

BusinessJet *interiors* INTERNATIONAL

NOVEMBER 2010

THE INTERNATIONAL REVIEW OF BUSINESS JET INTERIOR DESIGN AND COMPLETION

packleader

New G650 breaks the mould with the most sumptuous Gulfstream cabin yet

perfectten

Citation X rebranded as Citation Ten and given complete cabin makeover



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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

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BOOTH C530

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

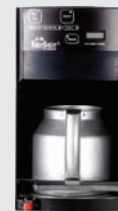


P/N: MK279-00
Model: half-size trolley



P/N: HFEJ2008-01
Model: Nespresso maker

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P/N: HFAWB2007-01
Model: water heater

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statesecrets

In these austere times, there is much to be made by newspapers and the mass media regarding 'lavish' private jets for use by heads of state. It's an easy story to write – president or prime minister luxuriates aboard flying gin palace, while the rest of us worry about our jobs and scraping together enough money to buy some Christmas presents.

Hence it was of little surprise when a reporter recently rang me in the hope I would dish the dirt on the A330-200 delivered to France's President Sarkozy in October, after an estimated €30 million refit by Sabena Technics. Formerly in service with Air Caraïbes, 'Air Sarko One' replaces two ageing A319s previously used for presidential purposes. Unfortunately all I could reveal was that the aircraft is rumoured to include an office, meeting room, bedroom, large bathroom, medical facilities and a rear cabin with 60 business-class seats for travelling media and support staff.

These simple facts were not enough for the newspaper hack – what was required was more 'colour', I was told. I was briefly tempted to invent some details about a fully equipped hair salon and sumptuous, walk-in wardrobes – France's first couple enjoy a glamorous reputation – while an imaginary onboard wine cellar and cigar humidor should ensure the student fires of rebellion back on French soil would burn even brighter. In particular, the reporter seemed aghast that the president should enjoy his own bedroom and bathroom. I found this strange – after all, the French people would surely not begrudge their president the best possible rest and a chance to freshen up before arriving on foreign soil to negotiate on their behalf in lengthy trade negotiations or other essential affairs of state?

He also seemed keen to know more about the entertainment facilities. I pointed out that first and foremost such aircraft are flying offices, and that the sophisticated communication and entertainment systems installed were primarily there to ensure a more productive flight, while also keeping the principal connected to events back on the ground. At this point the interview was cut short. Fortunately, he only had to wait a few weeks to write something more exciting – November's newspapers saw headlines stating Silvio Berlusconi had been accused of using his private jet to transport marijuana to sex parties held at his villa in Sardinia – now that's what I call entertainment!



Anthony James, editor



Cover Image:
Design Q



“Work on an 82in screen had to be abandoned at the design review stage when it was realised that the aircraft’s doors were too small for it”

screenstars 30

WIDER, THINNER, BRIGHTER AND LIGHTER SCREENS ARE MAKING LIFE EASIER FOR CABIN DESIGNERS AND ONBOARD ENTERTAINMENT MORE COMPELLING FOR THEIR CUSTOMERS

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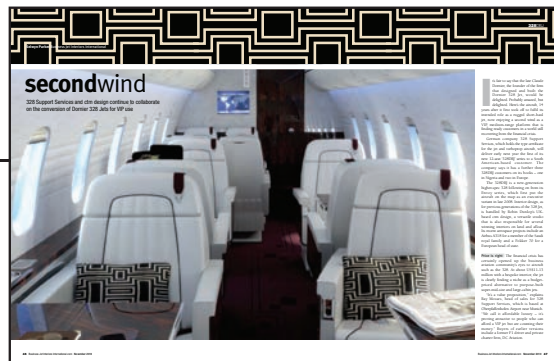


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First flight of the Citation Ten is scheduled for late 2011, with certification and first delivery in 2013

Cessna launches Citation Ten

A larger version of the Citation X, the Citation Ten features a redesigned cabin with new seats and appointments. Cessna has also teamed with Heads Up Technologies to develop a cabin management system (CMS) integrating electrical systems, avionics and communications through a fibre optic backbone. Cessna says it opted for fibre optics instead of copper cable for weight reasons and to enable future system growth. A 15in cabin stretch provides nearly 9in of extra legroom in the forward club four grouping and nearly 5in in the aft grouping. Seats have also been restyled and redesigned to recline further back when in take-off and landing positions. See page 38 for full feature.

Comlux America wins new Boeing completion

Comlux America has received an order for a new Boeing aircraft. "This is the fourth order for a large cabin VIP completion only two years after the launch of our company at NBAA 2008. We now have one A320 Prestige, one ACJ and one undisclosed Boeing aircraft in our order book, in addition to a 767 VIP refurbishment," said David Edinger, CEO of Comlux America.

"Next year, to maintain our growth in the market, we will need to double our hangar space capacity," said Ettore Rodaro, president of Comlux America. "We are currently analysing potential expansion capabilities at Indianapolis International Airport, but also in other major US cities."



BizJet delivers second BBJ to Boeing

BizJet International, Lufthansa Technik's 100% US subsidiary, has delivered (on time) its second Boeing Business Jet (BBJ) to Boeing's corporate flight department. The aircraft ran through a complex programme at BizJet, including major maintenance checks and refurbishments. The first BBJ completed was delivered in the second quarter of 2010.

BizJet's work package included periodic inspections and the clearance of findings; the removal and reinstallation of the complete cabin; several interior modifications; the installation and update of electronic equipment; and the performance of over 50 service bulletins and service letters.

"We are very satisfied with the results BizJet has provided for both aircraft," said Michael G. Wuebbeling, senior manager of maintenance in Boeing's corporate flight department. "They showed great responsiveness and flexibility and delivered high-quality work over the past months."

BizJet has 350,000ft² of hangar capacity and a variety of workshops.

JetTech Aerospace launches completion centre focused on BBJs

JetTech Aerospace has acquired Cascade Aerospace's completion division, based in Spokane, Washington, USA. Established in 2008 to provide services for BBJ including completions, refurbishments, and maintenance, the company will now operate as JetTech Aerospace.

The staff and management team of Cascade Aerospace USA will remain with the new company, including Bret Burnside, who will continue to manage operations as president of JetTech Aerospace.

Meanwhile, JetTech has been selected to deliver full completion services including interior and exterior design, engineering, certification, fabrication, and installation for First Virtual Air's new green BBJ. The company will also provide ongoing maintenance services for the aircraft.

Expected to be completed in late 2011, the VIP completion has an open, contemporary floor plan that includes a kitchen, executive lounge, private office, living room, dining room, master stateroom, and three bathrooms. The aircraft will also include ground and satellite-based internet, and Honeywell's Ovation Select cabin management system.



The G250's redesigned divan is 6ft 8in long and features a four-position base cushion



Altitude proves a point with VIP mock-up

Altitude Aerospace Interiors has unveiled a VIP interior mock-up, named Pounamu, installed in a retired Boeing 737 at its facilities in Christchurch, New Zealand.

The mock-up features a grand entrance-way flowing through to a salon with bar area and seating for six. A fully functional conference room follows on from the bar area, complete with a 55in (139.7cm) monitor, swivel chairs and credenzas. The remainder of the fuselage is left for fit check testing and a further mock up area for customer designs.

"Although our design, technical and installation experience on 737 aircraft stems back several decades, the Altitude name was new to the BBJ market," said Pascal Jallier, head of programmes and procurement at Altitude. "We sensed that potential customers looking for a completion centre, although impressed with our facilities, knowledge and experience, really wanted to see a tangible example of what we could produce."

The mock-up features a ceiling with a new ducting system design. "The result is a more spacious cabin, with an additional 4in of height compared to the standard recess ceilings in most BBJs," said Jallier. "This ceiling, built with aerospace-certified material, is available for any green BBJ completion or refurb project."



Gulfstream reveals G250 interior

The G250 cabin boasts a cabin management system (CMS), high-definition (HD) IFE system, integrated storage, 19 windows, and a modern lavatory. The new seats are 25in wide with 21in between the armrests, creating an aisle nearly 2ft wide. The seats feature a telescoping headrest with optional flexible wings, an articulating seat pan for full-flat berthing, and an optional recliner-style legrest. The G250 will come standard with Gulfstream's Audio/Video Distribution System (AVDS), which supplies HD video content using a fibre optic cabling system; a dual Blu-ray/DVD/CD player with USB ports; and a 19in HD LCD forward bulkhead monitor.

Lufthansa Technik and Panasonic combine forces for IFEC and CMS

Lufthansa Technik and Panasonic have signed a letter of intent to establish a joint venture for the development, manufacture and sale of IFEC and cabin management systems (CMS) for VIP aircraft.

These new solutions will be based on a combination of the technologies seen in Panasonic's X Series commercial IFE system and Global Communications Suite (eXConnect and eXPhone); and the nice CMS/IFE system developed by Lufthansa Technik's Innovation Business Unit. The joint venture's efforts will be primarily aimed at narrow- and wide-body VIP aircraft and will incorporate digital distribution, high-definition (HD) media playback, iPod and iPhone controls, remote maintenance, high-speed connectivity, ipTV, media and game libraries and more.

"The combination of these two great systems and the combined experience of both companies in commercial and private aviation will provide a cutting-edge system for VIP aircraft," said August Wilhelm Henningsen, CEO of Lufthansa Technik.

AMAC Aerospace receives first 777-200LR from Aviation Link

AMAC Aerospace Switzerland has received its first wide-body aircraft, a brand new Boeing 777-200LR purposely built for a VIP conversion. Completion work on the aircraft has already started and delivery to the client (in the Middle East) is scheduled during 2012.

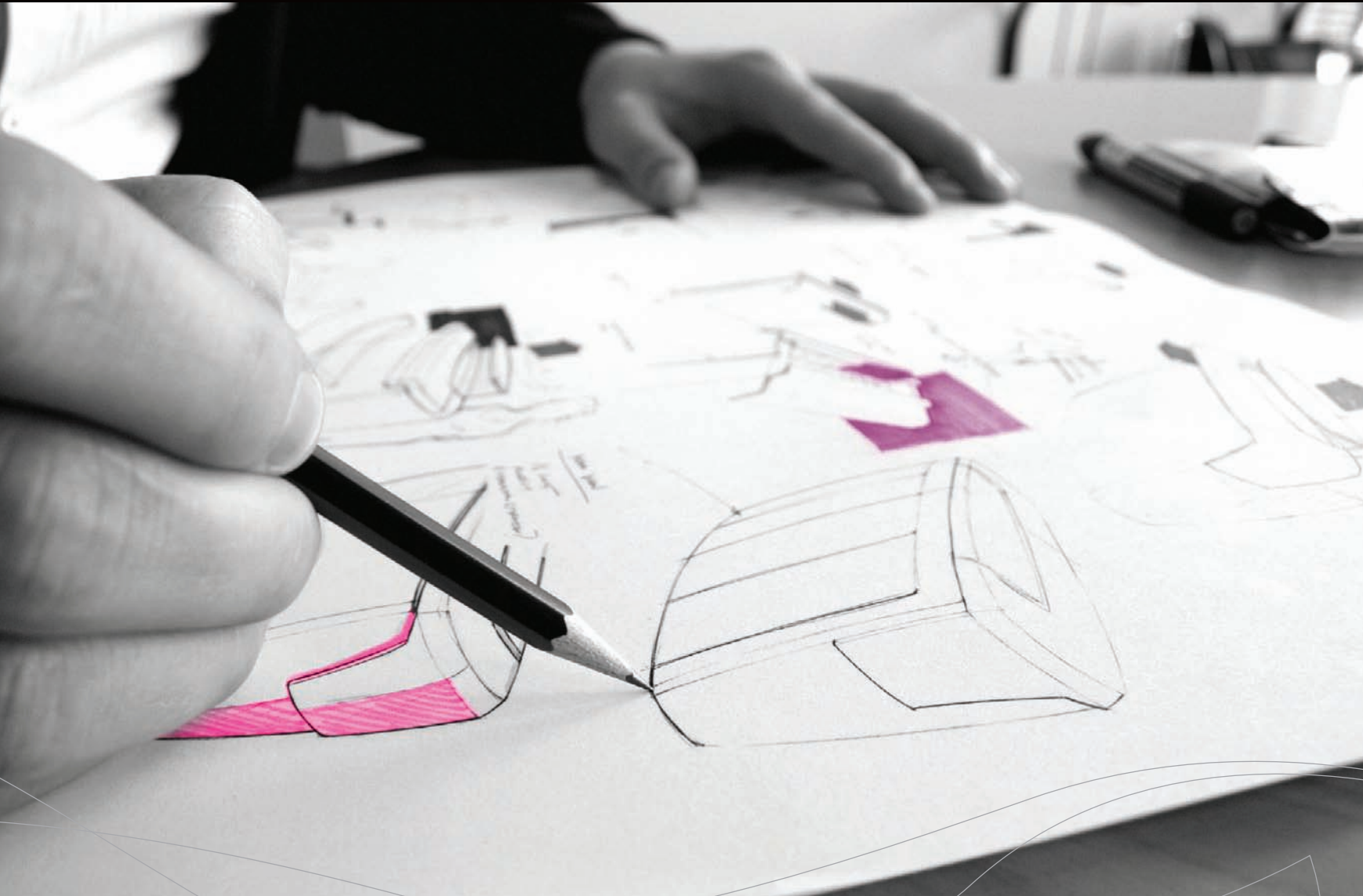
"The high quality of workmanship and on-time delivery on previous completion projects convinced us to select AMAC for this prestigious project," said Abdulaziz Al-Rowaished, president and CEO of Jeddah-based Aviation Link Company.

"AMAC will no doubt be delivering this aircraft in the same way we are used to delivering our projects – on time and within budget at a quality that best suits the satisfaction of our clients," said Heinz Koehli, strategic president at AMAC.

AMAC Aerospace offers aviation services for corporate and private aircraft, including maintenance, refurbishment and completion, aircraft management and chartering. The company is based at EuroAirport Basel-Mulhouse-Freiburg.

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The aircraft owner, a Hollywood movie producer and director, will screen films and review his productions during flight

Flying theatre for Hollywood producer

Flight Display Systems' new cabin management system (CMS), Select CMS, has been installed by International Jet Interiors in a 'flying theatre' configuration on a Gulfstream III. The CMS features a high-definition (HD) 42in widescreen LCD monitor. Multiple Blu-ray Disc players and satellite TV channels provide hours of entertainment. The Gulfstream III has three separate zones, each with cabin lighting, attendant call functions, and electronic window shades controlled by Select CMS. iPod docking stations, auxiliary input ports for computer video, and 20in HD and 10.2in personal LCD monitors were also installed.

High-speed broadband system certified on BBJ

Boeing Business Jets has announced the first certification and installation of Panasonic's inflight wireless high-speed broadband service, eXConnect, on a BBJ 737 aircraft. As part of the installation agreement, Panasonic will use the privately owned BBJ for ongoing testing and validation, as well as for live demonstrations of the system.

The system supports a wide range of passenger and crew applications including high-speed cabin internet access anywhere in the world, at speeds of up to 50Mbps to the aircraft. The fuselage-mounted antenna communicates through a global network of satellites.



Greenpoint contracts new BBJ3 completion

Greenpoint has contracted a full VVIP interior completion for a green BBJ3 with an undisclosed Middle Eastern client. This is Greenpoint's second contract for a full green interior completion in 2010. The aircraft is scheduled for induction in 2011 and for redelivery in 2012.

The interior and décor is being developed in-house working closely with the client and a private designer. Greenpoint's in-house design studio provides interior designers and 3D modellers who develop photo-realistic renderings to assist with material selection during the initial design process. "The interior is VVIP with state-of-the-art systems," said Sloan Benson, executive vice president of Greenpoint.

Meanwhile Greenpoint Products and Services (GPS) has been awarded the manufacturing contract for the new Boeing 747-8 Aeroloft. The Aeroloft consists of 36.5m² of useable space above the main deck. The kit includes eight custom-designed private sleeping berths and a changing room.

Hawker Beechcraft displays new cabin concept for Hawker 200

Hawker Beechcraft Corporation (HBC) has displayed an interior concept mock-up for the new Hawker 200 at its static display at 2010 NBAA Annual Meeting and Convention (held in Atlanta, USA on 19-21 October). The mock-up includes an expanded four-place club seating space with additional side-facing seats in the aft position and in the lavatory. The interior styling has also been upgraded to mirror that of the Hawker line-up, including a larger galley, full-height closet, new cabin controls and new tables.

"The concept mock-up is intended to help us to gain more insight into what customers would like to see in a light jet," said Vince Restivo, vice president, aircraft completions at HBC. "This configuration is just one of the options we are considering for the new Hawker 200 and we're looking forward to getting feedback from customers and NBAA attendees."

Having determined that 95% of light jet missions consist of three or four passengers, HBC's Completions Center of Excellence in Little Rock, Arkansas, USA, expanded the four-place club area for greater comfort. Customers also indicated the occasional need to carry more passengers, so the new configuration could accommodate as many as eight.

The Hawker 200 is scheduled for certification in the third quarter of 2012, with first deliveries planned for the fourth quarter of that year.





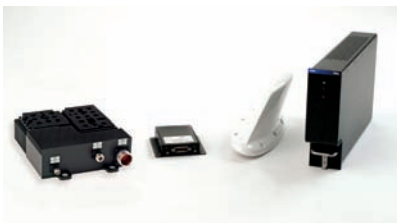
The G650 sees a new divan design that converts into a flat sleeping surface

EMS Aviation launches Aspire inflight connectivity product family

EMS Aviation has launched the Aspire family of Iridium and Inmarsat voice and data systems for small- and medium-sized business aircraft. “The Aspire product family offers operators an easy upgrade path, and customised bandwidth that will grow with their needs, making it easy for operators to fly like they live – with seamless, global connections,” said Nim Evatt, general manager of EMS Aviation.

EMS will introduce the product line in phases. The systems will offer various services – from voice and/or data to high-speed internet – while also providing flexible installation and customisable capabilities and bandwidth. Key to this flexibility is a standard wiring configuration and interfaces that support either Iridium or Inmarsat components. This means owners can change systems without rewiring, and airframe manufacturers can wire an aircraft early in production, without having to commit to a specific system until later.

The first offering, the Aspire 200 LG connectivity system, will be installed on a Cessna Sovereign aircraft. The Aspire 200 LG system is an Inmarsat cabin solution that offers voice and data connectivity through one channel of SwiftBroadband (SB200) service. The system also supports automatic switching to Swift 64 services.



G650 interior introduced at NBAA

The new G650 interior features 16 windows, LED lighting, redundant systems, a cabin management system (CMS), and large galley. For the first time in a Gulfstream aircraft, two of the standard seats are electrically operated, and feature heated cushions, four-way pan tilt, massage, single-position memory preset, and press-and-hold controls. The inboard armrest can be used for an optional 12.1in HD monitor. The G650 also offers a divan that converts to an 80 x 41in flat surface, a crew rest area, and electrically operated console tables. See our full features on pages 22 and 52.

GDC signs head-of-state A320-200, welcomes Boeing 777-200

Gore Design Completions (GDC) has signed its second A320 for completion. The aircraft, designated for a central Asian head of state, will come to GDC from Airbus with a modified airline configuration. Delivery to GDC is due in December 2010 with an expected redelivery in early 2012.

The new interior will include a presidential suite and conference room. All design and engineering will be completed at the company’s newly expanded facility at Port San Antonio, USA. The aircraft is the second project contracted to GDC by this customer; the first was a Boeing 767-300 completed in 2008.

Meanwhile the company welcomed a Boeing 777-200LR for completion in October 2010. Redelivery is scheduled for late 2011. The aircraft is for a central Asian head of state. The company has completed two other aircraft for this customer – a Boeing 767-300ER, and a Boeing 737. The interior specification for the aircraft calls for a luxurious VIP suite to include a state room, dressing room and office.

Petroff Air’s BBJ wins inaugural Custom Jet Show Award

Private operator Petroff Air took the award for best customised aircraft interior for a privately owned Boeing 737-7JF, at the first ever Custom Jet Awards. The ceremony was held at the AVEX 2010 International Airshow in Egypt on 7 November 2010.

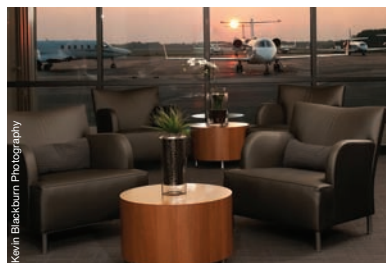
Dina Tkacheva, development director of Petroff Air, thanked partners such as Boeing and Greenpoint Technologies, who “moved back and forth between Russia and the US to realise this dream”.

The US\$85 million jet is owned by a Russian businessman. Highlights include a dining table with folding leaves, six beige and olive recliners, and a 42in (106.7cm) LCD monitor. The master bedroom and bathroom includes a queen-size bed, dressers, wardrobes, and a shower stall with a transparent hinged door.

Meanwhile Bell Helicopter won the best customised livery design award for the Bell 429. The awards were provided by French livery specialist, Happy Design Studio. Each winner received a 1:100 scale model of Concorde covered with 450 real diamonds.

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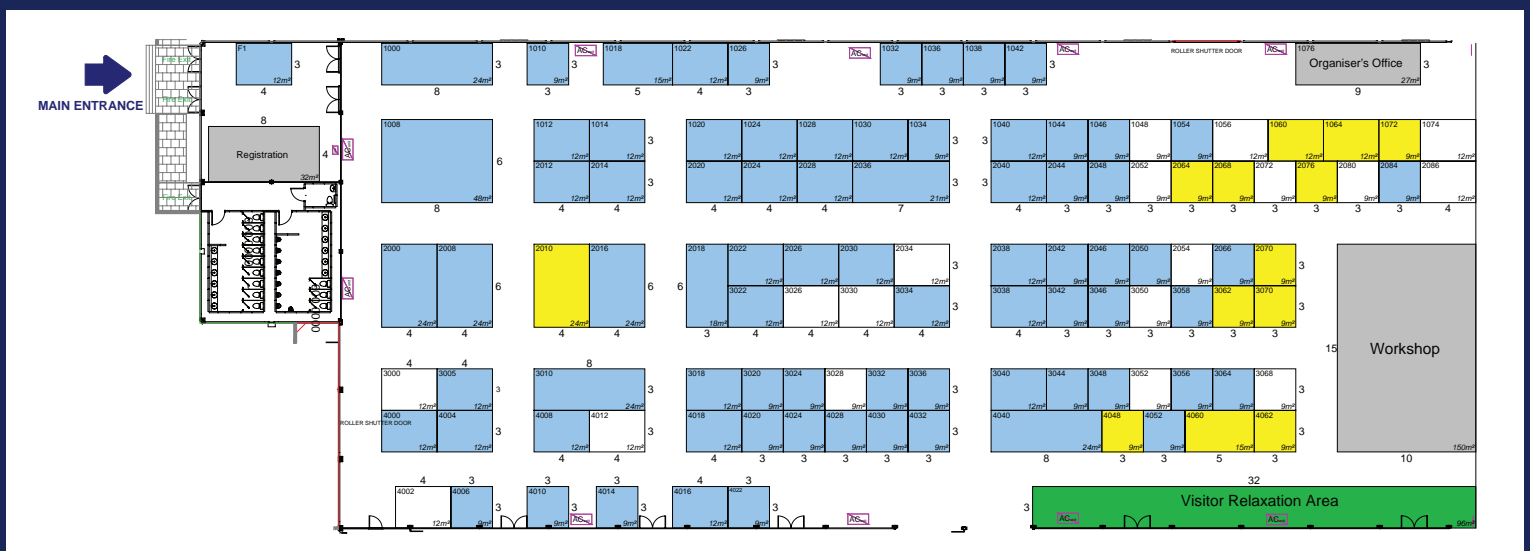
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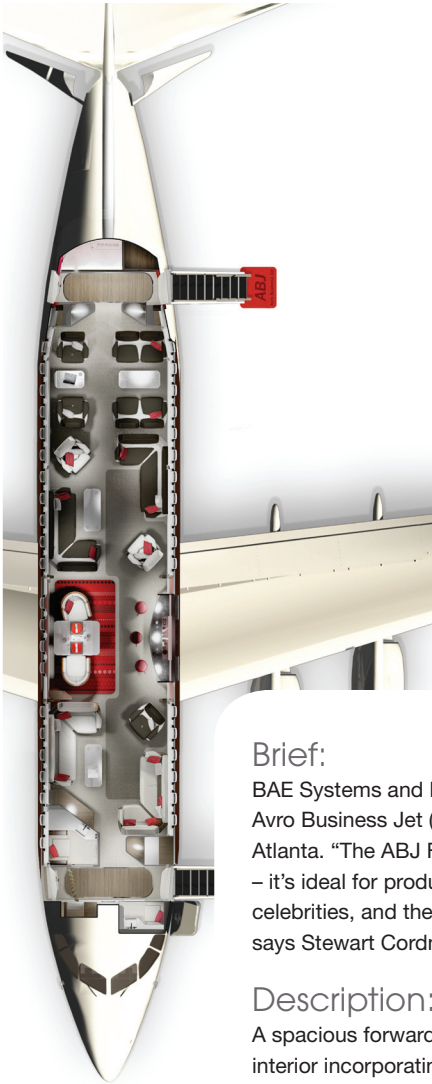
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Brief:

BAE Systems and Design Q unveiled their latest concept for the Avro Business Jet (ABJ) at the recent NBAA convention in Atlanta. "The ABJ Fusion is aimed at the charter aircraft market – it's ideal for product launches, sports teams, musicians, celebrities, and the exclusive travel and corporate VIP markets," says Stewart Cordner, vice president of Avro Business Jets.

Description:

A spacious forward entrance leads through to a large open plan interior incorporating separate lounges. A bar and intimate seating area is located half way down the aircraft underneath the wing box punctuating the uninterrupted view down the cabin with a change in texture and colour. As there is no requirement for additional exit doors in the mid-cabin area this has allowed the design team to develop an interior layout that concentrates on delivering a functional and harmonious solution. The interior can seat 19 passengers within the three lounges in a relaxed and informal atmosphere. Mood lighting can be used to light each lounge independently, with individual accents used to reinforce particular use. The forward lounge has a 50in HD monitor mounted on an offset and angled bulkhead to provide a bold visual focal point. A discrete library is also incorporated into the forward lounge. The angled bulkhead allows for a large forward VIP lavatory, making the most use of the space available and adding an additional window to the room over what is generally provided. The large rear lounge incorporates an informal seating layout along with a club four and club two pairing at the aft end. The lounge backs on to an impressive galley adding both interest and a modern informality to the catering offer. Passengers are encouraged to talk with the cabin crew and choose from the selection of beverages and nibbles laid out on the angled serving worktops.





Verdict:

The ABJ Fusion is the third of five concepts commissioned by BAE Systems from Design Q to meet different VIP aircraft market segments (the remaining two will be unveiled later this year at MEBA and early in 2011). Design Q has striven to create an atmosphere that encourages passengers to socialise during the flight. The overall effect is one of sophisticated informality, which should prove popular with select VIP customers.



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Image courtesy of Heim Aircraft Interior Designs



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MEBA 2010

Dubai Airshow organiser F&E Aerospace is preparing to welcome a record number of visitors to the Middle East Business Aviation show (MEBA). Taking place at Dubai's Airport Expo on 7-9 December 2010, MEBA is organised on behalf of the Middle East Business Aviation Association (MEBAA).

MEBA 2010 is expected to attract more than 7,000 attendees, who will be able to tour an exhibition area of some 350 stands showcasing aircraft design and technology, and suppliers ranging from aircraft interior designers to management and flight chartering brokers and MRO specialists.

Visitors will also have the opportunity to be invited on board business jets, with more than 70 aircraft on display outside on the airfield. Hospitality chalets lining the display park are traditionally a sanctuary for companies to network and negotiate deals. Manufacturers showcasing their aircraft and services include Boeing, Airbus, Gulfstream, Dassault, Bombardier, Embraer, Cessna and Hawker Beechcraft.

The previous MEBA show, in November 2008, attracted 250 exhibitors from 30 countries and over 5,500 visitors, resulting in US\$1.5 billion (£0.9 billion) worth of orders. Visitors can register online (at www.meba.aero) now to pay US\$20 (£12.43) for three days' attendance; the price at the door is US\$35 (£21.74).



Complete control

Erteq will showcase SkyPro, an all-digital, high-definition CMS system designed to offer passengers unparalleled control over their cabin using a modular, peer-to-peer system design. It is a highly scalable system with advanced options available for customisation.

Also being featured is the company's new Daylight variable white lighting system – a white wash-lighting system capable of outputting many shades of white light, and offering 100% variable dimming without the need for a dimming module. Dynamic control of cabin lighting on a single bus with Daylight includes control of white colour temperatures, intensity values, fade times, as well as control among groups or zones of lights. Multiple track and lens options are available.

Quasar, Erteq's full-spectrum LED lighting system, will also be displayed at MEBA. This system features almost limitless colour options and pre-set lighting modes, including sunrise and sunset mode capability, as well as 100% dimming capacity.



The private office on Al Jaber Aviation's A318 Elite

Elite market

Airbus will display the A318 Elite, which offers a wide and tall cabin and seats up to 19 passengers. With the range to fly non-stop from the Middle East to Europe, Airbus believes the A318 Elite is ideally suited to this growing market.

Ten operators are now offering more than 15 Airbus corporate jets (A318 Elite, ACJ and A320 Prestige) for private charter, allowing customers to see for themselves what the aircraft have to offer. One of these operators is Al Jaber Aviation, which has an A318 Elite (pictured).

Airbus offers a full range of aircraft for corporate or VIP use, from the A318 Elite all the way up to the double-deck A380. Airbus has won more than 170 such sales to date, with aircraft flying on every continent, including Antarctica.



Star power

Lufthansa Technik will present highlights from its SixStars portfolio and the latest developments from its networked integrated cabin equipment (nice) cabin

management system, niceview 3D moving map, nicestuff online news content application, and aerosight camera surveillance system.

The company's SixStars portfolio encompasses creative design and customised interior solutions, cabin products, experience in completions and modifications, as well as operational support and technical services. Based on the experience of over 40 years of design engineering and craftsmanship, the company has carried out more than 80 full completions to date.



Happy talk

Aircell will feature its entire line of inflight connectivity and communications systems. Of particular note are Aircell's global

SwiftBroadband solutions, including the new Aviator 200. This system allows travellers to use their personal laptops and mobile devices for email and light internet services at up to 200Kbps with coverage virtually anywhere in the world. They can also use the system's integrated cabin handsets to make and receive voice calls. Aircell's SwiftBroadband solutions are powered by Thrane & Thrane. Along with the new SwiftBroadband 200 service from Inmarsat, Aircell's new low-gain antenna (pictured) is helping make SwiftBroadband voice and data connectivity available to a whole new segment of the market.



Light and shade

Vision Systems will display Nuance, which can be used to control the amount of light entering the aircraft. It can be set to be either optically clear or to block over 99.5%

of visible light and is tunable to any level of light transmission between clear and dark. Nuance can be piloted by the cabin management or directly at the seat. It is also possible to synchronise multiple tintable windows at the same time. In addition, the company will feature VisiVip, an IFE system providing AVOD distribution and cabin management control. Vision Systems has also added connectivity features to VisiVip through the launch of a complementary system, VisiConnect.



Keep connected

TrueNorth Avionics will present its Simphone OpenCabin airborne telecom system. Built-in functions include custom voice and data handling; WiFi, smartphone

and broadband support; modular architecture; menu-driven handsets with full-colour displays; unlimited personalisation options; enterprise-level security; and interfaces to all available off-aircraft links, including Inmarsat, Iridium, Ku-band and ground networks.

New for 2010 are a USB phone charger and TrueNorth Express, a solution for WiFi-capable smartphones that lets aircraft operators send and receive email through their existing Iridium phone systems. The company says that TrueNorth Express offers worldwide coverage at any altitude; a self-contained smartphone interface; and email messaging for a fraction of the cost.

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packleader

Gulfstream's new G650 breaks the mould with the most sumptuous cabin yet





Executive aircraft interior component suppliers have known for years that Gulfstream can be a difficult customer for one simple reason: it always wants the best. If a supplier doesn't meet its requirements, it will find someone that can. If no one else can meet its standards, it will do the job itself. It's hard to say if this reflects the current state of the interior component business or just some fresh thinking on Gulfstream's part, but there is an awful lot of in-sourcing going on with the new G650. Some of what is being contracted is going to non-traditional vendors. Indeed, much about the G650, in terms of both product and process, breaks with the past, including the development of its own proprietary Gulfstream cabin management system (CMS) – see our separate feature on page 52.

The interior team on the G650 is all new. Hiring automotive design firms to consult on, and even develop, new aircraft interiors has been all the rage for nearly a decade. Several OEMs have done it lately. Either that, or you tap a long-established, in-house design component. Gulfstream did neither. It built a brand new design studio for the G650 and hired a bunch of young fresh faces from both the automotive and aircraft business. Armed with the latest technical resources and a specific mandate from management, they did more than think outside the box – they burned it down.

1. Space aplenty – the G650 boasts 28% more cabin volume than the G550



THE FIRST THING YOU NOTICE ON THE AIRCRAFT IS, OF COURSE, ALL THE EXTRA SPACE

2

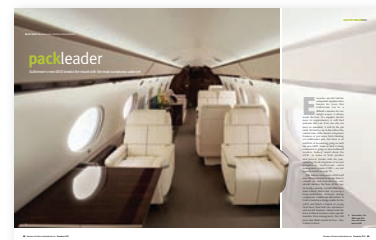
2. An easy-to-berth divan converts into an 80x41in flat surface for sleeping
3. In its upright position, the divan sits closer to the ground and provides a 104° back angle for optimum seated comfort

Customers will notice the changes. The super-sized, super-fast business jet will begin deliveries in 2012, but the test programme is already far along. Through mid-October the four-ship test fleet (soon to be five) had amassed 700 hours, punched the speed envelope through Mach 0.995 (fast cruise will be around Mach 0.925) and confirmed a wide range of operating data including minimum control speeds, initial cruise and flight control performance, and avionics validation. A production

interior has been flying aboard Test Ship 6004 since the summer. That aircraft – ballasted for four crew and eight passengers – flew a 5,000 nautical-mile closed course in 9 hours and 45 minutes at an average speed of Mach 0.90.

First impressions It was also the aircraft the company flew to this year's NBAA convention in Atlanta, graciously allowing the trade press to tramp through it in advance of paying

customers. The first thing you notice on the aircraft is, of course, all the extra space. The G650's oval fuselage is more aerodynamically efficient than the G550's round-tube design and offers more cabin volume. The G650's floor is 80in wide – 15in wider than the G550 and more than a foot wider than Bombardier's Global Express. That means more space for seat recline, legroom, stateroom options, as well as larger lavatories, galleys, crew-rest facilities and luggage areas. The wider



THERE ARE ROUNDED EDGES AND ACCENTS THAT APPEAR VAGUELY ART DECO, BUT THEY ARE SPARSE AND SUBTLE

floor also accommodates wider seats – 28in wide, some 2in wider than those on the G550 – more aisle clearance, six seats around a conference table and bigger monuments. The cabin windows also are proportionately larger and the entry door is massive – almost 75in tall.

The second thing you notice is how clean and streamlined the cabin appears. There are rounded edges and accents that appear vaguely art deco, but they are sparse and subtle. Andrew Fulford, Gulfstream's chief interior designer on the 650, calls it "a timeless,

modern approach" featuring "uncluttered surfaces" and an overall exorcism on needless lines. "Anywhere we can eliminate lines in the cabin, we have," Fulford explains.

Fulford says it was important to keep the appearance of the aircraft's interior somewhat stylistically neutral: "It had to appeal to a wide audience," he says. "We've got such a big worldwide customer base and everyone has different tastes – and we really couldn't alienate any or our current customers. A lot of people who have a G550 will have a G650 as well."

But he stresses that traditional does not mean dated: "The whole project was all new – it was not an assembly of catalogue parts as we so often see. It was all new even down to the (door and drawer) latches – they were all new and unique for the 650. It was great from a design view – we were able to touch everything."

It also needed to be flexible: "This is a new design we will dress in many ways," says Fulford. "It is not a one-off. A new interior design needs to be very adaptable to take many choices of colours and materials. It cannot be too restrictive." To achieve this, Gulfstream embraced a "very modular design philosophy".

It starts with 12 basic cabin layouts and components that can be placed virtually anywhere in the aircraft. While the main components such as seats, conference table, divan and credenza compliment each other, Fulford says they are "deliberately designed to look like separate pieces of furniture; the unique look of the pieces make the

3



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Measure of success

After the G650 is introduced, the only way to get a wider cabin on a business jet will be to buy an airliner. While the G650 still tips the scales at just under 100,000 lb to skirt all those pesky weight restrictions at smaller airports, its new fuselage shape yields impressive interior dimensions: 6ft 5in tall, 8ft 6in wide and 53ft 7in long.

Accordingly, key interior components have been dramatically enlarged. The seats are now 28in wide and the divans are 80in long. For a business jet, the main external entry door is massive – almost 75in tall as opposed to 59.25in on the G550. The baggage area provides 195ft³ of space and is accessible at all altitudes through the aft lavatory. Compared with the G550’s external baggage door, the one on the G650 is 8% bigger and 4in lower to provide for easier loading.

cabin look more home-like.” Only six tools are needed to install the interior and Fulford says that the modular concept, while not designed with quick-change configurations in mind, could lend itself to that application. “It would not be a big deal,” he says.

Sit up and take notice Clean lines and a fresh look are nice, but on a US\$65 million aircraft that only seats a dozen passengers everything has to be perfect. The team spent a lot of time evaluating functionality, starting with those notorious breeders of discontent on virtually all corporate aircraft – the seats. Fulford won’t reveal who Gulfstream is working with on the seats other than to say “they are new to the aircraft industry” and have produced a “very innovative mechanism that is extremely progressed – it is not a concept, it is the real deal.”

4-6. Two of the G650’s standard seats are electrically operated, and feature heated back and base cushions; four-way pan tilt; back cushion massage; single-position memory preset; and press-and-hold controls for full upright and full-flat positions

Two of the single seats in likely ‘command’ positions will have the latest and greatest in full powered function, a standard feature on every aircraft. The powered seats will contain heated back and seat cushions, back massage, four-way pan tilt, press-and-hold controls for take-off and landing or full berthing positions, and memory presets.

The seats will either contain a separate 12in monitor that stows in-arm or have stowage room for a magazine-style laptop. The custom-styled, wide-screen, high-definition monitors are built by an outside vendor, but are unique to Gulfstream. Fulford says they all have the “same crown, same surfacing, and same appearance” and were part of a concerted effort to design “surprise and delight” features into the aircraft. The club seats are serviced by an oversized console table that electrically deploys from the sidewall and contains woofers in the base as part of the cabin sound system.

The unnamed seating company is also working with Gulfstream on the divan that will be available with either manual or full electric ‘one-touch’ function. Fulford says the new divan deploys to an 80 x 41in fully flat sleeping surface. However, Gulfstream also wanted the divan to be a comfortable seating area. “On a lot of business jets you find that the divan is very upright and has a very benchlike feel; you are high off the ground and your back is very upright. We went to a lot of effort to lower the seating position

and recline the back angle, which sounds really easy until you realise what (structure) is under the divan.” Fulford says the new design has “a much more couch-like feel”.

Softly, softly approach Gulfstream also spent considerable time rethinking mechanisms on other interior components, from the strikers in the latches to restyled and redesigned locks, new powered monitor lifts and a new-style powered pocket door. “It is not a manual door that has an electric attachment fitted,” explains Fulford. “It is a brand new design that has a soft close feature – as it approaches the bulkhead it slows down and closes nicely.”

Gulfstream worked with Enflite to develop a variety of mechanisms and galley equipment, including the electrically operated console tables, pocket doors and monitor lifts. Other Enflite products aboard the aircraft include a dual-leg, low-stow pedestal table in the conference grouping, a “zero clearance, even flow” convection oven and an “inverter technology” microwave.

Fulford says the galleys are also a styling departure, with ovens and other devices being clearly visible in a high-tech, stainless steel stack, rather than hidden behind doors. Galley controls are contained in a 10in, intuitive touchscreen that can easily be used by flight attendants and passengers, and the breadth of equipment is likely to match what you would find in your



THE SMALL TOUCHES HAVE EVEN FOUND THEIR WAY TO THE CABIN'S AIR GASPERS AND LIGHTING

7

All systems go

The G650's systems have been designed with maximum passenger comfort in mind. Not only are the engines more fuel efficient, they are quieter and this leads to an anticipated reduction of cabin noise of up to 6dB compared to the G550. Meanwhile the pressurisation system delivers a cabin altitude of only 2,800ft at an altitude of 41,000ft and increases to only 4,850ft at 51,000ft. The aircraft also incorporates Gulfstream's '100% fresh air' system and the lavatories are now independently vented.

A new Cabin Essential package, which incorporates improved onboard lighting with advanced communications systems and enhanced redundancy of essential cabin systems, should ensure the highest reliability. There are back-ups for seemingly anything that could go wrong in the cabin, including communications, lighting, power, sanitation and water.

house: convection and microwave ovens, refrigerator/freezer, dual coffee makers, adjustable shelves, and over-the-sink removable cutting board, and natural light via a window behind the sink. Customers will be able to choose from a wide variety of faucets.

The standardised control panel and galley layouts make it easy for flight attendants and others to move between aircraft, regardless of whether they have a forward or rear galley, according to Fulford.

The small touches have even found their way to the cabin's air gaspers and lighting. The gaspers are electronically controlled and a recessed valve funnels the air through a muffler before it

- 7. All in the detail – cabin air is muffled to reduce noise
- 8. The ledges contain covered docking stations for a passenger control unit (PCU) and a wireless phone
- 9. Seat controls are located in the outboard armrest

8



9



enters the cabin. Air direction is still controlled manually, but this new system significantly quiets the airflow. As one would expect, LEDs are also used extensively throughout the cabin, even in places you wouldn't expect, like the exit lights.

Get real While development of the G650 is well progressed, it will be subjected to more testing in the lab and in the air before a final production variant is locked in. "We want to validate the design in a real-world environment before we start delivering the G650 to customers," said Gulfstream vice-president Pres Henne during the NBAA. **END**

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1. Flight Display Systems recently installed this 42in widescreen LCD monitor into a Gulfstream III for a Hollywood producer
2. The 10.6in screen on board this Cessna CJ4 is part of the Rockwell Collins Venue cabin management system
3. A 42in B&O screen installed on an Avro Business Jet operated by Bulgaria Air
4. An iPad mount from Flight Display Systems for use on smaller jets





4

Owners of private aircraft want the entertainment systems on board their jets to be at least as good as those they enjoy at home or on their yachts.

In visual terms that means high definition, and HD screens are fast becoming the standard on anything from wide-body conversions to the latest very light jets.

“HD is definitely all the rage right now,” says Rick Routly, business development vice president with Custom Control Concepts. “Everybody wants the highest quality screen.” His company has been distributing HD signals round wide-body and other aircraft for five years now, and he believes its ability to do so over distances of 300ft to multiple outputs without degradation is unique. “There’s a lot of folks out there going from one audio/video source, like a Blu-ray DVD player to one LCD, but I don’t know of anyone else doing what we’re doing. That is what I would say sets us apart and why we feel we are providing the highest quality cabin management/audio visual systems in the market today.”

The company installed its first 32 x 32 channel HD video switcher on a BBJ in 2006, he says. “We’re always trying to stay on the leading edge of the products out there. The consumer industry is what drives this market, but the wheel’s spinning so much faster now because of all these high-speed devices that can store a lot of content in smaller, lighter, faster packages.”

Go the distance Regulatory requirements and the resulting need for testing and qualification mean IFE applications of new technology have longer lead times than consumer products, but they are not the only considerations. “HDMI is a common

iPad impact

“We’re always interested in appropriating the latest technology devices into our industry,” says Rick Routly of Custom Control Concepts, which has already adapted the Apple iPad as a remote control. “We just commissioned a BBJ with five of them as remotes and the customer was just thrilled,” he continues. “It’s very light, it’s considered a carry-on by the regulators, and the clients just love it. They can just walk onto their aircraft and start controlling their lights and their audio/video entertainment system.”

The hardware is not modified, but the device uses a purpose-designed app and software: “The software is specifically conducive to the customer’s control, his CMS/IFE system configuration, whatever he wants to control – light shades, monitor on/off, speakers – it’s very customised, very personalised.”

For smaller jets, Flight Display Systems has developed an iPad mount that is a straight replacement for existing 7in armrest monitor mounts. “It’s on the same mounting,” says the company’s Nick Gray. “The same pin-outs even can be used for power and grounding, so it receives power to charge the batteries. It can be rotated to portrait or landscape, so people can watch a movie during the flight and it removes the surface area from their desk or lap.”

consumer format for HD signal distribution, but if you go beyond 30ft you’re going to have some degradation in the signal, some quality loss. Sometimes in a wide-body you have to go over 300ft, because the cable has to go round ballasts and monuments and structure.”

Instead, Custom Control Concepts uses the HD-SDI format, “and we’ve allowed it to do some amazing things in these narrow- and wide-body customised aircraft. There may be others distributing HD-SDI right now, but I don’t know anybody that’s distributing it simultaneously from multiple independent sources to 32 independent outputs, which are the HD LCDs, and I don’t know anybody that’s doing it over 300ft without degradation.”

Custom Control Concepts started in the wide-body industry 10 years ago, says Routly. “It’s much harder to design a system for a wide-body and keep the ambient noise out of the audio and video realm. But you can take that same system and scale it down to a narrow-body like a BBJ or ACJ, and you can easily convert it into the smaller jets. We started off on the wide-bodies now we’ve done very well on the Boeing/Airbus narrow-body market, and we’re doing really well on HondaJet too right now.”

Size matters Customers tend to want the biggest possible screen, says Routly, but they also want HD on the smaller displays: “We actually have a 4.8in HD

5. Flight Display Systems’ new iPad arm mount enables owners to replace 5 or 7in LCDs with the Apple device and its 9.7in touchscreen
6. Custom Control Concepts’ iPlane app turns iPad into a CMS controller





OnAir Takes SwiftBroadband-based Connectivity Services One-Step Further

Exhibiting on booth # E105 at the Middle East Business Aviation show (MEBA), the first and fastest-growing SwiftBroadband (SBB) Distribution Partner, OnAir, will focus on its Mobile OnAir solution, offering mobile telephony services – including voice (GSM) & data (GPRS) – on aeronautical routes covering five continents.

OnAir's own SBB-based and highly successful Mobile OnAir service enables passengers to use their own mobile phone or Smartphone (e.g. BlackBerry, iPhone, HTC) during flights to make and receive phone calls; check voice-mail; send & receive SMS & MMS; exchange emails; and be reachable on their usual number.

The Mobile OnAir solution is the only SwiftBroadband-based GSM & GPRS solution available on new production Airbus Corporate Jets (ACJ) and for retrofit via Service Bulletin on ACJs and BBJs or STC, where applicable.

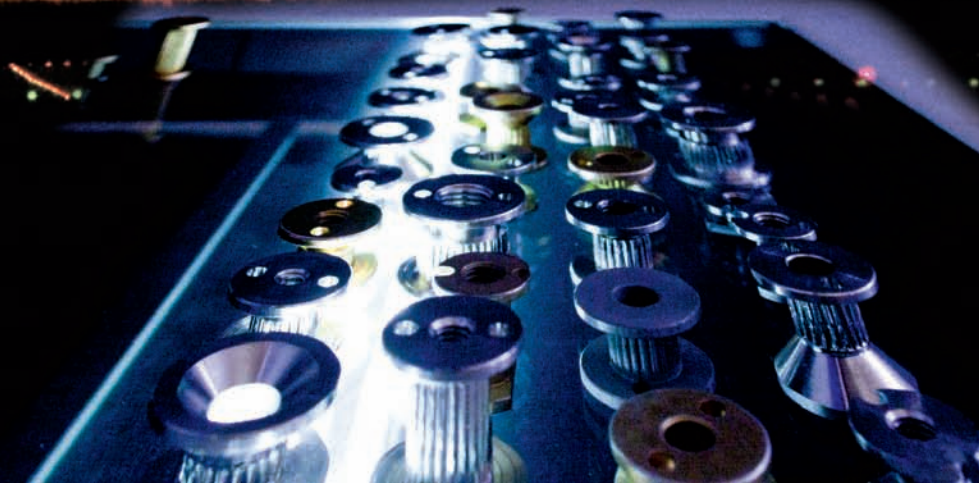
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B&O on board

Apple aside, terrestrial brands of equipment rarely find their way into aircraft cabins, but Coventry, UK-based Tenencia has revealed that it is in positive discussions with high-end audio visual manufacturer Bang & Olufsen about an aviation line of products.

The details must remain under wraps for now, but Tenencia's Paul Johnson says the original impetus came from a Bulgarian customer for an Avro Business Jet: "He owns B&O equipment and he wanted it in his aircraft. So we looked at the 40in Beovision 7 and the surround sound speaker system and we modified all the units as much as was necessary to help them pass the environmental testing they have to do." Modifications included a new back to enable the TV to plug into a mounting structure on the aircraft and various wiring changes.

The equipment was then subject to environmental testing, including operational shock testing on a centrifuge to demonstrate that it could withstand a 9g shock, temperature extremes, vibration and electromagnetic compatibility. "It all passed with flying colours," says Johnson. "The only modifications were just to interface it into the aircraft. The units themselves were very well built and made it relatively easy."



8



LCD, believe it or not, all the way up to a 64in currently, and all sizes in between." Work on an 82in screen had to be abandoned at the design review stage when it was realised that the aircraft's doors were too small for it.

Thin line Rosen Aviation has been migrating all its displays to HD over the last couple of years, says engineering vice president Jeff Unger. So far the range spans sizes from 9in to an industry first slimline 32in model that uses Rosen's proprietary remote display electronics technology to make the displays much thinner and lighter. "The

7. Tenencia's installation of a 42in Bang & Olufsen plasma screen in an Avro Business Jet for Bulgaria Air has led to talks about a possible line of B&O aviation products
8. The B&O screen was subjected to extensive testing before installation

OEMs over the last year or two have been making a much bigger push for improving the industrial design and look of their cabin interiors," explains Unger. "Quite a few of them have outside design firms creating new looks for the cabin." That has led them to seek better-looking displays.

"One of the major issues has always been the thickness of the displays," continues Unger. Rosen responded by developing technology for the larger bulkhead displays that enables the aircraft power supply and the video electronics – the main causes of thickness and generators of heat – to be mounted in a separate box up to 50ft away from the display module itself. "Being able to do that, we can take the display module and make it as thin as the LCD technology allows us to, and with the latest LCD technologies going to LED backlights, making those LCD assemblies very thin, it allows us to make our displays much thinner and lighter than we ever could in the past."

The 32in display is just over 1in thick, he says, compared with a typical 3 or 4in-thick unit: "We're using that same technology to make very thin 19, 24 and 26in displays."

And the thinner, lighter displays make installation easier. "In order to

put the displays on the bulkhead you had a lot of structure to hold the size and the weight, and because of the thermal issues with the power supplies and video boards they had to run cooling to where the displays are. And now that we can make that display assembly very thin we can give it a much better industrial design. So our 32in display actually looks more like your home theatre TV than it does a big, boxy aircraft display."

That is a big consideration, says Rosen's OEM sales manager, Mark Cook: "I think that highly stylised look in the interior has become the big focus for a lot of OEMs going forward. There wasn't a lot of difference in the interior, everybody's kind of looked the same, and I think a lot of them were saying that if you step out of your Rolls-Royce or your Maybach or your BMW and you get on your aircraft, it better look at least as good as that if not better. It costs a lot more money so you want to feel like you're not taking a step backwards."

Logic says a 9in display would be too small to benefit from HD technology, adds Unger, but seeing, it seems, really is believing: "As we've developed the display with the high-definition LCD and put it side by side



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with others, driving a standard definition signal into one and HD into the other, it's a much more drastic difference than you might expect. We questioned it ourselves, so we actually did a side-by-side demonstration. Then we presented that side-by-side demonstration to some of the OEMs, and every single one that saw that selected the HD version."

- 9. Design Q's ABJ Fusion concept features a 50in bulkhead-mounted HD monitor
- 10. A 24in super thin HD monitor from Rosen Aviation

10



Technology trends Some customers have enquired about 3D, says Routly, and Custom Control Concepts has started to research the possibilities, but his own view is that the format has little future. "I just don't see the consumer industry embracing it," he says, predicting that it will go the same way as the laser disc player of the early 1990s: "That didn't take over because the media were so large, and I don't think the consumer industry is going to embrace 3D because they have to pick up their goggles and put them on."

He does, though, expect LED TV – actually LCD with light emitting diode backlighting – to make an impact, competing closely with the LCD just as LCDs did with plasma screens. "The LCD market really took off and plasmas are soon going to be extinct," he considers. Plasmas offered better brightness and clarity when they first appeared, but improved LCD technology has eliminated that

advantage, says Routly. "When you compete the two devices, LCD is lighter, it uses less power, the displays last a lot longer, the quality is just as good, you can produce them for a lot less cost and you can sell them for a lot lower price."

He sees LED technology competing with LCDs very quickly, though: "You're able to make the displays thinner, and thinner is the other thing the aircraft owners want because it means lower weight. Another drawback with plasmas is they weigh an incredible amount more than the LCDs, because you have to have a larger power supply." Beyond that, he predicts, there will be curved LCD panels: "That's going to be the next wave. At the rate the wheel is spinning they will be introduced into this private narrow/wide-body industry very soon."

Flight Display Systems is already adding more LED backlit screens to its product line. "Our first LED backlit

screen was the 5in Flipper unit we introduced in 2007," says Nick Gray, director of international sales. "Our most recent is our 32in HD 120Hz model." The company's range extends up to 52in in size. But it is not investing in 3D, and it has focused exclusively on LCDs: "We have stayed away from plasma due to its high heat and altitude issues."

The lower weight of the latest LCDs also makes innovative mountings easier. At the NAA's annual exhibition in Atlanta in October the company showed a 32in monitor built into the lid of a credenza that also houses a Blu-Ray DVD player. "It flips up for viewing or hides away very nicely to give full use of the entire credenza," Gray comments. "It's very low profile, extremely light weight and a fantastic VIP installation." **END**

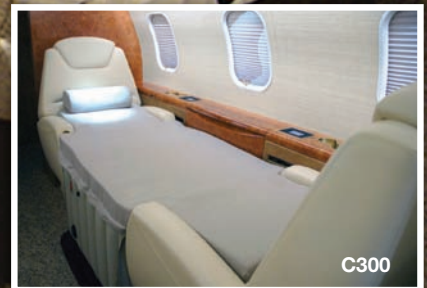
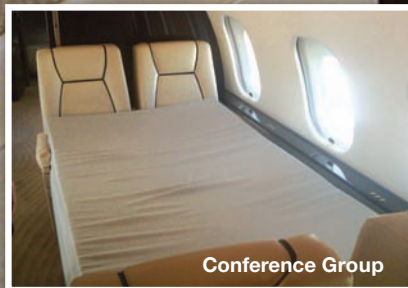
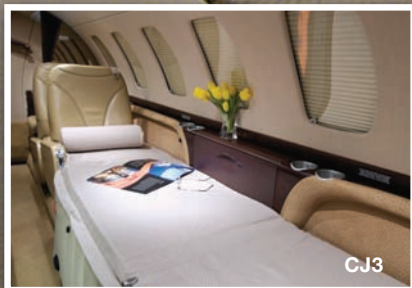
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Citation X hits puberty in style: rebranded Citation Ten features complete cabin make-over

Like most 14-year-olds, the Citation X wants to go faster, have pricier personal electronics and redecorate its room. It looks like Cessna is going to accommodate the aircraft and its customers with the launch of the Citation Ten. At this year's NBAA, the Wichita airframer announced a major block change to its venerable mid-size 0.92 Mach speedster. It gets winglets, a new glass panel Garmin G5000 avionics suite, a whizbang cabin management system co-developed by Cessna and Heads Up Technologies, sportier seats, extremely hip LED cabin lighting and a 15in cabin stretch. First flight of the new Citation Ten will be in late 2011, with certification and first delivery in 2013.

The main object of the new aircraft appears to be to give the owners of the existing fleet of more than 300 Citation Xs somewhere to go when they are looking for an upgrade. "Our existing Citation X owners do not want production discontinued," says Joel Mugglin, Citation X product marketing manager. "We are excited to give them something to think about again. We have a niche market. People who have the airplane love it and are happy to operate it."

While the X has developed a strong following, even 14 years after it was introduced, Cessnas are largely still known as docile-handling, dependable aircraft – not rocket ships. After Cessna entered the business jet market in the 1960s, its Citation line of simple and wildly popular turboprops crushed much of the turboprop market. Piper Cheyennes, Turbo Commanders, Mitsubishi's, even Cessna's own Conquest twin turboprop line went out of production. King Airs survived, but fewer were being manufactured. (After the Citation had battered King Air sales for almost a decade, Raytheon spent an estimated US\$1 billion developing a futuristic turboprop successor to the King Air called the Starship – it sold only 53 copies.)

While early Citations weren't much faster than turboprops and drank more fuel, they had the jet cache. However,

1. The Citation Ten features a 15in longer fuselage for more cabin space



- 2. Optional large galley covers the right-hand forward window and features a translucent back panel to transmit light
- 3. New vanity unit
- 4. Larger table for forward club seating group

a Gulfstream pilot I know condescendingly refers to these vintage Citations as “slow-ta-tions”.

On the green in two That reputation began to change in 1983 when Cessna unveiled the Citation III, a swept-wing medium cabin jet with transcontinental range, a 51,000ft ceiling and a 540mph top cruising speed. Then in 1990 Cessna blew the market away when it launched the Citation X programme. The first aircraft was delivered in 1996 to golf legend Arnold Palmer.

Building on the Citation III design, Cessna collaborated with Boeing engineers on a new highly swept wing – one of the aerodynamically cleanest wings ever designed. The X’s 37° wing sweep, equal to that on a Boeing 747, makes it very efficient at high speeds.

Allison (now Rolls-Royce) designed enormously powerful, efficient and



THIS GIVES THE SENSATION OF SITTING IN, AS OPPOSED TO ON, THE SEAT: "YOU FEEL CRADLED, LIKE YOU DO IN A SPORTS CAR"

quiet engines to power the Citation X. The engines come with a 2,500-hour, five-year guarantee and typically operate at only half of their maximum potential thrust, a good omen for increased engine life and lower maintenance costs. (As a general rule of thumb, the closer an engine operates to its maximum potential thrust the more maintenance it requires.) While efficient, the AE-3007C, like most jet engines, still burns a large amount of fuel at the lower altitudes. The key to taking advantage of its potential is getting high and staying there and in that sense, the X, unlike Cessna's smaller Citations, is not a good short-haul aircraft.

A dramatic belly fairing on the X improves aerodynamics and holds key

control cables, wiring and hydraulics. This frees up more cabin space compared to the Citation III. The X's seats and floor were also lowered 2in to provide more headroom. The 24ft-long centre aisle is trenched, providing 5ft 10in of headroom when standing.

But for tall passengers, the 'short' seats position knees above the waist, and some found this uncomfortable. Fold-down armrests create a more open appearance, but look like they were stripped from a minivan. Complaints about overall seat comfort prompted Cessna to order a redesign for the 2002 block change. The new seats were only marginally more comfortable. The cabin's eight single passenger seats are arranged in two facing club groups and

work/meal tables can be deployed from the cabin sidewalls. A three-place, side-facing divan can be custom-ordered for this aircraft, although it is not listed as a standard option.

Complete makeover With this newest block change, Cessna is attempting to address the aircraft's perceived shortcomings and keep it "on top". Cessna CEO Jack Pelton says this means a complete cabin makeover with new styling, more space and more storage.

And that starts with the Citation Ten's restyled seats. Aside from being more aesthetically pleasing than the old 'minivan' design, they also offer 8° of extra pitch and are less upright, allowing passengers to lean further back when in the take-off and landing position. The seat cushion has been lowered overall, but the front of the seat cushion is pitched up slightly. This gives the sensation of sitting in, as opposed to on, the seat: "You feel cradled, like you do in a sports car," explains Mugglin.

Mugglin says Cessna has yet to select a seat vendor or make decisions regarding whether to use viscoelastic memory foam in the build-up. The seats will not be offered with power-on options, but they will feature mechanical lumbar adjustments. While the cabin stretch yields nearly 9in of additional legroom in the forward club grouping and almost 5in for the rear club, it will still be necessary to swivel and reposition adjacent seats to allow an occupied seat to fully recline.

Between the seats there is a latchable storage drawer on the floor that opens into the trenched aisle. Mugglin says it is big enough for laptops, provided they are out of the case, otherwise a laptop case can easily rest on top of the drawer shroud.

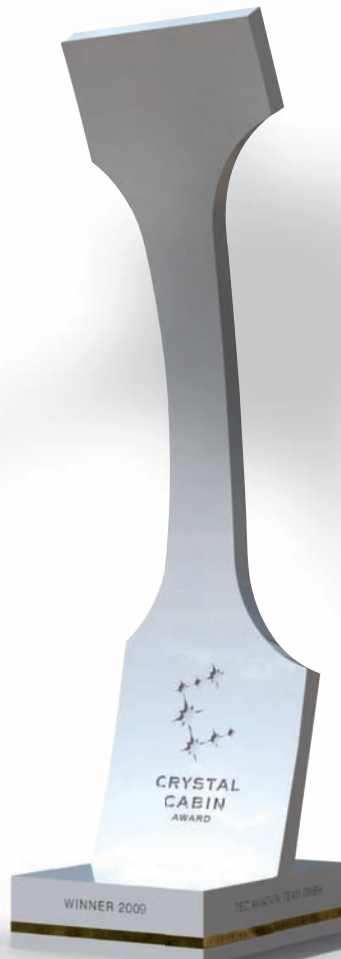


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Light relief

For the Citation Ten's new cabin management system (CMS), Cessna has opted for exclusive use of fibre optics instead of the more commonly used copper cable, not only providing sufficient bandwidth for system growth but greatly reducing aircraft weight. "This size aircraft requires almost 200ft of cable for the CMS; a fibre-optic backbone weighs less than one-tenth what a copper cable system weighs," says a company spokesperson. "Aircraft using current technology CMS architectures carry extra cable – and extra weight – to accommodate future system expansion; if not, expansion is limited. The Citation Ten's fibre-optic architecture is scalable, both for system growth and for various aircraft."

While a divan will be available on the new Citation Ten, Mugglin says it is "not necessarily something we will pre-certify and have ready".

Power play Connectivity and convenience from the seats will be substantially improved. Five 110V outlets are located throughout the cabin, with jacks available at each club grouping. While 110V outlets can be added at each seat position as an option, USB charging ports are standard at each seat position. There is a larger table in the forward club area, which becomes a snack draw in the folded position. A clever storage shelf rests above the table shroud, providing a place for retractable cup holder tabs and room for personal electronics. This ledge also contains the controls for the new cabin management system that Cessna is developing jointly with Heads Up Technologies.

The unobtrusive CMS control panel contains a screen about the same size as an iPhone. "You won't even know it's there until you touch it," says Mugglin. "It's unobtrusive, but very functional."

The CMS integrates the cabin electrical system, avionics, and communications through a fibre optic backbone. The interactive touchscreen controller at each seat controls digital audio and video, interactive moving map, cabin temperature, lights, window shades and cabin diagnostics. Texts can be sent from seat to seat and the VIP controls can be moved to any seat in the aircraft. The CMS trip computer includes a global database and can display flight data and location as well as access points of interest information.



TEXTS CAN BE SENT FROM SEAT TO SEAT AND THE VIP CONTROLS CAN BE MOVED TO ANY SEAT

5. Side ledge detail
6. The touchscreen control panel (at every seat) remains invisible when not in use
7. The control features customisable user pages, as well as flight timeline, moving map and inflight internet features

While the CMS screen is big enough to view movies, Cessna does plan on making monitor options available. High-speed internet, satellite radio and cabin WiFi are available options. Phone service will be provided via Aircell's Axxess II system, while internet will be available via Aircell's ground-based system or Inmarsat's SwiftBroadband. The CMS is scalable for future growth.

The aircraft offers both new standard and optional galleys. The optional large galley covers the right-hand forward window and has a translucent back panel that can transmit natural outside light, or the window shade can be closed to darken it. The aircraft also features a new left-hand forward closet, a new vanity and new latchware throughout.

Cabin lighting has been updated as well. The overhead white ambient lighting is lensed, dimmable and warmth-adjustable. The LED accent lighting on the side ledges, aisle and cabinetry is fully RGB colour-adjustable.



8



9

THE CITATION TEN WILL CONTINUE TO BE THE FASTEST MID-SIZE BIZJET

Driving force Cockpit aesthetics are dramatically improved as a result of the three-screen Garmin G5000 avionics system with touchscreen controllers. Key control levers such as the throttles, have also been updated with metallic accents.

Overall aircraft performance improves slightly with the addition of winglets and tweaked Rolls-Royce engines. Payload increases by 214 lb, range at high speed is boosted by 211 nautical miles to 3,107 nautical miles, and initial cruise altitude increases to 45,000ft with a decrease in time to climb. It takes only 23 minutes to reach it. However, you still have to step climb this aircraft after that to get up to the

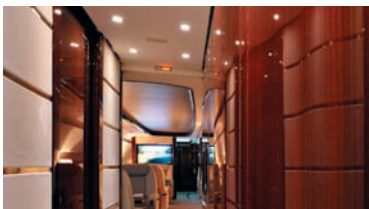
- 8. Low-profile seating contributes to a feeling of greater space
- 9. Side ledge features retractable cup holder tabs

aircraft's maximum cruise altitude of 51,000ft. Overall speed increases marginally, depending on altitude, from 2 to 19kts. On the average transcontinental trip, Cessna estimates the new jet is two minutes faster and burns 22 gallons less fuel. A hard top speed for the aircraft remains undefined, so it may be possible that the Citation Ten will lose the corporate jet speed crown to the US\$65 million Gulfstream G650, which recently flew

at 0.995 Mach. However, the Citation Ten will continue to be the fastest mid-size cabin bizjet.

When Cessna cancelled development of the wide-body Citation Columbus last year, many wondered where it would go next. Now we know – faster. **END**

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secondwind

328 Support Services and ctm design continue to collaborate on the conversion of Dornier 328 Jets for VIP use





It's fair to say that the late Claude Dornier, the founder of the firm that designed and built the Dornier 328 Jet, would be delighted. Probably amazed, but delighted. Here's the aircraft, 14 years after it first took off to fulfil its intended role as a rugged short-haul jet, now enjoying a second wind as a VIP, medium-range platform that is finding ready customers in a world still recovering from the financial crisis.

German company 328 Support Services, which holds the type certificate for the jet and turboprop aircraft, will deliver early next year the first of its new 12-seat '328DBJ' series to a South American-based customer. The company says it has a further three 328DBJ customers on its books – one in Nigeria and two in Europe.

The 328DBJ is a new-generation higher-spec 328 following on from its Envoy series, which first put the aircraft on the map as an executive variant in late 2008. Interior design, as for previous generations of the 328 Jet, is handled by Robin Dunlop's UK-based ctm design, a versatile studio that is also responsible for several winning interiors on land and afloat. Its recent aerospace projects include an Airbus A318 for a member of the Saudi royal family and a Fokker 70 for a European head of state.

Price is right The financial crisis has certainly opened up the business aviation community's eyes to aircraft such as the 328. At about US\$11-13 million with a bespoke interior, the jet is clearly finding a niche as a budget-priced alternative to purpose-built super-mid-size and large-cabin jets.

"It's a value proposition," explains Ray Mosses, head of sales for 328 Support Services, which is based at Oberpfaffenhofen Airport near Munich. "We call it affordable luxury – it's proving attractive to people who can afford a VIP jet but are counting their money." Buyers of earlier versions include a former F1 driver and private charter firm, DC Aviation.



1. Credenza rendering from a 328DBJ – the first customer has specified an all-HD CMS/IFE system, including a 32in pop-up monitor and a PlayStation 3 for his daughter

In round figures, a 328DBJ with equivalent luxury interior costs a quarter of the more storied jets from Bombardier, Dassault Falcon Jet or Gulfstream. However, the aircraft also has recognised non-financial virtues: a fuel-efficient aircraft, it can land on short runways.

“The design of the 328 means I can get in and out of almost anywhere,” says owner’s representative and pilot, Ben Bartel. “That’s a big advantage. The aircraft’s also got really good climb performance.”

Although Mosses admits the 328 is no Global Express in terms of range, speed and sleek looks, he points out that its unusually large interior has proved something of a USP with

potential customers. “Once you’re inside, it’s hard to tell what sort of aircraft you’re in,” he explains. In the 328DBJ series, which is a big step up from the Envoy, customers get an oval-shaped cabin that is 10m long, 2.15m wide and 1.8m high.

And although it is not part of the value proposition, the aircraft’s high wing affords unobstructed views that, suggests ctm’s founder and managing director, Robin Dunlop, “are very much part of the VIP experience”.

328 Support Services also holds sole certification to fit bigger fuel tanks, which extend the range to 2,000 nautical miles. And while the 328’s reach, even with bigger tanks, cannot rival that of a true super-mid or large

business jet, it is sufficient to take the aircraft from the tip of South America to the tip of North Africa, as one Middle Eastern customer does on a regular basis. For even longer hauls, the DBJ’s customers seem happy to tolerate an extra landing or two.

“You just have to accept the necessity of an additional landing, but this comes at a quarter the price of some other planes,” says Mosses. “That’s an awful lot of landing charges. If you need to fly really long distances every now and again, it’s probably better to go first class in a commercial carrier and get the luxury without the cost.”

Second life Clients have to know they will not get a new aircraft for their



THE 328'S ROOMINESS PROVIDES THE DESIGNER WITH A HIGHLY CONFIGURABLE SPACE

US\$11-\$13 million. Of all the 328s ever made, including turboprops, some 220 are still in service and roughly half of these are jets, albeit low-time aircraft with a lot of life left in them. “Buyers first have to accept the concept of a second-hand aircraft, with perhaps 5,000 hours on the clock,” explains Mosses.

According to Bartel, 5,000 hours is nothing for a 328. “They have a limit of about 60,000 hours,” he points out. But since the typical business jet does 200 to 400 hours a year, the aircraft is likely to outlive its owner.

Clients also have to understand that the 328 will not set any speed records. Long-range cruising speed is between 360-400kts, depending principally on temperature and load, but, as the owner of the first of the new generation of DBJ completions has remarked, “I

don't mind arriving a few minutes later because the aircraft is so versatile.”

328 customers also benefit from a large pool of trained pilots, as well as established engineering expertise and support inventory.

Meanwhile, the 328's roominess provides the designer with a highly configurable space.

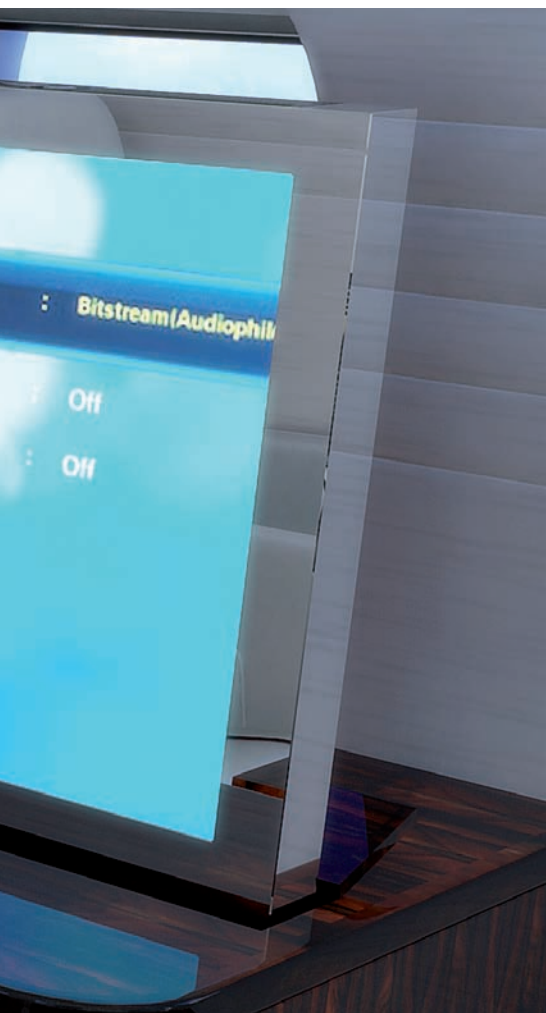
“The aircraft we've just completed has eight VIP seats and a club four dining and conference area,” explains Dunlop. “However, this aircraft can accommodate divans and a lounge-type area in various formats.”

Dunlop says he had a more or less free hand. Rather than specify an ethnic, classical or period theme, the owner asked for “a clean and functional look with nice detailing” that made the most of the cabin's spaciousness. Thus the designer opted for light colours high up and “sumptuous, rich colours lower down”.

The paint is bespoke, selected in conjunction with specialist German company Gelmar Lacquer, a 24-year-old firm that works closely with designers to help deliver their overall concept. Dunlop is a fervent admirer of its founder. “Manne Gelmar is an artist,” he says.

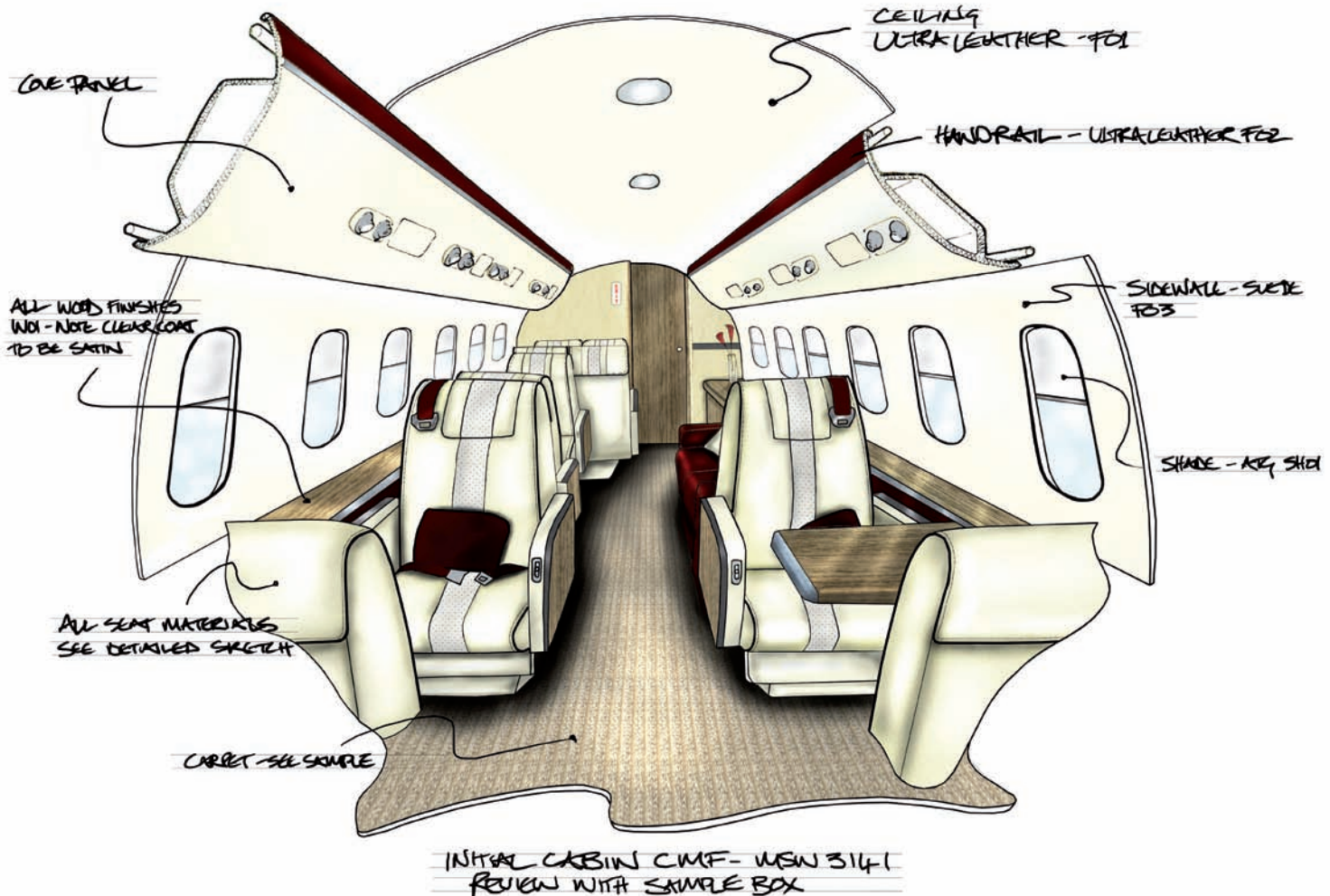
Entertainment options

“The owner of the first 328DBJ is very tech savvy – he wanted the best,” says ctm design's Robin Dunlop, who specified the aircraft's cabin management and IFE system. Two 21in HD bulkhead monitors and a 32in HD screen that retracts into a credenza take pride of place, with eight 10in monitors alongside each of the Decrane-supplied seats providing full touchscreen control, along with a further two handheld units. Full WiFi and smartphone connectivity is provided, while the owner's daughter has her own Playstation 3 console.



2





For surface materials, the design team chose a ziricote wood veneer with a deep and intricate pattern that delivers the required contemporary look.

Learning process While the practical assets of the 328 were never in doubt, Dunlop concedes that the conversion process continues to develop. “It’s been a series of incremental improvements,” he explains. “With each aircraft, we just do a little more than with the last one. I didn’t want to overload the 328 organisation. We’re taking a production-line jet and converting it into a bespoke aircraft. We didn’t want to get too clever and complicated.”

The design studio’s approach can best be described as softly, softly as 328 Support Services’ workforce continues to get its head around the conversion of a former workhorse into an *objet de*

3. Sketch showing cabin scheme and design details from a 328DBJ project

luxe. Dunlop prides himself on taking an active role in this regard. “We’re more than a design house,” he explains. “We have deep engineering and mechanical insights. More and more, the designer’s role is about completion management as much as it is about design management.”

The first of the DBJ series taking shape at Oberpfaffenhofen is two generations up on the original Envoy. The first revision saw a new cabin configuration to create a bigger bathroom, as well as the addition of LED lighting and a cabin management system (CMS) from Audio International. The DBJ series sees the redundant forward emergency exit blocked off with a new galley, as well as the addition of a forward closet, new cove panels, a state-of-the-art CMS/IFE system and electric blinds. Moving the galley to the front

provides more room in the rear for the club four dining and conference area. The extra space also enables all the seats to recline further.

One-piece ceiling and sidewall panels combine with Aerocon’s sound-proofing system, which uses insulation layering and isolation mounts to dampen noise. The 328DBJ is expected to be significantly quieter than its predecessors. Although sound tests will not be made until the first DBJ rolls off the completion line in January, the company is hopeful that it will meet 3dB speech interference levels.

The result is a “cleaner, quieter, more styled interior,” says Dunlop. “The DBJ takes the Envoy into the 21st century,” concludes Mosses. **END**

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graphic example

A new fibre optic and wireless cabin management system on the G650 improves reliability while reducing weight and wire count

One of the most notable features on the G650 cabin is an absence of switches. What switching exists is minimal. This lack of push-button potpourri goes a long way to contributing to the G650 cabin's clean lines. It's also the result of a new fibre optic and wireless Gulfstream Cabin Management System (GCMS).

The GCMS uses the Apple iPod Touch, synched to individual seats, to control the CabinView AVOD system, lighting, window shades, temperature, monitors, speakers and attendant call. Gulfstream's proprietary graphical user interface (GUI) will be developed for other personal systems such as the Android or Microsoft Windows 7 Mobile. The GCMS allows occupants to set individual preferences for these functions. However, Gulfstream does not want to tie its customers to specific hardware, whether Apple or other, because of the fast pace of change in the consumer electronics market. It will develop GUIs for whatever operating systems are viewed as industry standards.

Gulfstream developed its new CMS in house to satisfy a "mix of needs" according to Bob Geary, the company's director of final phase research and development. They included redundancy and reduction of weight and wire count. "We went out to the various cabin management suppliers and started talking to them about the various requirements," he says. "However, it soon became apparent that we were driving it beyond the requirements or





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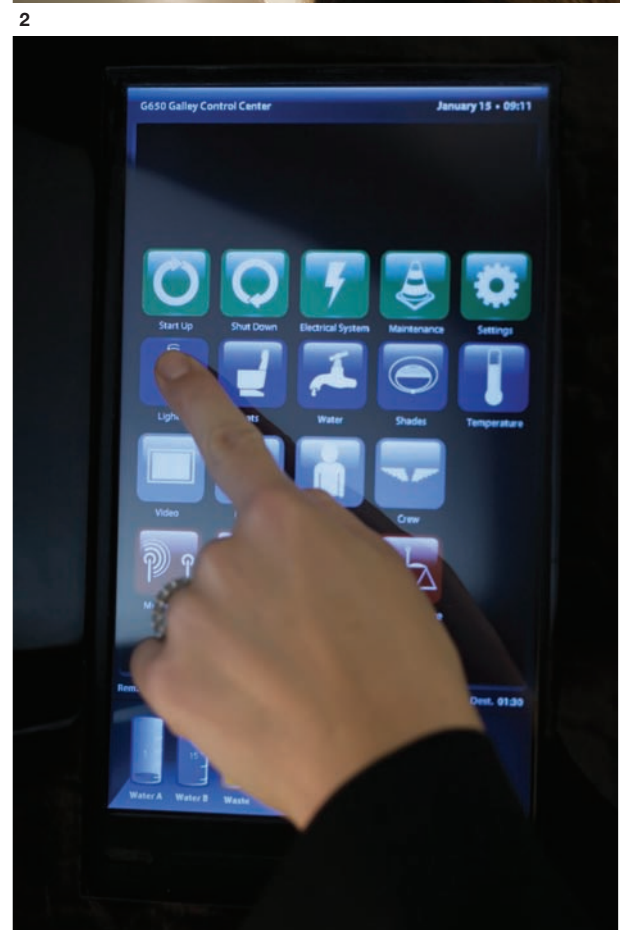
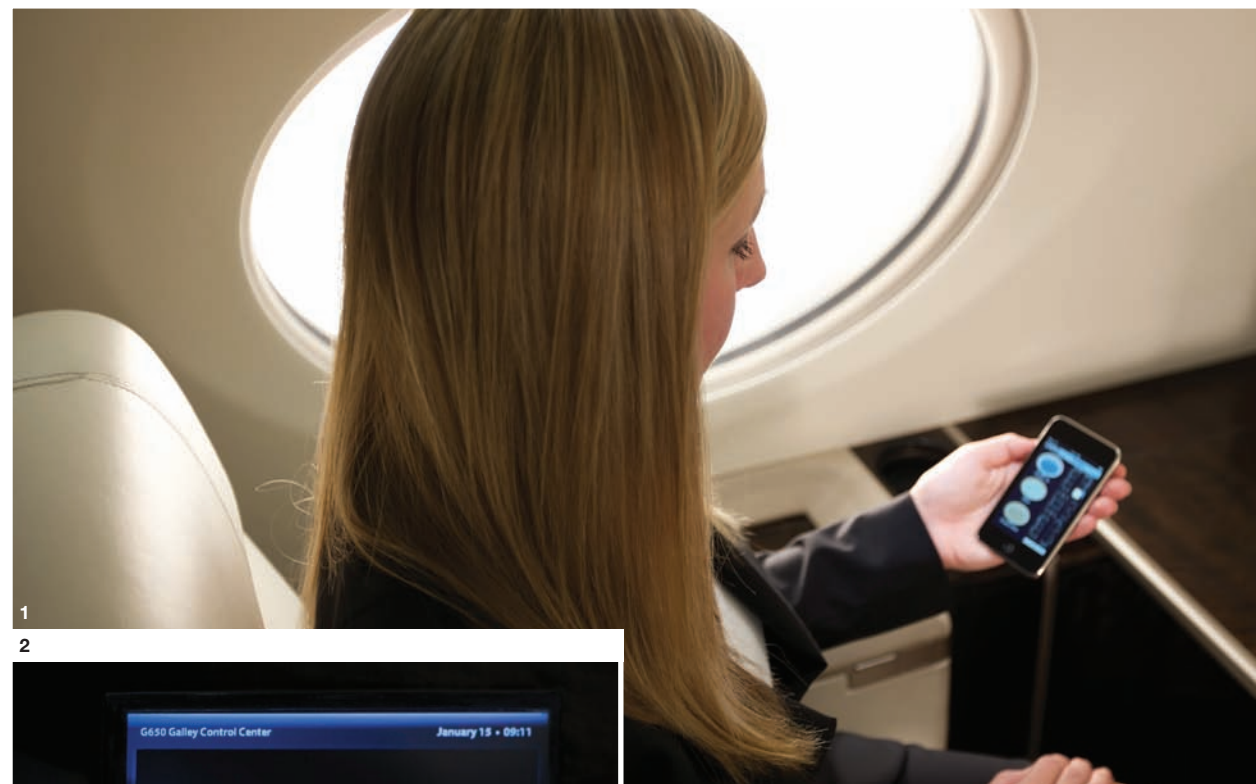
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EXPANDABILITY WAS ONE OF THE PRIMARY REASONS TO BRING CMS DESIGN IN HOUSE



1. Passengers can use an iPod Touch to control everything from the lighting to their entertainment choice
2. Galley control centre can be used to control all cabin systems

any previous cabin management system,” he continues. “We came to the conclusion that we were better off doing it ourselves so we could control the hardware and the software. We could control it and make it a modular system and scale it for different size aircraft such as the (super-midsize) G250.”

Geary said that eventually outside suppliers would be selected to produce the components, but noted that it would not be any of the traditional CMS companies. He said that expandability was one of the primary reasons to bring CMS design in house.

The system is built on multiple networks with a 24-channel fibre optic backbone used for routing audio and video and as a communications backbone for the system. The controllers, switches, and everything else that makes up the system are also wireless. They can receive commands, report status, and communicate wirelessly should primary

communications over the backbone break down. The system can also be serviced wirelessly aboard the aircraft via a laptop computer.

Fail safe This is part of Gulfstream’s much-touted Cabin Essential philosophy that basically means everything works all the time even if something breaks. Geary calls the system “redundant and reversionary”. He gives the following example of how the system compensates for faults in a nanosecond: “You are sitting in a seat with an iTouch and you press an icon that is supposed to make a light turn on somewhere. That message goes from the iTouch over a WiFi connection, through the cabin server and is routed over the fibre optic network to a GCMS controller. The controller then sends a different type of wireless message to the device that has control of the light you are trying to turn on, the light turns on, and sends a status message back.”



3 4



5



That is how it is supposed to work, but say it doesn't? Geary explains the redundancy: "Something could go wrong with the transmission or the wireless signal could be interrupted or interfered with, or something on the fibre or a chip could fail, the chain could be broken. So you press the icon to send the initial message. The controller that is supposed to be running the cabin is listening for it but there is also a back-up controller listening for it. If the first controller

- 3. Covered docking station for iPod Touch controller in side ledge
- 4. Gulfstream has designed CMS to handle HD content for entertainment
- 5. Push-button seat controls provide immediate access for passengers

doesn't take the appropriate action, then the secondary controller sends a message to the switching node that controls the light. If it doesn't get a response within a certain period of time, it assumes that the radio on the switching node or the processor associated with that radio has failed. So it changes the address and sends it to the redundant radio and processor on the switching node. All of this is there so that when you press the button, the light goes on and you (the passenger) have absolutely no idea that your aircraft has had a failure."

However, the aircraft does and the system automatically generates a failure message to the aircraft's PlaneConnect system that transmits it to Gulfstream's technical operations centre. Tech ops then sends an email to the customer describing the fault. On board the aircraft, a fault message is displayed on the galley touchscreen, so the crew can see the message and acknowledge it. Finally, at the end of a flight, the fault report is uploaded to, and is part of a report from, the aircraft's health and trend monitoring system. "A lot of things that could go wrong are immediately identified," adds Geary.

The aircraft's health and trend monitoring system monitors the data buses and collects trending information.

This database is continually updated so that data can be backtracked and used to spot likely failures before they occur in the future.

Easy to update The system is also designed to easily incorporate new technology – and not just on the controlling devices. Updating a traditional CMS with new technology can often be a vexing problem, but fibre optics make the system expandable. "The whole idea of fibre optics allows us to handle any standard," explains Geary, citing the example of converting an existing system to accommodate high-definition monitors. "We would have to go back and re-do everything because the audio switching box wouldn't be able to handle it or the network wouldn't be able to handle it. In this case we can actually distribute uncompressed 1080p (video) over the fibre network – and everything going back to that including standard definition video."

All this wireless and fibre optic capability has not entirely eliminated switches from the G650 cabin. "We've retained switch panels associated with the PSU, reading lights, table lights, attendant call – the things people are most comfortable just reaching up for the things that are right by them. But pretty much everything else can be controlled from the fixed touchscreens in the galley and entry vestibule or the personal devices," says Geary.

G650 customers will be relieved to know, yeah, there's an app for that. **END**

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belle of the ball

Edwards brings custom solutions to Bell 429 cabin



2

1

- 1. Bell 429 executive interior
- 2. The 429 cruises at 155kts

The new Bell 429 light twin helicopter was originally designed primarily for the medevac market, but an increasing number of customers are taking advantage of its capacious cabin to place it in executive livery. Demand for helicopters in this configuration is expected to increase once Bell develops a wheeled variant – the current production ships are only available with skid landing gear.

Deliveries of the long-awaited US\$5 million 429 began late last year and by year's end Bell will have manufactured 33, sold most of them and completed certification of customer option kits for the aircraft. Bell vice president Larry Roberts says the "supplier environment" in the down economy "caused us to slip a little bit on the kits". Bell is also continuing to work on wresting weight from the helicopter via manufacturing changes and perhaps certifying it to a higher gross weight.

Production in 2011 is expected to ramp up substantially and Bell is looking to boost export orders, especially from Asia, where it recently won several important customers.

Bell has also begun 429 deliveries to customers inside Canada. Those helicopters are being outfitted with VIP passenger interiors outfitted at both Bell Mirabel and its Edwards & Associates affiliate in Tennessee, USA. Edwards estimates it will do about a half-dozen executive 429 completions next year.

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Sporting behaviour To date, customer feedback on the new ship has been positive. Des Moines-based Mercy Medical Center's Mercy One placed its 429 into operation on 10 April and flew more than 65 missions in less than a month. Mercy One executives praised the 429's speed, spacious and versatile cabin, and overall reliability.

Dan Keough, Mercy One's director of emergency transport services, called the 429's performance "rock solid" and likened its speed to a sports car: "It's a Corvette – this thing is fast."

- 3. 429 cockpit
- 4. The 429 offers 204ft³ of cabin volume
- 5. 15.5in-wide utility seating can be arranged in either club or all-forward-facing configurations

The 429 breaks with several historical stereotypes associated with Bells. Namely, that they are slow and have small cabins. The 429 cruises at 150kts and its flat-floor cabin has 204ft³ of space (including 74ft³ that can be used for baggage) with room for four to six passengers behind the cockpit. Although the baggage door is large enough to accommodate out-sized items such as golf bags, rear clamshell doors are also available to facilitate the loading of truly bulky items and provide an added level of safety for "hot" loading while the main rotor blades are turning. The



luggage compartment can also be finished with a variety of flooring materials and the floor itself can be reinforced to accept heavy loads.

The overall cabin space seems even larger due to there being no partition between passengers and pilot, the oversized windows and a pair of enormous passenger doors on each side that together that are 61.9in wide. The larger, aft-sliding door opens flush along the cabin exterior, also useful if hot loading. The doors can be opened individually or all at the same time.

Full control Like cabin size, seating is also a departure for this aircraft. Pilots are treated to seats with adjustments for lumbar, up and down, and forward and aft. Seating comfort is further enhanced through the provision of adjustable control pedals. The cockpit area is far more ergonomic than in past Bells and is



OVERALL CABIN SPACE SEEMS EVEN LARGER DUE TO THERE BEING NO PARTITION BETWEEN PASSENGERS AND PILOT



equipped with easy-to-read Rogerson Kratos flat glass-panel flight displays.

Passenger seats come in three flavours: a 15.5in-wide utility seat and executive seats that are 18.5 and 21.5in wide, respectively. The 15.5in seats can be arranged in either club or all-forward-facing airline configuration. The 21.5in seats can be separated by centre consoles, effectively creating a club-four grouping. The most popular executive layout is typically three aft-facing 18.5in seats opposite two 21.5in seats demarcated by a console, although four of the larger seats and two consoles are an available option. A table can be deployed from the back of the 18.5in centre seat. The consoles can be fitted with beverage/snack stowage or IFE/communications components.

Each seat is installed on two traverse seat rail tracks attached to the cabin floor and fitted with quick release disconnects that allow them to be quickly rearranged or removed. Standard trim consists of full thermoplastic closeouts on airframe areas, a moulded thermoplastic headliner with slotted air vents, and nylon carpeting or vinyl floor covering. This can be significantly upgraded with colour coordinated fabric or leather trim, plush carpets and a moulded headliner with coordinated leather trim, LED lights and adjustable air vents. A bulkhead panel is available with or without soundproofing. A six-place aft cabin ICS is available.

Inspired ideas Edwards' vice president Paul Schreuder says executive customers have no shortage of ideas of what they want to see in a 429 interior, much of it inspired by luxury autos: "I had one customer come to me and say 'I want seats just like in the back of my Maybach.'" The über-luxury Mercedes-Benz brand produces richly appointed, V12-powered saloons that top out at around US\$700,000. A popular feature are rear seats that recline down and away from the trunk/cabin partition and have deployable legrests. Schreuder isn't sure a

ONE CUSTOMER HAS REQUESTED A LIMOUSINE-STYLE DIVIDER



6. Club four grouping of 21.5in-wide executive seating

helicopter seat with a legrest would pass the sled/drop G-loading test, but Edwards is working on a reclining seat that slides forward on its base with a new, unnamed vendor for this and other customers. Schreuder concedes it will be "not quite like the Maybach" seats.

Then again, the Maybach doesn't have in-arm monitors. Edwards can install them in the 21.5in seats. It can also substitute the factory standard console with one custom built to customer specifications with crystal glass holders, thermoses and a wide variety of consumer electronics. Some customers, particularly in the real estate field, rely on split-screen monitors that can show moving maps mated to synched presentations.

As a result of live mount vibration dampers in the main rotor gearbox, the 429 has a noticeably smoother ride than most helicopters in its class and reduced cabin noise. While supplemental sound dampening kits were available for a predecessor, the Model 430, there are no plans to offer them currently in the 429 beyond what is available from the factory. Schreuder says there isn't much of a demand for it or for cabin speakers or any kind of an audio package as most customers prefer to wear headsets with boom microphones, making it easier for them to communicate with the crew or other passengers. Individual headsets can

be isolated to facilitate private conversations or one passenger can listen to music on XM while the other makes a call on the Iridium satphone system. IFE and communications packages available on the 429 will have the ability to accommodate peripherals such as iPads.

Beyond these items, Schreuder says Edwards can do even more customisation with LED accent lights inside and outside the cabin. One customer has even requested a limousine-style divider between the cockpit and cabin with an electrically powered up and down window.

Nice price too Schreuder says most completions take four to six weeks and are generally accompanied by the installation of customer-specified avionics such as enhanced ground-proximity warning systems. The popularity of this helicopter is likely to grow in light of its price point compared to traditional VIP rides such as the Sikorsky S-76 or the newer AgustaWestland AW139 – helicopters that each cost more than twice as much. Bell is believed to be flight testing two variant aircraft – one larger and one smaller – but decisions have yet to be made on how and if to proceed with entries into those market sectors. **END**

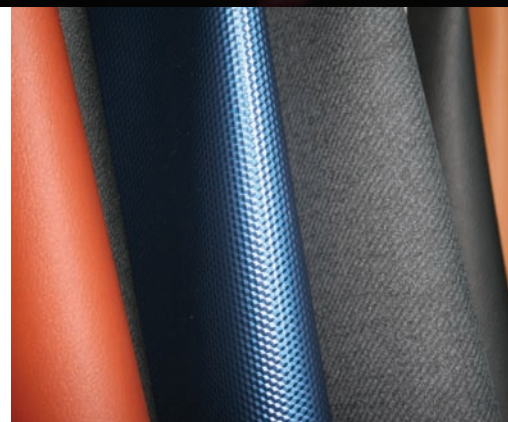
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**CABIN
STATS**

G450

Cabin Width: 7ft 4in

Cabin Height: 6ft 2in

Cabin Length: 45ft 1in

Seats: 2 crew + 11-14 passengers

Range: 4,294 nautical miles

High-speed cruise: 476kts

Max altitude: 51,000ft

Price: US\$38.2 million

large-jetreport

The large-cabin sector is about to get some new entrants including the wider and faster Gulfstream G650 and Bombardier's new Global line – but for now, here's what's currently out there

Gulfstream G350/450

Gulfstream's current production large aircraft use the same fuselage cross-section that first debuted on the GII in 1967. The G350's prime appeal is simple – when it comes to aircraft cabins, size has no substitute. Behind the cockpit, the G350's 40ft-long cabin is every bit as opulent as the one you'd find in a G450. Typical layouts feature executive seating for 12 to 16 across six floorplans. You can choose from forward or aft galleys; an optional second lavatory (forward); and mix-and-match, plug-and-play layouts within the three main cabin zones, each with separate temperature control, featuring various combinations of club, conference and divan seating. If you like to sleep in the air, an aft stateroom layout with either one or two berthing divans could be a good choice. Through the aft lavatory, you'll have in-flight access to the 169ft³ baggage hold, so this configuration provides a segregated sleeping, wash-up and changing area. The galley is big enough for two meal services and comes with a microwave, high-speed/temperature convection oven, two coffeemakers and cold drawers.

At a glance, the G450, first delivered to customers in 2005, looks virtually identical to the 20-year-old GIV. However, when carefully compared, it's easy to spot some pronounced differences – even in the airframe. The G450's fuselage is 12in longer and the cabin entry door has been moved 3ft to the right, creating a cockpit that is 30% larger. The passenger cabin also incorporates refreshed technology, including LED lighting, better

environmental systems, heated windows and updated seat-mounted controls. The aircraft's relocated main door provides a more spacious entry area. Gulfstream offers a variety of standard floor plans, with most seating 12 to 16, and will still customise an aircraft to your exact tastes – for a price, of course. The standard floor plans feature forward or rear galleys, a forward crew lavatory and a main executive lavatory in the rear of the aircraft.

A stateroom, complete with one or two berthing divans, can be created in the rear of the aircraft forward of the main lavatory. The 169ft³ baggage compartment is accessible in flight through the rear of the lavatory. The galley features a microwave, high-speed/temperature convection oven, two coffeemakers and refrigerated storage. An espresso maker is optional. There is ample space for two meal services.

The IFE package includes Airshow 4000 with moving map, dual DVD/CD players, 17in bulkhead monitors, a 15in credenza-mounted monitor (opposite the conference grouping), headphone jacks at each seat, up to four telephone locations, a fax machine and electronic shades. Single seats can be fitted with optional, individual 7in monitors. Satellite television (US\$200,000) and Gulfstream's Broadband Multi-Link System (US\$700,000) are two big-ticket options popular with G450 buyers. The latter provides internet connection speeds up to 3.5Mbps, about five times faster than dual-channel systems, and true wireless access throughout the cabin.



G350
Cabin Width: 7ft 4in
Cabin Height: 6ft 2in
Cabin Length: 45ft 1in
Seats: 2 crew + 11-14 passengers
Range: 3,719 nautical miles
High speed cruise: 476kts
Max altitude: 51,000ft
Price: US\$33.25 million

G500/G550

Compared with the G450, the G500/G550 cabin is 6ft longer. Overall cabin volume is a capacious 1,669ft³ and there is 226ft³ of baggage space. Most of that extra cabin space is used for a crew rest area and a larger galley. G550 cabins can be configured in a variety of layouts that generally seat 12 to 14 passengers. Ample natural light comes into the cabin from 14 of Gulfstream's large signature oval windows. The cabin is 88in wide and at 6ft 2in high offers true stand-up headroom.

Like the G350/G450 the main difference between the G500/G550 is one of price and range. The G500 has a maximum range of 5,800 nautical miles as opposed to the G550's 6,750 nautical miles. The G550 also has a larger list of standard equipment and more choices in the cabin, with virtually unlimited customisation available, while the G500 is offered in six basic cabin layouts.



**CABIN
STATS**

G500/G550

Cabin Width: 7ft 4in

Cabin Height: 6ft 2in

Cabin Length: 50ft 1in

Seats: 2-4 crew + 11-14 passengers

Range: 5,800/6,750 nautical miles

High-speed cruise: 488kts

Max altitude: 51,000ft

Price: US\$42.5/50.5 million





Bombardier Global 5000

Cabin Width: 8ft 2in

Cabin Height: 6ft 3in

Cabin Length: 45ft 7in

Seats: 2 crew + 11-14 passengers

Range: 5,200 nautical miles

High-speed cruise: 488kts

Max altitude: 51,000ft

Price: US\$44.7 million

Bombardier Global 5000

Designed to go head-to-head with the Gulfstream 450 and the Dassault Falcon Jet 900EX, Bombardier's Global 5000 has lots of things going for it: 0.85 Mach cruise speed, 4,800 nautical mile range, and an integrated cabin.

There are 300 possible cabin layouts – everything from seat spacing to the size of the lavatories can be varied. The 5000's cabin is spacious, light and airy, with bigger window surrounds, lots of headroom, a wide centre aisle, and many thoughtful touches. They include fore and aft vacuum lavatories, concave curved galley cabinets that yield extra work room, cleverly styled and comfortable wide executive seats with

wide arms that can be upholstered in viscoelastic memory foam, new and more practical sidewall and conference table designs, an aft stateroom, and a three-zone climate control system.

The aircraft is equipped with the latest cabin management and IFE technology; a digital distribution and Ethernet local area network (LAN), and the Rockwell Collins Airshow system – an integrated and expandable system that does not rely on circuit breakers. Other than a few master switches on the flight deck, an integrated power system electronically protects circuits and turns loads on and off. System loads in the cabin can also be controlled from the flight deck or from a galley touchscreen.



Bombardier Global XRS

Longer than the 5000, although sharing a common fuselage diameter, the follow-on aircraft to the original Global Express looks the same on the outside – save the addition of two cabin windows. However, on the inside it is a very different and vastly improved bird from the first one that rolled off the line in 1999. The galley, galley storage, aft storage, and crew rest areas have been redesigned to offer more useable space; differential cabin pressure is improved by 25%; and high-speed internet and a Local Area Network are standard

equipment. The communications suite features datalink, satcom, triple-channel Inmarsat, single-channel Iridium, and an Ethernet-based cabin electronics system.

Initial completions, many done by outside centres, on this aircraft were problematic, so Bombardier has brought the work in-house to its Montreal facility.

The baseline floorplan seats 11 passengers comfortably and offers an additional seat in the crew area. The mid-cabin area features a dedicated workstation with all the amenities of

an office environment. A fifth passenger can join a conference in the double-club seating area as a result of a swivelling seat. Other floorplans can seat up to 14 passengers.

Aircraft performance is improved, due to the addition of a fairing fuel tank that holds 1,427 additional gallons, and an engine software tweak that yields substantially better high/hot performance. Range improves to 6,150 nautical miles at 0.85 Mach.

Bombardier has delivered more than 300 Global Express and Global XRS aircraft to date.



CABIN STATS



Global XRS

Cabin width: 8ft 2in

Cabin height: 6ft 3in

Cabin length: 48ft 4in

Seats: 2-4 crew + 11-14 passengers

Range: 6,471 nautical miles

Top speed: 505kts

Max altitude: 51,000ft

Price: US\$53.25 million

Bombardier Global XRS

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**CABIN
STATS**

Global XRS

Cabin width: 7ft 2in (2.19m)

Cabin height: 6ft (1.85m)

Cabin length: 28ft 6in (8.72m)

Seats: 2 crew + 8 passengers

Range: 3,100 nautical miles (5,741km)

Top speed: 470kts (870km/h)

Max altitude: 45,000ft (13,716m)

Price: US\$24.275 million

CABIN
STATS**Dassault Falcon 900LX****Cabin Width:** 7ft 8in**Cabin Height:** 6 ft 2in**Cabin Length:** 33ft 2in**Seats:** 2 crew + 11-14 passengers**Range:** 4,750 nautical miles**High-speed cruise:** 460kts**Max altitude:** 51,000ft**Price:** US\$41.35 million

Dassault Falcon 900LX

The wide-cabin Falcon 900 trijet combines unequalled performance and versatility with a design that has remained popular since deliveries began in 1986. More than 400 are in service. Dassault Falcon has begun deliveries of the latest iteration in this series, the US\$41 million Falcon 900LX, featuring improved range and modernised avionics.

Compared with its predecessor, the 900EX, the new model will use less fuel and have an extra 300 nautical miles of range – a boost to 4,800 nautical miles – as a result of Aviation Partners' composite blended winglets that reduce drag during climb and cruise flight.

The 900's flat-floor, 1,264ft³ cabin features a galley opposite the main entry; a small forward closet; a forward club-four grouping of

larger executive seats bifurcated with folding sidewall tables; then four narrower seats arrayed around a hi-lo conference table across the aisle from a credenza/entertainment centre. Aft of that through an optional pocket door is a three-place, side-facing divan with berthing top that converts into a bed across the aisle from an executive workstation. Behind that is the lavatory with another small wardrobe closet and through the lavatory passengers can access the baggage compartment in flight.

IFE and communications options include satcom and high-speed internet. Natural lighting comes from 24 smallish windows – these could be bigger while the height of the seat bases could also be improved – for taller folk, they are a little short. Otherwise, it is airy, light and elegant.



Dassault Falcon 7X

Operators who fly out of shorter runways or airports at higher elevations, or who need unrestricted over-water routing, have traditionally gravitated towards Dassault's signature three-engine design. The 7X gives them more reasons to do so: it has an estimated long-range cruise speed of 0.80 Mach and an unrefueled range of 5,950 nautical miles (6,842 statute miles) – meaning it can fly nonstop between New York and Riyadh, Paris and Singapore, and Los Angeles and Rome.

Its cabin can be configured for 12-14 passengers and is 6ft longer than that on the Falcon 900. The extra length provides room,

depending on which of the nine major cabin configurations a customer selects, for forward and aft lavatories; a third flight-deck seat; a crew rest area; more closet space; and more passenger legroom or a 50in-long galley/work area. The forward galley, lavatory and crew rest areas can be closed off from the main cabin by deploying a pocket sliding door in the forward cabin divider.

A typical cabin configuration includes the forward and aft lavatories, galley and three seating areas, including a club seating section with four facing larger executive seats and foldout sidewall tables; a conference grouping with four narrower seats and an electrically

activated, folding hi-lo table and opposite sidewall credenza; and an aft stateroom with one or two divans that fold out into beds and/or executive single seats.

These three zones have separate climate controls. The environmental system maintains a maximum cabin altitude of 6,000ft and provides for more even heating than on earlier models.

Dassault also took a fresh approach to cabin lighting in the 7X. Its 28 passenger windows are 2in higher and 20% bigger than the windows on the 900, enabling a better field of view and more natural illumination. Emteq LEDs replace traditional fluorescent lighting.



CABIN STATS

Dassault Falcon 7X

- Cabin Width: 7ft 8in
- Cabin Height: 6 ft 2in
- Cabin Length: 39ft 1in
- Seats: 2 crew + 11-14 passengers
- Range: 5,950 nautical miles
- High speed cruise: 490kts
- Max altitude: 51,000ft
- Price: US\$48.6 million



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A round up of innovations in the business jet seat market





stretching out

Iacobucci HF Electronics, a leading manufacturer of galley inserts for commercial and business aviation, has entered a new market with the launch of a VIP seat designed by BMW Group DesignworksUSA. A new business unit and team were created by Iacobucci HF to manage this new product line, initially targeted at the business jet market. The entire product development was market driven, with transparent and customisable options for OEMs.

Taking Iacobucci's seat mechanism, DesignworksUSA created a premium seat design focused on the theme of perceived lightness. Using contour control and paying attention to negative space, the design team aimed to convey openness and transparency. For example, to emphasise lightness the designers removed material from the armrest.

Featuring a single backrest structure, a height of 45-46in (114.3-116.8cm), and a 7in (17.8cm) deployable and extendable legrest, the new VIP seat is designed to guarantee maximum comfort and support the body in various seating positions. A cradle recline mechanism with a seatpan tilt coordinated with backrest recline and a fully retractable armrest with friction drop-down movement convert the seat surface into a fully flat bed. The headrest movement includes vertical, horizontal and tilting features.

The new seat is manually operated, but electronic controls can be installed as an option. It was designed to boast a light structure and smooth movement, making it lightweight and easy to install and maintain, thus reducing operational costs. Conceived and developed with a customer-oriented approach, the VIP Seat can be customised to suit individual needs and fit a variety of cabin interior designs.

Continuing its focus on customer satisfaction, Iacobucci has strengthened its customer support network with an increased number of repair stations worldwide as well as an agreement with Lufthansa Technik in Tulsa, USA, to service the US market. A dedicated VIP Seat customer service team and call centre have been established, together with a spare parts stock department.

www.iacobucci.aero

defyinggravity

B/E Aerospace has launched a new Zero Gravity concept seat. The seat places the passenger in a zero-gravity position where the kneeline is elevated above the heart, a position designed to relieve back and bottom stress during long flights. An added benefit of this position is that it eliminates forward slipping that can be found in traditional seats when placed in a lounge position. “With this groundbreaking technology, our customers can truly customise their product offering to suit the diverse needs of their end users,” says Chuck Barresi, vice president/general manager at B/E Aerospace’s Business Jet Group.

Another recent development is the Ultimate Comfort Technology (UCT) Electric Divan. Features include a new low-back design for unobstructed views and natural light from cabin windows; electric actuation that moves the divan from an upright three-place seating surface to a fully retracted twin bed; and under-seat storage. Integrated airbags are under development. No harness towers or raising backrests are required for takeoff and landing.

www.beaerospace.com



pipinghot

Millennium Concepts of Wichita, Kansas, USA, has signed a contract to provide passenger and crew seats for Piper Aircraft’s new very-light jet, the PiperJet. The seats have been ergonomically designed to provide safety and support, and are equipped with adjustable headrests, a break-over seatback and recline. The passenger seat will include a three-point restraint system. The crew version of the seat adds a dual-harness torso restraint system, adjustable height, floor tracking and lumbar support. Both seats have energy absorbers in the seatpan and feature bolsters around the torso and thighs for support.

The seating has undergone extensive testing. “This testing has demonstrated that it is one of the safest and most reliable seats available for this class of aircraft. In fact, it has been shown to withstand loads of up to 30 times the force of gravity (or 30g), while maintaining compliance with the FAA’s standards,” says Kevin Reifschneider, president and managing director of Millennium. “In tests conducted at the National Institute for Aviation Research, the seat performed exceptionally well and exceeded the FAA standard and performance criteria.”

“For years aviation seat designs have sought to emulate automotive technology when it comes to both comfort and ‘producability’ – a design that can be produced in quantity with consistent quality – and this seat fits that description,” says Reifschneider. “We’ve incorporated lighter materials, injection moulding and high-precision CNC-based manufacturing techniques in the production of this seat, as opposed to traditional welded frame design using steel, which is generally heavier and less efficient.”

The single-engine PiperJet will provide cabin seating for up to seven people. Highlights of its interior will include leather seats, zebra wood details, rich fabrics and trim, storage, cup holders, and docking stations for personal electronics.

www.millennium.aero

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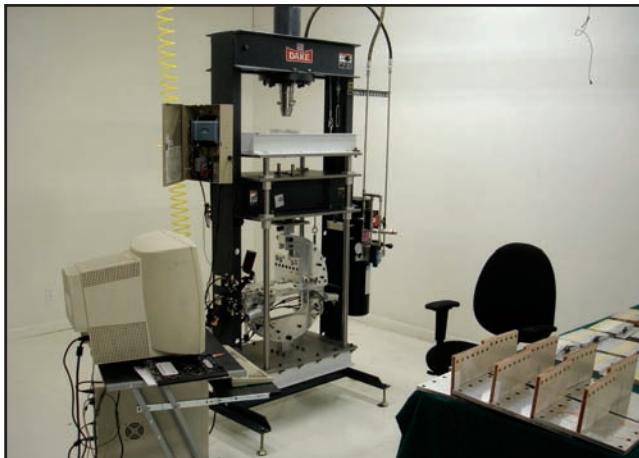
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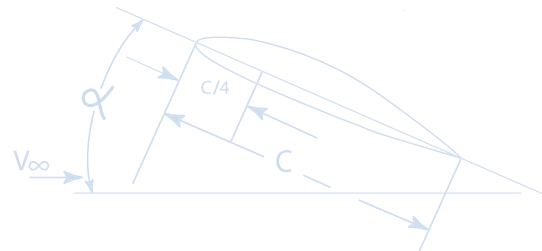
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AeroNautique

Aircraft Design and Analysis

Static Test Lab

AeroNautique now has a fully operational static test facility adjacent to the Tulsa International Airport (TUL). The test facility features an adjoining machine and cabinet shop for rapid response to fixture and/or component modification.

Static test capabilities include pull tests for interior monuments (Galley, Bulkheads, etc) and FAA approved allowable test programs (Panel Pins, Bonded Joints, Inserts, Latches, Bonded Fitting, etc).

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Photos may include components from Bizjet International – a leading narrow body completion center.

magnificentseven

With a backlog of seven Airbus Corporate Jet Family completions, the Airbus Corporate Jet Centre is increasing its resources to handle its growing services activity

The Airbus Corporate Jet Centre (ACJC) – a specialist in Airbus Corporate Jet (ACJ) Family VIP cabin completion and associated services based in Toulouse, France – has been so successful in winning new business that its facilities are essentially full until mid-2012. Of the seven cabins planned, three are currently being outfitted in the centre's facility and one is about to be delivered to an undisclosed customer.

This A320 Prestige has a wide and tall VIP cabin that features an elegant and cosy forward lounge with club seats and a divan, a bedroom with a large en suite bathroom, and two VIP guest areas.

This aircraft is the first operational A320 Prestige equipped with Airbus' GSM onboard system. ACJC has succeeded in adapting the sophisticated GSM technology to the VIP cabin and airframe systems, enabling passengers to use their mobile phones during flight. The cabin also features mood lighting, new touchscreen technology, satellite TV and advanced passenger entertainment and communications – including a passenger flight information system, internet and audio/video on demand.



"With the brand-new Airbus GSM onboard system, an exceptionally low noise level of significantly less than 50dB in the bedroom, and a cabin lighter than its target weight, this latest outfitting reaffirms our technological know-how and leadership in ACJ cabin completion," says Benoit Defforge, CEO of ACJC.

VIP Pass Over the last three years, ACJC has already completed and delivered five VIP cabins. ACJC also specialises in tailor-made services and maintenance for ACJs, including the A320, A330 and A340 families. Increasing its teams and the capacity of its facilities, the company recently launched VIP Pass, a package of services developed for executive and private operators of ACJ aircraft.

"VIP Pass confirms the ACJC team's commitment to supporting every operator's ACJ aircraft throughout its life, maintaining its airframe and engines at the highest standard of quality and certification," says Fabio Beretta, ACJC's head of customer support and services.

The team has also created a VIP conversion kit, which allows the forward A320 passenger area to be converted into a spacious VIP section. Installed in less than eight hours, the kit gives customers the opportunity to have a multimission aircraft for VIP or commercial transport. The first kit was recently delivered for an undisclosed customer's A320, giving the aircraft a dual-role capability. The company also made provisions for subsequent installation of the kit for the same customer on a second A320 aircraft.

"ACJC is now capitalising on its experience and know-how with this VIP conversion kit solution, which is the quickest to install in the current VIP market," says Bruno Galzin, head of sales and marketing at ACJC.

ACJC

Reader Enquiry No. 501

1. ACJC offers cabin completion services for the ACJ Family aircraft range
2. The company also provides maintenance services for all ACJs

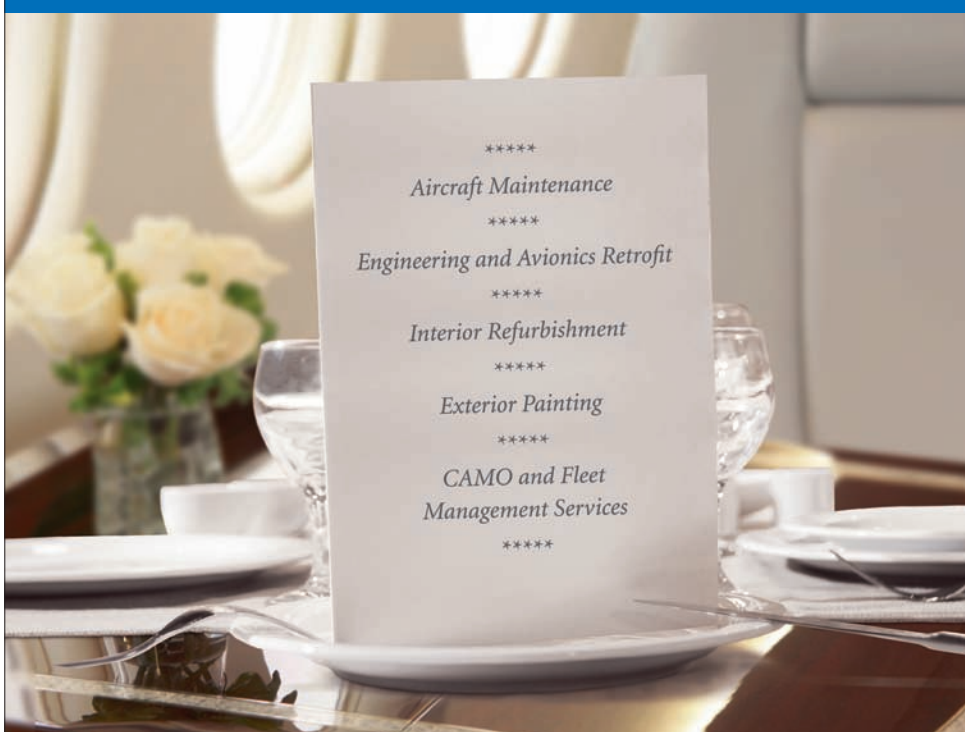


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lockingup

The merger of Sacs and Boysen in 2006 created a group offering a huge range of locking and connecting products in stock for the aerospace sector

The Sacs Aerospace Group was formed in 2006 with the merger of Sacs and Boysen. Then in 2009 the group acquired 100% of Rolf Boysen Beratungs, and 15% shares in Paolo Astori. The Sacs Aerospace Group focuses on the development, production and sale of locking and connecting systems, as well as special solutions for the aviation industry.

Sacs is located in Rottweil, Germany, and was formed in 2002 as a specialist in the production of fastening and connecting systems. Sacs is also a specialist in the development and manufacture of aircraft interiors.

Sacs' product range for business jets includes all kinds of table mechanisms, partition door mechanisms, damped hinges, armrests, flight book holders and all metallic parts inside the aircraft. It also offers a variety of latches (pin, hook, trigger, double button and emergency exit door), tie rods and struts, as well as standard parts such as inserts, studs, bolts, washers, nuts and screws. System offerings include the Ram air system for the A318-A321 aircraft, flanges fuel system for the A380 and B787, and assemblies for the ARJ21.

Boysen was founded in 1967 and produces washers and several nuts for the aerospace industry. Its main business is

the distribution of aerospace fasteners, with one of the world's largest stock – over 12,000 different parts.

Boysen's headquarters, sales office and warehouse is located in Munich, Germany, and it has additional sales offices in Hamburg, Germany, as well as in the UK and France.

Boysen says its global network of representatives ensures that it can respond quickly and that orders are processed on time.

In stock Boysen's product range at Munich incorporates (but is not limited to) metric and unified fasteners and electrical components, including screws, nuts, washers, rivets, inserts, hi-loks, latches, bolts, straps, bushings, collars, wires, springs, fitting, hinges, swivels, hinge bearings, sleeves, terminals, connectors, shims, balls, bearings, quick-release pins, ground straps, seals, rings, clamps, cables, split pins, pins, sockets, binders, cylinders and tools.

The Sacs Aerospace Group regularly exhibits at the Aircraft Interiors Expo in Hamburg, and in 2011 it will also exhibit a selection of its product range at Aero India 2011 (to be held in Bengaluru, India, on 9-13 February 2011).

Sacs Aerospace Group Reader Enquiry No. 502



- 1 Folding table mechanism
- 2 Inserts, studs, bolts, washers, nuts and screws are also available
- 3 Latch detail
- 4 Moveable cup holder

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industrialstrength

For BaySys, strong engineering is vital to successful completions

Starting as an engineering and certification house, BaySys Technologies then expanded into a full-service aircraft modification, completion, maintenance and overhaul centre. "We are an engineering-driven organisation," says Steve Walton, CEO at the company. "In this industry, engineering and certification capability is an area of weakness. For us, it is a strength."

BaySys is located on the highly secure NASA research airport at Wallops Island, Virginia, USA. The company specialises in wide-bodied head-of-state, VVIP and governmental special mission aircraft, and is currently working on an A340 and a Boeing 777. The A340 is undergoing FAA-sanctioned flight testing, while the 777 is scheduled for redelivery in the first quarter of 2011. Earlier in 2010, Boeing named BaySys a licensed Boeing VIP Airplane and Boeing Business Jet (BBJ) Completion Center. The agreement covers legacy, current and future aircraft such as the 747-8 and the 787.

Walton firmly believes that strong engineering is vital to hassle-free modifications and completions. He founded BaySys 13 years ago, after duty as a communications officer on a VVIP A340 operated for the government of Saudi Arabia. He also spent over a year supervising that aircraft's purchase and completion. Several of his colleagues at BaySys have similar experiences and Walton says that gives the company a unique, customer-driven perspective. "We know what to do and what not to do because we have actually operated these aircraft," he says.

BaySys recently completed a three-year test and certification programme with Boeing and

Messier Bugatti for the electric braking system on the new 787. In 2007, it worked with Eclipse Aviation and Swift Aviation to develop the single-engine Eclipse Concept Jet, a project that went from conception to first flight in just 200 days. It has developed numerous supplemental type certificates (STCs) for wide-body completions, including for the A340. One of these is for the design and parts manufacturer approval for a proprietary reclining and lie-flat VVIP 'cocoon'. Another was for the adaptation of the A319 forward crew rest area to the A340, eliminating the need for the crew to traverse the VIP section to get to their rest area.

BaySys also has a lot of experience with IFE and secure communications installations. It holds STCs for a variety of satcom, wireless, Direct TV, Aircell and cabin management systems, and manufactures and installs its own secure communications equipment and accessories for government and head-of-state aircraft. Over the years BaySys's Interad division, located in nearby Melfa, Virginia, has manufactured more than 15,000 receivers for the US Department of Defense and other clients. Interad's product line includes antennas, filters and receivers.

This vertical integration extends to cabin component build-up, from cabinetry to soft goods, manufactured at a BaySys-owned plant 20 miles from the airport. BaySys maintains a large inventory of Nordam honeycomb interior panels, which Walton says speeds up the fabrication of bulkheads and cabinets, cutting typical cabin completion time from two years to one. Not requiring a down payment until after the preliminary design review is another way BaySys eases completions for its customers.

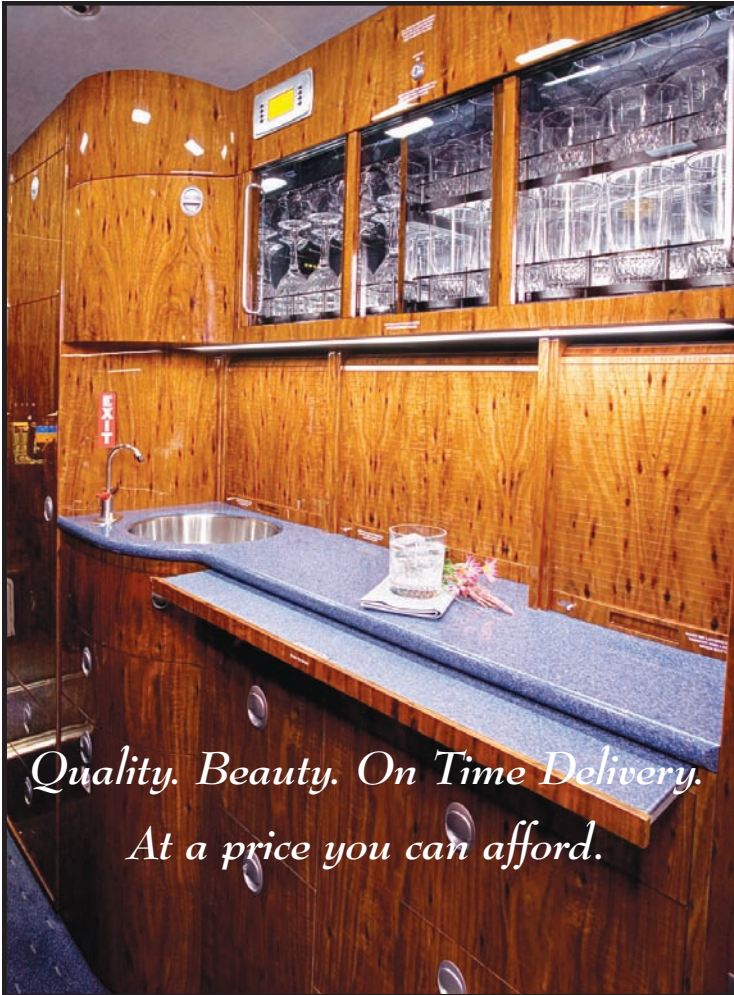
Going forward, BaySys is developing a large new hangar complex that should be open in time to receive its first 747-8 completion in 2012. 2010 has seen the company acquire several wide-bodied aircraft on the open market. Walton does not envision any difficulty moving these: "We believe the market is going to recover and when it does there will be a shortage of mod centre capacity," he says. "We will be ready."

1. The state room for a B777 completion
2. The lie-flat VVIP 'cocoon' for the A340



BaySys Technologies

Reader Enquiry No. 503



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showandtell

A variety of new airborne telecommunications options were launched by TrueNorth at NBAA 2010

While most aircraft operators are familiar with the Inmarsat and Iridium Satcom networks, several new off-aircraft options and new ways to use existing networks were announced at the recent NBAA Annual Meeting and Convention (held in Atlanta, USA, on 19-21 October 2010), all of which aim to improve airborne communications and save on operating costs.

One global solution is TrueNorth Express, a compact, plug-in hardware module that lets owners of virtually any brand of airborne telephone use their smartphones to send and receive emails worldwide over the Iridium Satcom network. Compatible with single- and multichannel Iridium systems, the TrueNorth Express unit offers instant support for all WiFi-enabled smartphones.

"Basically, TrueNorth Express provides a self-contained WiFi hotspot for email over smartphones," says Mark van Berkel, president at TrueNorth. "We showed the prototype to a number of business aviation users and they immediately saw that it enhanced the value of their existing single-channel phones by allowing them to stay in touch worldwide, at any altitude."

To help passengers make the most of their smartphone connectivity, the company introduced a compact USB charger, which can be used to recharge smartphones during flight. TrueNorth also announced two additional Express products designed specifically for Magnastar operators,

enabling passengers to send and receive email through their current Magnastar systems using the LiveTV Airfone network. TrueNorth Express Portable is a modular, self contained, carry-on solution the size of a 15in laptop computer that plugs into an existing Magnastar system to create a data link to the LiveTV Airfone network.

TrueNorth Express for Magnastar is a permanently installed box that does the same thing.

These developments followed on the heels of another TrueNorth announcement – that it will team with LiveTV and Satcom Direct to revitalise the popular air-to-ground Magnastar with open-architecture hardware derived from TrueNorth's Simphone OpenCabin airborne telecom system.

Another item of significance to global operators is the expansion of ViaSat's worldwide Ku-band application, Yonder. The service provides internet broadband access, VoIP, IFE and other office-in-the-sky applications. For aircraft equipped with TrueNorth's Simphone OpenCabin airborne telecom system, Yonder service is available via a simple software upload, with no additional hardware required other than the Ku-band Satcom system itself.

TrueNorth also announced a new software application, InControl, designed to help operators reduce their inflight broadband usage and recurring service costs. Key features of InControl, which should be



available in early 2011, include the ability to track service usage on all off-aircraft networks, including Inmarsat, Iridium, Ku-band and Magnastar; specify the volume of broadband traffic allotted to each passenger; automatically select the most affordable off-aircraft communications link; and coordinate and simplify service billing. The company says InControl is easy to set up and use, gives operators greater control over almost every aspect of service, and is especially useful for fleets. As with other TrueNorth applications, no added hardware is required.

For e-commerce applications, TrueNorth introduced a slimline handset that maintains the profile of its popular Simphone unit while incorporating a credit card reader (CCR) on the side. The new Simphone CCR handset supports real-time credit card billing in flight, as requested by fractional operators and other aircraft owners who deal with multiple groups of passengers. The launch customer is Gore Designs of San Antonio, Texas, USA, which has ordered 50 units.

TrueNorth Avionics Reader Enquiry No. 504



1. The new CCR handset, which includes credit card reader technology
2. TrueNorth's USB charger works with all smartphone brands
3. TrueNorth Express lets operators send and receive emails via WiFi smartphones

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theextramile

Although based on a successful auxiliary fuel system business, PATS Aircraft Systems also offers maintenance, modifications and completions



PATS Aircraft Systems prides itself on taking customers the extra mile, literally. For decades the company's auxiliary fuel systems have been extending the range of aircraft and OEM business jet platforms by as much as 50%. In September 2010, the FAA approved PATS' latest STC for the Boeing 757 auxiliary fuel system, which is designed to increase the total range of the aircraft, potentially to over 5,000 nautical miles (9,260 km). The new STC also adds to the certified systems offered by the company, which also includes the 737NG, 767, CRJ200 and CL850 aircraft.

"PATS' outstanding quality and delivery performance allows us to enjoy a very positive working relationship with our valued OEM customers for supply of the PATS auxiliary fuel systems," says John Martin, CEO of the company. "In the aftermarket, we anticipate that private, commercial, cargo and special mission operators will find increasing value in our auxiliary fuel systems as a viable means of employing existing fleet aircraft across a much broader route structure, all made possible by the extra range."

While the auxiliary fuel business is the cornerstone on which the company was founded nearly 30 years ago, it has given rise to expertise in other aspects of executive and VIP aircraft services. PATS is also a leading provider of VIP aircraft maintenance,

modifications and interior completions. With 20 VIP aircraft interior completions delivered, it ranks among the most experienced narrow-body completion centres.

As a BBJ-centric hangar facility, the company has a unique approach to serving this VIP market. "PATS has hands-on experience with the BBJ platform that is unmatched in the industry," says Matt Hill, director of sales and marketing at the company. "Our diverse business model allows us to approach our VIP customer projects in a unique way, not based on volume, but rather through a focused hangar plan that includes a single interior completion in work at any given time to complement our BBJ and other auxiliary fuel system installs and ongoing BBJ maintenance and cabin interior modifications."

PATS says that many BBJ aircraft are nearing 12 years of operation, and as a result, are facing large scheduled maintenance events and interior systems obsolescence. The company is prepared to support its existing and new customers as a one-stop-shop solution for maintenance and interior modifications and is currently scheduling hangar slots for 2011 and 2012. "We're prepared to provide every aspect of service and support the owners and operators need, from pre-buy inspections to heavy maintenance checks and from minor interior soft goods replacement to complete CMS replacements and interior reconfigurations," says Hill. The company says its in-house design engineering and FAA ODA designation enables smoother, quicker certification and regulatory approvals, which means shorter downtime for operators.

PATS Aircraft Systems Reader Enquiry No. 505

1. The company's facility in Georgetown, Delaware, USA
- 2-3. A BBJ completion for a US-based customer





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smoothmove



In a market offering diverse opportunities, purchasing a bizliner involves the skilful balance of many factors – such as the payload range to be achieved, the cabin size required, and the overall budget to acquire, outfit and operate the aircraft. Furthermore, bizliner outfitting is constrained by technical and regulatory issues – the cabin weight affects the performance of the aircraft once completed, while STC certification is highly complex due to a huge range of new technologies and the uniqueness of each aircraft interior.

In the face of these challenges and potential risks, Altair Aero Projects (Altair) offers turnkey project management solutions designed to make bizliner acquisition and outfitting a smooth experience. The company enforces a combination of technical and regulatory skills and financial expertise, allied to a legally sensitive approach and a vast experience of managing projects in the aviation industry over the past 25 years.

Right from the start, Altair defines the customer's needs, expectations and requirements, then calmly manages all technical, operational and financial due diligence. In the case of second-hand aircraft, it evaluates which maintenance checks or upgrades must be factored in as leverage against the asking price, and advises customers when to walk away.

Altair warns that although the majority of completion centres work diligently to meet customers' expectations, bizliner completions are high-stake projects fraught with challenges and pitfalls; inexperienced or insufficient project management can compound this further, so outfitting is inevitably delayed, and costs can easily overrun by several million US dollars.

Altair says that success requires precision and constant monitoring. The company independently manages aircraft as assets to ensure their integrity and value are maintained and enhanced at all times.

Altair Aero Projects

Reader Enquiry No. 506

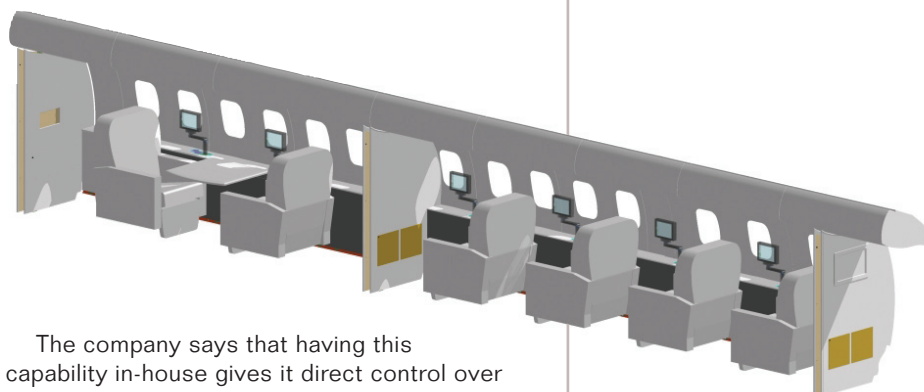
supersixty

With over 60 years in business, it's no surprise that engineering expertise at Field Aviation is nothing less than impressive. The engineering team has a diverse skill set gained from years of working in both the OEM and aftermarket industry. Benefiting from the invaluable knowledge of long-term employees and the fresh new ideas of younger staff, the group boasts an average of 16 years of experience.

"It is a unique team with a clear passion for aviation," says Carrie Servos, sales director, business development at Field Aviation. "Combine their enthusiasm with their wealth of knowledge and there isn't a modification programme we are not confident to take on."

With many Transport Canada delegates in interiors, avionics/electrical systems, flight testing and structures (including damage tolerance evaluation), Field Aviation has one of the broadest ranges of airworthiness delegation for Canadian modification facilities outside of the OEMs.

"As a Transport Canada Design Approval Organization we can certify most modifications internally – speeding up the certification process," says Mark Bennett, director of engineering at Field Aviation.



The company says that having this capability in-house gives it direct control over the design and enables it to address changes efficiently. All design development also involves the production team. "The feedback we get from the technicians who will be building the components and installing them on the aircraft is an invaluable part of the design process," says Paul Campbell, manager of interiors engineering at Field Aviation. "It is important to ensure the design is both technically and functionally sound."

Not only does the company utilise these resources extensively for in-house modification programmes, but it also offers consulting services should an OEM or aircraft operator require assistance with their design or certification efforts.

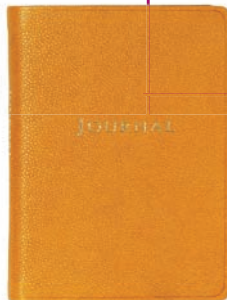
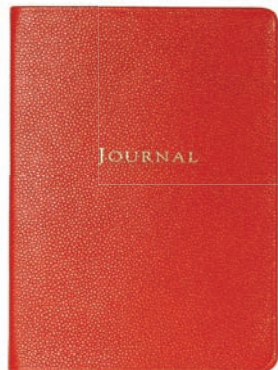
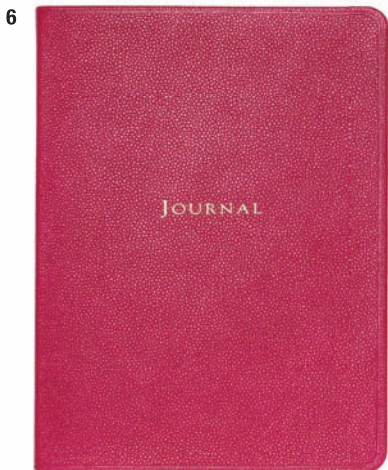
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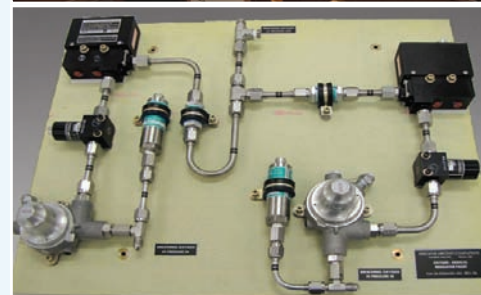
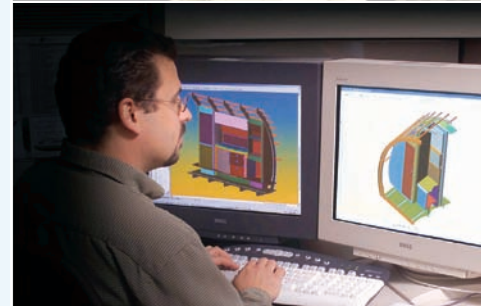
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