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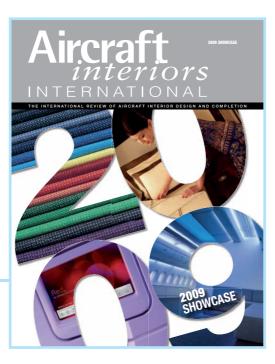
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premium rate

What a year – 2008 saw Emirates and Qantas take delivery of their first A380s, both using the supersized aircraft to launch exciting new inflight products – Emirates going as far as introducing on-board showers, while Qantas opted to include a premium economy offering first introduced on its 747-400s, as well as moving to fully flat beds in business and new luxurious suites in first class.

Both aircraft reveal much about the key battlegrounds going forward. Originally introduced 15 years ago by Virgin Atlantic and EVA Air, premium economy is also available on carriers such as British Airways, United and now Qantas, with more airlines likely to follow suit in 2009.

Air France has announced plans to launch a premium-economy cabin across its long-haul fleet, with the exception of its 747s, which it plans to retire by 2012. Air France will replace four rows of seating in economy with three rows of a new seat type, in a 2-4-2 configuration, with 22 to 28 seats in total, depending on the aircraft type.

The trick is to offer a product in its own right with clearly differentiated advantages, rather than sticking with the same seats as economy and just increasing the pitch. In Air France's case, the new class will be divided from both the economy and business cabins by wall partitions rather than curtains, and the 'fixed shell' seats allow passengers to recline without encroaching on those seated behind. Meanwhile, Emirates' decision to launch a new business class on its A380s, which in effect offers two different products in the same cabin, is further proof if any was needed of just how competitive and diverse the business-class seating market has become. Emirates' A380 offers business-class customers a choice between two seat variants: one with a seat pitch of 39in and a bed length of 70in; and a more generous alternative at 48in pitch with a 79in-long bed.

It remains to be seen how much the economic downturn will impact business-class revenues – and product strategies. Will higher density solutions prove the most successful, or will those still able to afford to travel in business seek more luxurious and spacious offerings? Carriers could also choose to strip out business seats altogether in favour of introducing a more affordable premium economy offering. However, the cost of converting cabins remains prohibitive – something both the 787 and A350 XWB aircraft programmes hope to improve.

Airlines will at least hope to make some money from ancillary revenues generated by a new raft of connectivity services – including the use of mobile phones in flight, a situation likely to generate a few hysterical headlines in 2009.

Anthony James, editor

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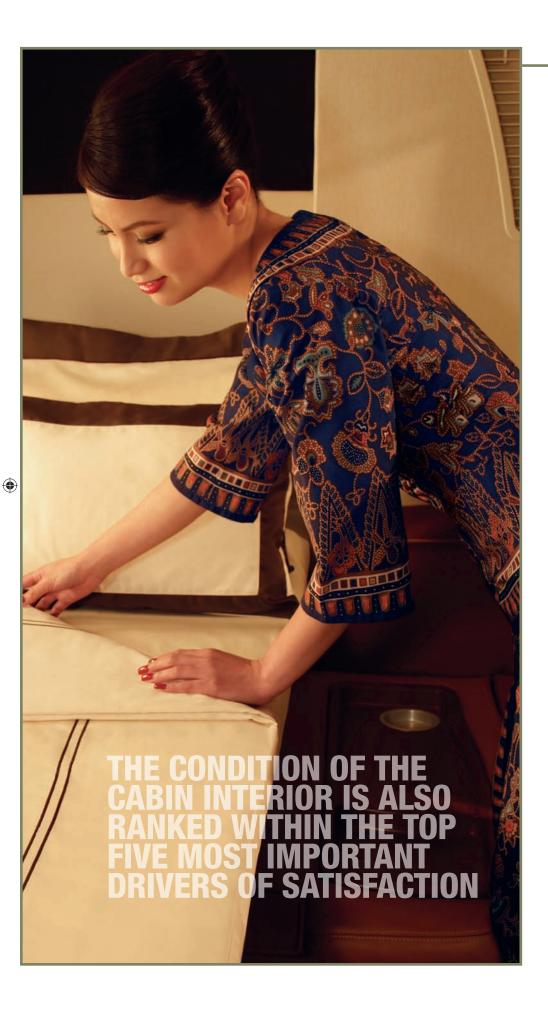
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CONTENTS



who dares wins

6

۲

TRAVEL ANALYST ANDREW SAMSON LOOKS AT THE SUCCESSFUL STRATEGIES BEHIND SOME OF THE WORLD'S LEADING LONG-HAUL AIRLINES

12 ones to watch

AIRCRAFT INTERIORS INTERNATIONAL PICKS FOUR MOVERS AND SHAKERS PRIMED TO MAKE AN IMPACT ON THE INDUSTRY GOING FORWARD

20 tough times?

ROBERT SMITH OF IMDC PROVIDES SOME COMMON SENSE IFE ADVICE FOR AIRLINES LOOKING TO WEATHER THE CURRENT ECONOMIC STORM

26 time travel

AIRBUS INDUSTRIAL DESIGN RECENTLY CELEBRATED ITS 40TH ANNIVERSARY – BOB LANGE REVEALS HOW ITS CABIN DESIGN PHILOSOPHY HAS CHANGED OVER THE DECADES

34 fear itself

PAUL WYLDE, TEAGUE'S NEW CREATIVE DIRECTOR, CONSIDERS HOW THE INDUSTRY CAN SURVIVE THE CREDIT CRUNCH BY DESIGNING FOR FEAR

40 long game

MATT ASLIN, PANASONIC AVIONICS, IS A FIRM BELIEVER IN FOCUSING ON THE ONGOING COSTS, AS WELL AS THE INITIAL COST, OF THE LATEST AVOD IFE SYSTEMS

44 beautifully formed

STG AEROSPACE EXPLAINS HOW A SMALL COMPANY CAN DEVELOP AWARD-WINNING, MARKET-LEADING PRODUCTS

48 double delight

ALTITUDE HAS RECENTLY HELPED AIR NEW ZEALAND SIMULTANEOUSLY INSTALL A NEW IFE SYSTEM ON BOTH ITS B767-300 AND A320 FLEETS ۲

52 heating up

YARWOOD LEATHER CONTENDS THAT THE USE OF LEATHER IS SET TO EXTEND BEYOND THE LIMITS OF SEAT COVERING WITH NEW ADVANCES IN FIRE RETARDANCY

56 eyes wide open

HOOVER INDUSTRIES' MARISA INFANTE MAKES AN IMPASSIONED PLEA FOR VIGILANCE, AS THE COMPANY STRUGGLES WITH ONGOING SECURITY ISSUES

60 fortune teller

LANTAL EXPLAINS HOW ECOLOGICALLY AND ECONOMICALLY SOUND PRODUCTS NEED NOT COMPROMISE ON COMFORT

64 happy talk

BUCHER AEROSPACE EXPLAINS HOW ITS CENTRE CONSOLE FOR AMERICAN AIRLINES IS THE RESULT OF COMMUNICATING SUCCESSFULLY WITH SUPPLIERS

68 presidential privilege

PRESIDENTIAL PATRONAGE AND A MERCURY AWARD CLEARLY UNDERLINE IACOBUCCI'S REPUTATION FOR INNOVATION IN GALLEY INSERT EQUIPMENT

70 all systems go

ROCKWELL COLLINS DISCUSSES ITS NEW CMS, VENUE, WHICH IS DESIGNED TO BRING HIGH-DEFINITION ENTERTAINMENT TO ALL SIZES AND TYPES OF BUSINESS AIRCRAFT

74 super saver

E-LEATHER LTD REPORTS ON THE RISE OF COMPOSITE LEATHER AS A WEIGHT, FUEL AND COST SAVING MATERIAL FOR SEAT UPHOLSTERY

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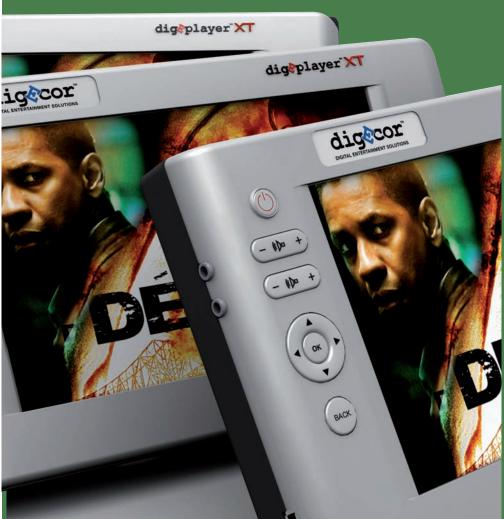
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CONTENTS

۲

IF CURRENT CONSUMER ELECTRONIC TRENDS TEACH ANYTHING, THE LESSON IS THAT CONSUMERS ARE ACCUSTOMED TO PERSONAL MEDIA DEVICES (WITH THE EMPHASIS ON PERSONAL)



78 new heights

S&S NUMERICAL CONTROL REPORTS THAT THE A350, A380 AND B787 ARE DRIVING DEMAND FOR BETTER IFE COMPONENTS

82 upper hand

WITH PASSENGERS USED TO TECHNOLOGY BEING PERSONAL, DIGECOR BELIEVES ITS PORTABLE IFE PRODUCT IS MAKING MORE AND MORE SENSE TO AIRLINES

86 more for less

THERMAX SPECIALISES IN INCREASING DATA RATE AND THE QUALITY OF DATA TRANSMISSION, USING THE MINIMUM AMOUNT OF CABLE

90 highway code

TYCO ELECTRONICS IS AT THE CUTTING EDGE OF HIGH-SPEED DATA DELIVERY

94 liquid assets

IWG SAYS THE MARKET IS WISING UP TO THE IMPORTANCE OF PROVIDING AIR TRAVELLERS WITH CLEAN, SAFE WATER

98 hide and seek

THE HIDE HOUSE EXPLAINS THAT WHILE ITS HUGE RANGE OF HIDES IS SOURCED FROM ALL OVER THE WORLD, ITS COMPANY IS ROOTED IN LOCAL HISTORY

100 here comes the sun

EADS SOGERMA PRESENTS ITS TWO NEWEST SEATING CONCEPTS – SOLSTYS FOR SUPER BUSINESS CLASS AND ULTIMATE 17 FOR SUPER FIRST CLASS

102 supply and demand

AIRCRAFT CABIN TECHNICIANS LTD IS FILLING A GAP IN THE MARKET BY SUPPLYING SKILLED INTERIOR TECHNICIANS

۲

104 win win

DIEHL AEROSYSTEMS CONTENDS THAT WHEN LIGHTING DESIGNERS AND CABIN MAKERS COOPERATE, EVERYONE WINS

106 spoilt for choice

AIRBASE INTERIORS REVEALS WHAT OPERATORS SHOULD CONSIDER WHEN CHOOSING SOFT FURNISHINGS TO REFLECT THE CABIN'S DESIGN CONCEPT

108 digital love

EMTEQ IS DRIVING INNOVATION WITH ITS LATEST WASHLIGHT, WHICH INCORPORATES NEXT-GENERATION PWM TECHNOLOGY AND DIGITAL CONTROL

110 high office

VT MILTOPE BELIEVES INDUSTRY STANDARDS ARE NEEDED TO ALLOW AIRLINES TO INSTALL NETWORK SYSTEMS THAT ARE AS FLEXIBLE AS THOSE ON THE GROUND

112 well connected

BEING WELL CONNECTED IS JUST AS IMPORTANT TO IFPL AS IT IS TO THE AIRLINE PASSENGERS WHO ENJOY ITS PRODUCTS

114 phone home

GORE EXPLAINS HOW ITS LEAKY LINE ANTENNA ENABLES PASSENGERS TO STAY IN TOUCH ON THE A380

116 light as air

GCE HIGHLIGHTS AN OFTEN-OVERLOOKED WAY TO REDUCE CABIN WEIGHT – USING LIGHTWEIGHT OXYGEN CYLINDERS

118 current affairs

MAGNUS POWER REVEALS IT WILL BE EXPANDING ITS PRODUCT RANGES AND LOOKING FOR LARGER PREMISES IN 2009

120 index to advertisers

who dares wins

TRAVEL ANALYST ANDREW SAMSON LOOKS AT THE SUCCESSFUL STRATEGIES BEHIND SOME OF THE WORLD'S LEADING LONG-HAUL AIRLINES

 Virgin Atlantic is winning over passengers with its Upper Class Wing facility at Heathrow
 The 'Singapore Girl' has become shorthand for exemplary service

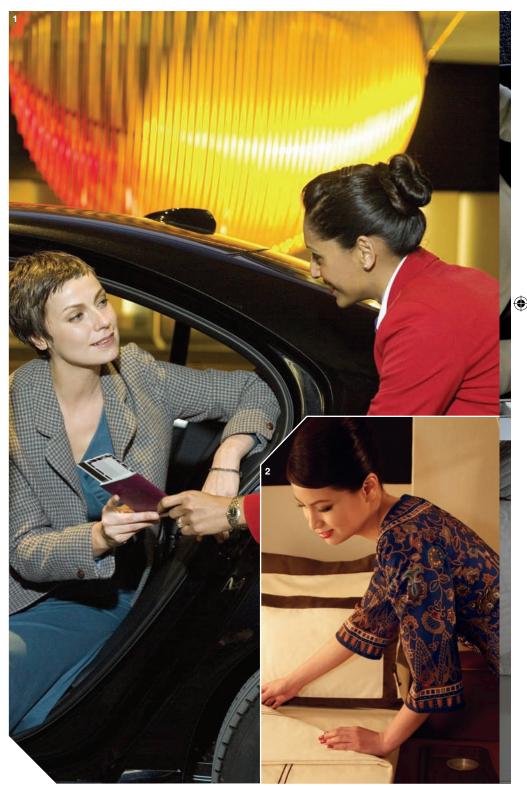
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t is no coincidence that the world's leading carriers have all invested heavily in their inflight products and service. But just how important has this investment been in driving success? More importantly, to what extent will the airline cabin environment contribute to the continued success of such airlines in the aftermath of 2008, the year that Richard Branson has so eloquently described as the year

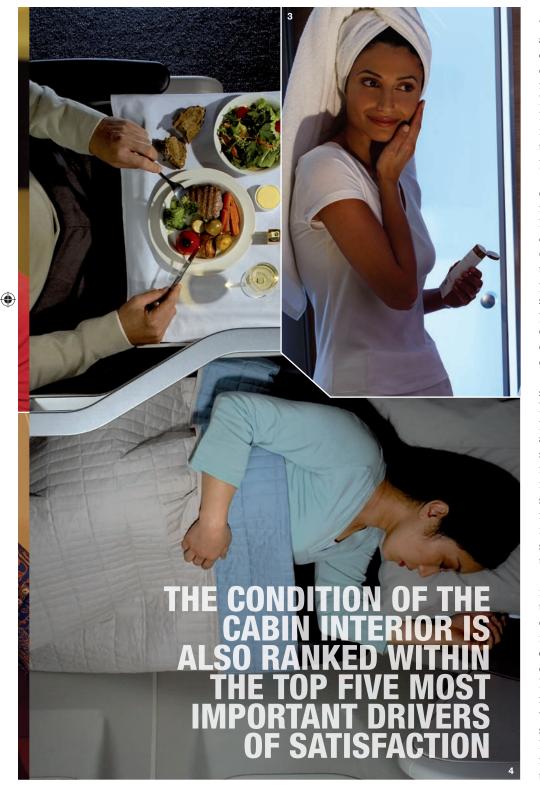
of "spectacular casualties"? As a starting point it is perhaps sensible to examine the factors that drive airline selection and passenger satisfaction on long-haul flights. For nine years now, IATA's Global Airline Performance (GAP) survey has been the largest and most trusted source of passenger satisfaction data, enabling leading airlines to benchmark their performance against their main rivals on specific routes. Although historically GAP data has been shrouded in secrecy, Aircraft Interiors International has been able to access the 'averaged' data for the 23 participating airlines in 2008.

At first glance, inflight products seem to have little influence. When asked to name 'the three main reasons for choosing this airline today', inflight elements do not appear within the top five reasons, regardless of trip purpose or class of travel. Frequent flier programmes, convenient schedules, the availability of non-stop flights and good value for money were the key influences.

Unsurprisingly, economy passengers travelling for leisure are more influenced by price with 'value for money' being mentioned by 11% of those surveyed. In comparison, 8% of economy passengers travelling for business purposes identified 'non-stop flights' as an important factor. Meanwhile, the fifth most common response for leisure passengers travelling in economy was actually 'offered the lowest fare' with a score of 9%.



AIRLINESTOWATCH



One common theme emerges. A 'previous good experience' with the airline was a key airline selection criterion for all passengers, irrespective of trip purpose or class of travel, a measure which is almost certainly linked to the inflight experience itself. However, it is only when we look at the factors driving passenger satisfaction that the true influence of the inflight product itself becomes clear.

Specifically, it is the 'strong' drivers of satisfaction that we should be most interested in. IATA and research partner P. Robert & Partners deploy a method of statistical wizardry called the Pearson Correlation Coefficient to evaluate the strength of association between passenger satisfaction, and a range of service items from the reservation process to luggage delivery at the destination airport. Any score over 0.5 on a scale of -1 to +1 is a very strong driver of satisfaction.

Interestingly, it is the cabin crew service elements of 'courtesy/ helpfulness', 'responsiveness in serving passenger needs', and 'professional appearance' that are the most significant drivers of satisfaction, ranked as the top three most important factors across the 115,000-strong sample. The condition of the cabin interior is also ranked within the top five most important drivers of satisfaction, by business and leisure travellers alike, regardless of class.

The seat itself is a key area of focus for all travellers, specifically with regard to comfort, although seat comfort is only a moderately strong driver (0.49) for leisure passengers travelling in economy. Seat cleanliness upon departure is more of a concern to leisure travellers. Interestingly however, none of the survey's seven IFE elements were returned as strong drivers of satisfaction, i.e. with scores above 0.50. However, as moderate drivers their influence is still intrinsically linked to the wider inflight experience.

- Emirates has installed showers on its A380s
- 4. British Airways' Club World

Armed with these statistics Aircraft Interiors International spoke to a number of the most successful long-haul airlines and their chosen design agencies about the inflight product strategies that have underpinned their success.

Advertisement feature The growing importance of interior products is best reflected by "those airlines that use new seats/innovations at the centre of their advertising campaigns", says Nigel Goode from design agency, Priestman Goode. Of course carriers that run such advertisements before the new product is installed fleet wide do risk incurring the wrath of customers who fail to read the small print. However, Emirates' Mike Simon believes the majority of passengers "do realise that it is not possible to roll out new products immediately".

While inflight product is seen as a key means of differentiation, it is only one of a variety of platforms from which to build brand equity. Loyalty and ground service elements continue to exert a strong influence over passenger satisfaction - a trend keenly exploited by the leading carriers, particularly when it comes to the most lucrative premium passengers.

Lufthansa claims to be the only airline to provide a dedicated terminal for its first-class passengers with streamlined check-in facilities, security/ immigration, shopping, beds and even a spa, at its Frankfurt hub. The time from check-in to boarding is dramatically reduced and Lufthansa has seen a large increase in demand for its Frankfurt-based first-class routes as a result. Private security screening is also offered by other leading airlines, including British Airways, Emirates and Virgin Atlantic – the latter reporting strong customer interest in its

upper deck of its A380s 6. First-class suite on Jet Airways

dedicated Upper Class Wing at London-Heathrow.

Launched just over a year ago, the Wing, which offers Upper Class passengers a seamless and super-fast journey through Heathrow's Terminal 3, has seen the airline attract 11% more business travellers from Heathrow over the last 12 months. Following the success of the Wing, Virgin Atlantic has introduced a 40-minute minimum check in time for its Upper Class passengers.

For many of the carriers interviewed, the seat itself represents the biggest on-board challenge, as well as having the potential to deliver the sweetest rewards. Weight and seat certification continue to cause headaches, especially where airlines refuse to compromise and develop their own bespoke designs. "The route to market can be shortened considerably if airlines adopt a proven and precertified shell that can then be adapted to suit their specific needs," points out Robin Dunlop of CTM Design.

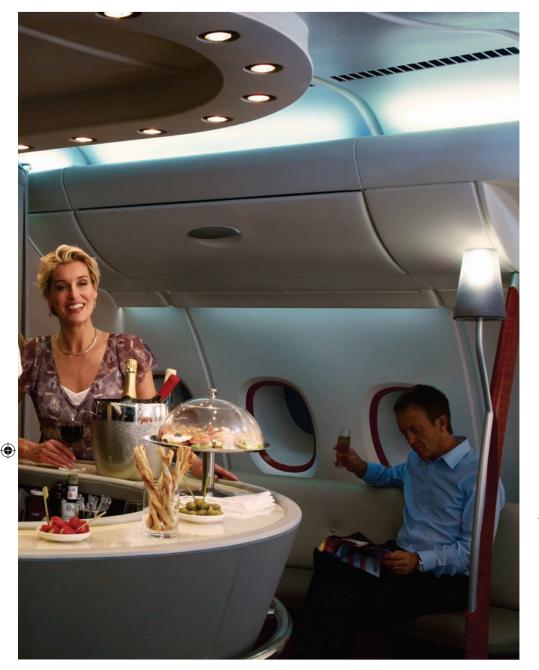
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However, where airlines insist on having a unique product, passenger opinions become even more important. Lufthansa regularly flies with innovations screened off from the rest of the cabin, in order to gather the views and feedback of its most loyal customer base, strictly solicited by non-



5. Emirates' bar on the

8 Aircraft Interiors International Annual 2009



disclosure agreements. Given that participating passengers have eight hours to fully test the seat, Lufthansa claims this method provides far more valuable feedback than that derived from focus groups at its ground-based cabin mock-up. And as British Airways' design manager Neal Stone observes: "There's no point putting in loads of gadgets if they're not what the customer wants."

Built to last Most, if not all of the airlines interviewed, accept that their seats could be in service for up to 10 years. Consequently, seat adaptability can set apart a good airline from a truly

great one as the product ages. Ensuring key seat technologies and features, particularly IFE equipment, can be easily updated is crucial if the seat is to remain competitive in the long term. "About 10 years since implementation, SIA's B747 First Class seat is still operational, still reliable and still well liked," asserts its designer, James Park of JPA Design. "Good design and good programme management is thus seen to be worthwhile."

Increasingly, the operational focus is now very much on lowering the cost of seat ownership over its lifetime. As Park points out, using more durable finishes, the latest generation of aircraft seats are

MOST, IF NOT ALL OF THE AIRLINES INTERVIEWED, ACCEPT THAT THEIR SEATS COULD BE IN SERVICE FOR UP TO 10 YEARS

able to endure increased levels of abuse and much wider temperature ranges and humidity levels for much longer periods. "The product must look and feel as good on its last day in service as it did on its first," adds Cathay Pacific's product manager, Alex McGowan.

Inflight product reliability is another fundamental – an unserviceable IFE system will actually damage perception. And as IATA's research highlights, a 'previous good experience' is all important.

Finally, the leading airlines continue to invest heavily in customised interior features that help them to stand out from the crowd: on-board shower spas (Emirates); first-class suites (Emirates, Jet Airways), yin/yang sleeper seats (British Airways); inflight bars (Virgin Atlantic); and iPod/iPhone connectivity to an IFE system (SIA). Continuous innovation will remain a key driver of success.

Crunch time Looking to the future, the credit crunch will have wide implications for the airline cabin environment in 2009 and beyond. Not surprisingly, given the higher associated margins, industry analysts are eyeing the demand for premium class and flexible ticket travel most closely.

It should be noted that the demise of 'all-business-class' airlines such as SilverJet and EOS was a direct consequence of soaring fuel prices and insufficient hedging rather than a shift in demand away from premium cabin travel. On some trunk routes previously operated by the more competitively priced all-business-class airlines, one incumbent carrier interviewed (which wishes to remain anonymous) has seen an increase in demand within its premium cabins. With this in mind, it

PREMIUM AND STANDARD ECONOMY PRODUCTS WILL EMERGE AS THE NEW BATTLEGROUNDS AS WE ENTER 2009

will be interesting to see how British Airways' OpenSkies fares over the coming 12 months.

Similarly, it will be interesting to watch Lufthansa's foray into the corporate jet market (Lufthansa Private Jet). It remains to be seen whether the economic downturn will affect the travel patterns of high net worth individuals. If demand remains strong, Lufthansa is well placed to make the most of this highly lucrative market – it remains the only airline in the world to operate a successful private jet service alongside a worldwide network of scheduled flights.

Back to basics In reality though, the credit crunch could force the majority of premium travellers to downgrade their class of travel. Premium and standard economy products will emerge

 Cathay Pacific's economy class guarantees the personal living space of passengers

 No more queuing at security – Virgin Atlantic takes the stress out of the airport at its Upper Class Wing facility





as the new battlegrounds as we enter 2009. Those airlines that have continually invested in their economy products will be poised to pick up those passengers that have traditionally enjoyed the good life.

Cathay's new economy long-haul seat is a case in point. An industry first in economy, Cathay's fixed-back shell ensures that the seat in front cannot intrude into the personal space of the seat behind, even when it is reclined.

Equally, we may see an increase in 'economy-plus' products in the mid-haul sector with priority check-in, lounge access and laptop power/ connectivity on board. Such a strategy has recently been introduced by Icelandair, which seems well prepared for the future despite Iceland's recent financial woes.

Tighter credit terms and a downturn in passenger numbers may force some airlines to postpone or even cancel aircraft deliveries altogether. However, the ingress of new aircraft has traditionally presented airlines with a unique opportunity to flood targeted routes with innovative seating and IFE concepts, thereby reinforcing brand equity and capturing new traffic. This has enabled many emerging airlines from the Middle East and Asia such as Etihad and Kingfisher, to steal a march on the so called 'legacy airlines' on trunk routes.

Will airlines feeling the pinch be able to justify further investment in cabin innovation? James Park thinks so: "Innovation is central to good design, but also offers opportunities to reduce weight, simplify maintenance and extend a product's life," he says. "Together, then, design and innovation can both improve quality and help reduce costs. That isn't risk taking but sound business sense. In that context, innovation is vital to survival and therefore when times are tough innovation becomes even more necessary."

Overall, the messages from the major service-orientated airlines are extremely positive. All of the airlines interviewed for this feature agree that investment in inflight products must continue if they are to sustain and build competitive advantage. As Emirates' Mike Simon concludes: "This is a fastmoving industry and to sit back would spell corporate death."

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 Paul Wylde of Teague
 Alex McGowan of Cathay Pacific

ones to watch

AIRCRAFT INTERIORS INTERNATIONAL PICKS FOUR MOVERS AND SHAKERS PRIMED TO MAKE AN IMPACT ON THE INDUSTRY GOING FORWARD

Paul Wylde As Teague's newly appointed creative director, Paul Wylde is responsible for leading and creatively directing its Aviation Studio. In this role, he oversees an exceptional team of talent known for creating provocative, innovative and powerful design work. Prior to joining Teague, Paul held numerous leadership positions within the industry, including creative director of New York City-based Imagination; creative director of the Advanced Communications and Concepts team at BMW Group's DesignworksUSA; and brand guardian of British Airways. As a brand consultant he has worked with Interbrand. The Nest and the BBC.

With nearly 15 years' industry experience, Paul has worked with some of the world's leading brands, including Airbus, Johnson & Johnson, Procter & Gamble, Microsoft, Roche, Halfords, Tesco and Thomas Cook. A regular presenter and lecturer, Paul speaks on topics of design management, corporate identity and branding at events and conferences across the globe. He has appeared on BBC Two and Dutch television and is a visiting lecturer at The London School of Marketing, Central Saint Martins School of Art and London Metropolitan University. Paul earned a Masters Degree in Design from Glasgow School of Art after completing undergraduate studies in Product Design at Ravensbourne College of Design & Communication, where he was twice honoured with the prestigious RSA student design award.

What will you bring to Teague? I have a wide experience of design and brand strategy, which should complement Teague's great team of talent. I can also provide a great sense of balance – between intuition and rigour, strategy and creativity.

What are your key objectives moving forward? To add a richer, more diverse





THERE IS ALSO THE QUESTION OF SUSTAINABILITY

and global view of design, innovation and creativity; to humanise the air travel experience by driving positive change in and out of the cabin interior; and to help Teague's clients deliver meaningful solutions that drive competitive advantage.

What are the main industry changes you have witnessed during your career so far? There have been many changes, both positive and negative. A few that stand out: the birth of true brand differentiation; the discovery, embracement and deployment of design strategy; the unwelcome polarisation of passenger experiences and erosion of the basics in parallel to extraordinary improvements for premium classes; and a new sense of fear in the industry and beyond.

What are the key trends likely to shape cabin design going forward? Certainly weight reduction and the intelligent integration of technology – we're seeing those take shape now. There is also the question of sustainability, designing for uncertainty and this idea of a new 'classless' paradigm for travel; trends that will undoubtedly change the experience of flight as we know it today.

And the main challenges, especially those most relevant to you in your new role at Teague? Perhaps convincing the industry to be courageous: to embrace innovation and positive change during economically

- 3. Charles Ogilvie of Panasonic
- James Thompson of Thompson Solutions

volatile times. This is a challenge for all industries today, particularly aviation.

How do you plan to ensure innovation across such a technical and complex industry? By recruiting the best talent and creating the right conditions for them to grow and shine; keeping the Teague team focused, inspired and engaged on the key issues driving the cultural landscape of our clients, their end users and the wider communities in which they operate.

What has been the high point of your career to date? Forming friendships with some of the most interesting, influential and without a doubt, delightful people in the airline industry. Truly great relationships can always be found behind great design work.

Charles Ogilvie Charles Ogilvie brings more than a decade of global experience in both interactive and traditional entertainment to his role as executive director of China at Panasonic. In this role, he is responsible for the business strategy in the China market.

A graduate of the University of Southern California (USC) with an MBA in International Business and Entertainment and a BS in Business Administration, Charles joined Comspan Communications to manage international distribution in Asian territories. He then moved to Panasonic Avionics Corporation (then known as MAS) as business development manager. Most recently he was the director of In-Flight Entertainment (IFE) and Partnerships at Virgin America, where he was directly responsible for designing, producing and managing Virgin America's inflight interactive passenger entertainment experience, 'Red'.

As an active member of the Academy of Television Arts & Sciences, Charles votes on Emmy nominees and is a member of the Academy's Interactive Media Peer Group. He has also served on the World Airline Entertainment Association's (WAEA) Educational Committee, is a member of the Asia Society, the International Academy of



Television Arts & Sciences and the Producers Guild's New Media Council. Oh, and he speaks Mandarin-Chinese fluently.

How did you first get started in the airline business? Since my early childhood, I've had a passion to fly. My great-grandfather was an airport entrepreneur, founding Bangor, Maine's international airport – where many ferry flights from the UK and Europe clear US customs, including Virgin America's aircraft.

What are the main changes you have seen during your career so far? The industry is constantly in a state of change. Progressive IFE organisations now see opportunity in the future, instead of solely relying on overhead audio and video in the past. Today, IFE has further evolved to an even higher level of entertainment, choice and control for the individual passenger. The latest IFE platforms have transformed the air travel experience, offering a combination of faster processing speeds and superior display quality features that result in a modern home-like entertainment experience and a stateof-the-art airborne communications tool. This combination of personalised and customised functionality also supports efficiency gains for the crew and airline operations.

What are the key trends likely to shape IFE going forward? 21st century passengers want a home-like entertainment experience on board the aircraft – one in which they can stay connected, informed, entertained, and in touch with the outside world during the flight. From communicating with email, to simply browsing the web or



5. Charles Ogilvie was integral to the development of Virgin America's interactive 'Red' IFE system reading more about the destination of their flight, passengers armed with laptops, PDAs, BlackBerrys and cellular devices want the convenience of accessing their email and the internet just as they would from a home, office, or any place on the ground. The vision of broadband connectivity and its role in expanding IFE platforms on aircraft is about to become a reality. In addition, IFE technology will continue to build upon the wider availability of inflight broadband and focus on ways that airlines can gain revenue to offset the rising cost of fuel with application innovations that drive both revenue and operational efficiency.

And the main challenges for Panasonic? Generally, new innovations for IFE platforms are seen publicly approximately 18 months after the core design takes place. Some more complicated hardware innovations can take even longer. Recently, times have changed and the industry as a whole has embraced the need for increased agility in this dynamic climate.

What are your objectives going forward, especially for next year? To provide passengers with the ultimate in convenience and a seamless connection to the world beyond the aircraft cabin – these goals will continue to be the primary goals of future IFE systems. Panasonic, with 30 years of R&D and manufacturing experience to draw upon, will continue to bring many new innovations to market that mirror the convergence of media on the ground with IFE – forging the future of the connected aircraft to support the needs of its passengers.

Innovation – how do you change mindsets and attitudes in such a technical, conservative and complex industry? We must all strive to push each other to think out of the box and try to deliver excellence across the entire industry value chain. Whether you're a service provider, content rights holder or studio partner, or an IFE equipment supplier, you all have a challenge at hand: to deliver innovation and efficiencies. Passengers don't equate the entertainment industry with conservative views, they equate it with progression and fast-paced innovation!

PASSENGERS DON'T EQUATE THE ENTERTAINMENT INDUSTRY WITH CONSERVATIVE VIEWS

Alex McGowan Alex McGowan joined Cathay Pacific in 2005 from airline connectivity provider Tenzing Communications (now OnAir), where he was vice-president of sales and marketing. He spent the first five years of his career with British Airways undertaking a number of commercial roles. He joined British Airways as part of its graduate management programme in 1995. In 2000, Alex was recruited to join Tenzing in Seattle. Alex was appointed Cathay's product manager in January 2008. His main responsibility is the development of Cathay Pacific and Dragonair's onboard and ground product portfolio, including worldwide lounges, aircraft cabin interiors and IFE. In addition, he oversees the company's research function. Before heading the product department, Alex spent three years as purchasing manager, IT and eBusiness. He holds a first class honours degree in business and is a member of the Chartered Institute of Purchasing.

How did you first get started in the airline business? I was attracted to the airline business as a result of its dynamic and diverse nature and the integral role airlines play in the economic and social development of modern society... and watching Concorde roar overhead at the Farnborough Airshow made a lasting impression, too!

How has the industry changed during your career so far? There are two opposing forces influencing the development of the industry. On one hand, the OEMs are driving



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standardisation of cabin interiors in an attempt to reduce aircraft delivery risks. On the other, airlines that pursue a strategy of differentiation are demanding products that can be customised to reflect their brand personality and the specific needs of their passengers. The optimum outcome is to remove customisation and complexity from those areas the passenger doesn't see or value but to ensure there is real focus on perfecting the things that count. Whether this is achieved remains to be seen.

What are the key trends likely to shape inflight product and services in the future? Passenger's expectations are continually evolving, shaped to a large extent by their experiences on the ground. For a daytime flight, this means business passengers expect to be able to work on board as they would on the ground – a true office in the sky. At night, the same travellers need privacy and a fully flat bed that allow them to sleep as soundly as they would at home. Everyone expects a myriad of entertainment options on demand, along with food and wine to rival a fine restaurant.

And the main challenges? Competition and structural changes in the airline industry have decreased product life-cycles dramatically. At the same time, the development cycle for truly innovative products has increased. The high asset utilisation and minimal downtime of modern aircraft lengthens the time it takes to deploy a major product upgrade across a fleet. All this means that most premium carriers are continually in product development mode, and perpetually operating with some degree of product inconsistency. Managing this process and having the right product in the right market at the right time is essential.

What has been the high point of your career to date? The Cathay Pacific Group has a terrific team of professionals – working with such diverse and talented people from engineering, inflight services, airports, planning,

THE DEVELOPMENT CYCLE FOR TRULY INNOVATIVE PRODUCTS HAS INCREASED

revenue management and purchasing is by far the biggest highlight.

Cathay's new business class

What are Cathay's objectives going forward? Cathay is currently part-way through the deployment of its new long-haul product. This includes its award-winning (Skytrax) first class; business class with a fully flat bed; and economy class with a fully flat bed; and economy class with a unique fixed backshell protecting passengers' personal space. In addition, we're expanding our StudioCX AVOD IFE system across all classes, with more than 100 movies, 350 TV programmes and 888 CDs. The programme will be completed during 2009.

How would you summarise Cathay's cabin product/service strategy overall? Cathay Pacific and Dragonair are clearly positioned as premium carriers, with an extensive network flowing through Hong Kong, a hard product to rival any flying today, and ground staff and cabin crew who will go out of their way to make their passengers feel special and cared for.

How do you plan to ensure innovation across such a technical and complex industry? Innovation can come from many quarters – there's no monopoly on good ideas. At Cathay Pacific we have processes in place to capture innovation from our staff and suppliers. Our home, Hong Kong, is one of the world's most dynamic and exciting cities and always provides additional inspiration. As always, assembling the right team – from both inside and outside the company – is essential to turning the best ideas into reality.

WE HAVE CULTURED AN ETHOS BASED ENTIRELY ON INNOVATION



 Delta is the first customer for Thompson's staggered, full-flat business-class Vantage seating units James Thompson James Thompson is founder, chief executive officer and president of Thompson Solutions, a design, engineering and patent holding company. He is also founder of Thompson Aerospace, a new company specifically formed as the centre of excellence for aircraft seating, including the certification, manufacture and final assembly of Thompson Solutions' seating systems. His career started as an apprentice toolmaker for a seating company more than 25 years ago. He has held positions within various aerospace companies, including tool room manager, prototype manager, lead/chief engineer, chief designer, and engineering director. James is a born entrepreneur: "We take chances and invest in new ideas," he says.

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How did you get started in this business? Growing up in rural Northern Ireland, I cultivated an aversion to farming, so at the age of 16, I joined Aircraft Furnishings in Kilkeel as a toolmaker. Later, I ran the prototype department before moving to the position of lead engineer in the drawing office. Little did I know at that stage that I would go on to meet stranger species in the industry than those I left behind on the farm!

How would you summarise the main changes during your career so far? From a product perspective, passenger demands for comfort have acted to change business- and first-class cabins and seating immeasurably, however economy cabins remain very much unchanged, with little advancement in seating products and furniture.

What are the key challenges going forward? From an operator

perspective, it is crucial that nextgeneration cabin interiors deliver improved efficiencies that result in quantifiable benefits to operating costs. This will encompass technological advances that reduce the mass of the interior, and improvements in design that reduce maintenance, turn-around times and life-cycle costs in general. From an industry perspective, programme deferments and cancellations create instability for entrenched competitors. This in turn represents opportunity for organisations such as ours.

And the main challenges for Thompson Aerospace? The current economic climate represents challenging times for our sector. However, such adversity demands creativity and lateral thinking in all our business activities. We thrive on adversity – that's what sets us apart from our peers and will stand us in good stead for the next phase of our development. We have set ourselves high ambitions and targets, so in many respects we are responsible for creating the challenges we face. What has been the high point of your career to date? I could look back retrospectively to a number of events in my career that have been satisfying for a variety of different reasons. However, I tend to look forward, viewing my career as a journey – a journey that is both challenging and demanding, but is extremely exciting and rewarding.

How do you innovate? By thinking less technically, less conservatively and in less complex terms! From the outset, we free our minds of the various technical and regulatory constraints otherwise we would never extend the frontiers of current industry thinking. We then take the route of minimal compromise to ensure the viability of our product in service. Since our conception we have cultured an ethos based entirely on innovation. Our drive for creativity has enabled us to successfully develop seating concepts that have provided step change advantages to both the passenger experience and operating efficiency. END

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tough times?

ROBERT SMITH OF IMDC PROVIDES SOME COMMON SENSE IFE ADVICE FOR AIRLINES LOOKING TO WEATHER THE CURRENT ECONOMIC STORM

s part of my research for this article I reviewed some material written in late 2001 by IMDC, just as the airline industry was facing its previous 'crisis'. After a quick flick through, I was left feeling as if I had just read something

hot off the press in late 2008. The similarity in important themes both at that time and the present day is astounding. Seven years ago we were writing about how government controls on airline ownership were preventing much needed cross-border consolidation; the similarity even extended itself to a partnership between British Airways and American Airlines.

We also wrote about airlines delaying decisions on all new technologies – and even back then – how broadband was likely to be the casualty at the time.

 Despite the costs, leading carriers continue to invest in customised premium products, such as SIA's First Class Suites, seen here

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 Virgin America's Red system enables passengers to select and pay for meals and snacks Anyone close to the industry today will know that the first and biggest casualty in this slow-down for the airlines is staff, just as it has been at this point in every industry cycle. Given that people costs are the highest costs, many airlines look to outsource and remove all non-core functions from their books.

There has been much attention paid recently to the industry's latest hot topic:





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ancillary revenues. Advertising dollars are seen as a key part of what some would describe as a potential industry saviour. Unfortunately at present, just as in 2001, what little inflight ancillary revenue exists can be expected to drop drastically. The quality of the advertising in magazines will deteriorate, and there will be heavy discounting as advertising agencies tighten up.

The old adage that airlines order aircraft in the good times to face delivery of them in the bad is heard often for good reason. Airlines delay taking delivery of new aircraft to reduce capacity and ease cash flow. For IFE, the

WILL ANCILLARY REVENUE AS A CONCEPT GO NO FURTHER THAN CHECKED BAGGAGE FEES AND SELLING SCRATCH CARDS?



media players go on to fulfil their potential? And will airlines go on to make significant ancillary revenues, or will ancillary revenue as a concept go no further than checked baggage fees and mumbling something about selling scratch cards on charter flights?

One thing to be cheerful about the current situation (or at least not so pessimistic) is to remember that this is a downturn, not a crash. Aircraft orders and delivery figures illustrate this point. While it is expected that more than 1,000 aircraft will leave the global airline fleet over 2008 as a result of retirements or carrier failures, orders of new aircraft have remained strong. At Farnborough Airshow in July 2008 Boeing and Airbus received orders that equated to three-quarters of the total from the equivalent Paris Airshow the year before and put both companies close to their annual targets.

After four strong years of aircraft orders by airlines, an aspect they will soon have to consider is how to equip these new aircraft. And even in tough times many airlines' reaction will be to go on the offensive and invest in their product in order to differentiate themselves. In times of weakening passenger demand the battle for market share becomes even more important.

Panasonic's Portable Media Player (PMP)

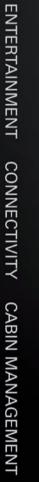
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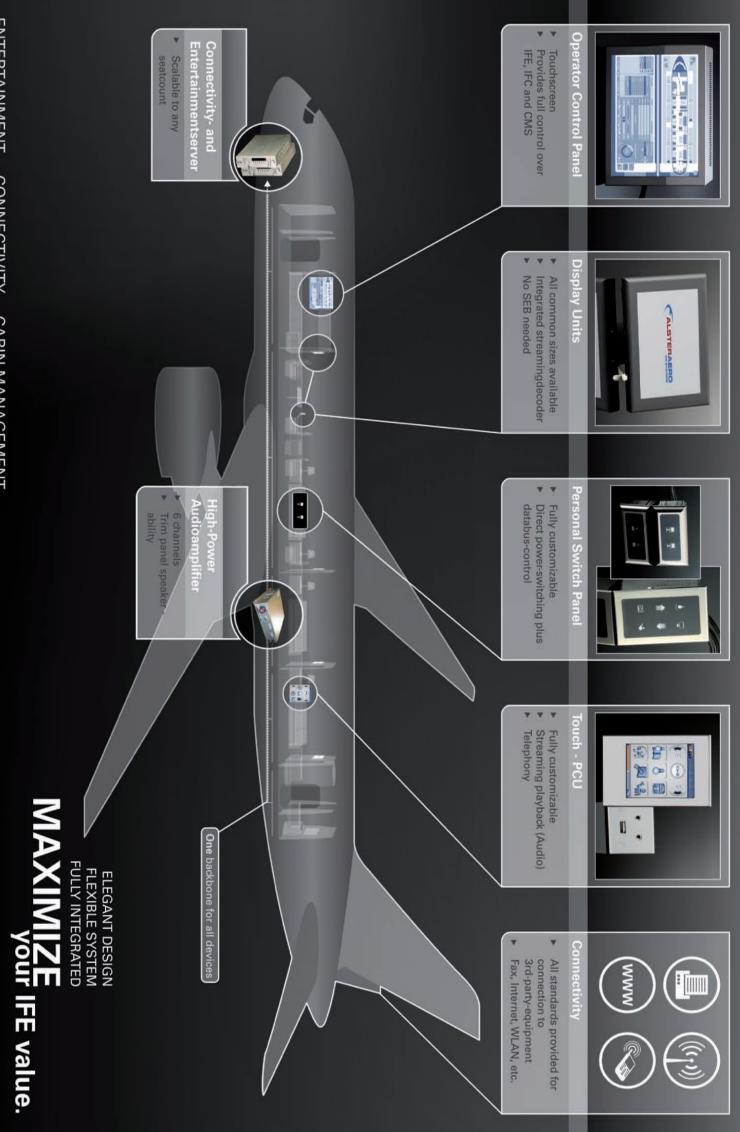
implications are clear - IFE systems are delayed as aircraft orders are delayed. However, an airline will never take the aircraft but cancel the IFE hardware on a twin-aisle jet as a cost-cutting measure.

Any good news? So with a downturn seemingly inevitable, is there anything positive on the horizon for airlines and those whose fortunes (ostensibly) depend on theirs? What, if any, are the sectors where we are likely to see some real growth and the emergence of some new leaders? And what does the future hold for the latest round of cabin connectivity services? Will portable









INFLIGHTENTERTAINMENT

Single-aisle developments Even so, airlines will expect improved value from any investment. The single-aisle market has moved on to a different level from an IFE perspective.

Recent entrants in this sector have focused their pitch on improved value from IFE investment. The likes of Lumexis, Bluebox, Sicma and SkyGem are using new technology and low weight to entice a greater range of airlines into adding in-seat IFE to aircraft previously considered not suitable for the required investment.

An alternative and more established, if still developing, option for airlines seeking to improve their short-haul product is portable media players (PMPs). Some providers in this sector have consumer-off-the-shelf (COTS) technology at the core of their value proposition. With the option of installing PMPs semi-embedded and embedded in to the seat, they are progressing their product to something very close to the inevitable future of traditional IFE. Both paths offer airlines lower investment and operating costs; the intricacies of maintenance and support may prove to be the defining factor in airline choice.

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A future value-add for PMPs is facilitating connectivity on board through WiFi-enabled broadband. There is undoubtedly value to both the passenger and airline in providing a connection to the internet as well as the airline's own IT infrastructure and back-office systems. Doing so could enable airlines to deliver a personalised experience to each passenger and demonstrates how connectivity can enhance existing inflight technologies.

PMPs are not the only way to make the most of an onboard connection, nor



are access fees the only potential revenue stream available to airlines. A connected aircraft gives a reason for passengers to bring their own devices onboard to make use of the service. Once on board, passengers can be offered an array of services in addition to an internet connection. As the device is personal to the passenger, the airline has the opportunity to communicate on a 'one to one' basis rather than a 'none to many'.

Tell it like it is Another example of how a connected aircraft can enhance

THERE IS UNDOUBTEDLY VALUE TO BOTH THE PASSENGER AND AIRLINE IN PROVIDING A CONNECTION TO THE INTERNET

 An example of an 'embedded' portable media player IFE solution in service with American Airlines
 An integrated 'seatback' IFE system, in service on SIA's A380s



existing inflight products comes from the likes of the SkyMall shopping magazine. The inflight catalogue is seen by approximately 90% of all US domestic air passengers, reaching more than 650 million air travellers annually. SkyMall went live with Bazaarvoice Ratings & Reviews in July 2008, enabling passengers to provide feedback on services and products. Company officials say it has "already begun to see the quantitative and qualitative benefits of allowing its customers to share their opinions on products to help each other make more informed purchase decisions."

A connected aircraft could bring the benefits of peer reviews of products offered for sale in flight, as well as the mechanism for these products to be purchased immediately on the aircraft. Anyone who has convinced themselves they really do need a portable sauna or

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such like mid-flight, before thinking better of it once their feet are on the ground will recognise how a connected aircraft has a greater potential for onboard sales.

The array of items available for sale to passengers can increase significantly in value if an aircraft is connected and the transaction can therefore be authorised at the time of sale, excluding the possibility of inflight credit card fraud.

In addition to bringing in extra revenue and making passengers happy, a connected aircraft has the potential to bring cost savings through increased operation efficiencies such as electronic flight bag support and advance notice of technical issues communicated to engineers before the aircraft reaches its destination.

Contact Wale Adepoju Email: wale.adepoju@imdc.net **Standard issue** In their rush to deliver a differentiated passenger experience, airlines might do well to rein in their demands for complete customisation. Across the airline industry, from seat installation to content delivery requirements, there are a bewildering array of anomalies and customised products. Whether it is for airlines themselves or an industry organisation to instigate standards is up for debate. What is clear is that the marginal benefits from so many tailored products are far outweighed by the higher prices and slower delivery that result.

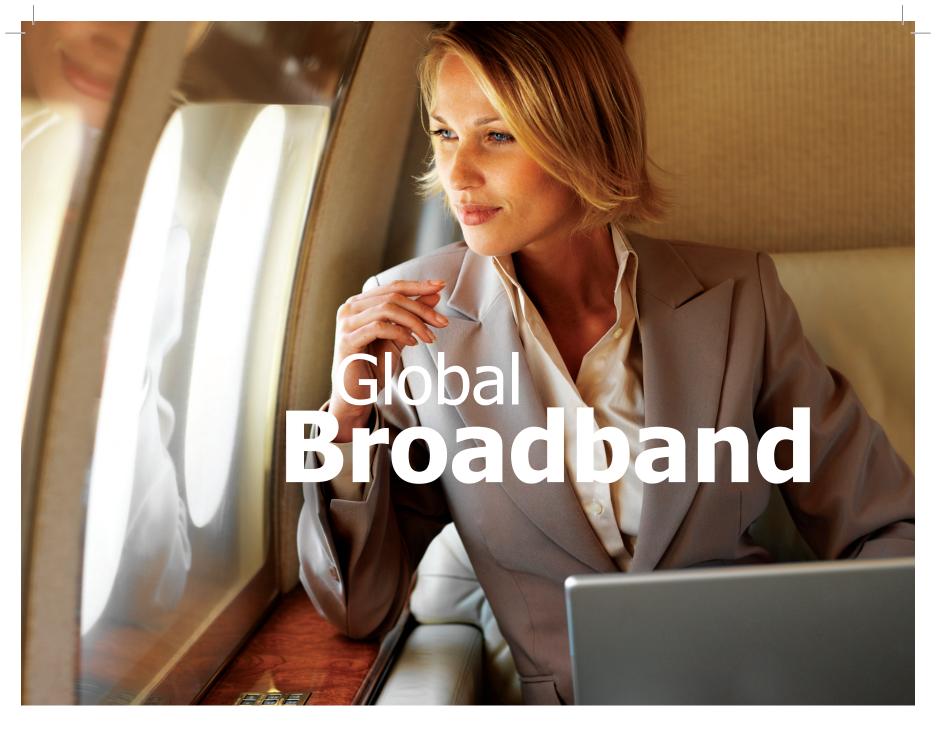
One problem with some reporting in this industry is that new developments are often too easily hailed as industry saviours. While it is in the interests of those providing these new services to propagate such a view it does cause somewhat of a distraction. In reality each new technology and service is an incremental improvement. Introducing passenger connectivity for example may yield no more profit than a single product on the duty-free trolley. But airlines need to develop their products in ways that suits their own circumstances and makes the most of all synergies. By doing so they might just make a significant difference to their business model, or at least be slightly better positioned to ride out an extra dollar on the price of oil. END

A CONNECTED AIRCRAFT HAS THE POTENTIAL TO BRING COST SAVINGS THROUGH INCREASED OPERATION EFFICIENCIES

- Connectivity could pave the way for increased ancillary revenues
 IMS' PAV707
- portable media player

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AIRBUS INDUSTRIAL DESIGN RECENTLY CELEBRATED ITS 40TH ANNIVERSARY – BOB LANGE REVEALS HOW ITS CABIN DESIGN PHILOSOPHY HAS CHANGED OVER THE DECADES

he driving force behind Airbus's design language can be traced back to the roots of the Airbus Industrial Design division set up in 1967. Since that time, while there have been many evolutionary stages and fashion cycles, one aspect has been foremost throughout: the creation of stunning architectural environments to showcase the airlines and their brands, and emphasising comfort, space and quality.

In terms of Airbus's design language, there are three core principles: simplicity, sustainability and saliency. Simplicity represents a clear, understandable rationale behind every design element. Sustainability is reflected in a contemporary cabin appearance over the operational life of Airbus aircraft, while still affording the airlines the flexibility to incorporate evolving trends and fashions. Thirdly, saliency underscores the confidence in understanding of customer's needs to allow Airbus to deliver market-defining products.

 1968 Airbus A300 cabin cross-section
 Today's A340-500

cabin

From the outset, following the foundation of Airbus itself, design of the passenger cabin was undertaken in close cooperation with aircraft systems and





structural design activities, and also in conjunction with production and marketing departments – and of course the airlines themselves.

Using this concurrent approach, functional and aesthetic designers can make the best use of available materials, manufacturing implications are taken into account early on, and costs are minimised. Benefits are also carried through into service operation – for example, fixed bin stowage boxes are reliable and mechanically simple for passengers and crew to operate, and are also low in weight. In a nutshell, this development philosophy would ensure that artistic creativity and aesthetic elegance were successfully aligned to industrial, commercial and operational practicalities.

26 Aircraft Interiors International Annual 2009



LONGITUDINAL LIGHTING TUBES WERE POSITIONED IN THE RECESSES OF A COFFERED CEILING

19705 – **'ATLAS' Cabin concept** In the early 1970s, Airbus's designers, in conjunction with a group of airlines, defined the ATLAS Cabin featuring an architectural grid with visible split-line-gaps. As with previous cabin concepts, this one could be adapted for different aircraft, and could incorporate customised changes. Notable design features included the curved lateral hat-racks, which not only blended smoothly into the ceiling panels, but also facilitated improved cabin-ceiling lighting.

As an additional feature, entirely new to an aircraft interior, longitudinal lighting tubes were positioned in the recesses of a coffered ceiling resulting in an even distribution of light. This contributed to a more generous appearance of cabin space and reduced the perception of the 'tube effect'. With this interior concept, the Airbus design department had achieved a major breakthrough. In the late 1970s, a Hamburg-based product design department was set up to keep in close contact with the production and manufacturing departments to allow for the most creative designs, while taking full advantage of available materials and manufacturing processes.

With the subsequent availability of more advanced cabin materials, components such as window panels were gradually improved. For example, the existing vacuum-formed sheets were replaced with honeycomb material, leading to a reduction in recess depth around the windows, as well as simplifying the application of decor films.

Furthermore, in common with both the outer frames of the ceiling panels and the stowage bin lids, the window panels featured a matching embossed frame, each surrounding a pair of windows.

3. 1970s ATLAS Cabin



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MANUFACTURING OF INTERIOR FURNISHINGS

Other ATLAS refinements included the accommodation of long baggage items by doubling the length of the stowage bin compartment. In this case, the embossed frames and the handle strip below the lids indicated that two lids surrounded by a frame formed one stowage unit.

1980s – computer-aided-design In 1980, Airbus introduced computeraided design (CAD) for the first time on a new programme. Not only did the use of CAD enable the established Airbus signature features (such as the architectural 'grid', split-line-gaps, coffered ceiling panels and embossed frames) to be easily applied to the cabin of any subsequent Airbus family member, it also allowed designers to finely optimise their practical characteristics. For example, the new digital tools enabled the stowage volume in the A320's overhead bins to be optimised with more width in the ceiling area. This ensured that items placed on top of other baggage pieces would not fall out when the lid was opened.

In addition, the lateral light covers with their transition between stowage bins and window panels represented another new feature that noticeably improved the lighting and visual spaciousness of the cabin. Separation walls, which previously had vertical edges towards the aisle, now featured curved contours to match the lining of the stowage bins above them. Even passenger seats became transformed when their previous 'rectangular' appearance was replaced with a curved profile to match the adjacent sidewalls.

In the late 1980s, the ATLAS Cabin underwent a partial redesign to save weight, which was achieved by deleting the lateral lighting tubes. This led to a change of the coffered ceiling panels on their lateral ends, where there was no longer any need for a frame to cover lighting tubes. Changes to the ceiling contours were such that enough light from the fluorescent tubes above the centre-bins could flow along the curvature of the ceiling panels. The lateral bins were also adapted to the contour of the centre bins, resulting in more light being projected onto the ceiling panels.

The 2D CAD, which was introduced in the early 1980s, was rapidly



 A310 interior
 A300 with retrofitted interior

succeeded by 3D techniques. Gone too were the rows upon rows of draughtsman's tables with their paper drawings, to be replaced by powerful PC workstations.

Computers were now able to render cabin design illustrations, which previously had to be hand-made. At first, these images were fairly low resolution; however, it did not take long before these images could be rendered in full photo-realistic detail.

1990s – the TARDIS effect! In the mid-1990s, the emphasis shifted to maximising the perception of spaciousness within a given fuselage crosssection. To this end, the product design departments in Hamburg and Toulouse were given the objective to generate more visual width and height wherever possible, described by the motto: "Larger inside than outside."

In line with this, careful detailed design was applied to all major cabin panels, be they ceiling panels, window panels or the lids of stowage bins all were graced with elliptically profiled edges and interfaces. Even passenger service panels above the passengers' heads were given a slightly concave curvature to not only enhance the perception of space, but also to support ambient light projection. In addition, these soft contours were supported by the use of subtle and reflection-friendly colours of the interior surfaces as well as the fabrics for passenger seats.



COMPUTERS WERE NOW ABLE TO RENDER CABIN DESIGN ILLUSTRATIONS, WHICH PREVIOUSLY HAD TO BE HAND-MADE

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Lighting

Keypad



A 'GOOD OLD-FASHIONED' MOCK-UP IS THE ULTIMATE WAY TO EXPERIENCE SUPERIOR CABIN INTERIOR DESIGN

Another solution to increasing spaciousness was by actually reclaiming some 'lost' inches. For example, window panels and insulation-blankets inside fuselage-sidewalls were redesigned to gain some more overall cabin-width.

Passenger ventilation was also improved. Previously, passengers with window seats were at a disadvantage in this regard, since they were furthest away from the only air outlet box in the ceiling area. Now, to give these passengers a welcome 'breath of fresh air', additional air outlets were routed between window panels and lateral stowage bins, combined with a new lighting cover above the window panels.

Engineering mock-up While CAD displays are fine for giving the teams of designers a concurrent electronic view of their evolving creation, to complement this, a real-life engineering mock-up centre was also constructed in a dedicated warehouse co-located with the cabin engineers at Airbus's Hamburg site in Germany. Moreover, this mock-up was constantly updated, and on display for customers, as their evolving designs would take shape in the design offices nearby. This facility proved particularly useful as a means to demon-



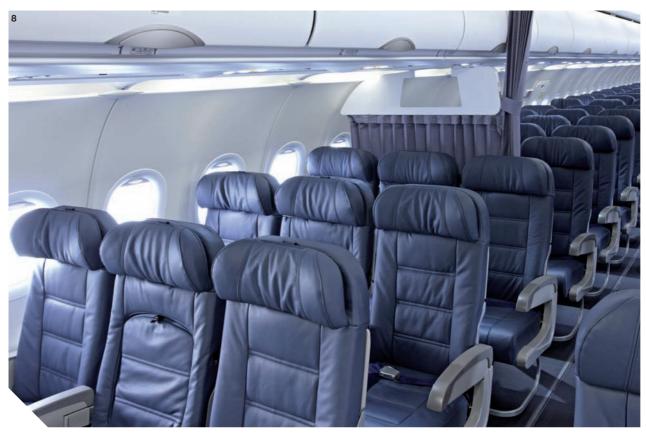
strate how the massive interior of the A380 would lend itself to showcasing not only the innovative branding ideas of the airline customers, but would also enable people to actually test and experience for themselves the practicality of the cabin features, and of course sample the unprecedented levels of comfort.

In some ways, it remains true today that regardless of endless advances in computer technology, Airbus designers maintain that a 'good old-fashioned' mock-up is the ultimate way to experience superior cabin interior design.

From 2D 'CAD' to 3D 'modelling' At the turn of the millennium, the Airbus A380 was officially launched, and by

that time had morphed through many intermediate stages into its final shape. As this milestone was achieved, with parallel input from the airlines, together with marketing, manufacturing, engineering and product design departments, all the component geometries of the interior furnishing took shape concurrently with 3D computer tools before eventually being released for the creation of physical tooling at the many Airbus factories around the world.

The industrial design department even appointed lighting architects into their teams to encourage all sorts of lighting features such as a continuously variable transition of 'mood-lighting'. Moreover, these 3D tools enabled Airbus A350 XWB interior mock-up
 Mood lighting is now a vital tool in the cabin designer's armoury



 A320 Enhanced cabin interior
 A340 interior



3D MODELLING ALLOWED FOR MAXIMUM FLEXIBILITY AND INDIVIDUAL CHOICE FOR THE RESPECTIVE OPERATOR

Industrial Design to hone to perfection numerous innovations such as the main staircase in the forward entrance area – connecting both passenger decks – as well as the spiral staircase in the rear area of the aircraft, which had to be developed and tested for their suitability in emergency situations.

Customers would also have the freedom to configure in a virtual 3D environment their own first-class and special areas including bars, lounges, restrooms, individual suites, and even shower-compartments.

Flexibility and brand adaptation The specific branding for each carrier was one of the most significant factors when conceiving their customised A380 cabin interiors. To this end, 3D modelling allowed for maximum flexibility and individual choice for the respective operator – to be distinguishable from the competition – and this need for flexibility had become the key factor in the cabin design. Yet all this had to result in a cabin that most definitely still said 'Airbus'.

Contact Robert Lange Email: robert.lange@airbus.com The development phase of the A380 certainly represented a 'peak' in terms of design techniques. For example, Airbus even developed the means to harness the power of its 3D data model to generate real-time presentation and simulation techniques. In fact, as early as in the definition phase of the aircraft, customers were able to experience a virtual cabin 'walkthrough'. They could then suggest changes and refinements, which could then be implemented for 'real' in the physical mock-up in Hamburg for further review.

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Today, Airbus's design language is referred to as 'Canvas Airbus', and in the Airbus cabin innovation and design centre (now called the Cabin Concept Centre) in Hamburg, many internationally acclaimed developments have been masterminded and showcased. These include 'Chrysalis', an embryonic A350 XWB interior demonstrator. Not surprisingly, modelling of this 'eXtra-Wide-Body' interior is keeping the teams in Hamburg and Toulouse very busy indeed. **END**

An answer to your needs on board

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 A320 Enhanced cabin interior
 A340 interior



3D MODELLING ALLOWED FOR MAXIMUM FLEXIBILITY AND INDIVIDUAL CHOICE FOR THE RESPECTIVE OPERATOR

Industrial Design to hone to perfection numerous innovations such as the main staircase in the forward entrance area – connecting both passenger decks – as well as the spiral staircase in the rear area of the aircraft, which had to be developed and tested for their suitability in emergency situations.

Customers would also have the freedom to configure in a virtual 3D environment their own first-class and special areas including bars, lounges, restrooms, individual suites, and even shower-compartments.

Flexibility and brand adaptation The specific branding for each carrier was one of the most significant factors when conceiving their customised A380 cabin interiors. To this end, 3D modelling allowed for maximum flexibility and individual choice for the respective operator – to be distinguishable from the competition – and this need for flexibility had become the key factor in the cabin design. Yet all this had to result in a cabin that most definitely still said 'Airbus'.

Contact Robert Lange Email: robert.lange@airbus.com The development phase of the A380 certainly represented a 'peak' in terms of design techniques. For example, Airbus even developed the means to harness the power of its 3D data model to generate real-time presentation and simulation techniques. In fact, as early as in the definition phase of the aircraft, customers were able to experience a virtual cabin 'walkthrough'. They could then suggest changes and refinements, which could then be implemented for 'real' in the physical mock-up in Hamburg for further review.

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fear itself

PAUL WYLDE, TEAGUE'S NEW CREATIVE DIRECTOR, CONSIDERS HOW THE INDUSTRY CAN SURVIVE THE CREDIT CRUNCH BY DESIGNING FOR FEAR

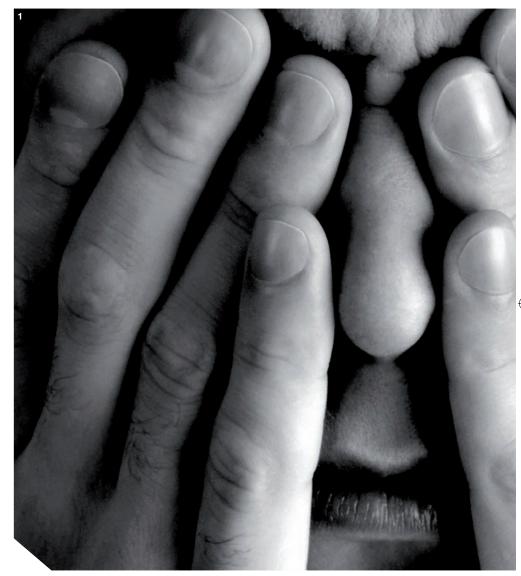
ranklin D. Roosevelt famously said: "The only thing we have to fear is fear itself – nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into

needed efforts to convert retreat into advance." Should fear impact our design programmes?

That sinister, all too familiar friend that has dogged our industry for so long is about to manifest itself yet again. This time however, fear has almost become a parody of itself. It's snowballing and sensationalising through the global financial systems on its way to the base of the world economy, consuming and colouring as it goes. In its wake, inspiring even the most conservative and level-headed commentators to proclaim that the end of capitalism is nigh, the most fundamental changes in economic systems are upon us and the fiscal systems that bind the global economy need to be torn up and re-invented.

The US government, the driving force of modern capitalism, the world's richest nation and pioneer of the free markets, contemplates its own version of fiscal re-invention. The ironic form to its action would have sounded unimaginable just six months ago. Intervention and regulation sounds a little bit like nationalisation – and isn't that a socialist idea?

The price of capitalism Crash, chaos, meltdown, depression, crisis, plunge, panic, agony, recession, destruction, darkness, suffering – all words I have extracted for the sake of illustration, from just one article, from *The Financial Times* of all publications. If the situation is as bad as all that, how on earth will western notions of ideology – modernity, technology, free trade, progress, consumption and democracy possibly gain influence and traction with the likes of Russia, China and Africa? How will we ever sleep

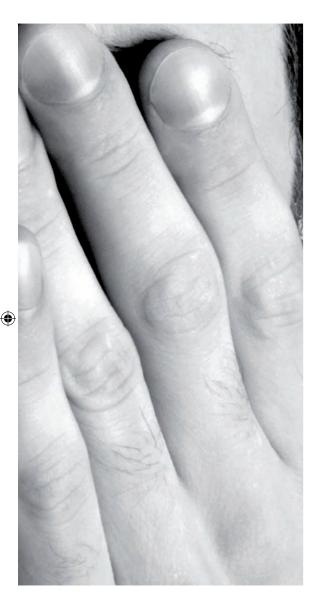


soundly again knowing that some people have lost their entire life savings overnight because no one really knew what a bunch of twenty-something, Paneri-wearing hedge fund managers in yachts off of Monte Carlo were doing for the past three years?

Welcome to a bad post-capitalism hangover. Many of us simply did not save like we were supposed to. We went on a spending spree symbolised by numbers on spreadsheets. House prices soared worryingly yet conveniently upwards. Money became an increasingly complex commodity rather than a supportive component to trade and commerce. Unbelievably huge profits were made, fuelling an expectation of entitlement, consumption. We became greedy.

On top of this, Iceland just might go bust. I never learned that at school – that it's possible for a country to become bankrupt. I thought that's what sometimes happened to small corner shops when they sell goods that no one

 Rather than being crippled by fear, designers can embrace uncertainty to drive innovation



WELCOME TO A BAD POST-CAPITALISM HANGOVER

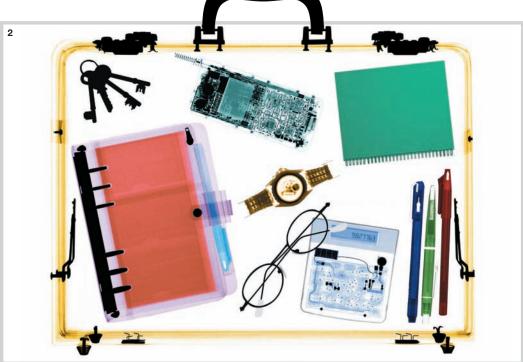
wants to buy. Now, a little older and wiser, I read with interest that credit default swapping is extremely dangerous if unregulated. But, being left alone for the past five years, US\$50 trillion of our money is tied up in these things. Not knowing what I'm reading about infects me with those little, all too familiar tingles on the back of my neck – here comes fear.

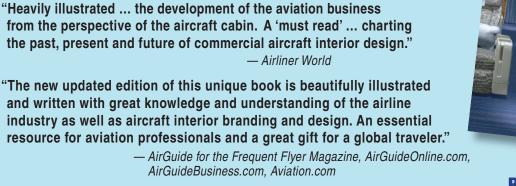
Uncertainty I can physically feel fear translate from nothing to something. It goes from unfathomable financial gobbledygook to wondering uneasily how these mind-boggling events will impact upon my lowly world of aircraft design – the world which I have committed to, worked hard to improve and feel I have a place in.

I met recently with some dear friends from British Airways. It was my immediate peer group, with a few new faces thrown in representing the next in line. Thirty-something designers, marketers, engineers and product developers who, along with you, the readership of this publication, have made a profound contribution to our industry through understanding the value of design in meaningfully differentiating product and service. The conversations, body language and facial expressions over the Pizza Express tables in Richmond and Ealing are only too familiar. It's déjà vu – another round of brutal restructure, consolidation, redundancies. Our industry is certainly not for the faint-hearted.

Having reformed and repackaged itself from the literal menaces of competitor product advantage, new entrants, localised disease, terrorism, war, and in some cases, internal mayhem driven by poor union relations and disgruntled staff, fear is back with a vengeance. It has a new form, a subtler, more sinister and ultimately, more acute flavour of dread that picks up from the focus of my previous

Wylde believes that in uncertain times, opportunity lies in improving passengers' experience of airport security





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An Aircraft Interiors International publication



observations that appeared in the tenth anniversary issue of *Aircraft Interiors International* (published this time last year) – uncertainty.

Designing for fear I have explored the notion of unpredictability for a while now on the premise that uncertainty is the only real predictable trend. Thus, by embracing uncertainty as a strategic design driver, new innovations could yield commercial advantage. I want to take that idea one stage further with this piece in exploring whether we could and should design for fear. Perhaps I could argue the financial and political systems are now in the process of designing for fear. The UK-inspired rescue package is a creative product, the result of analysis, multidisciplinary brainstorming, creativity, lateral thought, a late night and apparently, a very good curry. The package is first and foremost an attempt to design a solution to alleviate fear by injecting real cash into the system, thus retrieving confidence and stabilising the markets. In this new context the world waits with baited breath as banks, financial institutions, traders and brokers adopt new systems, processes and conduct, thus designing their own responses to the new landscape.

It's more tangible to observe design's response to fear in other sectors. What's

fascinating is that everybody's doing it. Ford is responding to insecurity through the new Flex. The Flex looks tough and safe, it protects and cocoons, and being laden with new technologies, can support an array of lifestyle pursuits all from the comfort of the owner's personal microenvironment. At the other end of the market, there is a now a 24-month waiting list for Smart Cars in the USA while sales of the new Fiat 500, Toyota's Yaris and Prius are through the roof in Europe.

Sales of white shirts are booming. Young men, intimidated and threatened by the current economic turmoil and unpredictable future are opting for a more conservative wardrobe that is more flexible, versatile and adaptable. Clever shirt manufacturers are offering a wider selection of white shirts – slim fit, single cuff, double cuff, classic collar, travel friendly, breathable, noniron, etc. The big fashion houses are quick to respond to fear. Most of the major brands such as Calvin Klein, Burberry, Mulberry, Paul Smith, Prada and so on are using the past as playground for new products through a renaissance in tailoring, classic styles and quality materials that are designed to last. New austerity is in, 'fewer but better' is a compelling marketing message when unpredictability dominates the retail landscape.

3. The Ford Flex

BY EMBRACING UNCERTAINTY AS A STRATEGIC DESIGN DRIVER, NEW INNOVATIONS COULD YIELD COMMERCIAL ADVANTAGE

Warmth and comfort Sales are up for real shoes that can be mended, and clothes and watch repairs are up too. John Lewis (a UK department store chain) claims that demand for hot water bottles is up by 247% and electric blankets are up by 81% Notions of comfort, warmth, home and family are big, relevant themes to exploit.

Marks and Spencer throughout the UK is aggressively and successfully marketing premium take-home foods to attract share away from restaurants, bars and hotels –marketing for fear through staying at home. There has been a 15% increase in demand for wines costing more than £10 and champagne sales are up by 13%.

Hollywood and Broadway are also playing their part in designing for fear.

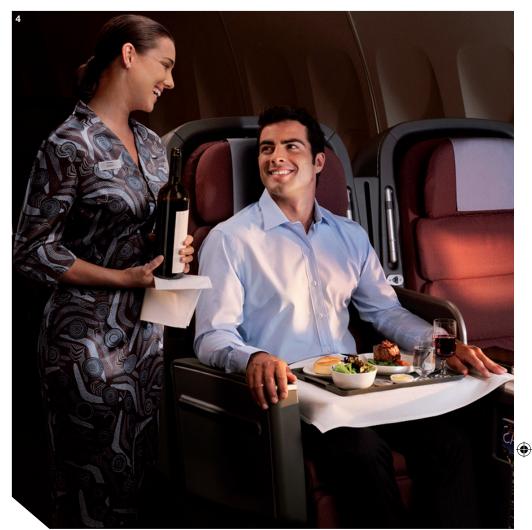
THERE WILL BE EVEN MORE IMPETUS NOW ON THE BASIC ELEMENTS OF GREAT CUSTOMER SERVICE – EYE CONTACT, HUMAN TOUCH, PERSONAL SERVICE, GENUINE ENGAGEMENT

Improving customer service is a good way for airlines to differentiate themselves There is huge demand for escapism and feel good films such as *Mamma Mia*. Comedy is in demand and sales of DVDs are up by 40%. The current DiCaprio blockbuster, *Body of Lies*, is of course, a good-over-evil paranoia flick that echoes the war on terror.

Architects are using bolder forms that symbolise strength and security. They are also exploring lighter structures that expose and demystify what lies within. Furniture designers are using organic forms and natural materials that are rich with texture and ooze sensuality.

Opportunities in aviation So what does all this mean for aviation? There are still opportunities to offer protection and comfort, cosiness and control. Warmth and sensuality will be huge themes for the next five years, so too community, comraderie, social networking, connectivity and dare I say it, love.

Love is the answer - internal love for the company, brand, product and colleague connectivity through to the external - customers, partners, suppliers and even the competition. There will be even more impetus now on the basic elements of great customer service - eye contact, human touch, personal service, genuine engagement, integrity, honesty and passion, and how much of the airline industry is devoid of those values. This is quite the opposite culture to the one that bred our current global disposition - greed, individualism, competition, hysteria, self-indulgence, entitlement, plenty and consumption. Thankfully, those times seem to be at an end.

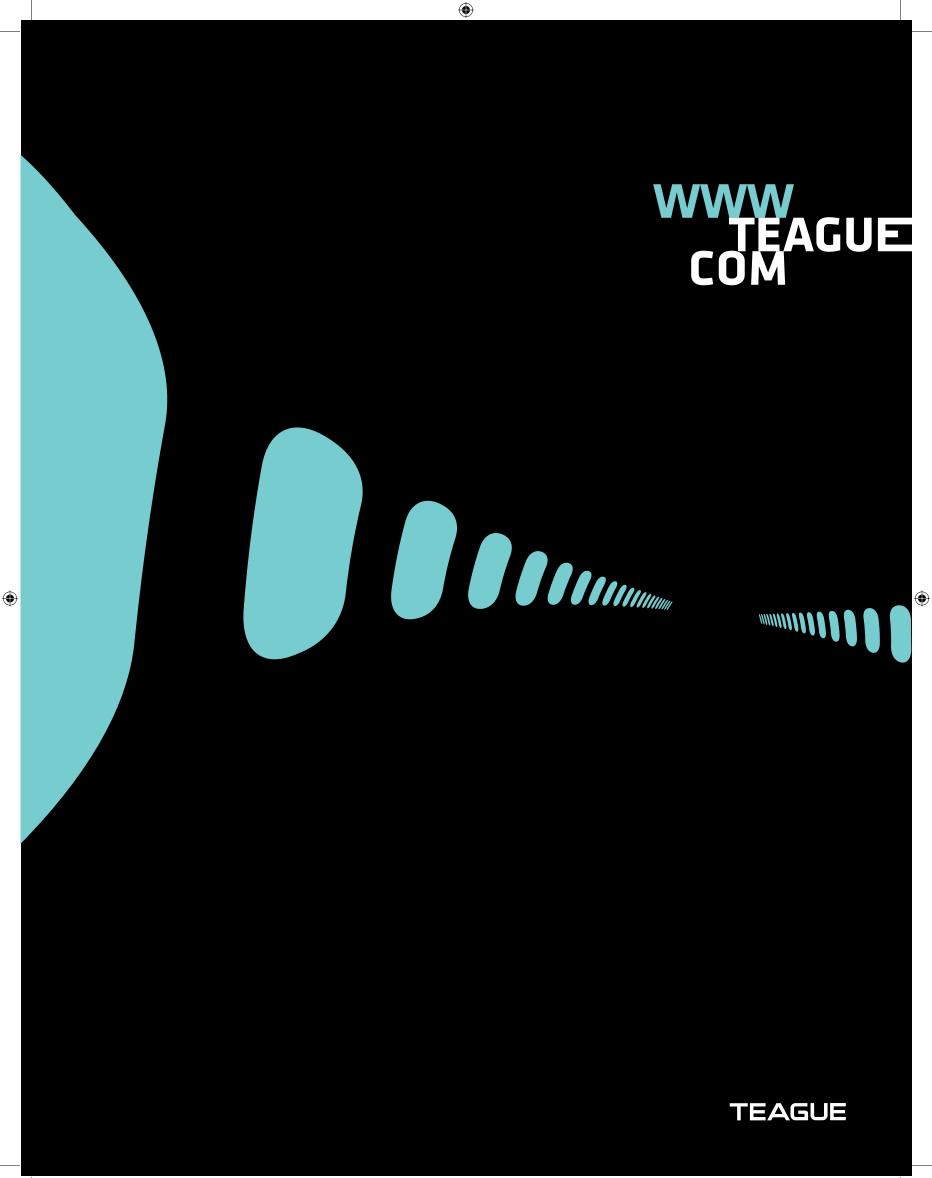


An immediate opportunity, albeit out of the control of most airlines, is security. At the moment, the security process at the majority of airports is as bad as it can be - intimidating, erratic, inconsistent, retrofitted, stretched and underfunded. It doesn't have to be this way. The vernacular of strength and security combined with the openness of transparency, demystification and high technology if applied with finesse and sensitivity, can turn a negative experience into a positive. Much like the way other sectors have embraced creativity, as outlined earlier. A great parallel to draw from here is hospitality security. Hotel security originated from customer service but quickly grew into security. For example, Ian Schrager had the foresight to position his security team as glamorous, red carpet hunks.

Contact Sarah Matheny Email: smatheny@teague.com They look fantastic but still perform a very serious role. Aviation however, originated in security and operation but market forces pushed it reluctantly over time into customer service. The vision is yet to be cast here.

The human factor It was Will Hutton who once said that the next 25 years is about making capitalism more humane. Welcome to a new age of humility – that idea is central to our vision at the Teague Aviation studios. We are passionate about humanising the flying experience through creative memorable experiences that touch people's lives for the better.

Is this all just a repositioned form of socialism I wonder? My late father, bless him, would be proud of my simple exhortation. **END**



long game

MATT ASLIN, PANASONIC AVIONICS, IS A FIRM BELIEVER IN FOCUSING ON THE ONGOING COSTS, AS WELL AS THE INITIAL COST, OF THE LATEST AVOD IFE SYSTEMS

ndustry sources estimate there are thousands of aircraft flying with audio/video on demand (AVOD) and that number is growing every day. Passengers are entertained and airline brand managers have a powerful new tool they can use to compete and grow their business. While in-flight entertainment and communications (IFEC) clearly delivers value to both airlines and their passengers, it comes at a cost. In this article we will explore how airlines can

and communications (IFEC) clearly delivers value to both airlines and their passengers, it comes at a cost. In this article we will explore how airlines can make the best strategic decisions about IFEC by looking at total cost of ownership, which includes both initial and ongoing costs.

Initial cost is often, understandably, a primary focus for an airline when deciding how to fit its fleet. IFEC suppliers understand this and are continually exploring a variety of approaches aimed at minimising initial costs. Reductions can be achieved through architectural, design and manufacturing innovations, as well as through continuous improvements in business and supply chain efficiency.

 Singapore Airlines' Krisworld IFE system, powered by Panasonic eX2

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2. Airlines can use the IFE system to create revenue, for example by inflight shopping These days, airlines are increasingly able to purchase only the capabilities they really need. While IFEC suppliers offer different systems at different price points, it is crucial that airlines examine

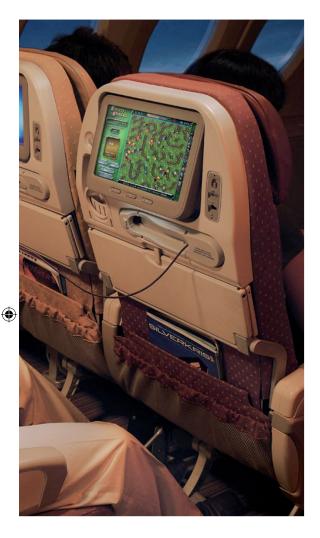




and understand the performance and functional limitations of systems with lower initial costs. What may be cheaper today, may be more expensive over the lifetime of the system when upgrades, expansion, maintenance and other factors are considered.

Ongoing costs As IFEC has become a central part of the flying experience, the ongoing costs of IFEC have come into focus more and more. While the issue can be complex and the trade-offs are unique to each airline, the sources of costs and approaches to managing them can be broken down in a fairly standard manner.

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Once the initial costs are known, financing the IFEC equipment and associated installation and certification becomes an ongoing cost. This is handled differently depending on whether the IFEC is fitted at the aircraft OEM and is included as part of the original purchase price of the aircraft or retrofitted after delivery and financed separately. Each airline (or leasing company) handles this differently and these costs should be included in any ongoing cost model.

Power consumption and system weight are factors that are directly tied to aircraft fuel burn and subsequent carbon emissions. Every watt of power

WHILE IFEC CLEARLY DELIVERS VALUE TO BOTH AIRLINES AND THEIR PASSENGERS, IT COMES AT A COST

consumed adds load to the engines and generates heat, increasing the load on the environmental control systems. As such, IFEC suppliers focus a great deal of scientific and engineering research and development in this area. Panasonic, for example, has been able to greatly increase the performance, capacity and functionality of its AVOD system, while reducing the weight and power consumption by around 50% since it was introduced 13 years ago. The search continues to cram even more performance into a lighter solution.

Space is also precious in an aircraft. What space exists needs to be available to paying passengers above the floor and valuable cargo below. Space occupied by IFEC equipment is space that is not generating revenue and is therefore an ongoing cost. Fortunately, most IFEC providers have greatly reduced the space required to support servers and other 'head-end' equipment. For example, Panasonic's latest generation of AVOD systems uses components that can be completely hidden within the seat itself, leaving maximum room for the passenger. In some cases, components have been eliminated completely. Looking ahead, IFEC suppliers are working to eliminate or reduce components and wiring through design innovations and integration into the aircraft, interior monuments and the seats themselves.

More than movies In many respects, media or content is the focal point for IFEC systems. A system that allows 600 or more passengers to independently watch the movie of their choice while flying at 40,000ft is still an amazing feat of engineering. Movies remain the

most important form of content as measured by how passengers spend their time, but the latest generation IFEC systems do much more.

Sophisticated interactive menus deliver a branded and easy to use experience. Support for the passenger's personal media, interactive moving maps, 3D multiplayer games, seat-toseat chat and on-board intranets are all widely deployed. Increasingly, mobile phones and internet connectivity are included. However, while these choices deliver value to passengers, they have the potential to drive up ongoing costs for airlines relating to media.

IFEC suppliers have responded by developing a suite of online tools and collaborative processes, allowing airlines to maximise the effectiveness of their IFEC investment while minimising ongoing costs. Because the selection, acquisition, formatting, integration and deployment of media is moving online, airlines, studios and other content publishers, service providers and IFEC suppliers can work collaboratively and more cost-effectively.

Getting media and content to the aircraft effectively and efficiently needs to be complemented by a way to measure how much of it is actually used by passengers. Panasonic has deployed a service called PAXUS, which measures media and content use by passengers. Upon landing, the service automatically offloads the data and makes it available online in a data warehouse. This allows airlines to make better decisions about the media they choose, helping to minimise ongoing media and content costs.

IFEC systems are made up of many components that are exposed to an

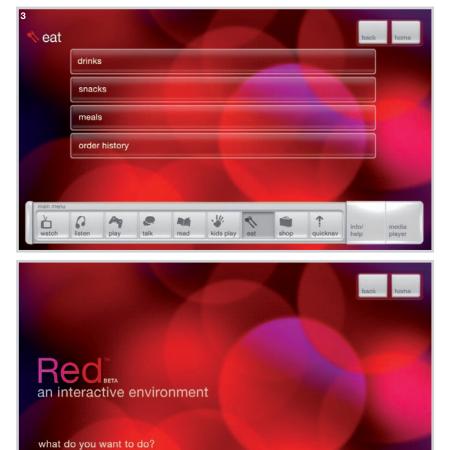
ESSENTIALLY, THERE ARE THREE WAYS TO GENERATE REVENUE ... ADVERTISING, PAY-PER-USE AND SHOPPING

 Virgin America's Red system is navigated easily via branded interactive menus

extreme operating environment. Consequently, providers are working to prevent failures and use redundancy to assure that passengers are rarely impacted. The rate of failure for IFEC components has improved dramatically over the last decade, but failures still happen and leading IFEC suppliers are working to help minimise maintenance costs in three primary areas: line maintenance, spares and repairs.

Line maintenance costs are largely driven by how often a mechanic touches the aircraft. Failures need to be quickly isolated and the airline must be free to fix or defer a maintenance action. To that end, IFEC systems use redundancy and extensive built-in-testequipment with the ability to transfer information to the ground so that mechanics can be ready with the right parts. Panasonic has taken this to the next level by implementing a consolidated data warehouse to enable engineers to analyse trends and identify areas for improvement.

Ancillary revenue Increasingly, airlines are exploiting the boosted power of their IFEC systems to generate ancillary revenue. Essentially, there are three ways to generate revenue. The first and potentially most profitable - is advertising. Advertising within IFEC systems has suffered in the past from a relatively small and fragmented audience, non-compliance to creative standards within the advertising industry and a lack of accountability. These issues have all recently been addressed. Several airlines are using a Panasonic service called 'OneMedia', which essentially transforms the IFEC system into an extension of the web from an advertiser's perspective, while allowing the airline to retain control of advertising appearing in their aircraft.



The second revenue stream is broadly called Pay-per-View, Pay-per-Use or Pay-per-Play. Under this model, the passenger pays to view content, play a game or use other services. Examples of this include charging to view a new release movie or live television or to access the internet. To expand the potential of this type of ancillary revenue generation, Panasonic has implemented Payment Card Industry compliant ways of handling transactional data and improved the ease with which airlines select and price content or functionality.

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The third category includes shopping and hospitality services through which passengers can purchase items on board and have their order fulfilled either on board – as in the case of food, beverages, or duty free items – or at the arrival gate or even at the home or office. In all three categories, the ancillary revenue generated is shared between the airline and the third parties that make the service possible. This revenue can be used to offset the ongoing costs associated with IFEC systems.

As recently as 2005, in-seat displays typically measured 5-7in across. Today, IFEC suppliers routinely deliver aircraft equipped with 15in and 23in widescreen displays in premium classes and 9in or 10in displays in every economy seat. With so much content and so many applications at their fingertips, passengers are happier and airlines have a powerful tool for branding and ancillary revenue generation. However, the fundamentals of aircraft and airline economics have not changed. IFEC suppliers understand this and continue to respond in new and innovative ways to lower the initial cost of IFEC systems and reduce ongoing costs. END

Contact Theresa Yeoh Email: theresa.yeoh@panasonic.aero

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Today, more than ever, your airline needs to stand out from the crowd. The trick is to deliver a personalized experience while keeping your total cost of ownership down.

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beautifully formed

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STG AEROSPACE EXPLAINS HOW A SMALL COMPANY CAN DEVELOP AWARD-WINNING, MARKET-LEADING PRODUCTS

1. STG's PL technology is power-free

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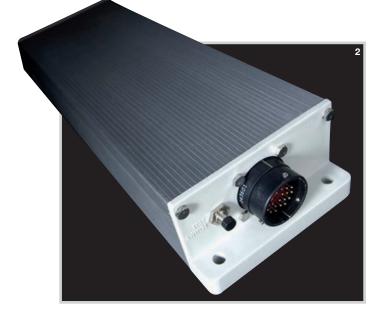
WEPPS battery module 3. WEPPS diagnostic panel

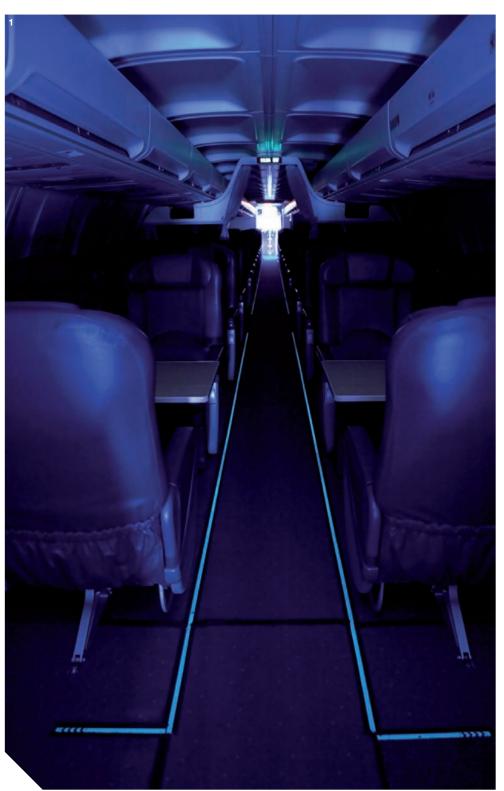


company based in the UK with a subsidiary in the USA, has achieved great success through its meticulous approach to

new product development. The pioneer of photoluminescent (PL) floorpath marking systems, it has generated an extraordinary level of market interest in its new non-rechargeable battery systems for emergency lighting, and most recently has been working with leading aviation security experts to create a discrete wireless alarm system, something cabin staff have been actively lobbying for since 2001.

STG has produced a number of firsts in the past 10 years - it was first to use PL technology in aviation, first to conceive of the idea of coloured PL systems, and first to develop a 'fit for life' power solution for emergency lighting. STG's pioneering work has been recognised by comprehensive patent awards worldwide and major awards for innovation and business. STG has recently become one of a very small number of companies to be awarded three Queen's Awards for Enterprise.





Peter Stokes (chief executive of STG since 1998) and his team have a clear product development blueprint for creating products that match the strict safety requirements of a heavily regulated industry, but are affordable and deliver safety and cost-reduction benefits. "At a time when the economy is unstable and numerous airlines are facing financial trouble, cost-effective safety solutions have never been more important," says Stokes. "Our company focuses strongly on providing radical cost-reducing, timesaving technologies which will make an entire fleet more efficient – our customers have shown that the payback on our product range can be measured in months rather than years."

The company's product development programme is built around three clear phases - enhancements and range extensions to products that have already achieved market success, bringing new technology to market and developing new technologies to be launched at some point in the future. "This conveyor-belt approach means we avoid the pitfalls of the classic product lifecycle," declares Stokes. "By having some products in a mature market, some in a new market and some on the drawing board we are constantly refreshing and replenishing our offer to customers."

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STG's mature market product is SafTGlo, a PL emergency floorpath marking system that is currently installed on over 5,000 aircraft, meaning it is fitted on almost one third of the world's operating commercial aircraft. SafTGlo saves the airline industry millions of dollars each year by replacing electrical floorpath marking systems whose batteries and bulbs cause maintenance cost and dispatch delay. STG's system stores and simultaneously emits light giving highly visible emergency exit guidance for up to 16 hours in darkness, after a short period of charging with normal cabin lighting. SafTGlo is easy to install and

is proven to be 100% reliable, with no reported incidents of failure.

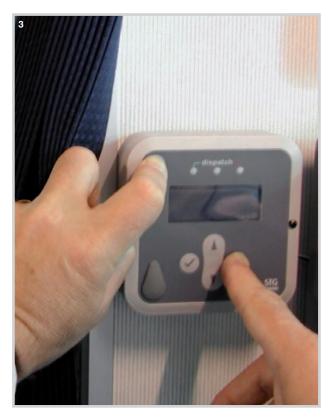
STG launched the first colour SafTGlo system in 2005. Narrower, lighter and in a range of colours, it proved an instant hit with airlines, who could now match the colour of their PL floorpath system to their cabin interior décor. But airlines still had the problems associated with cutting and binding carpets, a process that cost time and therefore money. As a result of conversations with a number of operators, STG addressed the issue and developed a new overcarpet system, ColorMatch OC.

SafTGlo OC's reversible track halves through-life costs and features a durable polycarbonate moulding into which the ColorMatch track is simply clipped, making installation easier. HingedWing extensions hide and grip carpet edges, eliminating the cost of binding carpet edges.

Recently, STG launched a major new innovation – Wireless Emergency Primary Power System (WEPPS), a 'fit for life' solution for powering cabin emergency lighting systems, with full BITE and wireless status monitoring capability. WEPPS virtually eliminates the arduous and expensive inspection, maintenance and replacement required of old battery systems, and STG calculates it is set to save the aviation industry up to US\$1 billion annually. Both WEPPS and SafTGlo resulted from careful programmes of research and industry interrogation.

It may be surprising that a relatively small company like STG can develop and produce award-winning products, but it does so by taking advantage of expert help during the design process, instead of employing extra staff. STG's Innovation Development Team regularly brainstorms new concepts and products by bringing in outside specialists at crucial times. The team includes consultant specialists in radio, electronics, product design, software development and marketing with

WEPPS VIRTUALLY ELIMINATES THE ARDUOUS AND EXPENSIVE INSPECTION, MAINTENANCE AND REPLACEMENT REQUIRED OF OLD BATTERY SYSTEMS



STG AEROSPACE ALSO BENEFITS FROM SHAREHOLDERS WHO ENCOURAGE STRUCTURED RESEARCH AND DEVELOPMENT



4. WEPPS diagnostic panel

 Another award in the bag!
 SafTGIo OC

cross-section

world-class experience from industries such as Formula 1, audio equipment, FMCG and even furniture design. "We create ideas and then seek input from other sectors to get a fresh perspective on solutions," comments Stokes.

Being privately owned, STG Aerospace also benefits from shareholders who encourage structured research and development. Unusually for a small business, some 20% of annual turnover is reinvested in this. "We control our risks well; while we make mistakes, they are few, and this has allowed our investors to continue to support our long-term development programme," notes Stokes.

This allows the company to pursue the third phase of its product development programme – bringing new concepts to fruition. STG's WEPPS system uses a low power wireless network that allows each of the battery modules to relay information to a



conveniently located diagnostic panel. This wireless 'backbone', called SecureControl, was the starting point for another new product development process. "We knew we could piggyback other applications onto this wireless backbone, but the question was what would airlines find most useful and what fitted with our company ethos of increased safety for passengers and reduced costs for operators," says Stokes. "In 2005 we had seen the FAA publish a NPRM for new security devices on aircraft. From the submissions to the NPRM we knew there was significant demand from cabin crew and their unions for a discrete wireless emergency system, designed to alert the flight crew in the event of a cabin disturbance."

Over the last two years STG has developed CAMS (Crew Alert Monitoring System), which has been selected for a simulated test programme supervised by the Aviation Security team at University of Western Michigan, led by Professor Lori Brown in collaboration with other experts in Europe.

An active product development programme means that STG has to take the topic of intellectual property very seriously. The company consistently seeks patent protection to ensure it can exploit its unique products and invest in next-generation solutions. In 1999 it secured a worldwide patent for the use of photoluminescence for emergency floorpath systems in commercial aircraft. This early patent also covered the use of coloured PL years before STG introduced its ColorMatch product.

Further patents followed for its unique SuperSeal design (which

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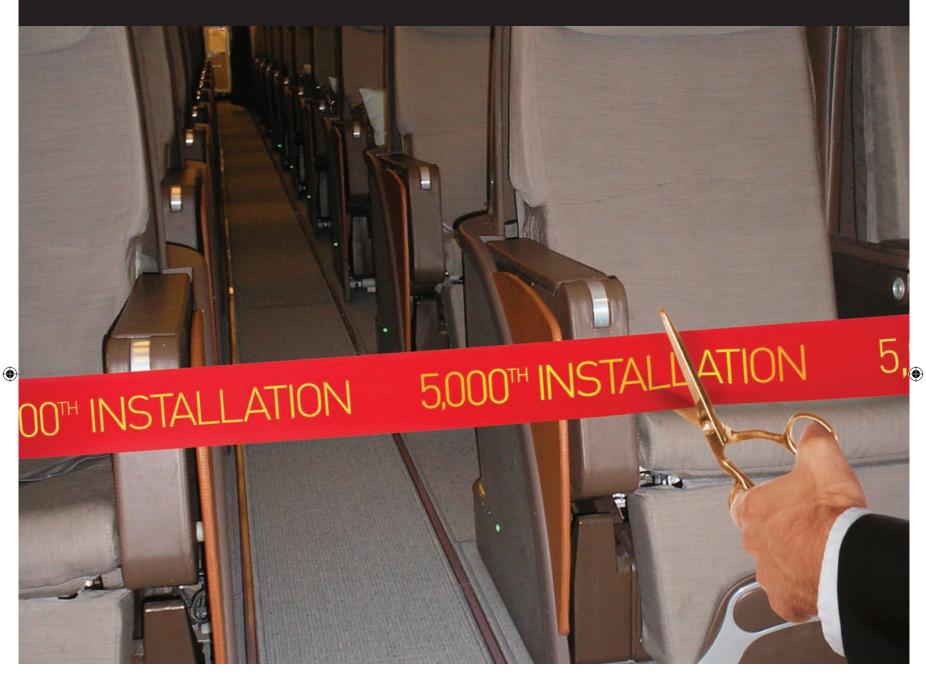
eliminates fluid ingress in PL systems) and the technologies underpinning WEPPS. Despite challenges from would-be competitors, all patents have been successfully defended worldwide. "If the industry wants innovative costreducing solutions, then it must respect the innovator's need to protect ideas," believes Stokes. "Patents allow us to recover our development costs. Without them, others would simply shortcut the process and copy us, and we wouldn't risk future development investment."

As the pioneers of PL on aircraft, STG sees itself as a 'guardian of best practice'. It seeks to maintain the highest standards and works closely with industry regulators in the application of PL systems. Its technical division provides white papers and information on its website to inform its market and serve as a central database of best practice. Stokes has seen poor practice in installations of other products. "To try to 'cheat the process' for commercial gain, by misinformation and inappropriate technology application, is - at best - irresponsible. We make our views known to ensure operators are informed and their passengers are safe. We believe our open approach reassures our customers and gives us a genuine edge," he concludes.

With three Queens Awards recognising innovation and business development and a Crystal Cabin Award for innovation, along with its straightforward and honest approach, STG Aerospace has quietly developed into a trusted supplier of innovative, valuable products. **END**

A third of the world's passenger aircraft now cut costs with SafTGlo.

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SafTGIo is the foremost photoluminescent emergency floorpath marking system in the world today. In fact, it recently celebrated its popularity among the world's largest and best-known airlines by notching up an unrivalled 5,000 installations. With no bulbs, no batteries and no wires to worry about, SafTGIo offers 100% reliability. It also dramatically reduces installation and operating costs, bringing much needed savings to hard-pressed airlines.

SafTGIo is available in up to 300 colour options and boasts a range of track designs that fit seamlessly within the décor of even the most luxurious aircraft. To find out for yourself how SaftGLo could benefit your airline, call us today or visit us online at stgaerospace.com



SafTGLO Emergency Floorpath Evacuation System

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double delight

ALTITUDE HAS RECENTLY HELPED AIR NEW ZEALAND SIMULTANEOUSLY INSTALL A NEW IFE SYSTEM ON BOTH ITS B767-300 AND A320 FLEETS

ltitude specialises in aircraft interior reconfiguration programmes and customised interior product design and supply. Based in New Zealand, Altitude (previously ANZES Design Engineering) has developed into a world-class centre of excellence for cabin design and integration, renowned for its ability to deliver comprehensive

integration programmes that match

customer briefs in a timely and cost-

effective manner. As an AS9100-accredited organisation for the design, integration, certification, project management and supply of interior components and refit services for commercial jet transport aircraft, Altitude has a strong focus on engineering, and a history in not only integration engineering but also product design and supply. This background and experience in managing large integration and reconfiguration programmes has provided substantial expertise and knowledge of certification processes and regulations.



Air New Zealand is one of Altitude's key customers. With competition growing in the South Pacific region, continuing improvement of inflight products is required, prompting Air New Zealand to invest in a new IFE system for its B767-300 and A320 fleets that operate on the South Pacific and Tran-Tasman routes. The airline enrolled Altitude to undertake this large and intricate programme.

An immediate hurdle for Altitude was that the customer wanted the same outcome on two completely different aircraft types: the Boeing 767-300 fleet and the Airbus 320 fleet. Although many of the same vendors were used on both aircraft types, Altitude operated two different programmes, as only a small amount of the engineering required could be transferred

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1. The new IFE system on a Boeing 767

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- 2. To upgrade the IFE system, seats had to be removed and installed
- 3. PC power packs were fitted to the 767's businessclass seating





ONLY A SMALL AMOUNT OF THE ENGINEERING COULD BE TRANSFERRED

between the different aircraft types. Compounding this issue was the fact that both programmes ran simultaneously. "Altitude managed each fleet programme out of our two offices simultaneously, one dedicated to the B767-300 fleet in Auckland and the other dedicated to the A320 fleet in Christchurch," notes Altitude's commercial manager, Baden Smith. "This separation enabled staff to become experts on their aircraft type and support the induction of the aircraft based at the two venues."

Upgrading the IFE system required the removal of drop-down IFE monitors in economy; installation of IFE and in-seat power supply (ISPS) systems; replacement of the Airshow system; IFE installation in the crew rest; removal and installation of businessclass and economy-class seats; installation of cabin provisions (raceways, seat track covers, etc); installation of cooling power/wiring provisions for the new IFE system; installation of the system controller and file servers in the electronics compartment; modification of existing VCC/ galley or rack mounting in the cargo hold; and the installation of SATCOM and its integration with the new IFE system. PC power packs were also fitted to each business-class seat on the B767-300, to ensure customers in business class were able to operate their laptops during longer flights.

The certification plan for the programme required substantiation of the IFE and ISPS equipment interface loads into aircraft structure; substantiation of aircraft floor beam loading due to increased seat weights; substantiation of separation from fuelling system wiring; aircraft level electrical load analysis; power harmonic testing; system safety assessment; and review and substantiation of the IFE supplier's engineering data and the seat supplier's engineering data.

Vendor management An integration programme such as Air New Zealand's requires expertise with supplier and material management, engineering design, manufacture, testing, certification and installation. Altitude's experience of the entire value chain helped Air New Zealand achieve its desired result in a timely manner. Altitude's integration programmes







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utilise a number of materials, parts and tools that require synchronicity with suppliers to ensure lead times are planned and programmes are executed accordingly. Baden Smith recognises the importance of maintaining close relationships with Altitude's suppliers: "The management of vendors is essential for Altitude's project management office, especially where unscheduled amendments to design, timelines and scope are required."

The aircraft were inducted into the new IFE system over a five-month period. One of the key outcomes of the programme was that the IFE system can be used from the moment a passenger sits down until the aircraft lands at its destination, effectively

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providing a gate-to-gate service. On average, this provides an extra hour of entertainment per flight.

4-5. Altitude also recently unveiled a crew rest compartment for the Boeing 777

Custom design Using its customised product capability, Altitude also provided cost-effective solutions for equipment racks in the cargo hold that the IFE vendors were unable to match. While the integration programmes are an important business stream, Altitude has also been focusing on its burgeoning customised product service.

Altitude's ability to provide a niche product is well documented on both new aircraft and retrofit aircraft, and its customised products include: crew rests, bars, closets, partitions, carrycots, class dividers, bulkheads, ceilings, and stowage boxes. Over the past year, Altitude has delivered two major customised programmes concurrent to the IFE upgrade for Air New Zealand. The first programme was a designed and manufactured B777 compartment crew rest installed on the main deck behind business class. Altitude's second bespoke programme involved bar units, partitions, ceilings and closets for newdelivery B777-300 aircraft and included the design, manufacture and the certification of these monuments.

The Air New Zealand IFE upgrade programme has strengthened Altitude's integration skills, but also drew on its customised product capabilities. Altitude's ability to provide a complete service, including reconfiguration, design and supply of product and programme certification, makes it a viable choice for innovative airlines looking to do something a little different with their cabin interior. **END**

SYNCHRONISEDESIGNINTEGRATE



HELPING OPERATORS ACHIEVE DIFFERENTIATION THROUGH THEIR AIRCRAFT INTERIORS EXPERIENCE.

A L T I T U D E

For more information visit: www.altitude-ai.com, E. info@altitude-ai.com, T. +64 9 255 8909, F. +64 9 255 832 Altitude previously operated as ANZES Design Engineering.

heating up

YARWOOD LEATHER CONTENDS THAT THE USE OF LEATHER IS SET TO EXTEND BEYOND THE LIMITS OF SEAT COVERING WITH NEW ADVANCES IN FIRE RETARDANCY

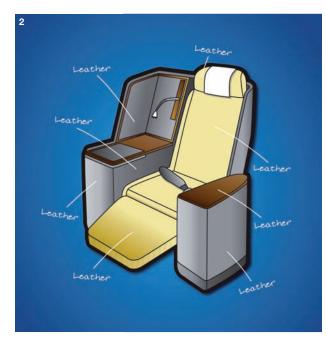
eather has, at last, made the giant leap from being used purely for seat covers to become a viable alternative in areas of an aircraft that until now were the preserve of synthetic materials. For carriers and passengers alike, leather means luxury, and with the development of new leather that not only performs perfectly but also meets the stringent demands of heat release tests, it looks like the luxury of leather is back on the agenda for some of the smartest aircraft interiors and seats.

The fact that leather is a natural product presents several challenges, the greatest of which is that it is incredibly difficult to apply a fire retardant uniformly to an irregular structure. This posed such a challenge that leather has been all but relegated to the proverbial substitutes' bench for the newer breed of first class, business-class suites and sleeper seats. Without a radical new approach to overcome the challenge of the heat release test, leather in the context of aircraft was destined for a future as a covering for



applications

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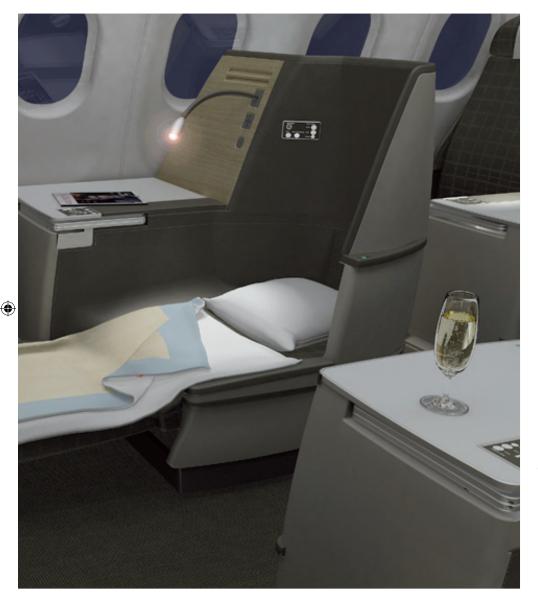
seat cushions. However, UK-based Yarwood Leather believes leather is set for a renaissance.

Differentiation As the novelty of highspeed travel wears off, passengers are focusing on other areas of the flying experience and they are not content to have only one choice of film for a 10 hour journey and have just two types of drinks in a basic seat – consumers demand greater choice than ever before.

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With the ability to choose comes the desire to replicate their home experiences. Makers of in-flight entertainment (IFE) systems were quick to respond, for example with video on demand.

The next step is to replicate the comfort and aesthetic experience of the home. Gone are simple, functional fabrics and uncomfortable foams and in come new advances in memory foams, leathers and high-tech materials. The simple recline and tilt function of



premium seating is giving way to full individual suites. As the demands of the passenger have gathered pace, one area that has played catch-up in technological terms is leather.

Leather lifts off Because of the everincreasing safety requirements of FAR/ CS 25.853, leather for aircraft interiors is not only subject to composite testing, but leather for wall and seat panels is subject to a much tougher heat release, smoke density and toxicity test regime. While density and toxicity were solved relatively quickly, the thorn in the side for leather specialists was the heat release requirements.

Contour Premium Aircraft Seating approached Yarwood Leather to verify its claim of being able to pass heat release tests in its usual composite combination. This was the catalyst for leather to be used beyond the seat. Early indicative tests showed that

AS THE NOVELTY OF HIGH-SPEED TRAVEL WEARS OFF, PASSENGERS ARE FOCUSING ON OTHER AREAS OF THE FLYING EXPERIENCE

Yarwood's KalorLite product was hitting the benchmark figures and warranted further testing for Contour's landmark seat, the Vantage business-class sleeper seat. With further benchmark testing confirming that the results were not a fluke, Contour adopted KalorLite for the customer launch of this seat.

"When we first met Yarwoods, we were sceptical of their claims," says John Higgins, business development director of PAIG, of which Contour is part. "But we were impressed with the results of the first round of benchmark testing and continued to the next phase involving one of our customers."

The technical challenges involved with making a composite that could pass the heat release requirements were numerous, but with input from the Yarwood technical team, Contour was able to find a solution that ultimately suited all aspects of the supply chain.

"There will always be challenges in meeting the necessary safety requirements of the aviation industry, but we are confident that with the right approach and attitude, we can provide a solution," comments Matthew Nicholls, Yarwood Leather's group managing director. "We believe in constructing a product from the ground

THE SWISS DESIGN LENDS ITSELF PERFECTLY TO THE USE OF LEATHER ON PANELLING AND OTHER AREAS



3-4. SWISS's new business-class seat could be the first of its kind to utilise nonsynthetics on cabin panels up that is tailor made to solve a customer's problem and working with them to ensure it is practical and efficient to use."

Working with a new technology will always be slightly unpredictable and to that end, the Yarwood team ensured that they were always on hand to support the PAIG team in Cwmbran, UK, should any problems arise. "We are always open minded towards working with new and advanced products, but the learning curve is always expedited when a supplier-partner supports their product in the manner that Yarwood does. Having specialists on site locally is always a huge benefit," confirmed Angie Davies of Contour.

The visual appearance of the Vantage business-class sleeper seat is of a very high quality – something airlines have come to expect from Contour. The wait for leather to make its debut in this application is long overdue, and looks set to bring opulence and status to the premium seating market.

SWISS steals the lead Earlier this year, SWISS unveiled a mould-breaking new seating concept for its intercontinental business-class cabins. The new seats, which recline to fully flat beds, will be gradually installed throughout the SWISS long-haul fleet from spring 2009. The innovative new interior concept has been developed under SWISS's overall charge in collaboration with numerous specialist companies in and outside Switzerland.

"The SWISS design lends itself perfectly to the use of leather on panelling and other areas. It will be interesting to see which materials SWISS use and how and where in the cabins when they start to appear in 2009," notes Nicholls. "SWISS really are responding to customer demands as the new seat apparently gives the passenger complete control, which allows seat firmness to be set for each seating position to meet individual preferences - hard as a futon, soft as a water bed or any level in between, the choice is the customer's. That really is going the extra mile."

Work will begin in spring 2009 on installing the new seat throughout SWISS's long-haul fleet. New A330-300s which will join the fleet from 2009 will all feature the seats and all SWISS Business customers should be enjoying a truly excellent in-flight

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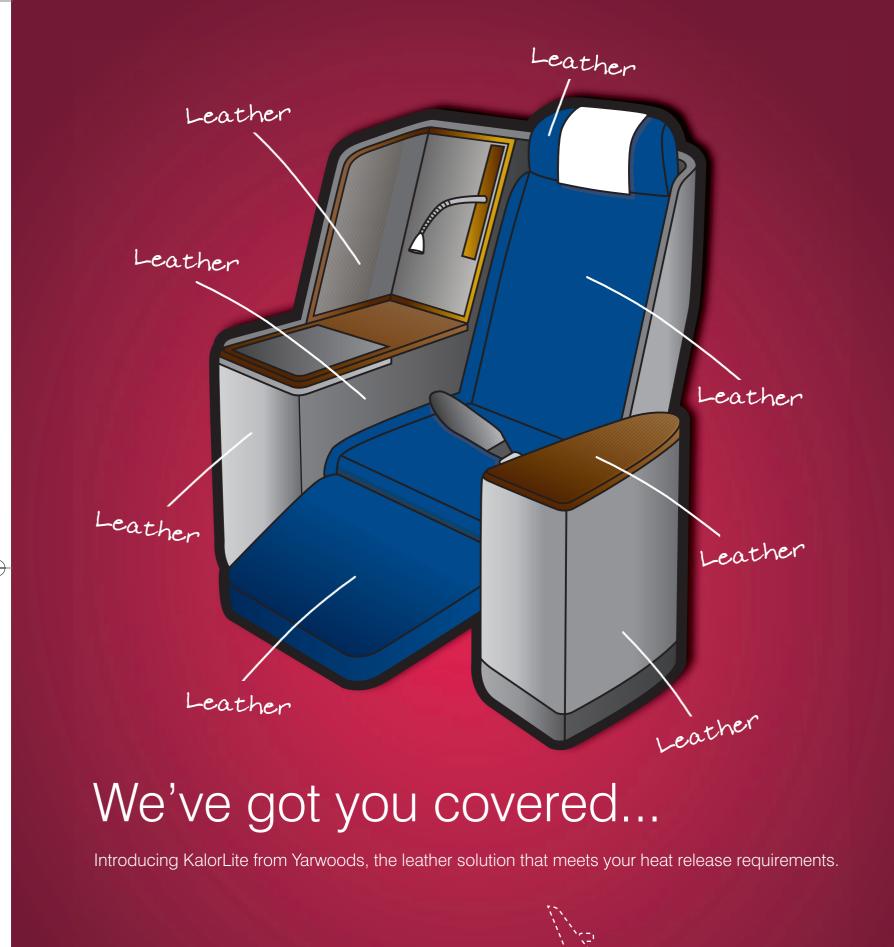
Contact Matthew Nicholls

seating and sleeping experience on all long-haul flights by 2011.

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Burning desires Meanwhile, Yarwood Leather has launched an aviation burns testing unit at its R&D facility in Leeds, UK – one of only a handful across the globe. Seating designed for aircraft can undergo vertical burn and seat oil burner composite testing at the laboratory, which was accredited recently by UKAS and the Civil Aviation Authority.

Hinting about future developments at the laboratory, Yarwood's Dr Andrew Hudson sees no reason why the company's ambition of developing other tests for the aviation industry should not be realised. "We have proved that the 12-second and 60-second vertical burns test for seating are well within our abilities, so the kerosene oil burner test for seating components was a natural progression," he remarks. "To add even more scope to the testing facility there is no reason why we could not consider developing heat-release and smoke density testing here too," he adds in anticipation of future demand and shift in CAA regulations. END





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eyes wide open

HOOVER INDUSTRIES' MARISA INFANTE MAKES AN IMPASSIONED PLEA FOR VIGILANCE, AS THE COMPANY STRUGGLES WITH ONGOING SECURITY ISSUES

> e're very concerned with the security of aircraft and the safety of passengers a t H o o v e r Industries, Inc.

Very. It's our job. As a world-leading manufacturer of life jackets, life rafts and interiors, our products are distributed globally, in service with the world's leading carriers, in prominent use at all of the aircraft manufacturers, including Airbus, Boeing, Embraer and Gulfstream, and in service with the US Air Force, as well as other global government military applications.

However, this isn't a sales pitch. We're not tooting our own horn here. These are facts – facts that keep us awake at night. At the end of 2007, management of Hoover Industries discovered that there may be illegal organisations gaining liberal access to our products, key subcomponents used in the making of our products, and most frightening of all, even the documents that make these products legal for use and able to be freely carried on passenger aircraft worldwide.

We immediately notified US Homeland Security, the FAA, the DOT, Customs and local authorities. We fired a number of personnel in house whom we found to have participated in taking parts, hiding information, falsifying DOT documents. We brought in teams of specialists to deal with the issues at our own expense. Little progress was made, the problems endured.

 Santana and Maria, two of over 100 dedicated and loyal Hoover staff who ensure the integrity and safety of the company's products
 Controlled

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 Controlled documents such as these Hazardous Materials Shipping Forms were stolen **Under attack** Our computer systems were attacked and disabled in May of this year as retribution for our ongoing, dogged fight-back. Our telephone systems were first tapped into and then also disabled. Our facility was broken into on numerous occasions. We notified the FBI. We notified all the others again. Nothing happened.

The FAA has tried to help in everyway possible. We filed a SUPS





(Suspected Unapproved Parts Notification) to report the many parts that we are missing (with an approximate value of US\$10 million). The OEMs have also tried to help in everyway possible. Our airline partners have been incredibly loyal and patient while we got our telephones to work and our email back. Our aviation partners have been wonderful.

We take some comfort in knowing that the parts that we ship out and that

WE HAVE FIERCELY LOYAL PEOPLE WHO HAVE BEEN FIGHTING TOOTH AND NAIL TO ENSURE THAT EACH OF OUR CUSTOMERS HAS WHAT THEY NEED WHEN THEY NEED IT

are in use with our legitimate customers are free of problems, fully certified, and entirely safe to use. But with US\$10 million of parts out there that did not legitimately come from Hoover, we have no way of knowing just how many after-market users are in trouble, using illegally acquired and uncertified equipment. And that's based on the optimistic outlook that these parts are only intended for black market use. Because of the nature of our products, there are implications for explosives and drug smuggling.

Nothing to hide So why is Hoover airing its dirty laundry so publicly? Well, in the past when tragic things have happened in our industry, it has often been the case that those involved have tried to ignore the malfeasance, preferring to sweep it under the carpet. However, should the worse happen in this instance, it will not be the result of the management at Hoover trying to pretend nothing is wrong. It will not be the fault of the FAA. It will not be the fault of any member of the aviation industry. It will be an issue of government not coordinating special agencies and communicating effectively.

Throughout this period there have been some positive accomplishments. We have fiercely loyal people who have

IF OEMS AND REPAIR STATIONS HAVE TO PASS MUSTER OF INSPECTION, WHY SHOULDN'T PEOPLE HANDLING THE PARTS IN AFTERMARKET UNDERGO THE SAME REQUIREMENTS?



 These empty cartons were found in the repair station one morning that had not been there at lockdown inspection the night before
 Raft cylinders have mysteriously come

in and out of the company's inventory in recent times







been fighting tooth and nail to ensure that each of our customers has what they need when they need it. It makes me love these people. If you could see how they have strained against the odds, against threats – staff have endured personal intimidation and threats to their lives – all the while continuing with business as usual, buckling down and getting the job done anyway. Hoover even passed its AS9100 audit, despite its systems being down – proving the sturdiness of its core systems for process control.

Despite these accomplishments, a great concern continues to dominate our minds: if this stuff is so useful to whoever is behind it, why will they stop at Hoover? We've shared these thoughts with our competitors as well, and hopefully they will heed our advice and keep a sharp eye out, particularly when recruiting. The average tenure of our employees is 25 years. We like to keep our people. While only a few of our former employees recently let go are involved or suspected of involvement, we recommend that you call us to check before they come to work for you.

After all, this is a small, fragile, beautiful industry that makes the impossible happen every day. We need to ensure that those of us working together to make it work, have its best interest in mind at all times.

Be vigilant And that is the final reason we decided to write this article. It will no doubt have negative repercussions to our business, but hopefully, it will have positive repercussions to yours, to our industry.

Be vigilant. Be cautious. Even in the best of operations, even with the best of intentions, there are people who like

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to use our industry for their own purposes, none of which benefit aviation in the slightest. Expel them. Expose them. Cast them out. Don't cut corners. Don't turn a blind eye.

We all need to question things that may seem on the surface harmless, but nonetheless not entirely by the book. Don't compromise aviation. Keep it a safe industry for all. Be prepared to pay a bit more for parts that you know come from legitimate sources, with full traceability. Make sure you audit your suppliers. Sell only to those who you know to be legitimate end users. Don't be liberal with the distribution of documentation (component maintenance manuals) and product drawings. Ensure you can account for every customs declaration form, every certificate of origin, every dangerous good certificate, every 8130-3 form and every EASA Form 1.

Stand together Don't be tempted to make an extra buck by selling to a company you have never even heard of. Check out everyone you work with in the *World Aviation Directory*. This is the Hoover policy: if we don't know you, you can't have it. Let's band together to demand regulation of distributors in our industry. If OEMs and repair stations have to pass muster of inspection, why shouldn't people handling the parts in aftermarket undergo the same requirements?

Hoover will still be here fighting every day. We'll still be getting products to our customers as best we can under these circumstances, for however long our customers want us to. We'll get out from under this rock with or without the cavalry... most likely without. This is our quest. Safety First. Security Always. **END** ()

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"Where Quality Is The Product"

w w w . h o o v e r i n d u s t r i e s . c o m **Hoover Industries, Inc.** 7260 NW 68 Street Miami, FL 33166-3014 Phone: +1.305.888.9791 Fax: +1.305.883.1925 E-mail: info@hooverindustries.com

fortune teller

LANTAL EXPLAINS HOW ECOLOGICALLY AND ECONOMICALLY SOUND PRODUCTS NEED NOT COMPROMISE ON COMFORT

> uch has been said and written about sustainability in aviation. Foresight was adopted as a core principle at b, as the company

Lantal long ago, as the company recognised the need to anticipate and consider the issues (ecological, social, technical and economical) that would be relevant in the future.

Values such as honesty, respect, trust, positive thinking and foresight are the foundation for the company's business activities and products, keeping it focused on assuring passenger well-being. Lantal has evolved from specialising in yardage textiles to being a comprehensive provider of soft interiors with ready-to-install products, pneumatic comfort systems, design competence and lab services.

 Waste water of more than 50°C is collected in a tank and the energy is reused to heat fresh water for dyeing
 Living up to its

single-source philosophy, Lantal offers a wide range of ready-to-install pleated curtains **Green production processes** In terms of ecology, the company has been making continuous efforts to save energy and other resources within all production processes to assure the sustainability of its products. The





company's innovations cover ecological and economical sustainability, weight reduction, maintenance, quality and operating cost savings.

Lantal believes that its developments contribute to sustainability in aviation. Less weight translates into lower jet fuel consumption per passenger mile and that helps reduce CO_2 emissions. Relying totally on its lightest fabrics and carpets, airlines can save up to 32% of the overall weight of their soft interiors. Conservatively calculated, 1kg saved corresponds to Euro100-300 in kerosene savings per year.

When attempting to tap into potential cost savings, many airlines only consider the purchase price and often tend to opt for the less expensive product. But the downside can be lower quality and more frequent replacements, or a downgraded visual appearance and a compromise in comfort. In reality, from a financial point of view, weight and lifetime optimisation are the two principal costeffectiveness factors. ۲

Lantal has a different approach – it does not consider the purchase price and operating costs to be separate elements, but looks at both in relation to a product's performance. With more than 50 years experience in the aviation industry, the company knows how carriers use textiles in the aircraft, what aspects need to be considered to make them as easy and convenient to use as possible, and what competitiveness really means. This is why its strategy is to develop premium products that holistically address customers' needs, looking at overall cost of ownership.



PRICE TAG COMPARISONS ALONE DO NOT TELL THE WHOLE STORY

For example, with its premium carpets, the company offers customers cost savings at three levels - lower installation costs, reduced maintenance and reduced kerosene consumption. Installation costs are lower because the carpets are pre-cut and laying is streamlined. They are cutfast and unserged. Maintenance is reduced because these easy-care carpets have longer lifecycles, resulting in longer intervals between replacement. With their proprietary designs, the carpets are optimised for the wear that is inevitable in commercial aviation. Finally, because the carpets weigh less, less kerosene is used.

Quality pays This example illustrates that price tag comparisons alone do not tell the whole story. A premium carpet incorporates many features and advantages that need to be reviewed separately in a competitive analysis versus seemingly less expensive roll products. When adding the value of all the intrinsic benefits of Lantal's carpets - such as lifetime, cutfastness and reduced replacement - to the basic price of other products, Lantal's carpets come out ahead as a wise investment. For extra cost-effectiveness, the company can also deliver its carpets with special finishes or as sets of precut elements of precisely the right size and shape for the cabin floor.

The quality of the company's carpets translates into an extended lifecycle, saving frequent replacements and the related stripping and reinstallation costs. Moreover, the life-cycle of these carpets matches the customary A-check intervals, so installation can be scheduled for when an aircraft is down for overhaul work.

An important criterion in timing cleaning intervals is the visual appearance of the carpets and how they perform given the extraordinarily high exposure to wear in an aircraft. This is a crucial issue especially in aisle zones.

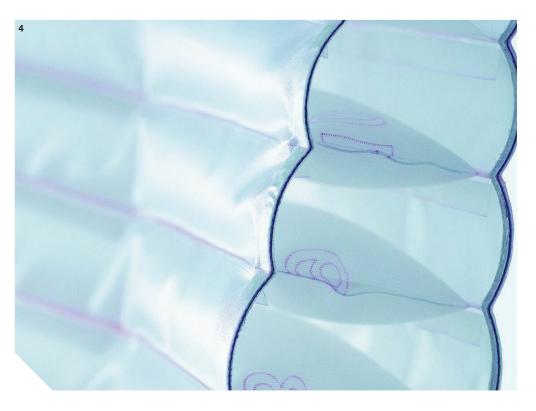


In this and many other respects, the company promises that airlines can rely on its experienced and competent specialists for recommendations and ongoing support during the product's entire lifetime.

Introduced in 2001, Climatex Lifeguard FR fabrics for aircraft are well known for their unique climate control seating comfort and full biodegradability. In June 2007, Climatex Lifeguard fabrics received the cradle-to-cradle gold certification for their eco-efficiency by MBDC, a world-renowned American product and process design firm. The underlying production processes and materials were reviewed in terms of environmental friendliness, energy and water consumption, reutilisation and social stewardship.

Climatex Lifeguard FR is an airworthy extension of the Climatex series without restrictions as regards biodegradability. It is made of wool and the redesigned LenzingFR cellulose fibre based on beech wood, both renewable resources. All Lantal's wool viscose seat cover fabrics in its Executive and Essentials lines are made Climatex Lifeguard fabrics are noted for their eco-efficiency

THE PNEUMATIC SEAT CUSHION COMBINES ECONOMICAL AND ECOLOGICAL ADVANTAGES WITH PASSENGER COMFORT



 Lantal's pneumatic seat cushion has air-filled chambers instead of foam
 The pneumatic seat cushion can be adjusted to suit

preferences at each

stage of the flight

of Climatex Lifeguard FR. In the near future another derivation will be launched that incorporates all the advantages of Climatex, but also offers a remarkably extended lifetime. Lantal guarantees its customers that its products are produced in a sustainable way – not only because of the high ecological standards stipulated by Swiss law, but also because of the company's commitment to future generations.

Comfort and sustainability Another Lantal innovation is its pneumatic seat cushion, which combines economical and ecological advantages with passenger comfort. It is constructed with lightweight materials and air-filled chambers and instead of conventional foam cushions, with the result that it cuts jet fuel consumption and thus generates cost savings for the airline.

Passengers can adjust the pneumatic pressure of the seat to suit their personal preferences at different stages of the flight, from firm when seated upright and medium when relaxing, to soft in the fully flat position. The seat also boasts a soothing integrated massage function.



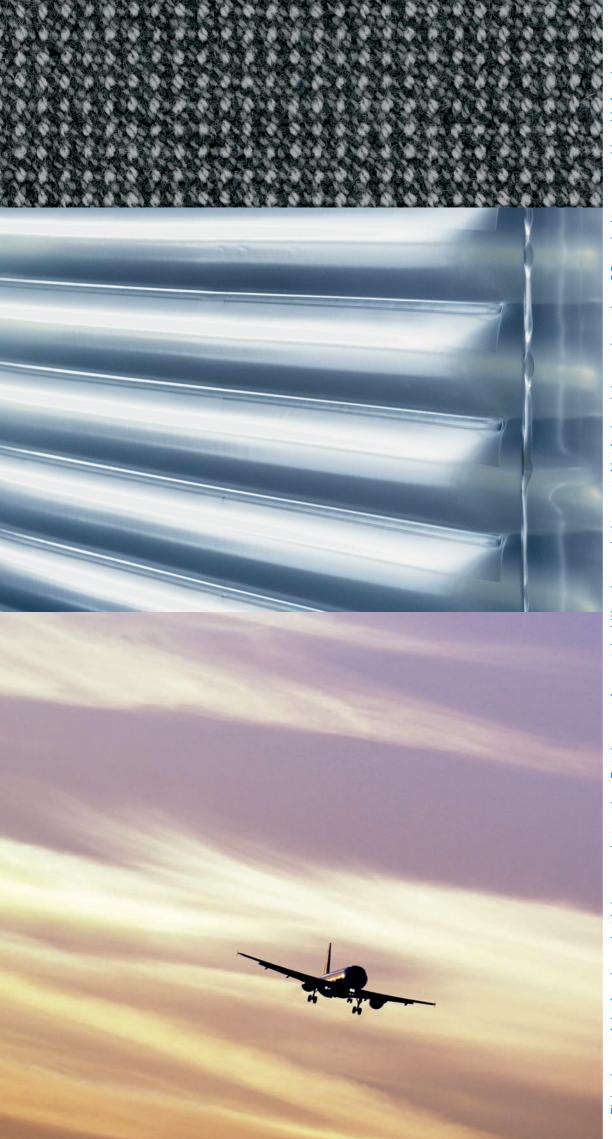
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After many thousands of hours in service, the pneumatic seat cushions have demonstrated their airworthiness. Since its commercial launch in 2005 in an Airbus A319, Lantal's technology has been pushed forward on many fronts. Today, the company offers fully pneumatic cushion systems for aircraft seats, including headrest, backrest, seat bottom and leg rest.

In May this year, Lantal announced Swiss as the launch carrier for its fully pneumatic comfort systems (which are based on a patented technology that fulfils all Airbus and EASA/FAA safety standards). Starting in the first quarter of 2009, they will be installed in all business-class seats on Swiss's longhaul fleet. Regardless of the seating position, business-class passengers in Swiss's new A330-300s will be able to indulge in a novel travel experience.

This project underscores Lantal's spirit of innovation. Pneumatic mattresses for crew rests and VIP jets are further applications. The potential of this technology has not been fully tapped yet, and the company intends to introduce this unique product in economy class as well. **END**



expensive. Lantal has developed smart solutions: Lightweight fabrics and carpets as well as pneumatic comfort systems that perceptibly reduce overall weight and operating costs.

TRANSPORTATION FASHION At the same time, with convincing all-in-one soft interior solutions, Lantal is fully focused on the well-being of your passengers. Express yourself with Lantal Textiles, Switzerland,

+41 62 916 71 71; Lantal Textiles, USA, +1 (336) 969 9551, www.lantal.com. Visit Lantal at Aircraft Interiors Expo in Hamburg, March 31 to April 2, 2009, Hall B6, Stand 6G50.

Lantal

Flying is one of the freedoms that brings people together. But the quest for sustainability, the escalating cost of jet fuel, and the need to reduce CO₂ emissions are making this freedom more

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happy talk

BUCHER AEROSPACE EXPLAINS HOW ITS CENTRE CONSOLE FOR AMERICAN AIRLINES IS THE RESULT OF COMMUNICATING SUCCESSFULLY WITH SUPPLIERS

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he next time you fly American Airlines Premium Class on an international flight, there is a good chance that you will find yourself on an angled lieflat seat by Recaro Aircraft Seating Inc, with a centre console engineered and manufactured by Bucher Aerospace.

As the air travel industry becomes increasingly competitive, airlines are continually striving for unique interior design solutions to differentiate their services. Bucher Aerospace's offering to airlines and aircraft seat manufacturers is the engineering and manufacturing of first- and business-class seat furniture – such as centre consoles, shells and pods – to exacting requirements and in accordance with airlines' corporate marketing strategies.

Natural progression The company celebrated its 20th anniversary this year, but its heritage stretches back over some 50 years to the origins of its sister company in Switzerland. Swiss design is known throughout the world for its quality, precision and exacting attention to detail. Building on the foundation of these Swiss design principles, Bucher Aerospace has experienced steady growth and expansion from galley manufacture to inflight service carts, IFE deployment systems (video arms) and deployable food tray tables. The success of its IFE systems and deployable food tray tables naturally led to the expansion of its offering into the engineering and manufacture of aircraft seat furniture with integrated IFE systems and food tray tables.

The company understands that the comfort and ambience created by the finished product in an airline cabin is a direct result of painstaking effort. This effort starts with the all-important relationships and communication with customers and partners, is applied to the technical approach and continues through to final product delivery





and throughout the entire service life of each product.

The American Airlines console is testament to the Bucher Aerospace approach, which resulted in a stylish product that fits together well and bristles with premium features. These features include tasteful styling and colour scheme, articulating leatherclad arm-rests, a pair of reliable and strong deployable food tray tables, ample stowage provision (including life vest stowage), incorporated IFE and electronics, venting paths for sufficient cooling and ease of maintenance and installation.

Incorporating wiring One key aspect of the product is the care and thought put into the incorporation of the IFE and electronic box wiring. The wiring requirements and the maintenance accessibility was optimised through careful internal design and continual collaboration with the customers and their partners.

Respectively enabled by CAD analysis and close communication with suppliers, weight and cost tracking throughout the development process were other important aspects that resulted in adherence to the design targets. 3D component modelling allows accurate part volume information to be quickly derived so that weight and material costs could be calculated and tracked. Additionally, FEA analysis gave the ability to see where material was not structurally required and so could be removed.

More than just virtually correct, the American Airlines console underwent an array of real-world testing to fully validate the design. Through the successful completion of dynamic sled testing, static testing, table reliability cycle testing (to 25,000 cycles), abuse load testing, flammability testing, mock-up testing and R&D testing, this console was fully validated for service.

The success of the console has its roots in Bucher Aerospace's approach to communication and customer service. From the outset, the company partners with the seat manufacturer, airline, aircraft manufacturer, industrial design consultant and IFE supplier to develop viable product requirements that provide the most attractive offering possible to the airline passenger. Customer requirements are extensive, covering everything from passengerpleasing features such as styling, functionality, incorporation of IFE, field-of-view, stowage provisions and other amenities, to practical requirements such as reliability, resistance to abuse, weight, cost, maintainability and ease of installation. Of course, FAA and aircraft manufacturer requirements

THE SUCCESS OF THE CONSOLE HAS ITS ROOTS IN BUCHER AEROSPACE'S APPROACH TO COMMUNICATION AND CUSTOMER SERVICE

STRONG, PROFESSIONAL PROGRAMME MANAGEMENT IS A KEY DRIVER OF SUCCESS

 The console's aluminium structure is covered with vacuum-formed plastic fairings
 Bucher Aerospace documented every stage of the design

process

meticulously

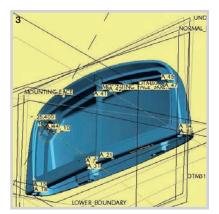
must also be strictly adhered to, particularly the ability to withstand the 16g forward and 14g down dynamic testing requirements (driven by the TSO), plus flight, gust and emergency landing loads, low flammability, heat release, smoke and toxic gas release requirements for the materials used in the furniture construction.

With multiple parties involved, communication control is a vital challenge that needs to be addressed vigorously from the outset. Bucher Aerospace's emphasis on thorough documentation of requirements, design decisions, information exchange, programme planning, test planning, test reporting, and of course the documentation of the final product itself, ensures that the process is effective and efficient. In short, strong, professional programme management is a key driver of success.

Collaborative effort With the communication channels and the requirements established and understood, the company can then confidently commence the development of the product. With the same level of rigour applied to the design process as to the communication process, Bucher Aerospace begins to develop the product collaboratively with its closely tied supplier base. The 777 American Airlines Premium-Class seat furniture, for example, meets its design requirements with an aluminium sheet-metal structure shrouded in vacuum-formed sheetplastic fairings that replicate the styling

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surfaces generated by the industrial design team. Interface features, certain structural elements and mechanisms – such as the deployable table and armrests – are CNC machined parts.

Developed and digitally mocked up in 3D CAD software, it is important to recognise that the components are only as good as the input that comes not only from the engineering design team, but crucially from part manufacturers as well. At Bucher Aerospace, the importance of a collaborative product development environment, in which the supplier base is heavily involved, is fully recognised. A promising design can be quickly derailed if the parts cannot be manufactured as designed and if the overall assembly does not fit together well.

Looking forward, Bucher Aerospace is primed to expand its role in this exciting and growing market segment. The successes of the past drive the projects of the future, and there are new products under development continually, making use of various technologies (such as composites). Change is always a factor, and new products must adhere to ever more stringent regulatory and product standards and be of lighter weight and even higher quality. Constant throughout, however, are the rigorous principles that Bucher Aerospace applies to both product development and customer communication. In an industry involving so many parties and so many technical challenges, the importance of this approach cannot be underestimated. END



presidential privilege

PRESIDENTIAL PATRONAGE AND A MERCURY AWARD CLEARLY UNDERLINE IACOBUCCI'S REPUTATION FOR INNOVATION IN GALLEY INSERT EQUIPMENT

acobucci HF Electronics SpA, an aircraft galley equipments supplier with over 30 years' experience, supplies espresso and coffee makers, water heaters and trash compactors for commercial and general aviation, offering the highest standards of

quality, safety, technology and design. Iacobucci HF Electronics' history began in 1994 when the Iacobucci Group, a leading manufacturer of serving carts, created a new product division, the Hi-Fly Division, to produce the first espresso machine destined for the aircraft market. Then in 1999, Hi-Fly Division developed the Hi-Fly Americana – a state-of-the-art product built around a new patented process for extracting American-style coffee and tea at high altitudes.

In 2000, the company received the International Flight Catering Association's (IFCA) Mercury Award in recognition of the Hi-Fly Americana's innovation. Immediately snapped up by the world's top international airlines, the Americana received its greatest



1. The Hi-Fly Americana

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2. The Hi-Fly Espresso



68 Aircraft Interiors International Annual 2009

IACOBUCCI'S PLANS FOR NEXT YEAR INCLUDE THE LAUNCH OF DEDICATED REFRIGERATOR AND OVEN INSERTS

mandate when it was installed on board arguably some of the most important business jets in the world – the American presidential fleet.

Iacobucci HF Electronics always aims to ensure its products surpass its clients' high expectations. Hence in 2005, the company began a new strategic partnership with the Nestlè Group. The result was a special coffee machine for the exclusive use of a new patented 'Nespresso' capsule: the Hi-Fly Espresso by Iacobucci – Nespresso.

Iacobucci HF Electronics beverage makers are created to endure pressure and retain precise water temperature even at 39,000ft to offer perfect Italian coffees, cappuccinos and delicious teas. All Iacobucci coffee makers and water boilers are rich in innovative and technical features, including a lightweight, anodised, milled aluminium frame; an automatic system for precise water temperature and pressure control; and an electronic touch-screen control panel.

Increasing airline demand to increase available space in aircraft galleys led Iacobucci HF Electronics to develop its next ground-breaking product in 2003: the Hi-Fly WastPak, an innovative trash compactor available in two different sizes: half- and fulltrolley dimensions. Offering low-level power consumption (360VA), two tons of compacting force, easy use and maintenance, the possibility to use either recyclable carton or aluminium trash boxes and improved ergonomics, the trash compactor won two Italian awards - the Innovalazio award and the Award for Excellence- in 2006.

ARINC-compliant galley inserts

Iacobucci HF Electronics has since launched an all-new ARINC-compliant galley insert product line, which offers standardised physical dimensions and electrical interfaces, and answers new aircraft weight limitation requirements. The product line supports rapid replacement of units, avoiding complex engineering and allowing airlines to return the aircraft to service in a very short time.

In 2008, Iacobucci HF Electronics launched its new range of espresso and coffee makers capable of performing with an external water tank: the Hi-Fly "t" Americana and the Hi-Fly "t" espresso and cappuccino maker. Both units work in combination with an external two-litre water tank using bottled water. A rail assembly enables quick removal for rapid cleaning, guaranteeing the highest hygiene and water quality, which has vastly improved overall coffee quality.

Investing in research Iacobucci HF Electronics will continue to invest in research and development, and in modern, computerised machinery to ensure it continues to deliver new products of the highest quality in order to meet its clients' high expectations. All its products are fully certified by the Federal Aviation Administration (FAA), European Safety Aviation Agency (EASA) and by Boeing and Airbus.

Iacobucci's products are currently in service with more than 60 airlines, including: Air France, Singapore Airlines, Emirates, US Airways, Lufthansa, Cathay Pacific Airways, Thai Airways, Qantas, SAS, Iberia, All Nippon Airlines, Qatar Airways, Air India, Air China and China Southern.

This year was a very successful year for Iacobucci HF Electronics, with an increase of 40% in its personnel, which now numbers over 100 employees. Iacobucci's plans for next year include the launch of dedicated refrigerator and oven inserts, offering the same high standard of aesthetics and advanced technology the company's existing products are renowned for. **END**

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all systems go

ROCKWELL COLLINS DISCUSSES ITS NEW CMS, VENUE, WHICH IS DESIGNED TO BRING HIGH-DEFINITION ENTERTAINMENT TO ALL SIZES AND TYPES OF BUSINESS AIRCRAFT

he modern generation is one of electronics addicts. People want to play games on their smartphones, watch DVDs in their cars, check email while grabbing a latte and listen to their iPod at the gym. They expect to be entertained and connected wherever they are.

Now avionics giant Rockwell Collins has broken the final high-definition in-flight entertainment/connectivity barrier by enabling travellers to have it all – enjoy high-definition video and audio and connect to the world while they search out emerging business opportunities around the globe.

The Venue High Definition Cabin Management System (CMS) delivers the same ultra-high quality video and audio and comparable broadband to what people enjoy at home, bundled into a system that fits in the cabin of just about any business aircraft.

All-inclusive Fully customised, highend entertainment and communication systems have been available for the 'heavy iron' jets – Gulfstreams, Falcons, Global Expresses and Boeing BBJs – for a long time. But Venue brings high-end entertainment and wireless connectivity into not only the cabins of these jets, but into the private space of much





smaller jets and even turboprops. In fact, the two aircraft that will be the first to offer Venue are the Cessna CJ4 light jet and the Beechcraft King Air 350i twin turboprop.

Market demand "Venue has been created to meet the rapidly growing digital entertainment and broadband connectivity demands of our customers no matter what size aircraft they are flying," explains Andrew Mohr, Rockwell Collins' director of cabin systems marketing. "Companies of all sizes are turning to the value, flexibility

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and security of light jets and turboprops for a wider variety of missions. So we introduced Venue into the light jet and turboprop categories because of the segment's rapid growth. We also chose this segment because the aircraft manufacturers want to be able to give customers more capabilities on these aircraft," he reveals. "They're learning that customers want 'big aircraft' capabilities in all of their aircraft regardless of cabin size." ۲

Venue is a totally integrated cabin system and Mohr insists that it is suitable for replacing any current

Venue allows

passengers to

environment 2-3. Rockwell Collins

also recently

unveiled its iPod

Solo Station and iPod Quad Station

control the cabin

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CUSTOMERS WANT 'BIG AIRCRAFT' CAPABILITIES IN ALL AIRCRAFT

What really sets the system apart, at least for the typical passenger, is the ability to watch true 1080p highdefinition movies. The passenger inserts a Blu-ray Disc into the system's Media Center and can watch it on a personal in-seat 10.6in high-definition video monitor or on the large bulkhead mounted display. Venue also includes digital surround sound to enhance the experience further.

Venue also enables passengers to plug-and-play their own music or digital media through an iPod, iPhone or other MP3 device. The side-rail mounted docking station also charges the device's batteries and automatically converts any video on iPods or iPhones so it looks great on the high-definition monitor. The system also boasts enhanced audio reproduction courtesy of a high-quality cabin speaker system with built-in amplifiers. Passengers can plug their personal headphones into the individual audio jacks to listen to music, movies or games. They can also listen to XM Satellite Radio, giving them a seemingly endless choice of top audio programming.

Satellite service For connectivity, Venue can be integrated with many of the popular types of wireless satellite systems to create a seamlessly connected cabin environment so that passengers can access the internet via a WiFi connection or email on their Blackberrys or iPhones.

With all these features, Mohr is keen to point out that the system is nevertheless easy to use. "Each seat has a simple, menu-driven touch-screen

entertainment and data connectivity systems in place. He also stresses that although Venue is a "smaller package", it delivers big capabilities. "Venue breaks new ground in many ways. The level of functionality is unsurpassed by anything else available for this class of aircraft," he maintains. "From the outset, our engineers made sure that it is extremely capable and flexible. We have worked hard to give it the capability to provide practically every in-flight entertainment and digital communications option that customers could want."



Music + Radio

Venue.™ Now you can take your digital lifestyle wherever you go.

It's the new standard in cabin management solutions, all at your fingertips. Innovative digital and high definition video on widescreen displays to transform your cabin into a home theater experience. Maximum flexibility to enhance your entertainment options including integrated support for the iPod® and other portable devices. And access to real-time information to keep you connected. Easily configurable, you can create the cabin management solution you want, without compromise. Your cabin experience has officially been transformed. To know more, call +1 319.295.4085.

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Building trust every day

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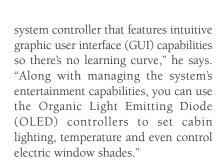
VENUE'S DESIGN ENGINEERS TOOK A LOT OF INSPIRATION FROM TOP-OF-THE-LINE COMPACT HOME ELECTRONICS UNITS

 Venue will be standard on the new Hawker 450XP
 Passengers can watch media on personal in-seat high-definition monitors
 Each seat has a personal system

controller

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Home from home At the heart of Venue's entertainment capabilities is the systems' Media Center, which works like a home A/V cabinet, but is a lot smaller and lighter (space and weight are two things you can't waste when you are outfitting a business aircraft). In fact, Venue's design engineers took a lot of inspiration from top-of-the-line compact home electronics units to develop its Blu-ray Disc/DVD/CD player combination.

"Individual DVD players and audio players and the like have been done before," Mohr reflects. "So we set out to consolidate all the emerging entertainment functions into a single compact unit." The Media Center enables passengers to access high-quality video and audio, photos, electronic games and an integrated 3D high-definition moving map.



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The Venue system is just as much a working tool as an entertainment system. Passengers can plug their laptop computer into the side-rail mounted USB ports, enabling them to work while in the air. The system also lets passengers display information on either the side-rail screens or the large, bulkhead mounted flat screen, which is useful for inflight meetings or putting the finishing touches to a presentation.

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Always-connected lifestyle The system is designed with modern needs and expectations in mind. Whether flying for business or for pleasure in a BBJ or a King Air 350i, the Rockwell Collins Venue CMS allows passengers to enjoy their mobile, digital, always-connected lifestyle wherever in the world they wish to go. **END**

Venue.™ Now you can take your digital lifestyle wherever you go.

It's the new standard in cabin management solutions, all at your fingertips. Innovative digital and high definition video on widescreen displays to transform your cabin into a home theater experience. Maximum flexibility to enhance your entertainment options including integrated support for the iPod® and other portable devices. And access to real-time information to keep you connected. Easily configurable, you can create the cabin management solution you want, without compromise. Your cabin experience has officially

been transformed. To know more, call +1 319.295.4085.





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Music + Radio

music service

super saver

E-LEATHER LTD REPORTS ON THE RISE OF COMPOSITE LEATHER AS A WEIGHT, FUEL AND COST SAVING MATERIAL FOR SEAT UPHOLSTERY

irline operators are looking to their suppliers to differentiate their brand, attract passengers to their aircraft and help them make cost savings to combat the financial impact of ever-

increasing fuel costs affecting the profitability of their businesses. Press reports estimate that up to 40% of airlines' operational spend is taken up by fuel costs, and with oil prices a continuing concern, the importance of fuel costs are a prime focus for all operators. This, coupled

prices a continuing concern, the importance of fuel costs are a prime focus for all operators. This, coupled with the increasing media pressure to reduce CO_2 levels and so propagate an environmentally friendly image, ensures that airline operators have a difficult job to manage.

Fuel costs and thus CO₂ emissions can be cut by reducing weight in the cabin. Additionally, if an operator can also avoid the changing, cleaning and re-treatment costs associated with textile covers, overall savings increase greatly. If these maintenance cost cuts can be achieved with the easy-clean benefits of natural leather, but without the associated weight penalty, the savings accumulate.

In deciding on a supplier, airline operators need to look at the long-term perspective, as well considering the image that is being portrayed to the passenger. Passenger comfort, the appearance of the cabin and safety cost savings are vital. Then there is the issue of how to deal with the environmental message of flying.

One of the most obvious cost saving methods is perhaps to reduce weight to lower running costs. This is applied across many transportation industries, not always efficiently. With aircraft, one area in which large weight savings can be made – but which is commonly overlooked – is the seats, the foam cushions and upholstery. By reducing the weight of the seat fabric, fuel and money can be saved.

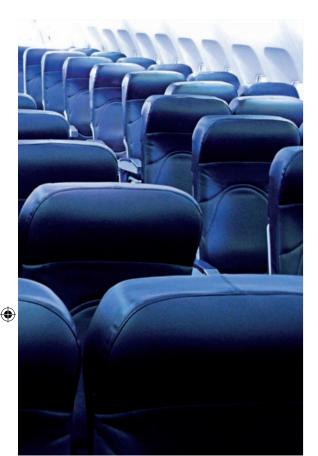


There are countless upholstery options available for airline seats, armrests and wall coverings. One form of upholstery that is becoming more popular in new and refurbished aircraft is composite leather. By using a composite leather product, airline operators could save up to 25% in fuel costs each year. Composites can be less than half the weight of natural leather.

Weight savings Composite products vary in weight, but recent innovations, such as E-Leather material, can weigh around 500g/m², as opposed to the 900-1,000g/m² registered by natural leather products. With about 3m² used to cover a typical aircraft seat, around 1.2kg could be saved per seat. E-Leather Ltd's research shows that for a typical 278-seat A330 aircraft, the

1-2. Seats upholstered with E-Leather Ltd's composite leather product

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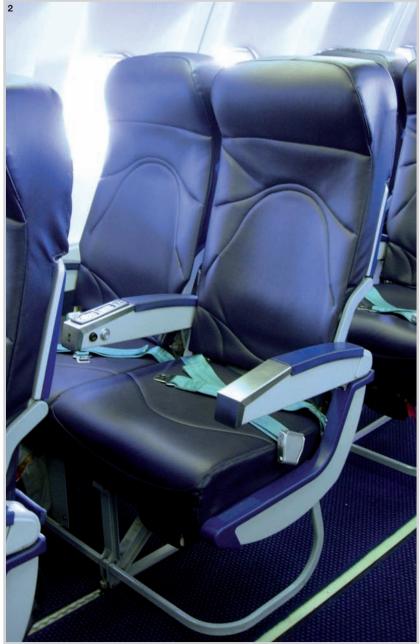


operator could save £38,256.65 (US\$57,354.40) in fuel savings per annum using a composite leather product. It could also save up to £4,020.47 (US\$6,027.09) per year purely in new seat-cover upholstery costs by using composite leather over traditional fabric options. A £15,554.16 (US\$23,323.50) saving could be made on cleaning costs each year, as composite leather is durable and can be wiped clean, eliminating the need for frequent cleaning and re-treatment.

As a man-made product made by automated machinery, these materials have consistent properties, thus avoiding the potential pitfalls of quality, variability and unpredictable yields that can be found with natural products. To achieve these properties at low weight in natural leather, properties such as

BY USING A COMPOSITE LEATHER PRODUCT, AIRLINE OPERATORS COULD SAVE UP TO 25% IN FUEL COSTS EACH YEAR

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Aircraft Interiors International Annual 2009 75



IN THE LAST SIX MONTHS, AT LEAST FOUR AIRLINE OPERATORS HAVE SWITCHED TO COMPOSITE LEATHER SEATING

tear strength are compromised. Other factors such as colour consistency and fire resistance are 'engineered-in', and part of the man-made product. A seat upholstered with composite leather holds its shape without bagginess and movement from the fastenings so the new appearance is maintained.

Reducing emissions Another aspect high on the agenda of any airline operator is cutting CO₂ emissions and improving its environmental credentials and image. By using a composite leather for upholstering seats, airlines reduce the amount of fuel they burn, and therefore the amount of CO₂ they emit. As cleaning is also cut, there are reduced emissions from the cleaning process. Industry statistics show that for every 1kg of fuel burned on an aircraft, more than 3kg of CO₂ is produced. By using a composite leather product, up to 80 tonnes of CO_2 can be saved each year.

But even before it is upholstered to an aircraft seat, the composite leather material shows environmental savings itself. By using tannery by-products

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Contact Doug Hacking

saved from landfill, an environmentally focused manufacturing process, and with cutting wastage standing at only 10% compared to up to 40% for natural hides, the environmental credentials mount.

Using a composite leather product on aircraft seats is a positive move on a number of levels. Reducing costs, pollution and operational expenses are all high priorities for airline operators and are all addressed in the move to composite leather upholstery.

Changing times The last 10 years have seen dramatic changes in the appearance and style of aircraft cabins. Video screens are becoming more advanced, and electronic maps charting the course of the flight are more regular fixtures. In the last six months, at least four airline operators have switched to composite leather seating and it is likely that this figure will dramatically increase over the next six months. E-Leather Ltd believes the luxury cabin, upholstered with composite leather materials, will soon be blazing a trail across the aviation industry. **END** 3. Seats upholstered with composite leather hold their shape

E LEATHER



SAVE FUEL • SAVE CO₂ • SAVE MONEY • PROTECT MARGINS

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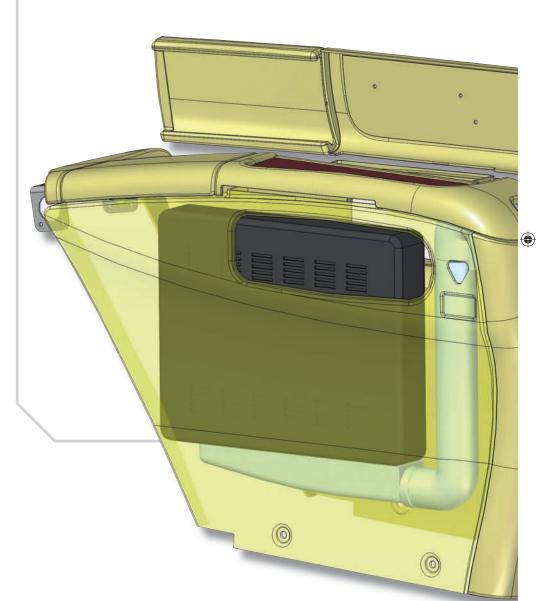
new heights

S&S NUMERICAL CONTROL REPORTS THAT THE A350, A380 AND B787 ARE DRIVING DEMAND FOR BETTER IFE COMPONENTS

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s in all prior generations of wide-body commercial aircraft, the demand for lighter and stronger materials is leading the way. The pressure for more efficient designs is felt not only in major structural components - with their increasing use of advanced composites - but throughout the realm of internal electrical and mechanic parts as well. Inside the modernised cabins of the A350, A380 and B787, the strength-versus-weight demands placed on designers are compounded by new targets for space reduction, lower cost and enhanced aesthetics. The combined impact of these challenges is well illustrated by what is happening now with key elements of IFE systems for the new aircraft, especially with regards to wiring harnesses and video-monitor-deployment arms.

Compensating for cabling In the A380 programme, the increased weight of the electrical cabling needed to span the longer fuselage has had an impact on the design of mechanical IFE components, some of which have had to be made lighter to compensate for heavier cables. A good portion of the wiring on the A380 is for the IFE



IT'S ALL ABOUT WEIGHT, DURABILITY, AESTHETICS AND COST. WE'VE REDUCED THE WEIGHT OF OUR ARMS BY AS MUCH AS 40%

A SMART MONITOR DEMANDS A DEMANDS A SMART VIDEO ARM

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Introducing the New Smart

Precision machined, light weight, highly durable

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- Reliably lifts all newer, heavier, smart monitors
- Accommodates harnesses up to 0.5 in (13mm) diameter
- Internal components protect harness from damage
- Designed to meet the new requirements of the A350 and B787

The latest video arms from Satterfield Aerospace allow cabin and seat designers to take full advantage of the latest IFE systems, using the new "smart monitors" with their larger cables. The Satterfield SmartArm[™] provides a premium look and feel resulting in an enhanced user experience in any cabin.

The SmartArm[™] is also very costeffective, providing a premium arm with higher aesthetics, better functioning and higher reliability for the same or better price as compared to many of the more conventional or "industrial-looking" products on the market today.

"With their beautiful ergonomics, light-weight design, and robust engineering, all backed by the best support in the business, you can't go wrong with video arms built by Satterfield Aerospace." [Greg Askelson, Koito Product Support North America] To find out more about the new SmartArm[™] and our complete line of video arms for every craft and cabin, call 1.818.341.4141 or visit us online at www.satterfieldaerospace.com



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S&S Numerical Control Division, 19841 Nordhoff Street, Northridge, CA 91324 TEL: 1.818.341.4141 www.satterfieldaerospace.com

broader, faster, multiple streams of content, cable diameters have doubled from around 0.25in (6.35mm) to the 'new standard' of 0.50in (12.7mm) in all the latest systems. The same content-hungry market has IFE video monitors expanding from 10in (254mm) to 18in (457mm). Monitor weights have doubled along the way with some premium-class screens now weighing 20 lbs (9.1kg). On top of all that, seat manufacturers are being pressured to fit a greater number of electrical and mechanical components into consoles constrained to finite amounts of space. The crux of the problem, the point at which these factors converge to produce the highest degree of difficulty, is in the monitordeployment system (the video arm).

system, the cabling for which has

increased not only in length but also in

diameter. To address the demands for

Designing video arms under these conditions is an interesting feat, one that represents the challenges found in various other programmes relating to the newer aircraft. Video arms need to be smaller and lighter than before, while accommodating larger cables and heavier monitors. "Monitors are not only larger than ever but heavier, in some cases now incorporating creditcard readers and other data-processing into the monitor itself. The added weight means higher leverage, so the arm needs greater lifting capacity despite being lighter and smaller," explains John Satterfield, president of Satterfield Aerospace, S&S Numerical Control Division, located in Northridge, California, USA. Satterfield has been designing and manufacturing videoarm components since 1995. "It's all about weight, durability, aesthetics and cost. We've reduced the weight of our arms by as much as 40% in some cases - arms that were 3 lbs are now down to 1.8 lbs," he says.

Dual video-arm

ever more tightly

packed seating

consoles

systems are being fitted into

Satterfield also outlines some of the maintenance issues involved, which are

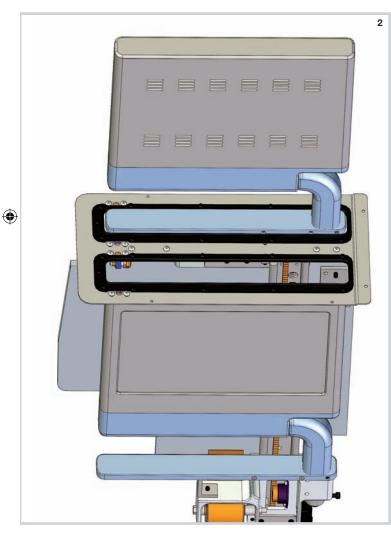
vital as airlines are always looking for ways to reduce maintenance costs. "The most common mode of failure in IFE systems is damage to cables. When that happens, you incur the cost of a new cable, the labour to replace it, and the lost revenues when a seat can't be sold during IFE downtime," he notes. "Cables fail primarily by twisting and bending, which is why we've gone to great lengths to eliminate these types of stresses on cables. Video arm specs typically call for inside diameters of 0.5in (13mm). Starting five years ago, we decided to future-proof our products by building in an ID of 0.75in (19mm) wherever possible. It allows larger harnesses to install easily and it protects them from damage due to chafing in service. It also saves time and money in routine maintenance since you don't have to wrestle the cable through a tight space," he adds.

The new aircraft also have certain visual requirements. "For durability and aesthetic appeal, we make our arms from aluminium, never from plastics or composites. It maintains low weight and allows more complex machining. A350, A380 and B787 cabins call for arms with better styling, no sharp corners, nice smooth contours, with clean, smooth coatings like bright anodize, satin polish and powder coating. Machined aluminium has that premium look and feel you just can't get with composites," says Satterfield.

Perfect fit A strong new factor in video arm design is the trend towards vertical integration of the arms with their directly mating seat components. In IFE applications, video arms and seating components must fit neatly together to maintain the quality of the user experience. "There are problems whenever you stack tolerances between two or more components coming from different sources. All too often they do not work smoothly together and usually the fact is discovered too late,"

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THERE'S A STEADY DEMAND FOR SUPPLIERS WHO CAN WORK DIRECTLY WITH A CUSTOMER'S ENGINEERING STAFF BECAUSE IT RELIEVES THEM FROM HAVING TO MANAGE EVERY SMALL DETAIL



2. Video arms are integrated with mating console components to ensure trouble-free performance reflects Satterfield. "A good example of how we prevent this is an A380 project started a few years ago. A major international airline asked us to work directly with the seat vendor to supply them with not only the pop-up style of video arm, but the console bezel through which the arm passes when deployed or stowed. We were to design and manufacture the arms and the seating structures that directly interface with the arm," he explains. "By building arms and mating parts together, we were able to ensure everything fit perfectly and functioned without problems when installed into the seat. All the seat manufacturer had to do was 'plug and bolt' the solution into place." This approach also allows the seat vendor to turn over some of the engineering work. "There's a steady demand for suppliers who can work directly with a customer's engineering staff because it relieves them from having to manage every small detail of a project. It reduces the chances of a failure caused by some invisible detail. The 'plug-and-bolt' approach is now a standard offering on our programmes for seat builders," Satterfield remarks.

Time-to-market is also a major factor on projects like these, but new technology is helping in this area. "The latest 3D modelling software allows us to conduct our primary testing on CAD systems using finite element analysis, which saves time in the design phase. To speed up development of the design once approved, we have in-house rapid-prototyping equipment that can deliver tightly toleranced prototypes in very short timeframes. The minute the prototype is accepted, our on-site factory is able to turn around completed arms for formal design review within a matter of weeks, not months," reveals Satterfield.

Market awareness As a company specialising only in video arms, it is important for S&S Numerical Control to keep up to date with every aspect of the market for arms and seats. "We try to anticipate events relating to design, manufacturing and new product development long before the situation becomes critical. For example, we already have arms that interface with the new self-contained portable IFE modules," he discloses. "We are seeing more and more people wanting solutions for video-on-demand and audio-on-demand. And then the latest thing is the integration of personal content devices into traditional IFE systems. We saw and began responding to that trend some time ago and are already several iterations into the development of iPod docking stations built right into video arms."

Satterfield believes the key to the company's future success lies in reacting quickly to new developments. "There are unpredictable new requirements on the horizon and we intend to address them as quickly as they appear," he asserts. "Our mission as we see it is to support the industry by keeping sharp, new, world-class products – our own and our customers' – rolling rapidly down runways and launching smoothly." **END**

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Contact John Satterfield

Email: jsatterfield@ssnumerical.com

SMART MONITOR DEMANDS A DEMANDS A SMART VIDEO ARM

Introducing the New

smart<mark>₄</mark>m[™]

- Precision machined, light weight, highly durable
- Reliably lifts all newer, heavier, smart monitors
- Accommodates harnesses up to 0.5 in (13mm) diameter
- Internal components protect harness from damage
- Designed to meet the new requirements of the A350 and B787

The latest video arms from Satterfield Aerospace allow cabin and seat designers to take full advantage of the latest IFE systems, using the new "smart monitors" with their larger cables. The Satterfield SmartArm[™] provides a premium look and feel resulting in an enhanced user experience in any cabin.

The SmartArm[™] is also very costeffective, providing a premium arm with higher aesthetics, better functioning and higher reliability for the same or better price as compared to many of the more conventional or "industrial-looking" products on the market today.

"With their beautiful ergonomics, light-weight design, and robust engineering, all backed by the best support in the business, you can't go wrong with video arms built by Satterfield Aerospace." [Greg Askelson, Koito Product Support North America]

To find out more about the new SmartArm[™] and our complete line of video arms for every craft and cabin, call 1.818.341.4141 or visit us online at www.satterfieldaerospace.com



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upper hand

WITH PASSENGERS USED TO TECHNOLOGY BEING PERSONAL, DIGECOR BELIEVES ITS PORTABLE IFE PRODUCT IS MAKING MORE AND MORE SENSE TO AIRLINES

digecor

hile working for Alaska Airlines as a baggage handler in 2003, Bill Boyer came up with the idea of having a

portable in-flight entertainment (IFE) device that required no modifications to the aircraft. It was an idea that took off when he presented it to top management at Alaska Airlines.

Initially designed for the IFE industry, the digEplayer 5500 was the first hand-held audio/video on demand (AVOD) entertainment unit to be designed specifically for use in flight. Just 18 months after its debut, the digEplayer 5500 won the IFE Product of the Year award. The company was purchased by Wencor in October 2004 and the name was later changed to digEcor, as the focus became digital entertainment.

text and crisp graphics.



Jed Thompson, content administrator at digEcor's in-house encoding lab 2-3. The digEplayer XT

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In the summer of 2007, digEcor released its next generation of portable players – the digEplayer XT. This boasts a larger LCD screen and hard drive, a lighter body, longer battery life, clear



"Excited to release a new, superior product to the market, we began design work on the digEplayer XT. Our salesmen began marketing the unit and we had demonstration models at the WAEA show in Miami, Florida in September 2006. Since we were testing new waters for our growing company, we had to delay scheduled deliveries," reflects Brent Wood, digEcor's CEO and owner. "However, we took the opportunity to focus on analysing the critical components of the development process and hire key personnel with the expertise to put to bed any lingering issues." Facing some negative press, digEcor overcame the challenges and the digEplayer XT emerged as a more reliable product. "Customers noted and expressed enthusiasm with the improvement in processes and

dependable service. Today, we are a better company with a better product," he adds.

dig player XT

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In-house encoding lab While most portable competitors opt for consumeroff-the-shelf (COTS) solutions, digEcor believes that airlines can better serve passengers by working with an IFE provider that owns the intellectual property to the device. "While other companies are strapped by the design restrictions imposed by a third party COTS solution, we have the advantage of flexibility in our system. We design, develop, and manufacture our units. We can therefore adapt our units to the specific needs of a given customer while others face change order constraints," notes Brad Heckel, president of the company.



Typically, IFE providers source content from post-production houses that encode and encrypt content such as movies and then mark-up the price. To offer cost savings, digEcor invested in an in-house MPAA-audited and Hollywood studio approved encoding lab. "digEcor has years of experience in providing content management services to its customers across multiple industries and across the world," says Jed Thompson, content administrator. "We offer the broadest selection of content, including Hollywood content, independent content, television content, foreign/regional content, foreign language support, and nonvideo content such as music, games, shopping, and books. We offer a turn-key solution handling the content selection, licensing, encoding/

TO OFFER COST SAVINGS, DIGECOR INVESTED IN AN IN-HOUSE MPAA-AUDITED AND HOLLYWOOD STUDIO APPROVED ENCODING LAB

encryption, content integration, quality assurance and delivery."

An article on USAToday.com several months ago outlined airlines' efforts to upgrade IFE in economy class. Noticeably absent from this article was the rising interest in portable solutions among airlines worldwide. One might ask: "With the likes of Panasonic and Thales, why pay attention to the hand-held guys anyway?" However the right question to ask is: "How sustainable are portables in a world of legacy IFE systems, mounting gas prices, and rapidly increasing consumer technology?"

Despite strong competition from traditional suppliers, portables offer remarkable value for airlines and the end user. For example, embedded systems cost an airline not only millions of dollars but days to install. Portables sell at a fraction of the cost and require merely carrying (or rolling in a lightweight cart) on to any aircraft. Moreover when an embedded system fails, the entire aircraft (or a large section of passenger seats) is taken out of service, potentially for many days. If any given portable unit malfunctions, the unit is replaced within minutes with a spare, requiring no down time.

Weight savings For the same reason that many people recently opted for a sporty little hybrid instead of an SUV, managing a fleet of gas-guzzling aircraft with rising fuel prices is a migraine in waiting. Typically weighing thousands



INFLIGHTENTERTAINMENT



of pounds, embedded IFE systems burn millions in fuel each year. Now imagine trading out the brute force of that 400lbs embedded IFE system for the lightweight agility of a portable. digEcor's hand-held systems reduce the weight of an IFE system to 150-200lbs, producing large fuel savings all while offering increased functionality and customer satisfaction.

Personal media devices Further, if current consumer electronic trends teach anything, the lesson is that consumers are accustomed to personal media devices (with the emphasis on personal). For example, try telling a nine-year-old girl that she has to watch Death Race while flying across the nation. Guaranteed, neither she nor her parents are going to be happy. At an economical price, the digEplayer XT offers a wide array of content options on each device so that every traveller has a personalised entertainment experience. Whether selecting from movies, TV shows, music, professional book summaries, music videos or browsing other features, any demographic can have suitable content in the palm of the hand. After years of experience, digEcor demonstrates that the personal value for passengers results in successful rental programmes. One long-time customer sees consistent rental uptake rates of 75-95%, helping to offset the cost of the programme. "That's why we see our current customers returning for a second and a third purchase," Wood remarks.

Frost & Sullivan, an industry expert in market research and consulting, has performed an extensive market analysis for digEcor to review market size, market share, industry opportunities, and key airline IFE requirements. "The results of our study show that digEcor, having created the portable industry, has remained the leader in terms of clients and number of units in operation regardless of encroaching competition," reports Frost & Sullivan. "We also determined that digEcor has one of the strongest strategic plans to remain not only viable, but profitable within this industry for the next several years. For this reason, we have given digEcor an award recognising its great growth potential and earning power."

digEcor's focus remains on the needs of airlines and desires of passengers. "Despite new entrants and old colleagues, digEcor has not swayed from its passion to create value through high-quality entertainment and flexible multimedia solutions. Understanding the market and meeting the needs of airlines and passengers alike are the key elements in all of digEcor's decisions," Heckel maintains. "The current economic strain challenges many airlines worldwide and we address each concern so that our products and services are not only of the highest calibre, but are at the right price, weight, and customer experience."

While some airlines wait to see the outcome, early adopters have reaped the rewards of successful portable IFE programmes. "Through packaging our proprietary personal media platforms with customisable low-cost content, digEcor drives cost savings to airlines, creates an exciting personal entertainment experience for passengers and will continue to shape the portables market as hand-helds rapidly gain acceptance," Heckel says. **END**

Contact Josh Rasmussen Email: sales@digEcor.com The digEplayer 5500
 The digEplayer XT boasts a larger LCD screen and hard drive than the 5500, its predecessor

EARLY ADOPTERS HAVE REAPED THE REWARDS OF SUCCESSFUL

PORTABLE IFE PROGRAMMES









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It's a crowd pleasing, fuel saving, market leading, friend of Grandma, if you know what I mean.









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more for less

THERMAX SPECIALISES IN INCREASING DATA RATE AND THE QUALITY OF DATA TRANSMISSION, USING THE MINIMUM AMOUNT OF CABLE

> usiness travellers can no longer afford to view their time in the air as 'downtime', as this would dramatically affect their daily productivity.

A seat on an aircraft, previously a place of relative inactivity, has become many a passenger's second (and in some cases, third) office. Meanwhile, leisure travellers have come to expect more ways to stay connected while flying, to enable them to use their time more productively, or as a platform for a variety of entertainment options.

As a result, in-flight entertainment (IFE), which began as a single projected movie, has blossomed into an interactive communication and media environment barely conceivable only a few years ago. Today's passsengers, whether travelling for business or leisure, have come to expect and demand an interactive environment with moving maps, on-demand movies in multiple languages, Live TV, satellite radio and real-time internet access. Future applications

include the use





of cell phones, PDAs, and Bluetoothenabled devices requiring a wireless LAN connection to the IFE system.

Wireless networks The popularity of wireless networks occurs for a variety of reasons. While weight and space savings provide the more obvious explanations for the elimination of cabled connections, what is even more important is the flexibility wireless networks provide. Although these systems are described as wireless, the internal 'nervous system' continues to be wire and can be more accurately described, from a cabling standpoint, as 'wire-lite'.

The direct link to terminals, and some cable, may be replaced by radio frequencies (RF) as a means of data transfer, but the electronic transmitting

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and receiving of RF waves still uses wired connections, as do other aspects of the system. Current wireless technology requires a vast amount of information flowing through the connections, and this actually increases the demand on the wired inflight network. Moreover, the desire for everincreasing forms of media and entertainment options will only require more and faster information in the future. Of course, there is an obvious desire to 'future proof' the backbone so as to minimise reconfiguration costs as systems evolve.

Information is passed to and from numerous devices in the aircraft, with a desire for ever greater bandwidth and higher data transmission rates. Concurrently, there is the desire and need to reduce weight, size and the

1-2. Airlines want to enable greater IFE

functionality while

amount of cabling

minimising the

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number of cables. Rising fuel and raw material prices, coupled with demand for ever more electronic and datahandling capabilities has created the current scenario for Thermax and other wire and cable manufacturers, i.e. to provide more performance with less.

Data rate challenge The challenge facing wire and cable manufacturers asked to increase the quality of transmission with the minimum amount of cable is, simply put, data rate. Improved IFE systems, glass cockpits, and the integration of consumer electronics into the aircraft network, all require vast amounts of data to be transferred at high speeds. To further compound this challenge, there are several industry standards that must be supported, such as IEEE 1394, ARINC

THERE IS THE DESIRE AND NEED TO REDUCE WEIGHT, SIZE AND THE NUMBER OF CABLES

629, and MIL-STD-1553. With varying interfaces and transmission rates for each system, installed cable systems must be able to interoperate seamlessly to avoid a profusion of incompatible wiring types. All of these factors must be considered when developing the right combination of conductor, insulation, shielding and jacketing to create cable that best fulfils the requirements of a specific application.

Looking back to the implementation of the first aircraft databus systems, Thermax began working within the Ethernet networking framework, meeting the requirements of the aircraft industry. Initial implementations consisted of the 10 Base-T cable (10Mbps), but as these were being implemented, the trend almost immediately began moving towards 100 Base-T transmission speeds (100Mbps).

Stranded conductors There were several obstacles to overcome in attempting to translate the transmission characteristics of commercial grade cable used in land-based networks to an aerospace environment. The most important of these obstacles being the

 Today's aircraft passengers expect more from the IFE than just movies



THERE ARE STILL ISSUES TO OVERCOME BEFORE FIBRE OPTICS CAN REPLACE THE TRADITIONAL CABLE COMPLETELY



 Fibre optic cable boasts excellent bandwidth capabilities

need to use a stranded conductor to survive in the high vibrations encountered in flight. Solid copper does not fare well in the aerospace environment, so Thermax engineers and others had the task of implementing a stranded conductor without sacrificing electrical properties. The response was a product that met and exceeded 100 Base-T requirements. Today's systems are now typically based on the highly capable 1000 Base-T standards (1Gbps) transmission rate. 1000 Base-T solutions have been developed in both traditional copper wire and optical fibre-based products. Future implementation of 10GigE (10 Gbps Ethernet) in both copper wire and optical fibre are on the drawing board and will soon be required.

Fibre optic technology Traditional copper wire is still the preferred solution for information transmission in most aircraft applications, but may gradually be replaced with fibre-optic-based products. Fibre holds several characteristics that are favourable to the

avionics needs of aerospace – it has excellent bandwidth capabilities, it is a lighter material than metal, and its transmission distances are greater than copper wire.

However, there are still issues to overcome before fibre optics can replace the traditional cable completely. Fibre-optic cable is difficult to terminate and requires more electronics at the terminations to convert electronic signals to light and vice versa. As fibreoptic transmission is still a relatively new technology compared with copper, given time, its limitations may no longer exist. However, until these limitations and challenges are overcome, instead of replacing copper wire in applicable systems, many airlines are beginning to use fibre optics for the backbone of the system, while copper wire, with its greater ease of termination, comprises the connections to most peripherals and seat-to-seat

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configuration. Ultimately, the decision on copper versus fibre will be based on ever-changing fuel and material costs, as well as the pace of technological innovation for both copper and fibre based cable.

More for less Regardless of the technical direction, the integration of improved and expanded electronics applications will continue in commercial aviation. Systems are now being introduced into both smaller aircraft and business jets, in line with passenger demand. As the technology continues to improve, the wire and cable that functions as the veins through which the information flows will continue to improve as well, keeping passengers productive, happy and safe in flight. Thermax and other wire manufacturers are poised to meet the demand - to provide more performance with less. END

Most people don't think of the importance of wire and cable when flying... We do.

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highway code

TYCO ELECTRONICS IS AT THE CUTTING EDGE OF HIGH-SPEED DATA DELIVERY

yco Electronics is one of the largest electronics companies in the world and the largest manufacturer of passive electronic components. Tyco Electronics is a US\$13.5 billion company and operates in 45 countries with nearly 100,000 employees. It supplies over 500,000 different products and has over 17,000 patents.

Since 1942, the Tyco Electronics AMP brand has been an integral part of the aircraft electronics market. Most recently, Tyco Electronics created a dedicated Global Aerospace, Defense & Marine business unit (GADM). Today, GADM provides expertise in the areas of interconnection, relay and contactors, wire and cable and harness protections related to such brands as Raychem, CII, Hartman, Kilovac and many others.

 ARINC 664 Quadrax and fibre optics in different interface styles
 SAC 1 - S2S

receptacle

To ensure the company is best positioned to deliver innovative and often customised product solutions, GADM also offers fibre-optic products, identification labels, power resistors, sensors, harness design software and any





type of sealed or standard cable harnesses. Through its worldwide sales, engineering, production and logistical network, Tyco Electronics actively supports its customers, including its suppliers, in the global development of new aircraft, ships and defence solutions.

Market shift Historically at GADM, the majority of new product developments are dedicated to the commercial aircraft industry and most specifically to the cabin interior products market. Applications like on-demand in-flight entertainment (IFE) and on-board web access are already implemented today. In a similar manner to the automotive industry, flexible airline cabin customisation with 'plug and play' line-replaceable units are appearing on the horizon.

As data networks merge together, Cat5E broadband performance becomes a requirement to achieve future passenger entertainment and food service expectations. This market trend is underlined by recent and actual ARINC standardisations of the Airline Electronics Engineering Committees (AEEC). The task of these standard working groups has changed from focusing on defining interface connections between suppliers to the development of complete new aircraft platform network systems, including compatible hardware solutions.

Tyco Electronics continuously provides product solutions to the AEEC working group teams that ensure signal integrity; reduce size and weight of interface components; and improve material capabilities to fulfil the latest



application requirements resulting from composite airframe structures.

In 1994, Tyco Electronics delivered a fibre-optic-based network for an Airbus A340 IFE system, capable of a 1,000Base/T data speed performance and compliant with ARINC 628 and ARINC 600 SP13 standards. This is the actual benchmark due to be introduced as a copper-based network for the fourth GCN drafted by ARINC 832 projected for the A350XWB aircraft.

Taking the challenge to raise the speed of copper networks to the speed of fibre-optic systems supplied 14 years ago, Tyco Electronics has participated in the definition of major milestones such as ARINC 664 – more commonly known as Quadrax or aircraft Ethernet standard – and ARINC 810, which describes the galley insert standard

TYCO ELECTRONICS HAS PARTICIPATED IN THE DEFINITION OF MAJOR MILESTONES SUCH AS ARINC 664

(GAIN), including the new Twinax/ CANbus network. During the development of the third GCN, described in ARINC 809, it became clear that a new level of performance can only be reached by introducing Gigabit Ethernet-capable interfaces that are rugged, reliable and robust enough for aircraft cabins.

ARINC 810 The current ARINC 810 standard covers the interface development for galley inserts on new aircraft programmes, such as the B787 and the A350XWB. This new ARINC Galley Insert (GAIN) equipment specification will provide increased flexibility for airlines, enabling them to select varied galley equipment from multiple suppliers, allowing easy and flexible configuration and integration. These new galley systems will also incorporate a fully integrated CANbus data network to provide automatic function control of all the equipment and associated interfaces.

Tyco Electronics has helped to create this new industry standard and many of the associated interconnection components. We also offer a valueadded service for the compatible CANbus data transmission cable assemblies for the integration of the galley electrical interconnect on the aircraft.

The specific components Tyco Electronics has designed for use in the manufacture of the CANbus cable assemblies include a new 26 AWG 120-ohm screened twisted pair cable, which has a small overall diameter that allows for a smaller bend radius and provides weight savings. Tyco Electronics has also developed Size 8, non-concentric Twinax twisted pair dedicated contacts suitable to terminate to the new cable – this is used as the CANbus interface contact between the equipment and the data network.

Meanwhile, a range of lightweight, low-profile cable junction boxes, that enables the CANbus to be designed and configured as a true data network offers easy and quick system integration. Finally, a rectangular, modular rack and panel connector used as the interface connector between the galley equipment and the aircraft wiring to provide the power and CANbus interconnection has also been developed. These components can be supplied as fully assembled subassemblies, which have been designed, built and tested to ARINC 810 standard requirements. In addition, complete test systems used to validate the final installation functions are available from Tyco Electronics' application tooling division.

Subminiature aircraft connector With the introduction of composite airframes, it became necessary for the electrical aircraft cabin engineers to seek a real alternative for Subminiature D electrical installations.

The potential replacement is needed to fulfil additional new performance requirements for lightning strike protection, support high-speed network introduction and offer a modular concept to support cabin customisation. Furthermore, such a new interface needs to be able to replace costly circular connectors.

As a stakeholder within the industry standard groups, Tyco Electronics has listened carefully and created a new subminiature aircraft connector (SAC 3). It is based on EN4165 module

AN INCREASED NETWORK SPEED OF A 1000BASE/T SYSTEM IS NEEDED FOR THE FUTURE A350XWB 4GCN



3. ARINC 810 rectangular and ARINC 801 butt joint fibre optics technology selected by the ARINC 809 CCS working group members. The SAC 3 connector gives electrical engineers new levels of robust flexibility in creating fourth-generation aircraft cabin distribution (4GCN) networks.

The connector is rich in userfriendly features. The housing supports a minimum of 16 keying options to ensure proper matching of mating connectors. The push-on back shell provides visual colour-coded identification to distinguish connectors without needing to access the mating face to see the keying.

A new lightweight composite housing combines strength with EMI/ lightning protection and blind mate capabilities. An integral back shell includes a rotatable cable exit. Plug connectors are cable-side devices; receptacle connectors are available for free-hanging or panel-mount cable-tocable connections or in board-mount versions. In light of 4GCN aiming for more robustness, reliability, and re-configurability, SAC 3 connectors are an excellent answer with respect to meeting both today's needs and those to come.

As the generic SAC 3 connector is designed for EN4165 modules, a special 90° PCB version is offered to support cost-effective LRU installations. The SAC 1 PCB interfaces will be available in standard EN4165 layouts to be fully compatible with SAC 3 plugs that utilise M39029 crimp contacts.

ARINC 809 aims to support the established ARINC 664 Ethernet

standard. These aircraft cabin network systems operate at a 100Base/T speed and make use of the Quadrax contacts and two differential pair screened cables also offered by the company.

High-speed networks With its latest developments, Tyco Electronics targets Gigabit Ethernet modules that fulfil the performance requirements of TIA/EIA-568B capabilities. An increased network speed of a 1000Base/T system is needed for the future A350XWB 4GCN and will be potentially listed in the new ARINC 832 standard proposal.

Within the development process, Tyco Electronics faced new challenges as a result of the smaller size of LRU front panels calling out to reduce the number of input and output interfaces. Looking also at further weight and costsaving potentials, the task was set to develop an insert that enables the combination of all required power, signal and data contacts within one module for the SAC 3 connector. With a new special insert dedicated to seatto-seat (S2S) applications, Tyco

Contact Christian Koppe

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Electronics has realised a first prototype that combines the contact layout: 6x #16 for power, 2x #24 for signal and one Gigabit Ethernet unit. The different insert designs of this contact layout will support power in and power out for 90° and 180° PCB installations.

Weight, cost and time savings First prototype network tests indicate that the targeted performance requirements will be reached. This could potentially lead to a reduction of 50% of the seat-to-seat cable installations and presents a tremendous weight, cost and installation time saving.

The only further option to increase the network speed to the passenger seat is to leverage the fibre-optic technology as already applied to the aircraft network backbone – fibre to the seat.

With the developments described above for new high-speed rugged aircraft networks and their hybrid combinations 'power, signal and data' combined, Tyco Electronics has demonstrated its capabilities in product customisation. **END**



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1. Gulfstream

the G650

2. The IWG A6, IWG's

treatment unit

latest water

Aerospace chose

the IWG A6 for its new business jet,

liquid assets

IWG SAYS THE MARKET IS WISING UP TO THE IMPORTANCE OF PROVIDING AIR TRAVELLERS WITH THAT MOST BASIC OF HUMAN NEEDS – CLEAN, SAFE WATER

he savvy air traveller today is far more demanding than the Wright Brothers could have ever imagined. No longer do aircraft owners and passengers just want to arrive at their destination safely, on

time and in comfort. They want to know their aircraft meets the highest health and safety standards, and that includes the water.

Commercial airline passengers have become accustomed to 'do not drink the water' signs in the lavatories. Most travellers know the water on aircraft is, at least, not very palatable. But what they don't know is that they need not be resigned to this situation, however commonplace it has become.

Cabin water quality Numerous studies of aircraft water systems have shown unacceptable concentrations of biological contamination. In 2002, *The Wall Street Journal* published the results of an investigation into potable water quality on 14 American, British and Mexican commercial airlines: "We took samples of airline water from 14 flights and sent them to a prominent lab to test bacteria levels. We collected samples not only from lavatory taps but also from the galley. The reason – although most airlines insist they serve only bottled water, flight attendant unions told us they use galley water when bottled water runs out. In all but two of the cases, bacteria levels exceed the maximum level the US government allows in municipal drinking water."

Water loaded onto commercial airliners or private aircraft all face the same challenges. The quality of the water depends on three factors - its source, the potential for on-board contamination and the handling of it while loading or on the ground. It is risky to automatically assume the water supply on an aircraft meets safe municipal standards. This is especially true for business jets and VIP aircraft that can literally find themselves anywhere in the world at a moment's notice. Increasingly, water supplies are compromised and do not meet minimum standards for health and safety in many areas of the world. Sometimes, improper handling of the water occurs before or during the time it is being loaded onto the aircraft.





WATERTREATMENT

<image>

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Sometimes it is growth within the aircraft's water systems themselves that increases the level of contamination. Aircraft with air-pressurised water systems are 'on-demand' systems, meaning the water remains stagnant in the lines and in the water tanks until someone turns on a tap. Bacteria thrive when water is stagnant.

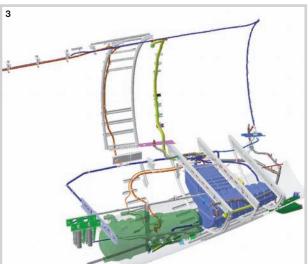
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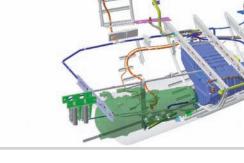
Over the years, several methods of water treatment on aircraft have been attempted, with varying degrees of success. One company, International Water-Guard Inc (IWG), headquartered in Vancouver, Canada, has emerged as a leader in the field. Today, its patented array of Smart water treatment units and systems are found on many types of large business jets and VIP aircraft. Its products utilise ultraviolet radiation to eliminate bacteria, viruses and other unwanted organisms in aircraft water supplies. "By installing the water treatment units in strategic locations throughout the aircraft, pure water is the result every time you turn on a tap," says David C. Fox, president and CEO of IWG. "Ideally, these units are placed at the tank exit and at points of use, such as galleys and lavatories. This multibarrier approach provides clean, safe water on demand, every time."

IWG designs and produces several different water treatment units. Some feature filtration – which removes particulates and improves taste and odour as well as eliminating risk from biological contaminants of all types – and other models are specifically designed to fit small spaces on aircraft. "All of our units are designed to the most stringent aviation requirements, and meet the highest accepted levels of ultraviolet disinfection," Fox points out. "All of our products are flightcertified," he adds.

In addition to standalone water treatment units, IWG also supplies

THERE IS INCREASING PRESSURE FROM THE TRAVELLING PUBLI AND PRIVATE JET OWNERS FOR CLEAN WATER ON BOARD





- 3. Typical configuration of a IWG circulating water system on a **VIP** airliner 4 IWG A4 water
- treatment units complete their final inspection

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special water systems and components including its patented circulating potable water system (C-PWS). This features water pumps and shaped unpressurised tanks to save space, as well as ultraviolet water treatment. It is freeze-proof in flight and gives consistent water pressure and increased water capacity. "This is particularly useful on private aircraft with galleys and showers that create greater demands on the water supply," says Fox.

The use of ultraviolet technology to provide clean water on aircraft has not escaped the notice of organisations such as the United States Environmental Protection Agency (EPA). Last March, the EPA issued a proposed rule titled National Primary Drinking Water Regulations: Drinking Water Regulations on Aircraft Public Water Systems. In this document, while not mandating supplemental water treatment, the EPA writes: "Another option for providing a barrier against microbiological contamination is the use of ultraviolet light (UV) to provide a means of physical disinfection. Interest in using UV light to disinfect drinking water is growing among public water systems due to its ability to inactivate pathogenic micro-organisms without forming regulated disinfection byproducts. It is a chemical-free solution. UV light has also proven effective against some pathogens, such as Cryptosporidium, which are resistant to commonly used disinfectants like chlorine. EPA is aware that at least one manufacturer provides UV disinfection

Contact Giles Lapierre Email: glapierre@water.aero



systems certified by the FAA to be retrofitted onto passenger aircraft."

"There is increasing pressure from the travelling public and private jet owners for clean water on board," notes Fox. "We now live in a time of increasing awareness of the environmental impact of bottled water. On aircraft, we generate higher fuel use with the added weight of bottled water. With an onboard water treatment unit or system that added weight is eliminated. Likewise, when our units or systems are installed, we believe airlines will encounter reduced cost of compliance with new regulations, and may well need less sanitisation maintenance over the years." END

THE EVOLUTION OF AIRCRAFT WATER SYSTEMS



COMING TO AIRCRAFT INTERIORS EXPO – MARCH 31, 2009 EBACE – MAY 12, 2009 AND NBAA – OCT 20, 2009



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hide and seek

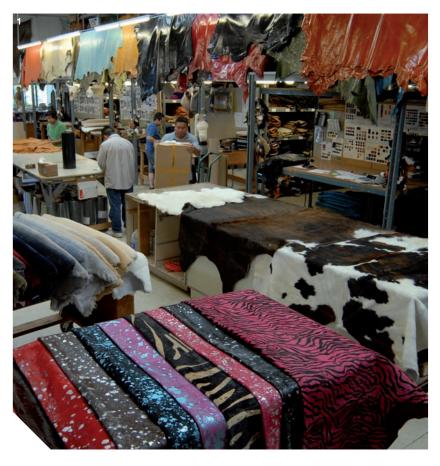
THE HIDE HOUSE EXPLAINS THAT WHILE ITS HUGE RANGE OF HIDES IS SOURCED FROM ALL OVER THE WORLD, ITS COMPANY IS ROOTED IN LOCAL HISTORY



wine-growing region of Napa Valley, California, USA, The Hide House has a played its part in the history of leather in

industry took prominence, the city of Napa had a sizeable leather industry. Sawyer of Napa was founded in 1869 to process the abundance of raw material that the area provided. Soon another tannery – Calnap Tanning Company - was founded to meet growing demand for leather on the West Coast. In its heyday, Napa employed hundreds of people. The Hide House's sister company, Napa Glove & Safety, Inc (founded in 1888), was the one of the first customers for the tanneries.

The Hide House was set up as a factory outlet for the two tanneries some 30 years ago. The tanneries no longer exist, but The Hide House carries on the tradition by sourcing and importing leathers from around the world. Domestically, it does a lot of contract tanning of various leathers



1-2. The Hide House stocks over 600 types of leather, including lightweight aircraft products

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including cowhide, deerskin, elkskin and bison.

Lightweight leathers Today, The Hide House offers a huge range - stocking well over 600 types of high-quality leathers. For the aviation industry, it has made a concentrated effort to offer some of the world's finest aircraft upholstery leathers. These are available in 15 colours and meet all applicable certified vertical burn tests. The leathers are top-grade raw material from the USA, and average 45-60ft² per whole hide. Ultra clean hides offer superior cutting for even the most ambitious aircraft interior design.

Contact Rob Deits Email: rob@hidehouse.com

In these economically challenging times, the company has made a effort to source lightweight hides that are 0.9-1.1mm thick, thus ensuring the lightest weight possible. Reducing weight in the cabin enables airlines to save fuel and therefore money, while reducing CO₂ consumption. Although the hides are lightweight, their tensile strength is not compromised.

The company prides itself on its friendly and knowledgeable staff, and its ability to expedite orders within 24 hours of receipt. It is prepared to send 10 hides or thousands of feet - it says that no order is to small or to large for it to handle. END

The Other Reason Napa is Famous

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here comes the sun

EADS SOGERMA PRESENTS ITS TWO NEWEST SEATING CONCEPTS – SOLSTYS FOR SUPER BUSINESS CLASS AND ULTIMATE 17 FOR SUPER FIRST CLASS

ADS Sogerma's cabin interior activity focuses on high quality, reliability, comfort and simplicity. As well as developing 'off-theshelf' seating products such as Class 180 for first class and Evolys for business class, the company has also created products in response

has also created products in response to airlines' demands (for example its super-business-class seat Solstys and its new super-first-class seat Ultimate 17).

Business class The company's core business-class seat is Evolys, which was designed in 2005 for Gulf Air. It flies on around 10 airlines (including Air Europa, Aeroflot, TAAG, Thai Airways and Turkish Airlines) and is certified for the A320, A330, A340, A380 and Boeing 777. Evolys belongs to a range of products (also including first-class seat Class 180) that are based around certified concepts that can then be customised with a range of designs, according to the airlines' requirements.

1-2. Solstys boasts enhanced comfort, a larger passenger space, an extra table, more privacy and storage and easy maintenance

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Also in 2005, the company developed a super-business-class seat for Etihad Airways – the Pearl. This



horizontal-flat bed seat was so popular that the airline won the World Travel Award in 2006. Currently, 700 of these seats are flying, with 100% proven reliability.

The company's latest superbusiness-class seat, Solstys, provides the same benefits as the Pearl, but boasts enhanced comfort, a larger passenger space, an extra large table, more privacy and storage and easy maintenance. The seat has been certified for A330, A340 and B777 aircraft.

Thai Airways, which has previously ordered Evolys seats for its A330-300 and B777-200ER and B777-300 aircraft, has shown its confidence by ordering Solstys for its six A380s. Solstys was first shown privately at the Aircraft Interiors Expo Asia 2007 in Hong Kong, again at Aircraft Interiors Expo 2008 in Hamburg, and officially at Dubai AIME 2008.

First class In terms of first-class, perhaps the most well known of EADS Sogerma's portfolio is Class 180, which was developed 10 years ago with Cathay Pacific. Now in its third incarnation, this seat flies with more than 10 airlines, including on Gulf Air A330 aircraft and Asiana B777 aircraft.

The company's latest super-firstclass seat is Ultimate 17, launched and developed from the BetterFly concept created for Oman Air's new fleet of A330 aircraft at the beginning of 2008. Oman Air also ordered Class 180 seats for its new business-class cabin on the



100 Aircraft Interiors International Annual 2009

same fleet (four A330-200s and three A330-300s). The two products were developed using the same mechanical structure, to provide operational cost savings for the airline.

Ultimate 17 is a luxury lounge concept that provides more passenger space, privacy and storage than its predecessor. It will be shown at Aircraft Interiors Expo 2009 in Hamburg.

Improved service The last few years have seen the company greatly improve its service following a major reorganisation. Since September 2006, the company has delivered 100% of its first- and business-class seats on time, for both Airbus and Boeing aircraft. Airlines' main priorities are a high standard of quality in the product, and

THAI AIRWAYS HAS SHOWN ITS CONFIDENCE BY ORDERING SOLSTYS FOR ITS SIX A380S

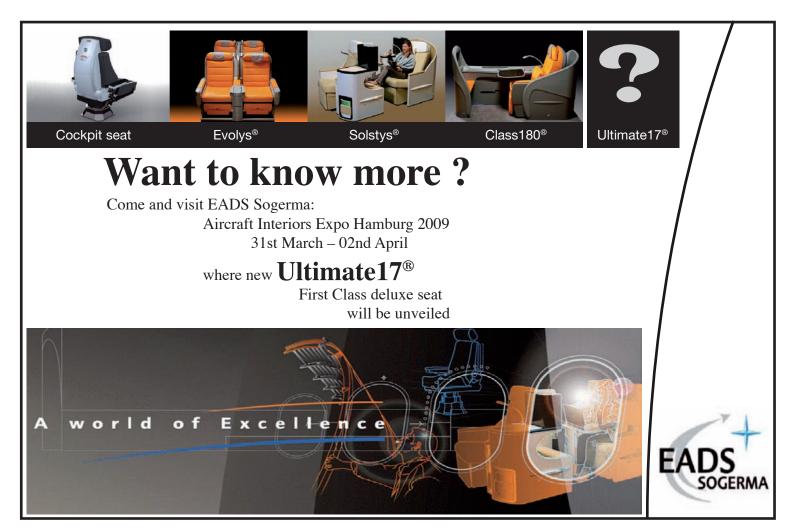
for the delivery dates to be respected. To comply with these requirements, the company now only takes on orders from customers whose schedules harmonise with the company's production capacity.

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The company takes customer service very seriously. As EADS Sogerma has customers all around the world (with more than 20 airlines flying with its products) it has an extensive customer support department at various points around the world – Singapore for Asia, Dubai for the Middle East, Miami for North America and Rochefort (its headquarters) in

Contact Marc Gentil Email: marc.gentil@sogerma.eads.net France for Europe. It also strives to foster strong and close collaboration between its design office, the customer and the programme managers.

Environmental awareness Many airlines are becoming increasingly aware that they should try to improve their green credentials. This is mirrored by EADS Sogerma's engineering department, which is (more than ever) trying to make its seats as light as possible, and use natural materials. Weight savings lead to fuel savings, so as well as benefitting the environment, airlines can save money. **END**



supply and demand

AIRCRAFT CABIN TECHNICIANS LTD IS FILLING A GAP IN THE MARKET BY SUPPLYING SKILLED INTERIOR TECHNICIANS EXACTLY WHEN AND WHERE THEY ARE NEEDED

any companies in the aviation sector have reported problems recruiting enough skilled workers recently.

One recruitment agency, Aircraft Cabin Technicians Ltd (ACT), was set up to alleviate this problem, specialising solely in aircraft interior technicians.

The agency was established in September 2007 by director Tony Seville, who has experience on the other side of the fence, as a contracted interior technician. He has accumulated over 25 years of hands-on experience, working for major companies such as Jamco, Fokker Aircraft Services, Driessen, Jet Aviation and Bombardier.

Case by case Many years were spent researching the recruitment sector of the aviation industry before setting up the company, paying careful thought to the specific needs of customers. With his personal knowledge and experience of aircraft interiors, Seville has created a successful recruitment agency, with the ultimate goal of providing technicians that are not only capable, but well suited to the demands of each individual contract.

Rather than sourcing permanent employees, ACT provides its workforce as and when they are needed to help companies on specific projects. "Companies worldwide constantly





require additional labour for short- and long-term projects on all types of aircraft (corporate and commercial, including VIP), working on every discipline throughout the aircraft cabin," explains Lisa Rollett, business development manager at ACT.

The benefits of using temporary contractors are manifold. For example, if aircraft are delayed entering the hangar, the company is not paying employees for doing nothing – it can simply delay the contractors' start date. Likewise, contractors can be deployed to cope with unforeseen or seasonal demand, at short notice. Clients also benefit from not having to make payments associated with permanent staff (such as tax, insurance, pension, training and administration costs).

In its first year of trading, ACT's workforce has worked on short- and long-term projects in the UK, Ireland, Germany, the USA, Brazil, Spain, Holland and Denmark. These projects have varied from new-build, composites, cabin refurbishment and cabin line maintenance, within corporate and commercial aviation. Technicians supplied by the agency include VIP cabinet makers and mechanics, galley builders, seat mechanics/builders, Tedlar specialists, composite fitters and laminators, upholsterers, carpet fitters and fiberlam fitters. All technicians wear a smart uniform displaying the company logo, name and the technician's name, so they can be easily identified.

Recently ACT provided VIP cabin technicians for a company in Denmark, which had initially attempted to cut costs by transferring its permanent external engineers to work on the interior. "After a period of six weeks, the company called us back as the external engineers could not do the job through lack of experience on VIP interiors, resulting in the aircraft being delayed and materials, time and money being wasted," recalls Rollett. "Four of our cabin technicians were contracted to

skilled workforce of aircraft cabin technicians

1-2. ACT can supply a

BUSINESSES COMMENTED ON THE DIFFICULTY OF SOURCING SKILLED LABOUR FOR AIRCRAFT INTERIORS

the company, the job was completed within four weeks and the company was very grateful," she notes.

The agency recently introduced a labour charging scheme to cut the cost of medium- to large-scale recruitment for companies. The scheme is based on a sliding scale, so the more technicians that are recruited by a company, the higher the savings per person per hour. Potentially this can amount to large annual savings.

Appropriate skills The company's rigorous selection process ensures clients are provided with only the best personnel, each equipped with the appropriate skills for the job. Its success is achieved by delivering what

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the client wants, when they need it, and saving clients from having to handle the recruitment and selection process. "Basically, using our company cuts out the recruitment process for businesses," summarises Rollett. "No advertising fees, no receiving mountains of application forms, no interviewing or collecting references. Companies simply telephone us with details of the contract, we send them a selection of CVs that are suited to their requirements and they select the technicians that they require. It's simple and saves companies time and money."

Contact Lisa Rollett Email: lisa@aircabtech.com ACT is being greeted with enthusiasm by the industry. "Our company has been very well received recently at the Aircraft Interiors International Expo in Long Beach, California, USA, MRO EXPO in Madrid, Spain and the MEBA in Dubai, where businesses were very excited to know that there was a recruitment agency solely providing interior technicians," reports Sandra Whalley, sales and marketing manager at ACT. "All businesses commented on the difficulty of sourcing skilled labour for aircraft interiors, and our company was like a 'breath of fresh air'." **END**



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win win

DIEHL AEROSYSTEMS CONTENDS THAT WHEN LIGHTING DESIGNERS AND CABIN MAKERS COOPERATE, EVERYONE WINS

EDs are taking over aircraft interiors. OEMs such as Airbus and Boeing have fallen in love with the attractive combination of colours, extended lifespan and low energy needs offered by luminescent semiconductors. Because of their unique optical qualities, LEDs have also sparked the imaginations of lighting designers. The new technology is more than a fad – the Boeing 787 will be the first commercial airliner equipped exclusively with LEDs.

Integrated design Using LEDs demands expertise and imagination from engineers. The key to cabin and lighting design is creating a comfortable atmosphere where passengers can relax as they travel. Close cooperation between cabin makers and light engineers is vital, especially when developing new lighting concepts. The challenge lies in correctly positioning the LEDs and using the right optics to avoid shadows. Preventing the lights from realising their full potential is also a mistake.

 Diehl Aerosystems experiments with different lighting scenarios
 A380 floor-to-floor mock-up

The design process necessitates continuous collaboration between both development units. Early on, lighting



designers are given cabin elements that allow them to simulate whether things like blinds will get in the way of light from LEDs. If the simulations show a need for adjustments, the industrial design department can then adapt linings and contours to create the desired effect. Lighting designers then optimise the lights' optics. Simulations ensure the development of the bestpossible solution.

Simplifying assembly Cooperation also has its advantages during assembly and maintenance. By assembling light fixtures along with cabin elements and systems, joint functions can be combined and integrated. Integrated modules – for example a hat-rack and lights with other electronic components – can then be tested and inspected as a single unit before delivery directly to a aircraft manufacturer's production line. This minimises expenditure on development and production costs – and even lowers maintenance costs.

Diehl understands the potential of integrating cabin interiors and lighting. To offer fully equipped cabin modules, the former Airbus factory in Laupheim, Germany (which specialises in cabin construction) became Diehl Aircabin in October 2008 and was added to Diehl's corporate division, Diehl Aerosystems. Both enterprises, Diehl Aerospace and Diehl Aircabin, are joint ventures of Diehl and Thales. Diehl Aerospace is currently working with Diehl Aircabin on an integrated cabin for the Airbus A350 XWB. "By offering complete cabin modules that even include integrated lighting as part of a floor-to-



floor concept, we simplify supplier management for our OEM customers and lower manufacturing costs. Since there are fewer areas of contact between suppliers, the full potential of integration can be used to create an attractive and relaxing cabin atmosphere for passengers," says Manfred Kennel, CEO of Diehl Aerospace, explaining the advantages to aircraft builders of a joint approach.

Trendsetting "Aircraft manufacturers get a product whose parts are tailored to fit together," adds Axel Rodenberg, CEO of Diehl Aircabin. "In addition, with the early, close cooperation during the concept and development stages we can establish trends more

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JOINT FUNCTIONS CAN BE COMBINED AND INTEGRATED

quickly, allowing our customers to fly away from their competitors."

Passenger expectations Gerald Weber, executive-vice-president operations and chairman of the board of Airbus Deutschland, also emphasises the market significance of producing highquality cabin equipment: "Customers and passengers already have high expectations for aircraft interiors. Cabins have become the business card of the airlines. The demand for individuality continues to grow – there are showers, bars, starry skies and automatically operated overhead bins, to name just a few examples."

Harmonious, integrated products that make optimum use of new technologies are in demand from OEMs, airlines and passengers. The concepts combine the wishes of the OEMs and airlines with the years of experience and cutting-edge expertise of cabin makers. Innovations at Diehl Aerosystems are currently being driven by the A350 XWB and the Boeing 787, with lighting and cabin designers working closely together to set new standards in on-board comfort. **END**

Contact Guido van Geenen or Marcus Puknatis Email: guido.vangeenen@diehl-aerospace.de or marcus.puknatis@diehl-aircabin.de

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Diehl Aerosystems combines many years of experience in the fields of cabin interiors, avionics expertise, and lighting with a high degree of creativity and effectiveness.

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Aircabin

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spoilt for choice

AIRBASE INTERIORS REVEALS WHAT OPERATORS SHOULD CONSIDER WHEN CHOOSING SOFT FURNISHINGS TO REFLECT THE CABIN'S DESIGN CONCEPT

n the current economic climate, when the need to monitor all costs carefully is paramount, airlines need reassurance that expenditure on cabin items is fully researched and justified before it is approved and signed off.

In the case of seat covers, the cycle starts with a design concept and finishes with a fully serviceable seat cover that should last for at least four years. The design concept, briefed and signed off by the airline, is a representation of the cabin interior incorporating the colour scheme, textures, textiles and carpets, lighting and the contours of the seats. These elements have to be translated into products that reflect the design statement, provide a comfortable and clean environment for passengers, conform to all industry regulations and approvals and, importantly, maintain these features over the cabin's lifetime. The selection of fabrics for curtains

particularly the colour and any pattern,

must reflect and enhance the brand,

- 1. Airbase uses a range of tests to predict fabrics' performance Seat cover fabric
- has to fulfil practical as well as branding requirements





but should not show stains and marks too readily. For weight savings in the cabin and enhanced fuel efficiency, the trend is towards lightweight fabrics, but to go too low in weight could be a false economy as the fabric may not last for the full anticipated life of the cover, usually a minimum of four years. The economic impact of selecting a fabric with a pattern repeat also has to be carefully considered, as pattern matching can have a dramatic effect on the yield of the fabric.

The fabric must meet UKAS regulatory approval in terms of fire retardancy, both as new fabric and also post dry-cleaning as a made-up seat cover. To prolong the life of the seat cover it is important to change and dry-clean it regularly. The frequency of changes varies between airlines, but

following extensive testing by Airbase Interiors, the company recommends that this period should not exceed 180 days. A longer period between changes and dry-clean cycles not only compromises the appearance of the cover, and by extension the whole cabin, but can also increase the probability of burn test failure and fibre degradation, increasing the incidence of scrapped covers. To mitigate this, antimicrobial treatments can be applied during dry-cleaning. At this critical stage in the industry, it would be easy to cut costs by cutting maintenance, but although SARS has been consigned to history, no one can predict when the next superbug will come along, and it would be foolish to lay the industry open to accusations of poor hygiene and slack maintenance.

Performance in dry-cleaning is another important element to consider when assessing a fabric for its likely service life as a made-up cover. This is particularly true of laminated covers, where the dry-cleaning process can cause the fabric to separate from the foam layer if the lamination process has not been carried out correctly. It is very difficult to remedy this and rejected covers usually have to be replaced.

The in-service conditions that a seat cover experiences can have a big effect on its life and so on the cost of ownership. Ideally, these conditions are evaluated during the development and patterning process so that inherent design features of the seat – which may have a negative impact on the seat cover, either in use or during the

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TO PROLONG THE LIFE OF THE SEAT COVER IT IS IMPORTANT TO CHANGE AND DRY-CLEAN IT REGULARLY

change-out and replacement process – can be considered and worked around.

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Predicting performance Airbase provides management solutions for the complete supply chain of all cabin textiles, and has developed a staintesting process that can be used during the fabric selection process to predict the performance of each fabric. It has its own UKAS-approved test house, where all fabrics received by the facility are fire tested, and seat covers are batch-tested after dry-cleaning.

The company also performs preproduction dry-cleaning trials on

Contact Penny Martin Email: pmartin@airbase-interiors.co.uk fabrics and seat covers to assess likely in-service performance and highlight any issues prior to decisions being made that could have a costly impact further down the line. Airbase advises on production improvements to enhance the life of the product, reduce scrap levels, reduce fitment time, and therefore enable large cost savings to be made. The company also has a dedicated seat cover repair team to minimise the scrapping and disposal of seat covers. This enables the company to 're-life' over 25% of covers that would normally be scrapped, again saving money. END

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digital love

EMTEQ IS DRIVING INNOVATION WITH ITS LATEST WASHLIGHT, WHICH INCORPORATES NEXT-GENERATION PWM TECHNOLOGY AND DIGITAL CONTROL

mteq has developed a new technology that incorporates RS485 and digital control with pulse width modulation for enhanced performance and simplified system integration.

and simplified system integration. ELW90, the first in a line of products designed with this technology, is a washlight for corporate, business jet and VIP aircraft interiors.

While the product benefits from an impressive technological leap forward, many of the functionality options that are standard throughout the company's washlight product line are retained. The light offers bright, easily controlled illumination and 100% variable and/or step dimming (requiring no separate power supplies), as well as options for customisation. On the practical side, the light also boasts improved electrical performance with longer life and less maintenance, increased reliability and reduced weight.

Programming and control The ELW90 washlight incorporates these features and advances beyond by incorporating RS485 and digital control technology. RS485, used for long distance and multipoint data communication, greatly simplifies the programming and control of the system. "Digital control and RS485 technology allow for direct interface and communication with cabin management systems (CMS),



 Emteq's Quasar mood lighting

liahtina

2. The FI W90

lights

washlight

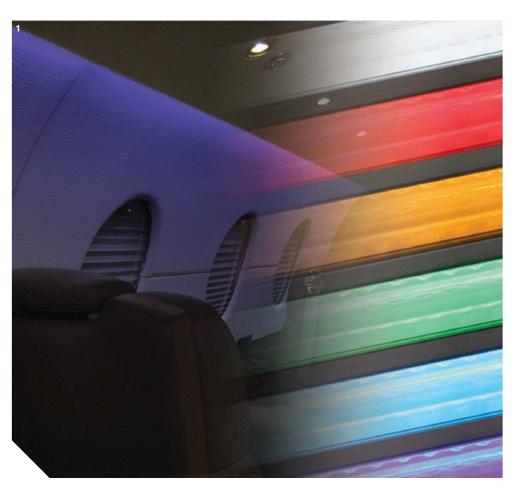
3. The company's wide

product range also

includes reading

system pushes the

boundaries of cabin



which completely eliminates the need for additional hardware to control the lights and allows for optimal performance of data transmission between multiple devices," explains the project engineer, Cory Wasniewski.

In addition, the direct CMS interface also enables a reporting system that communicates to the CMS following each command, to let the CMS know if the command was interpreted and addressed properly. For those aircraft without an existing CMS or RS485 bus, Emteq is developing a small analogueto-digital interface bus module, which will mean ELW90 can be installed on a wider variety of aircraft. Customers can simply install a potentiometer or analogue control to the lights. Of particular appeal to end-users will be

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the single command fade feature and the near elimination of electro-magnetic interference (EMI). As the system is digitally controlled, the lights are much less susceptible than analogue interfaces are to EMI such as induced noise and ground voltage differentials. Digital control also means that the ELW90 is capable of fading to various intensities of white with a single command. ۲

Separate cabin sections The operator can determine and control the aesthetics of separate sections of the cabin by creating lighting zones or groups, contained on a single bus. This allows the user to highlight or downplay features such as upholstery and fabrics, or to alter the mood for a

particular situation. The ELW90 has options for dozens of light settings – including light intensity and stagger, previously unavailable in a standard washlight design.

Quick and easy installation The digital control and RS485 technology also makes installation easier and quicker, as the ELW90 washlight has less wire and fewer connections to terminate. The end result is decreased installation times and reduced weight compared to most current washlight systems.

Emteq believes its RS485 with digital control technology could have a big impact on the interior aircraft lighting industry in general by encouraging the competition to evaluate their own similar products to see if they can

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DIGITAL CONTROL AND RS485 TECHNOLOGY ALLOW FOR DIRECT COMMUNICATION WITH THE CMS

improve the products' electrical performance and installation. "Continuously advancing technology drives innovation, as do customer demands for products that are lighter, faster and better performing. It's important for companies to not only be attuned to industry trends, but to positively impact the market with intelligent incorporation of those technologies," says Wasniewski. The company is also modifying several of its existing interior LED products to include this new technology.

Incorporated in 1996, Emteq specialises in integrated interior and exterior LED lighting products, design

Contact Kellie Griffin Email: kgriffin@emteq.com



engineering and avionics installation kits for aircraft navigation, and communication and entertainment systems for the commercial, corporate and military aviation markets, including helicopters. **END**

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high office

VT MILTOPE BELIEVES INDUSTRY STANDARDS ARE NEEDED TO ALLOW AIRLINES TO INSTALL NETWORK SYSTEMS THAT ARE AS FLEXIBLE AS THOSE ON THE GROUND

istorically, network systems on aircraft designed by a single supplier were designed for a specific function based on custom

specifications. These single-purpose systems were often proprietary nonstandard solutions requiring a fixed configuration. This approach may work well for flight deck avionics, but is fundamentally opposite in design, administration and maintenance to the scalable, open network architecture that works so well in modern offices.

VT Miltope has been a leader in the design, development and manufacture of computers, computer peripheral and networking products for flight deck and cabin applications for over 20 years. In recent years it has continued in this vein by championing the development of industry standards,

 A 2MCU Ethernet switch
 VT Miltope wants

aircraft networks to use standardised equipment as in offices



using a building block approach to aircraft networks. The goal has been to standardise packaging, electrical interfaces, software services and protocols to enable airlines to design and tailor their own networks in a similar way to office networks. This offers airlines great freedom and choice in developing aircraft network solutions - even across mixed fleets - that are tailored to both the airline's operational needs and the entertainment and communication required by passengers. These solutions can then be integrated and managed using commercial network approaches.

Standard equipment Among the developments are a common method for tray wiring and a connector index key, which allow airlines and airframe manufacturers to define the space needed for network components before the operational requirements are finalised. This concept is unique in the history of the airline industry, as it creates the airborne equivalent of the standardised equipment racks used for corporate IT networks. To support this strategy, VT Miltope has developed a family of Airborne Network Products in the standard ARINC 600, 2 MCU package and tray wiring specification. The products can be used to form a network optimising the combination of interfaces and computing resources to meet the operational, spatial and functional requirements of the network, be it simple or complex.

The product range includes servers (NSU or CRU), Ethernet switches (ESU), network printers (nPrinter), access points (MAP, nMAP, and TWLU) and network attached storage (NAS) units. Both wired and wireless networks can be created, to support the wide array of passenger services more commonly found on business jets but increasingly demanded by commercial airlines – including telephony, internet and email services, and improved



gaming, music, TV and IFE content. The networks can handle broadband air-to-ground communication, flight crew cabin support services, aircraft-toground network wireless link, EFB (electronic flight bag), flight operations and maintenance support services.

When the company installs a network, it begins by loading an aircraft configuration file (ACF), which defines the characteristics of the network. Details of the configuration are subsumed by the aircraft interface service so network applications do not require any information or adaptation based on aircraft type. For example this approach would allow a single version of an EFB to be used across a mixed aircraft fleet without adaptation.

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THE GOAL IS TO ENABLE AIRLINES TO DESIGN THEIR NETWORKS IN A SIMILAR WAY TO OFFICE NETWORKS

The messaging structure of a VT Miltope network provides the fundamental features for secure communication between applications, and forms the basis for data loading, configuration management and remote network management. The components are designed to support the creation of networks, and include services for multipath routing, aircraft interfaces, centralised maintenance and remote network management. The company's network services needed to create a platform upon which common

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Contact Robert Guidetti Email: r.guidetti@miltope.com operational applications can be hosted, across mixed fleets without the need for customisation.

For aircraft that feature an air-toground communication system, the company offers remote aircraft network maintenance services to support airline personnel with the installation of the network. The service manages all aspects of network configuration, security, performance and maintenance, and is available 24/7, providing repair tickets and telephone assistance for network troubleshooting and the replacement of equipment. **END**



well connected

BEING WELL CONNECTED IS JUST AS IMPORTANT TO IFPL AS IT IS TO THE AIRLINE PASSENGERS WHO ENJOY ITS PRODUCTS

assengers expect to be able to connect to the IFE system without problem. It therefore can be extremely frustrating if the only thing that stands in the way of this is a broken audio jack. Airlines can spend millions each

year fixing simple breakages. Inflight Peripherals Ltd (IFPL) designed a more reliable jack (the Long Life Jack) to solve that problem, and then went even further with the Rapid Fit Jack, which has a removable cassette that can be changed in less than 30 seconds. It then went on to expand the idea of sound connections with INCAM, a low-cost, high-quality noise cancellation audio jack, which tucks the expensive noise cancellation electronics safely into the audio jack. INCAM is also available with the Rapid Fit removable cassette or the Long Life reliability, to provide the ultimate product to keep passengers connected within a personal zone of silence.

Airlines often like to promote brand identity between cabin classes. For example, British Airways chose IFPL



 IFPL supplies a range of multiport connectors
 Geoff Underwood is presented to Her Majesty Queen Elizabeth II



products to retrofit its entire wide-body fleet (for 24,000 pax). The Long Life Jack was fitted in economy seats and INCAM Rapid Fit was fitted to club and first class to give the best available noise cancellation.

In providing a solution to unreliable audio jacks, IFPL has gone from a small engineering design company to a manufacturing company supplying (among others) Panasonic, Thales and Rockwell Collins. The development of expertise in connectors has increased its product portfolio, so for example, its third-largest product in terms of sales is an Ethernet/USB connector combo. Wireless technology is approaching, but currently the only reliable way to stay connected is via copper.

Ever keen to provide customers with connectors that suit their particular

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needs, the company supplies a whole range of bespoke multiport connectors to the major IFE OEMs and is now finding opportunities within the business jet and VIP marketplace.

Wide-body success The company also reports that it is the 'supplier of choice' on most new wide-body IFE systems, providing around 85% of peripheral products on both the B787 and the A380. Many of the largest airlines carry IFPL products, either because they have been designed into a system through one of the main IFE OEMs, or because airlines have chosen to retrofit the products onto existing fleets.

Changes in airline requirements have led to the exciting development of passengers carrying personal electronic devices (PEDs) onto aircraft. With the

company's latest offering, passengers can enjoy accessing their own media and business travellers can use the opportunity of long flights to catch up on work. The company developed its multimedia docking stations in 2007, achieving maximum flexibility in one small unit. These units provide video and audio inputs to the IFE system via the universal RCA phono jacks suitable for most carry-on devices, as well as a dedicated port for the ubiquitous iPod. These compact multi-usage modules are generating great interest in the business and VIP jet markets, and have a variety of applications in other fields, such as cars and hotels.

2008 was an excellent year for IFPL because it was awarded The Queen's

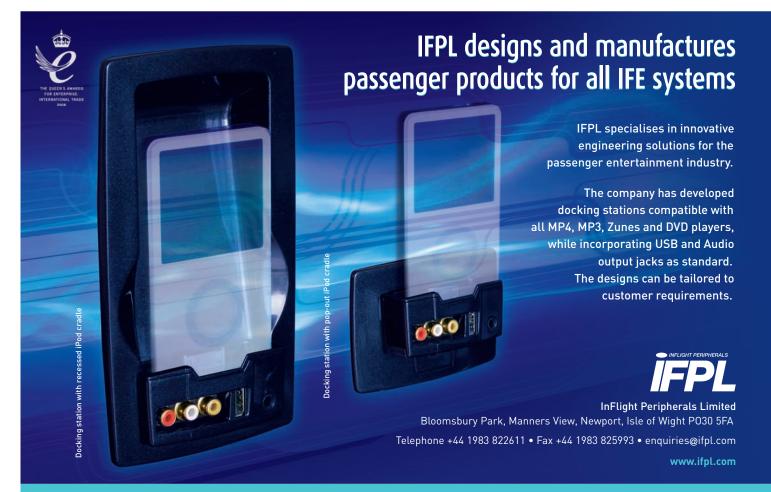
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IFPL PROVIDES AROUND 85% OF PERIPHERAL PRODUCTS ON BOTH THE B787 AND THE A380

Award for Enterprise: International Trade 2008. This is seen as the most prestigious award a British company can receive, and this category was presented to only 85 UK companies. IFPL was given this award alongside well known UK companies such as JCB, Land Rover and Motorola, as well as aircraft emergency lighting specialists STG Aerospace. Principally the award recognised the fact that IFPL exports over 95% of its products and has consistently shown quality in its production processes and robust business practice.

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Contact Claire Underwood Email: claire.underwood@ifpl.com Various receptions and meetings with key players in UK trade and industry followed. IFPL's managing director, Geoff Underwood and co-director, Claire Underwood were presented to Her Majesty Queen Elizabeth II and Prince Philip at a reception held at Buckingham Palace. The award was presented to IFPL staff at its factory by the Lord Lieutenant of the Isle of Wight with several key customers and suppliers from around the world in attendance. That is how being well connected gets you well connected. **END**



CONNECTIONS FOR INFLIGHT ENTERTAINMENT SYSTEMS

phone home

GORE EXPLAINS HOW ITS LEAKY LINE ANTENNA ENABLES PASSENGERS TO STAY IN TOUCH ON THE A380

hen the first A380 was officially handed over to Singapore Airlines on 15 October 2007, the airline's

CEO, Chew Choon Seng noted: "Our passengers will soon be enjoying a new age of flying." The A380 certainly offers a wealth of advantages. Passengers travelling on the 'mega-liner' would soon be appreciating more than just its huge dimensions, luxury interior design, quiet engines and excellent food. High up over the clouds, they would also be offered a comfort which until then had only been provided on the ground. During the entire flight they would be able to use their own mobile phones to call whoever they wanted in the world, or use their laptops for wireless internet access.

Any kind of device that emits radio waves is typically forbidden in modern aircraft. The signals can interfere with the aircraft electronics and impair the control of the aircraft. Enabling lots of passengers to talk on their mobile phones at the same time or connect up to the internet therefore was a challenge rather akin to trying to square a circle. Airbus approached Gore in

 The Gore Leaky Line Antenna
 Skyflex Aircraft Sealant tape

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2003 in the hope that it would be able to respond to this challenge. The two companies knew each other, as Gore was already supplying a wide range of special cables and cable assemblies to Airbus. The problem of radio waves in aircraft was to be solved by an antenna system that would cover the full length of the 45m long cabin.

Over two years, specialists from Gore's Electronic Products Division worked in close cooperation with the aircraft manufacturer on tests and developments. The Gore Leaky Line Antenna was the outcome. This antenna can send and receive signals in all the necessary frequencies – from 400MHz upwards for mobile phones and up to 5.8GHz for laptop wireless LAN connections. The centrepiece of this antenna is a highly sophisticated

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coaxial cable that is extremely light and yet still satisfied all the requirements with regards to fire performance, shock, vibration, and so on.

Uniform network connection The ingenious thing about this development is that the antenna runs along the length of the ceiling of the passenger cabin, guaranteeing a perfectly uniform network connection to all seats, while the transmit power of all the devices in use remains so low that the aircraft electronics are not interfered with. The radio signals of the passengers are transmitted via a network computer and a conventional outside antenna to satellites that set up a connection to the worldwide network.

After this decisive technological breakthrough, in 2005 Gore was

chosen by Airbus as the exclusive supplier of leaky line antennas for the A380. Airbus is now also considering using this antenna in other aircraft types, including the A340-600, which has a cabin length of 63m.

Aside from its Leaky Line Antenna, perhaps the most notable of Gore's innovations in the aviation sector is its Skyflex Aircraft Sealant, a sealant tape made of expanded PTFE. The tape is used to seal panels on aircraft exteriors. Aircraft have these panels to allow service access to many electronic and mechanical components. Before this solution, airlines had to apply a liquid sealant compound to seal the panels, a process that could take between 10 and 12 hours and had to be repeated each time components were serviced.

IT WAS A CHALLENGE RATHER AKIN TO TRYING TO SQUARE A CIRCLE

Now instead of a lengthy process lasting several hours, Gore's tape can be carefully formed in place in one short step. Unlike the sealing compound, the tape remains tight even after multiple panel removal. It not only provides a reliable seal against water and dust, but also against oil, fuel and chemicals. Furthermore, the tape saves on weight and withstands temperatures between -240 and +260°C.

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The sealant tape is now used on a wide variety of commercial aircraft, including Boeing 737, 757 and 767 and Airbus A320 and A340. Gore has designed a variety of tapes for these applications. The material and its design have permitted a deceptively simple and sustainable technical solution that saves time and money on servicing and helps avoid technical failure in aircraft. **END**

Contact Petra Tillmanns Email: ptillman@wlgore.com

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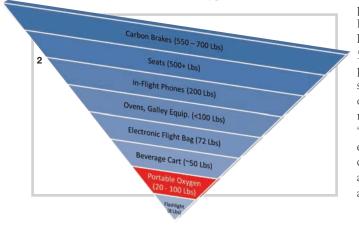
light as air

GCE HIGHLIGHTS AN OFTEN-OVERLOOKED WAY TO REDUCE CABIN WEIGHT – REPLACING STEEL OXYGEN CYLINDERS WITH LIGHTWEIGHT ALTERNATIVES

uring the past year there have been dramatic developments in the price of crude oil. 2008 saw the price spike over US\$140 a barrel and even after falling back to nearer

US\$100 a barrel, there is lack of stability in the market. These events, coupled with the current economic environment clearly had a big impact on profitability as several airlines ceased operation or went into bankruptcy, while older, less fuel-efficient aircraft were grounded. The impact on the cost of jet fuel, which has been exhibiting an increasing crack spread from crude oil, has prompted many airlines to search for ways to save fuel.

One option is to remove weight from the aircraft. But how far can one go to remove weight whilst maintaining appropriate levels of safety and service? The large weight saving projects are clear - replacing brakes, seats, some galley equipment and even emergency flashlights with lightweight alternatives, installing electronic flight bags and removing inflight phones and excess potable water. One thing that was consistently overlooked was portable oxygen cylinders, which are fitted on all commercial aircraft. It is estimated that there are over 500,000 of these in operation. Most of these cylinders are manufactured from steel, with a bulky regulator. Depending on the number carried, the type of aircraft and what



116 Aircraft Interiors International Annual 2009

1. GCE's Integra range

Potential weight savings in the cabin

and lightweight

oxvaen cvlinders

cylinders

3. A weight

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of portable oxygen

comparison of steel



the aircraft is used for, airlines can save up to 60kg per aircraft by retrofitting with a lightweight composite cylinder.

Return on investment The viability of the steel-to-composite retrofit was confirmed when Thomas Cook Airlines selected to remove the steel cylinders and replace with GCE's lightweight portable oxygen cylinder assembly, Integra. The reduction in weight is large as the composite products are 50% lighter than steel cylinders. This presented the airline with a fleet weight saving of 780kg (1,200 lb). The return on investment was also boosted by reduced unscheduled maintenance. "The reduction in fuel burn expected, enhanced by favourable acquisition cost, has proved to be a financially attractive package for the airline," says an airline representative.

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GCE's Integra product uses proven composite technology in the carbonreinforced aluminium cylinder, which has been designed to fit into existing brackets. These materials are the primary, but not the sole, source of the weight saving – halving the total weight of the existing product.

The design of Integra's regulator is derived from the company's extensive background (it has produced over one million integrated pressure regulators). Integra is intended to be easily and intuitively used by cabin crew in an emergency, removing the chance for confusion and saving vital seconds in starting the oxygen flow when it is needed most. These factors combined with other user-friendly features set the product apart from existing regulator designs and have been met with unanimous approval by users.

Removal of weight can easily be valued by the airline and is typically expressed in cost/weight/aircraft/year. It can typically range from US\$50-250/lb, depending on the aircraft. In other words what it takes to fly an additional pound in an aircraft type based on a particular jet fuel price. Some ecofriendly airlines add a 'carbon tax' to this number and have in-house incentive 'fly-lite' programmes.

The portable oxygen cylinder retrofit can provide fuel fleet savings of over US\$1 million per year. However this is not the only financial incentive for making the swap. Portable oxygen cylinders require scheduled overhaul and in some cases, the existing portable requires additional overhaul. Reduction of these activities and the associated

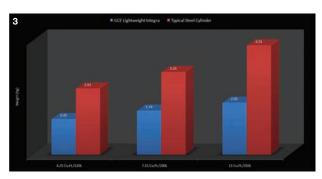
THE REDUCTION IN WEIGHT IS LARGE AS COMPOSITE PRODUCTS ARE 50% LIGHTER THAN STEEL CYLINDERS

material, labour and transport costs all contribute to the life-cycle cost. When the cost savings through fuel and overhaul are calculated and offset against a competitive acquisition cost of the lightweight portable oxygen cylinder assembly, the result is a very short return on investment.

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Despite the recent drop in crude oil price (which many airlines may not see for some time because of hedging), the priority to remove weight and cost from the aircraft has not subsided. The future value and long-term supply of oil could be easily affected by world events, which could dramatically match and

Contact Jon Zinopoulos Email: jon.zinopoulos@gcegroup.com



exceed the 'super spike' oil price from earlier in 2008. Many airlines are now taking the long-term view – being more environmentally aware and preparing for what the future holds. **END**

Integra

Portable Oxygen Cylinder & Regulator Assembly

Lightweight solutions with heavyweight benefits

Weighing less than 50% of similar products with steel cylinders, the lightweight Integra is easy to use in an emergency and has been specifically designed to fit into existing brackets on aircrafts.

Many safety features have been designed in to eliminate human factor error and operators will benefit from low in service cost.

Start to improve your carbon footprint by contacting GCE and ask for further information on the Integra benefits and weight saving programmes. Try our total cost guide to calculate the savings available to you today! Available for forward fit and retro-fit applications.

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current affairs

MAGNUS POWER REVEALS IT WILL BE EXPANDING ITS PRODUCT RANGES AND LOOKING FOR LARGER PREMISES IN 2009

> agnus Power, which makes frequency converters and power supplies, is currently expanding and looking to move

into much larger premises in the first quarter of 2009.

The company was established in 1985 as a manufacturer of electronic power units (EPUs) for the oil and gas industries, supplying over 600 systems worldwide over 20 years. Those systems have to withstand tough environments such as oil rigs in the North Sea and on ships in the Indian Ocean. Magnus Power has been able to bring the reliability and good design of those EPUs to its range of frequency converters that it now sells to the avionics and aviation industry.

 Magnus Power's range of frequency converters includes the LF3-400 (top) and the LF1-400-3kW (bottom)

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The company's frequency converters range from a 1kW bench unit (LF1-400) up to 150kW floor standing unit (ME3 range), typically with 400Hz, 60Hz or variable frequency outputs. These products have been sold to companies worldwide and Magnus Power now has a growing distributor



MAGNUS POWER HAS A GROWING DISTRIBUTOR NETWORK IN EUROPE, WHICH IT IS PRESENTLY LOOKING TO EXPAND

network in Europe, which it is presently looking to expand to include North America and the Far East.

Testing products and systems The company's products are used by a number of major companies in the aerospace and aviation industries for the testing of aircraft seating, galley systems, instrumentation, aircraft braking systems, de-icing systems and aircraft ground power.

The products include the LF1-400, a compact 1kW power unit with a fixed output frequency of 400Hz and an output voltage of 115VAC with a single-phase output. The LF1-400-3kW is the same as the LF1-400 except that it has 3kW of output. Then there is the LP1, which has a single-phase output, but the output voltage and frequency are variable. The voltage can be adjusted from 0-270VAC and the frequency can be adjusted between 45Hz and 1kHz. The company also manufactures the LF3-400, which has a single phase input but a three-phase output with a fixed output frequency of 400Hz. The total power available is 3kW (1kW per phase). The LP3, like the LP1, has a variable voltage/ frequency output, but this unit has a three-phase output. All these products are available as bench-top or 19in rack mounting versions.

There are also a couple of ranges of floor-standing models – the ME1 range, which are all single-phase output, and the ME3 range, which have three-phase outputs. Both these ranges have fixed

outputs of 400Hz ranging from 3.2-32kW in the ME1 range and from 10-150kW in the ME3 range.

The company also has a number of new products in development that it plans to bring to market over the next 12 months, including expansions to its LF, LP and 28VDC product ranges.

Bespoke products Magnus Power is also often involved in designing bespoke products, and because its long-standing expertise in the frequency converter market is able to offer cost-effective solutions. If a customer needs a power source to test aircraft interior equipment, whether it is seating, galley equipment or lighting equipment, the company will have a suitable power source available. If the

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customer cannot find the power source he needs from the existing standard range, Magnus Power can build bespoke units for the application.

As part of its philosophy of offering a complete solution to customers, the company pays attention to its service department, with well-trained engineers that are able to commission units when required. The service department is also able to offer service contracts to suit customers' individual requirements, which can include annual inspection visits, annual service contracts with unlimited call outs and annual health checks. **END**



3. The LP1 power unit

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Contact Keith Hammond Email: keith.hammond@akersolutions.com





index to advertisers

SEAT DEVELOPMEN

41 OPEN plan

CABIN TO P

| Aerosat Corporation | 25 | General Ecology | 16 | Rockwell Collins | 73 |
|--------------------------------------|-----|--|-----|------------------------------|-----|
| Airbase Interiors Ltd | 107 | Glen Eden Wool Carpet | 19 | S&S Numerical Control Inc | 81 |
| Aircraft Cabin Technicians SL | 103 | Hoover Industries | 59 | SIA Engineering Company | 11 |
| Alster Aero GmbH | 22 | lacobucci H F Electronics Srl | 33 | STG Aerospace | 47 |
| Altitude Aerospace Interiors | 51 | Inflight Canada | IFC | Teague | 39 |
| Andrew Muirhead & Sons Ltd | IBC | Inflight Peripherals Ltd | 113 | Telefonix Inc | 4 |
| Bucher Aerospace Corporation | 67 | International Water-Guard Industries Inc | 97 | The Hide & Leather House Inc | 99 |
| Business Jet Interiors International | 36 | J Clay Consulting | 36 | The Young Engineers Inc | 2 |
| Diehl Aerospace GmbH | 105 | Lantal Textiles | 63 | Thermax CDT | 89 |
| digEcor | 85 | Magnus Power | 119 | Tyco Electronics | 93 |
| EADS Sogerma | 101 | MSA Aircraft Products Ltd | 16 | VT Miltope | 111 |
| E-Leather Ltd | 77 | Neotex | 28 | W L Gore & Associates GmbH | 115 |
| EMTEQ | 109 | Panasonic Avionics Corporation | 43 | WASP Switches Ltd | 30 |
| GCE Aviation | 117 | PGA Electronic | OBC | Yarwood Leather | 55 |

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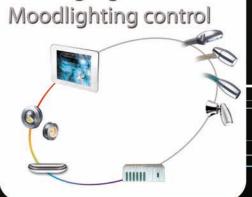


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