "To build for a centre in our area and see the interior going in, is an exciting part of the process."

The final component was soft goods supplier Interiors In Flight. "We have already been successful supplying seats to Embraer and Cessna, adding M&D only increases our share in the southeast USA," says Larry Heilbron, vice president of Interiors In Flight.

"The timing is perfect for a new outlet," says Mike Plavchan, COO of M&D. "Wide-body completion space is tight and many sales from both Boeing and Airbus require M&D's capacity."

**M&D Aviation**

Reader Enquiry No. 509

# highflyer

The sort of person who owns a jet is also likely to have a home theatre or entertainment centre decked out with the latest flat-panel displays and projectors – all rendering the latest Blu-ray movies in high definition (HD). On board their aircraft it may be a different story. Many of the aircraft delivered – even today – do not support HD for some or all of their monitors. Innovative Advantage says the unique demands of the aircraft environment – having multiple displays with the same content, audio that has to be synched – combined with certification and support requirements, have made delivery of HD content difficult.

Starting with a blank slate, Innovative Advantage spent five years working with a major airframe OEM on the next generation of audio video distribution (AVDS). With AVDS, Innovative Advantage says the aircraft owner sees all HD content rendered the way Hollywood meant it to be – no compression artefacts, no lip sync issues – just beautiful HD at every seat and display.

A fibre optic backbone provides a 72Gbit highway around the aircraft for video, audio and gigabit Ethernet. Up- and down-conversion, plus scaling capabilities can simplify the completion centre's engineering task of providing a great HD experience. Blu-ray, VGA,



component video, composite video, analogue audio and digital audio are supported through out the AVDS network. The company says reduced wiring and no single points of failure are further benefits.

Innovative Advantage has extensive experience of VIP IFE systems, Ethernet networks, video processing and digital audio.

**Innovative Advantage**

Reader Enquiry No. 510



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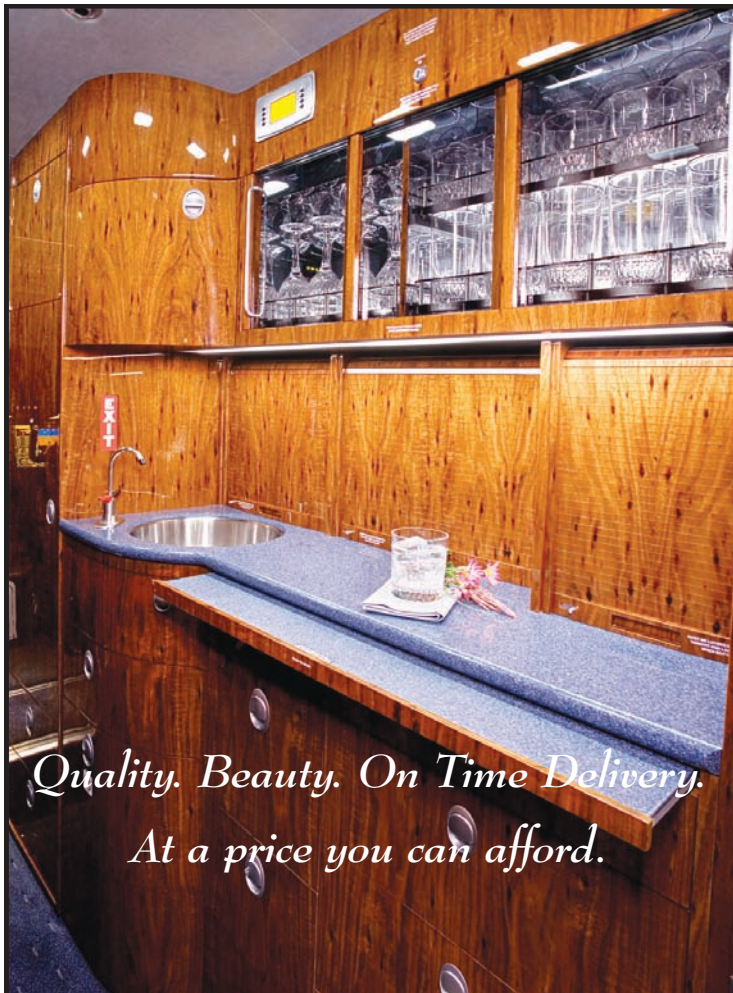
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# goldenapple

Managing digital content can be a real challenge, and at 35,000ft it's a daunting one. With technology and customer expectations evolving at lightning speed, customers are looking for the most advanced and cost-effective solution to their IFE needs. Esoteric, based in New York City, USA, produces IFE for business and general aviation that is designed specifically to make life simple.

Esoteric's SkyPad system is a certified wireless IFE and cabin control system integrated with iPads. Esoteric says it employs a sophisticated yet simple approach to wireless technology and can be implemented for a fraction of the cost of traditional wired systems.

More than just a pretty interface, the SkyPad system is also DO-160 certified and is installed on the Bombardier Global XRS aircraft. Esoteric was recently awarded an order for 35 shipsets of the Skypad system for the Bombardier Global platform, and the system is currently under consideration by other leading airframe manufacturers.

For airframers and operators alike, the Skypad system has been designed to translate into considerable savings in weight, power consumption and installation costs.

For the end user, Skypad is designed to offer an easy-to-use, engaging and luxurious means of enjoying an ever-

growing range of digital media, all while flying across the country or oceans at 35,000ft.

Esoteric's worldwide distributor is Marion Aircraft. Serving the industry since 1947, Marion, which is located in Lake Forest, California, USA, is a full-service distributor of aviation carpets, coverings, finish materials and related products.

Marion is an authorised distributor for Aerosea Carpets and Glen Eden Wool Carpet. Utilising its offices and stocking locations around the world, Marion serves a growing customer base located in Asia, Europe, Latin America and the USA.

Marion Aircraft

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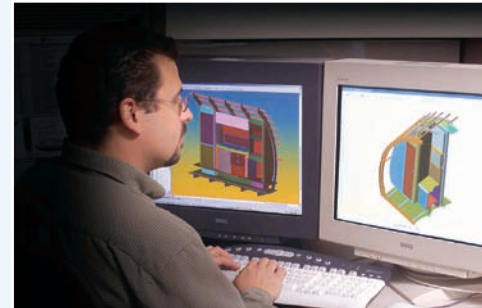
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