

CABIN ELECTRONICS REPORT 2013

by Kirby J. Harrison



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charter fleet with high-speed Internet and cabin Wi-Fi connectivity.

When NetJets placed a firm order with Bombardier for 30 Globals, it included the requirement that all of them be equipped with single-channel Inmarsat Aero H+ SwiftBroadband, providing a data transfer rate of 432 kbps delivered to personal communication devices via cabin Wi-Fi.

As one charter executive put it, "Not having Internet connectivity and cabin Wi-Fi has become a deal-breaker, especially on large-cabin aircraft and long-range flights."

At the European Business Aviation Convention & Exhibition (EBACE) in May, numerous announcements related to in-flight Internet connectivity, and there have been more since.

Aircell made an agreement with P3 Voith Aerospace to develop several new STCs for Aviator 200 in-flight connectivity in the European market, and OnAir said its Mobile OnAir and Internet OnAir are now available as catalogue options on the Falcon 7X.

ViaSat unveiled Yonder Premium and Yonder VIP, providing new quality of service assurances and enhanced network operations, and Satcom Direct signed an agreement with OnAir to be "a value-added reseller" for OnAir's GSM mobile phone service, Mobile OnAir, on business aircraft.

More recently, W. L. Gore & Associates announced that its Gore Leaky Feeder Antenna has been picked for the Dassault Falcon 7X to enable the OnAir in-flight communications system to deliver GSM connectivity.

TrueNorth Avionics has begun delivering a GSM software solution, "a killer app" that president Mark van Berkel says allows business aircraft passengers to get on the jet and use their GSM phone just as they would on the ground.

What's new gets old, really fast

One thing is certain in the world of aircraft cabin electronics: what's cutting edge today will be dull and discarded tomorrow. And there is little doubt that some of the technology discussed in this feature will be replaced sooner rather than later by something newer or faster or bigger with more bells and whistles.

We once thought that cabin connectivity would eventually allow a seamless transition from the home or office. But no matter how fast and how efficient cabin connectivity becomes, it looks as if it will always be a few steps behind the world beneath the wings. Only rarely is technology in a business jet cabin ahead of technology in the average electronics store, home or office.

One contradiction, however, is the LED (light-emitting diode). Only a

decade ago, LED lighting was an engineer's dream. Today, virtually every business jet that rolls off the assembly line has LED lighting throughout the cabin, and yet the technology is only just beginning to find its way into the average household light fixture.

Companies such as Emteq have taken LED from one end of the business jet cabin to the other, from accent lighting to curved wash lighting, to reading lights to programmable mood lighting. Now the New Berlin, Wis. supplier and others are offering drop-in LED replacements for traditional incandescent and fluorescent tube lighting. Most recently, Emteq's eFit drop-in LED replacements have the added advantage of providing a so-called mood lighting feature.

Custom Control Concepts in Kent,

Wash., a supplier of cabin electronics for larger bizliners up through ACJ330s and Boeing 747-8s, is expanding its LED product line from up- and down-wash to reading lights. Its programmable Spectrum system offers "endless color variations."

The Wireless Cabin Rules

Wireless connectivity in the business jet cabin might not be on par with the commercial market in terms of data transfer speeds, but it still lets the passenger stream audio and video effortlessly.

On a commercial flight aboard Lufthansa, Comlux Group chairman and president Richard Gaona made use of the airline's newly installed cabin Wi-Fi and Internet connection. "It was a long flight and a closing was scheduled while I was in the air. So I was connected via my iPad and closed the deal while I was still in the air," he explained. It prompted Gaona to equip the entire Fly Comlux



Honeywell's all-digital, high-definition Ovation Select cabin management system is scalable and customizable to fit any business jet, according to the cabin electronics supplier.



While cabin audio systems are becoming more and more sophisticated, charter operators such as Comlux are still providing high-end audio headsets for their customers.

Business aviation providers are still debating whether Ku-band or Ka-band satellite communication service is better, and while the dispute continues, the International Conference on Satellite and Space Communications (ICSSC) in Rome released a study that indicates the difference may be minimal.

Ka-band proponents note that those satellite systems coming into the market are expected to deliver substantially greater throughput, and as a result, some in the industry have concluded that it is a superior evolution of Ku-band capacity.

However, in noting the ICSSC study, Chris Hudson, senior solutions engineer with global communications supplier Intelsat, explained, "The superior performance of Ka-band is the result of customized satellites and multiple spot beams, [and] a Ku-band satellite using similarly sized spot beams can equal or exceed the performance of Ka-band satellites."

That's Entertainment

In cabin entertainment, Blu-ray players, especially in large-cabin business jets and bizliners, are rapidly being replaced by audio/visual on-demand mega-servers capable of holding hundreds of high-definition videos.

Honeywell was expecting to announce a new high-definition AVoD solution this summer that includes a 1.5-terabyte server. The first box in the system is the server and the second a wireless access point that allows video streaming to as many as 20 iPads simultaneously.

Completion and MRO specialist Lufthansa Technik has been promoting the latest advances to its NiceHD cabin management and in-flight entertainment system with a package it says offers "many industry firsts" through its turn-key AVoD technology.

Rockwell Collins announced in May that its Tailwind 500 and 550 multi-regional in-flight direct broadcast satellite television systems now enable live HD and high-compression digital video programming. The company is also offering a for-fee subscription-based AVoD solution, providing access to motion picture content provided by major studios, including "early window" content films still in theaters.

Custom Control Concepts is offering streaming from its AVoD to both iOS and Android devices. (See article on next page.)

It's a brave new world out there, and business aviation electronics suppliers are forging ahead.

Cabin Electronics Activity Appears To Be Growing

While the economy is still stumbling along and the market for used and new aircraft is barely moving forward, the world of cabin completion and refurbishment appears to be growing, if not thriving, and demand for the latest electronic technology appears likewise to be on a slow rise.

"We're seeing a segment of cost-conscious owners," said Mike West, Gulfstream v-p of product support sales



The typical business jet today offers almost any electronic communication amenity the passenger might find at home or in an office environment.

and new business development. "But we're also seeing another segment that wants the latest and greatest technology."

"We're looking at an increase in activity," added Matt Duntz, director of sales for refurbishment and design product support at Gulfstream. "There are airplanes changing hands, and every airplane that changes hands is an opportunity."

Most of the demand, both new and used, is for super-midsize and large-cabin business jets. These are the aircraft with long legs that call for real-time connectivity and the latest in entertainment. The same is true of used large-cabin business jets, "and there's a movement by owners of out-of-production large-cabin airplanes to bring them up to date," said West.

In the bizliner segment, activity is growing as the first Airbus ACJs and Boeing Business Jets to be delivered are now due for major inspections. This is good news for completion and refurbishment companies, as the cabin electronics in those older airplanes are near antique and upgrading to the newest technology is a high priority.

At the same time, most of the new Boeing 747-8s destined for private use are now in completion centers, where the latest and greatest is being installed. Deliveries of the 787 to completion centers will begin in December. There will be a period while the completion industry digests these giants, probably well into 2015. And by then the first Airbus A350s should begin arriving for outfitting.

Governments or extremely wealthy individuals account for most of the new bizliner purchases, and when money is not a factor the latest in cabin electronics is not on a "wish" list but a "gotta have" list.

If there's a problem with new technology in the business jet cabin, it is the speed

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Quick BYTES

Compiled by Kirby J. Harrison

Dassault Picks Gore for GSM Antenna

The Gore Leaky Feeder Antenna from W. L. Gore & Associates has been picked for the Dassault Falcon 7X to enable the OnAir in-flight communications system to deliver GSM connectivity.

The Leaky Feeder Antenna provides access to a variety of wireless protocols, permitting passengers to connect to Internet servers, e-mail accounts, telephone networks and in-flight entertainment. They are installed along the cabin ceiling, with signal propagation occurring every meter along the length of the antenna.

According to the Newark, Del.-based company, the technology does not require separate hardware for each type of wireless access. The antenna sends and receives signals in frequencies from 400 megahertz to 6 gigahertz, making it compatible with more than a dozen communication standards, from Bluetooth and Global Star to Iridium and GSM.

"This new OnAir service with Gore Leaky Feeder Antennas allows passengers to make calls, send texts and access the Internet in flight just like they do when sitting in their office," said Gore product manager Adrian Milne. "Simply pick up the device and start using it."

Honeywell Sees Growing Demand

Honeywell recently opened a new demonstration room at its facilities in Sarasota, Fla., highlighting its Ovation Select CMS digital backbone and related cabin communication and entertainment systems.

Bill Rowell, senior technology sales manager for cabin products, said Honeywell expects a large uptick in cabin upgrade business to come from "a considerable fleet of Falcon 900, Global Express and older Legacy 600 business jets currently equipped with the earlier Ovation C."

He added that the company has delivered more than 40 shipsets of Ovation Select since



Visitors to Honeywell's new demonstration facilities in Sarasota, Fla. can get hands-on experience.

the system was certified 18 months ago, a key to the success being "the flexibility of its digital backbone that can adapt to new technology."

TrueNorth Corners Market

TrueNorth, claims CEO Mark van Berkel, has "a majority of the most recently completed executive 747-8 business jets" installing its Simphonē OpenCabin communications system.

In addition, said van Berkel, the supplier has an 80-percent bizliner market penetration for BBJ green completion and retrofit, as well as Airbus ACJ forward fit. "We're moving more and more into the bizliner market, and our goal is to reach a 90-percent share by the end of this year," he added.

TrueNorth is a "software-defined" cabin electronics supplier, which van Berkel claims gives it an advantage in that, "If I ship the equipment today, as late as the day before the airplane rolls out, it will be up to date, software fresh."

The company also has a retrofit program to put its Simphonē OpenCabin system on Bombardier's

Global line. "It's the perfect upgrade for aircraft that are just beginning to come in for their 10-year maintenance check," said Berkel.

ACJC Promotes Real-time Connectivity

Airbus Corporate Jet Centre, a specialist in cabin completion and support services, claims it is the first center to install and activate the Global Communications Suite from Panasonic Avionics. The aircraft, an ACJ319, belongs to a Middle Eastern owner.

Using a single Ku-band antenna, passengers will be able to watch real-time television worldwide, as well as access high-speed Wi-Fi Internet connectivity. Passengers will also be



Airbus Corporate Jet Centre has collaborated with Panasonic Avionics to bring the cabin electronic specialist's Global Communications Suite to business aviation.

able to make calls and browse the Internet on a smartphone via the aircraft GSM network.

The installation, said a representative of Toulouse, France-based ACJC, has opened a new collaboration between ACJC and Panasonic that brings to business aviation a cabin communications system previously in the domain of airlines.

Lufthansa Technik and Schott Shed Light

Lufthansa Technik and Schott are offering a new development in cabin lighting that allows owners to take advantage of light-emitting diode technology while avoiding the color shifts that occur as LEDs age.

The new Nicemood system from Lufthansa regulates the light output on different diodes for what the developers call "significant cost savings compared with traditional lighting and a dramatic improvement in lighting quality."

The system consists of the access point and interface unit from the Hamburg, Germany cabin completion center and the actual lighting system and control system interface from Schott's Heliogel TCS (True Colour Stabilization) technology. The controls are managed through a passenger's smartphone or the cabin crew touchscreen. Schott has main corporate offices in Mainz, Germany and North American headquarters in Elmsford, N.Y.

Satcom Direct OnAir Reseller

Satcom Direct has signed an agreement with OnAir to be "a value-added reseller" for OnAir's GSM mobile phone service, Mobile OnAir, on business aircraft.

OnAir's service works on the Inmarsat SwiftBroadband satcom system and is based on roaming agreements for passengers and crew to use their mobile phones in flight the same way they communicate on the ground.

OnAir's picocell cell installed in the aircraft connects GSM mobile phones to the satcom network and "ensures that GSM devices transmit at a very low power level that prevents interference with the aircraft systems and terrestrial networks," according to OnAir.

Charges for the GSM services are assessed on the mobile phone user's normal billing statement. The GSM service, however, is available only in global regions where airborne mobile phone use

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Quick BYTES

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is authorized, which currently does not include the United States. OnAir has regulatory approvals in 80 countries on five continents and can be used over ocean areas.

Emteq eConnect Gets an Upgrade

The wireless eConnect router from Emteq has gotten an upgrade that promises to expand cabin connectivity substantially through new



Emteq's new IntelliUSB SR can charge more than 90 percent of the market's leading tablets, smartphones and e-readers from a single port.

acceleration and compression software provided by XipLink of Montreal, Canada.

"The bottom line is that it increases speed and decreases data costs," said Greg Cornell, product manager for the New Berlin, Wis. cabin connectivity specialist.

Adding eConnect now allows the user to upgrade the in-flight entertainment (IFE) system to high-definition and to turn any tablet or smartphone into a cabin control device. It is also more versatile, said Cornell. The company is currently involved in a Global Express cabin upgrade, adding eConnect to SwiftBroadband and at the same time leaving the existing IFE system intact but upgrading all the monitors and video sources.

An upgrade of the existing eConnect router requires only that the user install the latest software package from Emteq. In a retrofit replacement of a router of a different brand, it is simply a matter of swapping out the older router for the new eConnect.

According to Cornell, addition of eConnect can allow an IFE upgrade at about one-third the cost of a full IFE system replacement.

Aircell Expands Connectivity

In-flight connectivity equipment and service provider Aircell has signed an agreement with P3 Voith Aerospace of Hamburg, Germany, to develop several new supplemental type certificates (STCs) in the European market for the Aviator 200 in-flight connectivity system.

Under the program, Aircell will provide complete, no-cost STCs to operators installing an Aviator 200 system at an authorized Aircell dealer and activating a new SwiftBroadband service plan with Aircell.

"Providing no-charge certification packages to operators will significantly reduce installation costs and allow more people to enjoy the productivity-enhancing benefits of in-flight connectivity in Europe," said Aircell executive v-p and general manager John Wade.

Lufthansa Technik Picked

Bombardier has selected Lufthansa Technik's cabin management and in-flight entertainment systems for its new Challenger 350.

The announcement came on the heels of news of Bombardier's selection of the same systems for its Learjet 70, Learjet 75 and Learjet 85 business jets. To date, Lufthansa Technik has delivered more than 300 shipsets of the first-generation Nice and NiceHD successor to Bombardier for installation in a variety of the OEM's business jet lines.

NiceHD is based on a wired and wireless, high-bandwidth Ethernet backbone and the company claims it incorporates a number of "industry firsts," including turn-key audio/video on-demand (AVoD).

Other features include telephony integration, call alert and auto-muting, as well as Bluetooth 2.a connectivity at each seat. The embedded and wireless networked distribution is compatible with all leading mobile devices, including Windows 8, and allows each passenger to watch an individually selected movie. NiceHD also offers an embedded digital rights management (DRM) framework for studio-licensed content required by major Hollywood studios.

ICG Fills Need for Speed

Improvements in cabin communications are coming faster and faster, and one of the latest is the eRouter from International Communications Group (ICG).

The eRouter from Newport News, Va.-based ICG measures 21 inches by 8.5 inches by 3.75 inches and weighs eight pounds.

It offers access to multiple communications networks—Inmarsat, SwiftBroadband, Ku- and Ka-band, VSAT, Iridium and others. In addition to satellite communications connectivity, it provides 4G global mobile cellular services at a much lower cost for data and file transfers while the airplane is on the ground.

The cost is dependent on what contract is worked out between the customer and the service provider.

TrueNorth Wins Approval for Gulfstreams

Cabin electronics specialist TrueNorth Avionics received an EASA supplemental type certificate (STC) for installation of its Simphonē



TrueNorth's Simphonē has received EASA approval for Gulfstream business jets as a retrofit item.

cabin communications system in Gulfstream business jets from the GIII to GV and the G350, G450 and G550.

The STC, developed with aviation services supplier and partner StandardAero of Cincinnati, enfold a comprehensive connectivity solution, including TrueNorth's Simphonē with SwiftBroadband Wi-Fi connectivity as well as both wired and wireless handsets. It is applicable to both the Chorus and Duo editions of Simphonē.

The EASA approval makes it easier for European-based Gulfstream owners not only to upgrade the quality and functionality of their onboard phones, but also to add certified Wi-Fi, said TrueNorth CEO Mark van Berkel.

Idair Intros Media Content Service

Idair has introduced what it calls the executive business jet market's first media content service, allowing passengers to watch in-flight high-definition movies not yet released on Blu-ray or standard DVD.

"No longer is it necessary for you to manage your onboard content; Idair can manage it for you," according to the Hamburg-based "brain trust" created in 2011 to merge the knowledge and expertise of cabin electronics specialists Lufthansa Technik and Panasonic Avionics.

Idair offers studio-approved, early-window-content service that puts the latest Hollywood blockbusters in the cabin even before they can be purchased for a home theater. All it requires,

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Custom Control Concepts expands cabin dimension

Cabin electronics specialist Custom Control Concepts, acquired last December by private equity firm Sorenson Capital Partners of Salt Lake City, is already engaged in a major expansion effort.

According to Custom Control president Bill Weaver, 2012 was about 15 percent better than 2011 in terms of business volume. While this year might be "a bit flat," he added, what is going to be different next year is the arrival in completion centers of executive variants of Boeing's 787—in addition to nearly a dozen new 747-8s already getting an executive transformation.

Custom Control is unusual in the industry in that it builds everything it provides, "except the fuselage- and tail-mounted cameras, but we do build the interface technology and controllers for them."

That in-house expertise includes everything from AVoD servers and wireless interface for both iOS and Android personal electronic devices to high-definition cabin management and entertainment technology and the SkyShow moving map and full-cabin LED lighting.

Focused primarily on the bizliner market, the company recently authorized its first service center, Jet Aviation Basel in Switzerland. "It will be up and running this month and we have plans for more," said Weaver. CCC also has its electronic systems installed aboard a variety of smaller aircraft, from executive Gulfstreams to Sikorsky helicopters.

Niche Television Market

Even as interest in 3-D television in the commercial market appears to be waning, CCC is betting that its high-definition version, which can be switched from 3-D to 2-D and back, will find a more popular reception among business and private jet owners. Introduced last year at the NBAA Convention, the television has already begun shipping and the first aircraft equipped with CCC 3-D will be flying before year-end.

The Kent, Wash. cabin electronics specialist offers the monitor in sizes from 42

to 64 inches, and it will also convert standard 2-D video to 3-D. Included with the monitors are "ultralight 3-D glasses with designer frames," according to marketing coordinator Austin Campbell. Replacement glasses are available from CCC.

The technology, explained Austin, was not created by Custom Control. Rather, the company's research and development team explored the available 3-D technologies and adapted the most advanced available. "The result is an in-flight 3-D experience that rivals the 3-D our clients enjoy in their home theaters," he said.

On the subject of 3-D, the company is also now engaged in 3-D printing, a process that made headlines this past spring with the revelation that a working handgun could be made using the technology.

"The 3-D printing is part of the reason that we've more than doubled our factory capacity," said Weaver. "We're making some complex shapes—subwoofers, chassis parts, enclosures for switches—from Ultem thermoplastic material. It's half the weight of aluminum, passes all the FAA flame testing, and the engineering allows us to do things we couldn't do otherwise, faster and more efficiently."

The company has also expanded its systems integration lab. In the facility, engineers and technicians set up every system it builds before delivery, including wiring and cables. The system then undergoes an extended test period—from one to six weeks—during which the customer is invited to come in and play with it. While the customer learns and puts the technology through its paces, CCC system engineers are plugged in and can make any changes "on the fly." Every system comes to the customer with on-site technical support during the cabin electronics integration and installation process.

Now, with the acquisition by Sorenson Capital Partners, "we're in a position to expand and increase our manufacturing capacity, including a 30-percent increase in the workforce in the last six months," said Weaver. "We're in a good place and it's getting better."

—K.J.H.



Custom Control Concepts of Kent, Wash., is betting its new 3-D monitor, which can be switched from 3-D to 2-D and back and available in sizes from 42 to 64 inches, will find a ready market in the business jet cabin.

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with which it changes. Several years ago, wireless cabin connectivity was a novelty. Today, it is the standard, and new technology and upgrades of existing technology are being introduced monthly.

This makes it wishful thinking to spec out a business jet interior a year or 18 months

in advance and expect that frozen design to remain frozen. Hardly a completion center out there doesn't have stories about an owner rushing in half-way through the outfitting process and demanding a major change to the cabin communication and entertainment systems that were settled on 18 to 24 months earlier.

In other words, no one wants to buy "old" technology, and these days, technology as recent as a year ago is "old." As fast as manufacturers introduce it to the commercial market, business jet customers will demand it in their airplanes, and cabin electronics suppliers will rush to fill that demand. It's the nature of the beast. ■



Rockwell Collins's new FalconCabin HD+ adaptation of the Airshow moving map includes the new Airshow app for the iPad.

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claims the Hamburg, Germany company, is for the user to "select the movies you like on a Web-based portal and Idair will deliver the content to the aircraft."

ViaSat and L-3 Collaborate

Cabin communication supplier ViaSat and cabin completion specialist L-3 Platform Integration have agreed to collaborate on in-flight broadband satellite communications for business and private aircraft in the bizliner category.

The system will combine an airborne ship set and global broadband network service from ViaSat, with the Waco, Texas-based center providing completion services, including system integration, design, engineering, installation, in-cabin networking and certification.

Working together, L-3 and Carlsbad, Calif.-based ViaSat "see an opportunity to accelerate the implementation of satellite communication systems for aircraft operators by streamlining the vendor review and selection process and providing a proven package of advanced technologies, engineering skills and program management."

ViaSat has also added two new classes of its Yonder high-speed Internet service for business aviation.

The services—Yonder Premium and Yonder VIP—will provide higher data rates, compared with the current Yonder service, new quality-of-service assurances, enhanced network options and field engineering customer support. Along with the new services, ViaSat recently rolled out a 60-percent increase in capacity for its worldwide network.

Further, this summer operators were expected to be able to select from Yonder Internet for Web browsing, e-mail, VoIP and office applications; Yonder Premium, which adds multimedia streaming and video teleconferencing; and Yonder VIP, which adds to the Yonder Internet and Yonder Premium support for a high number of Internet connections. ■



ViaSat has added two new classes of its Yonder Internet service.

Mecaer iFeel created for helo cabins

Pick pretty much any corporate or private AgustaWestland AW101 or AW139 and odds are it will have the Mecaer iFeel cabin management, entertainment and communications package installed.

The iFeel system is the product of a collaborative effort with Leaff Engineering of Osimo, Italy, which provided the proprietary Nu-Tech Kernel software



The iFeel controller includes touch-screens with customizable icons.

core. The main features are the interphone system with collective and selective communications, a built-in hard disk to store audio and video files, and interface with any number of audio and video systems, including moving map, MP3 player, iPod, Blu-ray player, laptop and camera. Touch-screen controllers include customizable icons. High-definition is possible, depending on a number of factors, including the size of the helicopter.

Passenger connectivity is provided by GSM and satcom terminals and full integration allows for private calls, conference calls and pilot calls. Cabin amenity functions include environment controls as well as direct control of LED lighting, speakers, the cockpit partition window and window shades.

According to Alessandra Pasqua, head of the Mecaer Aviation Group Design Studio, nearly 80 iFeel systems are currently EASA certified and in service on AW101 and AW139. The system has also received approvals from aviation authorities in China, Jordan, Malaysia, Panama, Russia and the Ukraine.

Pasqua noted that the customizable system can be adapted to fit any helicopter brand or model. In fact, iFeel is approved for and is already being installed in the Eurocopter EC145. In addition, the company has plans to adapt the system for certification on business jets at some point in the future and is considering possible collaborations for that project, said Pasqua.

The Italian interiors and MRO provider expects that with

43 executive helicopters forecast for delivery this year, the number of iFeel systems in service is going to grow considerably.

Mecaer has primary facilities, design studio and headquarters in Montepandrone, Italy, and other

completion and MRO facilities are in Vergiate (near the AgustaWestland factory); in Yeovil, England (near the AgustaWestland facilities); in Philadelphia and Hagerstown, Pa.; and in Tomlino, Russia.

—K.J.H.



The iFeel cabin management and entertainment system is in service now in nearly 80 AgustaWestland and Eurocopter executive helicopter cabins. The system is the result of a collaborative agreement with Leaff Engineering of Osimo, Italy.