

EVA

EXECUTIVE AND VIP AVIATION

SPRING 2016

High Net
Worth Profile:
Michael Amini,
AICO



Interview with CEO, Howard Guy

Company profiles include: ALOFT AeroArchitects, Air Service Basel, Bombardier, Chameleon Products, Comlux, Finavia, Pratt & Whitney Canada, Textron

Special features: In-Flight Entertainment, Paint special report

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The inspiration never ceases...

There is an undeniable buzz that goes with being involved with an industry sector dedicated to crafting and supporting one of the most beautiful and most complex objects humanity has yet designed. Business jets, in all categories, are things of wonder. That they also help to stimulate commerce around the globe is a huge additional bonus. Not surprisingly, the sector attracts some of the finest entrepreneurs, designers and engineers on the planet to its banner. EVA's mission is to tell their stories, for this is a tale that never grows old. Our cover, this issue, features Howard Guy, CEO of Design Q, the design lead on Aerion's AS2 supersonic jet. That design win came about through the perfect combination of business acumen (opening negotiations with Aerion as soon as its deal with Airbus came to light) and design talent. Again, inspirational stuff! Another designer featured is California's King of Bling, Michael Amini. Margie Goldsmith's interview with Citation X owner Amini brilliantly charts his transformation from furniture salesman to one of the most sought after designers on the West Coast.

Two of the outstanding highlights of this issue involve Bombardier and ViaSat respectively. Chief strategist, Jean-Christophe Gallagher gives a clear and vigorous sketch of how Bombardier has navigated itself through adversity to a position where, with the Global 7000, it has an excellent shot at achieving industry leadership.

James Person, head of business aviation at ViaSat takes us through the incredible progress ViaSat has made in satellite based connectivity. This is truly a company possessed of the Midas touch. The revenue base it is building, together with its technological know-how, looks set to make its lead in this space (pun intentional) unassailable. Satcom Direct is a ViaSat distributor and a leading player in aircraft connectivity and IFE. The company's Michael Skou Christensen, Director of Business Development, based in Hong Kong, talks about the introduction of Satcom Direct's Global Voice and Text offering, while John Martin, President and CEO of ALOFT AeroArchitects reflects on the company's sensational rebranding. With 16 BBJ completions to its credit, the latest being a world-beating interior for the Sultan of Johor, ALOFT is keen to show that while it retains its roots as PATS Aircraft, it is now so much more, and the rebranding does this in spades.

We also talk to Tom Perry VP of European Sales for Textron and P&WC's Mike Perodeau, VP of corporate aviation and military engines about the latest developments and state of the market. Our Paints Special Report features three of the sector's biggest names, Akzo Nobel, PPG and Sherwin Williams, talking about why and how the latest paint technologies provide yet more scope for designers and better margins for paint shops.

In addition to ViaSat and Satcom Direct our IFE Special Report features interviews with sound engineering specialists Alto Aviation and engineering and electronics specialist Astronics PGA. John Wade, Executive Vice President and General Manager of Gogo Business Aviation discusses Gogo's latest offering, Gogo Biz 4G for the North American market. Plus we talk to Arnaud Martin, Executive Director for Comlux about the completions business.

Which brings me to EVA's EBACE After Party. Is it the most elegant After Party you'll ever attend? Nope! Does it rock? You bet! Come and dance, drink and network your head off. This is the most fun you'll have at EBACE! Tickets from Max. We'd like to take a moment to thank our sponsors, without whose support this great and meaningful event would never come to pass. They include: World Fuel Services, Satcom Direct, Primus Aerogroup, Fly Aviation Services and First Class Cars Ltd. If you would like your company to get involved in the most talked about event in business aviation, there's still time, call Max. And of course, come and meet the EVA team at our stand at EBACE (Stand W127) close to the Bombardier and Gulfstream stands, where we will be delighted to discuss editorial and advertising opportunities with you.

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first thought

Cover image:
DESIGN Q
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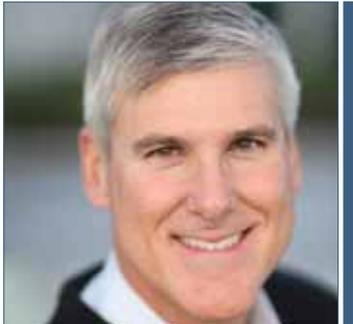
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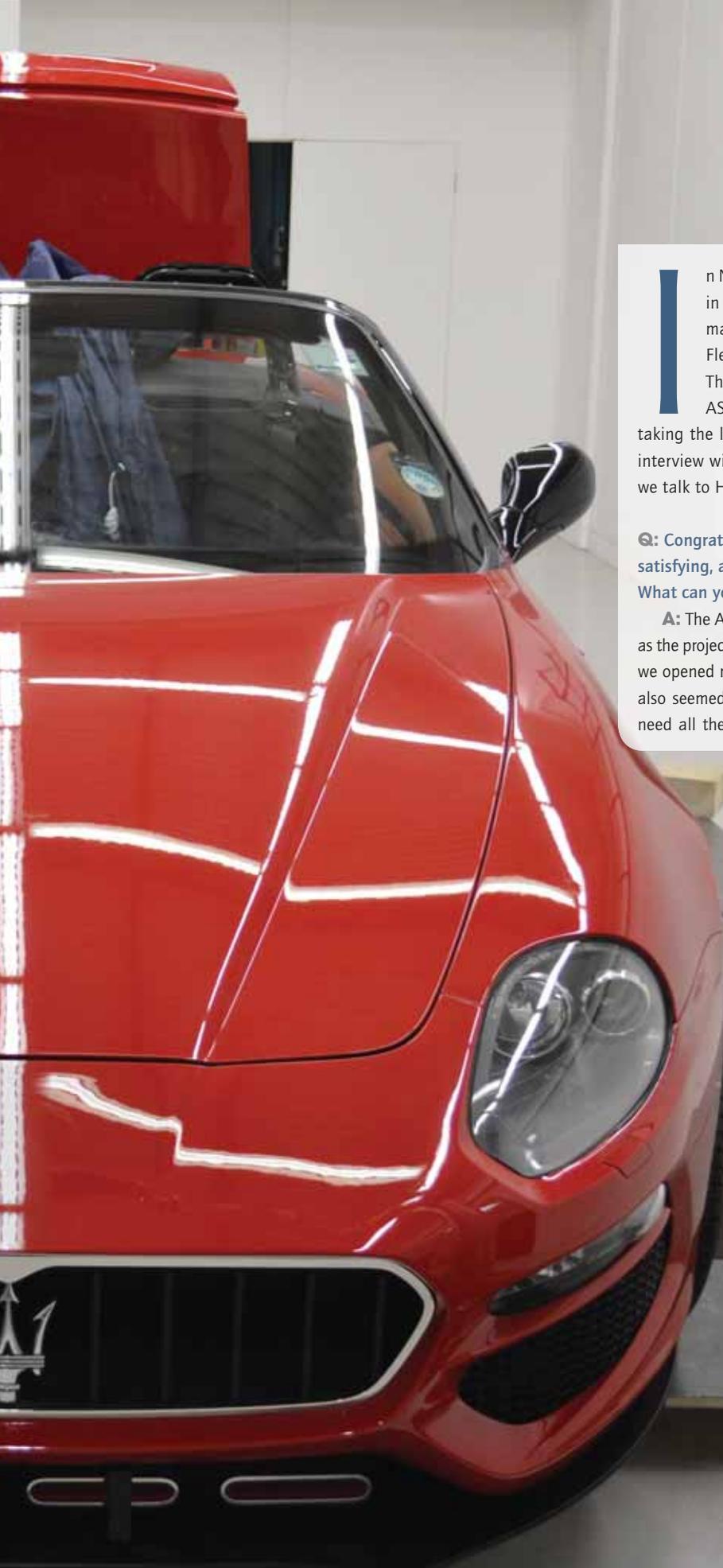
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Design Q

EVA talks to Howard Guy, CEO, Design Q

Designed for speed



In November 2015 Aerion Corporation, which is now well advanced in its plans to bring the first supersonic jet to business aviation, made two huge announcements. The first was that Ken Ricci's Flexjet has signed an order for 20 of Aerion's AS2 supersonic jets. The second announcement was that the design contract for the AS2's interior has been awarded to INAIRVATION, with Design Q taking the lead on industrial design. *EVA* covered the order in a detailed interview with Doug Nichols, CEO of Aerion, in our last issue. In this issue we talk to Howard Guy, CEO of Design Q.

Q: Congratulations on the AS2 design win. That must be immensely satisfying, as well as setting Design Q some significant challenges! What can you tell us about the win?

A: The Aerion programme has been on our radar for several years. As soon as the project gained momentum, signified by Aerion's partnership with Airbus, we opened negotiations with them in partnership with INAIRVATION, which also seemed like a perfect synergy because it was clear that Aerion would need all the services that the INAIRVATION partnership, which consists of ▶▶

Our focus is on anything we can do to make the Aerion clever, innovative and logical but at the same time distinctive, different and better than any previous interior for a business jet

► F. List, Lufthansa Technik and Design Q, can bring to the table.

Design Q's brief for the project is as much self-imposed as it is a directive from Aerion. We are primarily concerned with what layouts and opportunities we can identify, using the real estate within the envelope of the fuselage. Our approach is to look for clever uses of space and things that differentiate what is currently taken as standard in the marketplace. Our focus is on anything we can do to make the AS2 clever, innovative and logical but at the same time distinctive, different and better than any previous interior for a business jet! The expectation from the customers is higher than anything that has been done before. The fact that this is a supersonic jet is a key element, of course, but the price of the product, too, demands that the finest of everything goes into the aircraft!

Q: How does the collaborative process between the client and the designer work in practice, not just on the AS2 project, but generally?

A: There are two levels here. The first looks at the typical client/owner requirement and the other is the OEM requirement. The drivers are very different. Clearly, each party wants



as much as possible for as little cost as possible, but the OEM is driven by the profit motive too. They want to make parts and systems that generate margin on the sale price. This is a very different brief and we need to satisfy both sides!

Q: What happens if the client gets whimsical and comes up with radical changes late in the day?

A: Radical changes late in the day are very expensive and often perilous. This industry is not tolerant about such changes. The very nature of the business means that late changes carry risks and risks are the last thing you need in manufacturing a safe product to a real deadline. Time is always the thing that some customers think they can buy but the reality is that all the money in the world can't buy you time you don't have!

Q: How much attention do you pay to the deep engineering issues that a design might raise, or is that down to the completions house to solve?

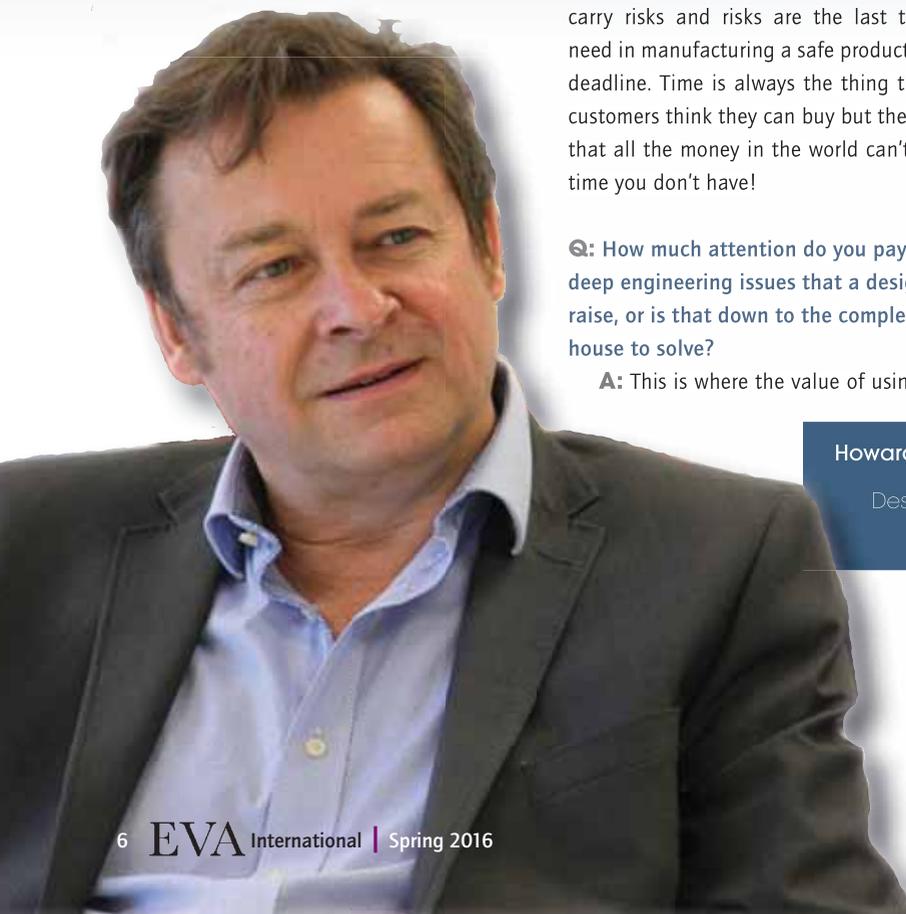
A: This is where the value of using Design

Q really makes a difference. We are visionaries and we produce fabulous images of what could be. But we are engineers too and we usually build what we design. So our job is to give the completion centre or the OEM solutions to manufacture rather than challenges for them to resolve. That is why we can produce something like the Global 7000 marketing prototype from scratch and produce a full ship set of totally new seats in five weeks with a fit and finish quality that can be translated into full production. A large part of the joy of design is turning the vision into the real thing, which is why we do not waste time designing something that can't be produced!

Q: How much do you enjoy the challenge of actually winning new design projects for Design Q?

A: It is immensely satisfying. We have some exciting product developments in hand, one of which has been waiting in the shadows for nearly three years but at last the funding is in place and the programme is about to begin. This is how our business is... You come up with a new invention, you present your plan, you hope and you wait. Then one day, completely out the blue, a lady calls you and tells you that you are going to be busy for a couple of years.

What is that project I referred to? Well it is to do with business jets; however, this invention applies to all of them and not just one manufacture. It is revolutionary – but you will have to wait until patents are filed and our prototypes are ready to show the world! ■



Howard Guy
CEO
Design Q



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Positioning for the future

Jean-Christophe Gallagher, Vice President, Strategy, Marketing, and Innovation, Bombardier Business Aircraft, talks to *Anthony Harrington*



Q: Bombardier has had quite a bit of negative press over the last year, with the various layoffs the company has made. What do you see as the positives?

A: It is clear that 2015 was a very important year for Bombardier Business Aircraft. We took a number of steps that have positioned us for long-term success. In May 2015 we announced a significant rate adjustment on the production of our Global aircraft product line-up. In this we led the industry. We were the first manufacturer to recognise and take the necessary action to respond to a definite slowing of demand, especially in emerging markets which had been driving demand growth.

So it was very important to adjust our Global aircraft production rates to the right level, thereby protecting both the value of the brand and the residual values of the pre-owned Global business jet fleet. Taking this decisive action was important and most of our competi-

tors have since followed suit. All the industry indicators have since confirmed the softening of the market that has taken place since May 2015. So we were ahead of the market in anticipating the downturn, and we have benefited from this.

If you look at pre-owned inventories, particularly all long-range models except for Bombardier Global aircraft, the number of pre-owned aircraft for sale is up significantly. There is a very recent report from UBS, which showed that pre-owned inventories for G650s and Falcon 7Xs is up quite sharply, while there is a slight decrease in the Global aircraft pre-owned inventory. This in itself is proof that we were right in realigning production numbers.

This of course led to us having to lay off employees, which was a hard decision to make. But when you look at how important this business is for us, we needed to get the match between production rates and market demand

right to protect our business for the long term.

Q: How do you view the cancellation of the Learjet 85 programme now?

A: The decision to cancel the Learjet 85 aircraft programme was a difficult one to make but the market slowdown, which has been particularly sharp in that category, has proved that it was the right decision to make. When we announced the Learjet 85 aircraft programme in 2007, before the global financial crash, the industry sold over 200 jets in that segment in 2007. In 2015, in that US\$15 million to \$20 million model [price-point] category, the industry only managed to deliver 41 aircraft across all OEMs. So what we are seeing is a complete collapse in that segment.

What happened when we cancelled the Learjet 85 aircraft project was that it freed up a number of skilled employees to move across to our other development programmes. ▶▶



We have a huge backlog of orders for the Global 7000 business jet, and we are determined to have the flagship aircraft in the industry in that segment





Highly regarded in the aviation industry, Design Q thrives on challenging and innovative projects. We have revolutionised luxury travel working alongside Boeing, Airbus, Bombardier and Aerion, along with iconic brands such as Ferrari, Maserati, Bentley, Jaguar and Range Rover. We design the finest aircraft interiors and automobiles for the most discerning clients pushing the boundaries of creativity to discover new ways of providing exclusive products.

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The Challenger 300 series aircraft programme was another first in the marketplace, and has become incredibly successful



All images provided courtesy of Bombardier Inc.

► Last year, we also announced that we would be delaying the Global 7000/Global 8000 aircraft programme. We are now very focused on bringing the Global 7000 aircraft to market. We have a huge backlog of orders for the Global 7000 business jet, and we are determined to have the flagship aircraft in the industry in that segment.

The Global 8000 aircraft is actually a shorter version of the Global 7000 business jet, but with increased range. The Global 8000 continues to be part of our development programme. As a derivative of the Global 7000, many of the features and technology of the Global 7000 aircraft will carry over to the Global 8000 aircraft. As such, Bombardier's plan always focused on the Global 7000 aircraft entering into service first. Right now we are focusing on first flight. We'll communicate further updates on the Global 8000 once the Global 7000 is in flight testing.

Q: What kind of reaction are you getting to the Global 7000?

A: The Global 7000 aircraft is going to redefine the long-range market. It has four living zones, and it can land at London City airport. The Global 7000 aircraft will also feature a maximum operating speed of M 0.925. It has state-of-the-art aerodynamics, making it the most efficient jet in its class. Last year, when we reset

the schedule, we acknowledged there had been some challenges. We said then that we expected to bring the Global 7000 business jet to market in the second half of 2018, and we are on track to meet this revised schedule. We now have Flight Test [vehicle] 1 all assembled, with Flight Test [vehicle] 2 just behind it, and work is starting on [FTVs] 3 and 4. Developing new aircraft is hard and challenging, but the programme is going well. This aircraft will be the future of business aviation for a long time to come.

Q: You have also made changes in your distribution channel, taking more in-house. What is the objective there?

A: In January we told the market that we were embarking on a transformation of our business model to improve profitability. Through the boom years leading up to 2007, we developed a global network of agents, representatives and distributors to extend our sales reach globally. However, in January [2016] we announced that for 21 countries around the world we would be taking sales back into our own hands and have our own sales teams selling direct to end users again in these places.

Once you do this, and move back to a direct-selling approach, you find that you are really changing the game from a profitability perspective. Getting active in these regions lets us do a great deal more.

Q: The C Series regional jet is not your area of responsibility, but it has been a difficult road for Bombardier. You must be delighted that the programme now has the backing of a major order from Air Canada.

A: My perspective on the C Series, looking across from Bombardier Business Aircraft, is that it is yet another instance where Bombardier has successfully challenged the status quo and led a major industry advance. We challenged the status quo when we launched the Global series, taking on Gulfstream, when no one thought we could do so successfully. The Challenger 300 series aircraft programme was another first in the marketplace, and has become incredibly successful – last year we delivered twice as many Challenger 350 aircraft as our nearest competitor's sales in that segment.

The C Series is better than anything Boeing or Airbus can offer right now. We are here to be successful in this market with the best product in the category. For those who doubted Bombardier's liquidity position it is now obvious that we have taken all the right steps. We have key financial institutions participating with us and we have backing from the Quebec government. We have liquidity and now we have some market momentum building up, so the future looks very exciting. ■

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Michael Amini

A California 'King of Bling' designer in love with crystals and sparkles

Michael Amini, known as the 'King of Bling', is Founder, President, CEO and Chief Designer of AICO (Amini Innovation Corporation) – a leading Los Angeles, California-based luxury home furnishing company he created in 1988 and which now serves over 3,000 worldwide retail partners. The company offers original, high-quality furnishings inspired by high fashion, Old World architecture and travel.

Born in Iran in 1956, Amini left the country at 17, and travelled to England. He returned to Iran to join the army, and the day he finished his service, Amini left to discover the world. He travelled to Greece, Paris, and London, and in 1979, left for Southern California to pursue a degree in electrical engineering from California State University. Upon graduation, he stayed in California and worked first as an engineer and then as an importer of designer shoes which he resold to select retailers. His next endeavour cutting his teeth as a salesman was as an importer of German luxury cars, which he resold to US consumers.

In 1988, he took a job as salesman for a furniture company. Three months later, he began to design his own furniture and started AICO. The company combines Old World craftsmanship with modern production techniques offering unique features such as stylish bedazzled furniture with Swarovski crystals, self-closing doors and drawers, and luxury leather upholstery. One of his design divisions, Michael Amini and Jane Seymour, A

Design Collaboration, is a partnership with award-winning British-American actress and artist, Jane Seymour.

Amini received the Furniture Supplier of the Year Award from Furniture Today, the industry's premier publication; was honoured by the International Home Furnishings Representatives Association with its Pillar of the Industry award and by the Anti-Defamation League Awarded with its American Heritage award in 2008; and serves as the first non-American born president of the American Home Furnishing Hall of Fame. He was awarded The Spirit of Life, Lifetime Achievement Award, and an honorary doctorate degree from City of Hope's Irell & Manella Graduate School of Biological Sciences, where he established the state-of-the-art Michael Amini Transfusion Medicine Center to benefit cancer patients and blood-related research programmes. He lives in Newport Beach, California with his wife Lily and two sons.

Q: What did your father want you to do for a living?

A: He wanted me to be an electrical engineer because he needed engineers to service the US-imported dialysis machines he imported. I was supposed to return to Iran, but after the revolution we decided it was better for me stay in America.

Q: You became an engineer after graduation, but the next year you were importing designer shoes. How did that happen?

A: An old friend had relationships with some Italian shoe manufacturers and suggested we partner up and import shoes: he'd buy them in Italy and I'd sell them in America.

Q: And how did that go?

A: It was fine in the beginning, but after the first shipment sold, I ended up with big sizes and small sizes that nobody wanted, and I had to discount them to get them out of my hands – basically, I worked for free.

Q: What was your next job?

A: I started designing leather jackets in Italy and importing them here to America.

Q: Did you have a flair for designing?

A: When I was nine, I watched a TV series called *The Saint* with Roger Moore and was amazed by the way he dressed. I developed an appetite for designing my own clothes. When I was 14, I'd buy fabric and have my father take me to a tailor and tell them how I wanted it created. At 14, I dressed more like an English Lord than a 14-year-old boy.

I travelled to Paris and London, window shopped like crazy, and figured I'd go into clothing. My aunt in Iran was a high-end tailor for celebrities and political figures and together with my shoe business partner's mother, made the crowning gown for the Queen of Iran. I started a clothing venture with my friend, but soon found out that in America, you had to have a lot of influence and money to do business with department stores. So I voluntarily exited myself.

My father gave me and my siblings each US\$10,000 and said, "Go find yourself something to do. If you find something to do that I feel has good potential, I'll help you." I went to Europe and blew that \$10,000 having fun. But while I was there, I saw there were a lot of cars, called grey market cars, being shipped to the United States. I returned to the US and

started getting car orders, went back to Germany, bought and shipped the cars to the US, and made a lot of money. Unfortunately, overnight, the government changed its rules: to import cars you had to own them for two years; so, that ended. I started selling cars at dealerships, become a closer, and learned a lot about selling.

Q: What was the most important thing you learned about selling?

A: Never let the customer walk out without selling him something. I learned how to deal with frustrated customers who don't want to buy anything – I still use that technique today.

Q: How?

A: Listen and make sure you overcome their frustration with positive statements. With cars, they have 'closers'. A car salesman promises the world, but when you sit down with the customer, you find you're back to square one. The salesman leaves and you walk in and start the selling process from the beginning. That was my job. I learned a great deal about relationships and how to talk to customers when they are so frustrated they want to leave.

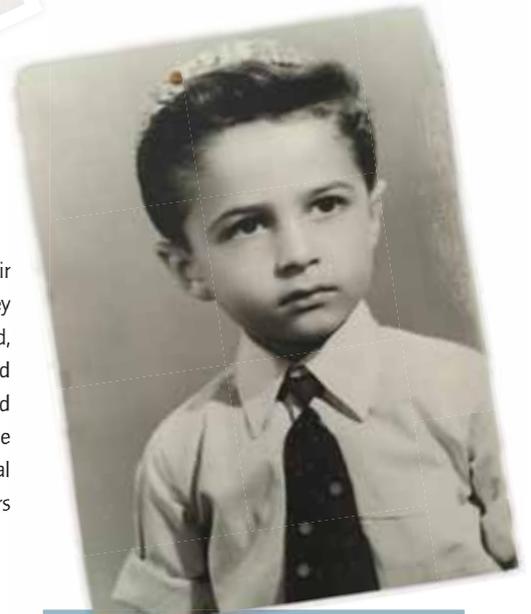
Q: What was your next job?

A: A local furniture manufacturer was looking for a salesman. The owner had no good sales people, no good infrastructure, and no designer. He'd been making the same furniture for 20 years. When he was about to say 'no' because I knew nothing about furniture, I said, "I can sell anything. Hire me, and if I can't sell, fire me." He said he'd give me three months.

I had no idea what I was doing. I went inside furniture stores with the catalogue and showed, selling a little here and there, but also observing what was out there. There was nothing new and the prices were not good for the furniture I was selling. After a week, I sat down with the owner and told him I had a little talent for design and thought I could bring some inspiration. He gave me the chance. I sat down with his foreman, made a sample of a bedroom, photographed it, came up with a price, and I started showing it. The first week I sold 52 sets.

Amini: on the runway at age 6, clothing model for his Aunt and her partner who had one of the most fashion-forward high-end premier tailoring studios in Iran

A few months later I single-handedly set up a showroom in an LA furniture show so people could see the product. While there, I looked for other companies to represent as well. Lily Trading Company belonged to a young lady named Lily who imported beautiful high-quality cocktail tables from Taiwan. She hired me. I was also hired by an upholstery company, so I had three lines to represent.



Amini at age 6: very opinionated and particular regarding what his mother dressed him in. From that age, he never dressed like any of the boys his age

Q: Is Lily the woman who became your wife?

A: Yes. I soon became her sales manager. She invited me to a furniture show in Taiwan, but my boss refused to let me go. I went anyway and made many connections. When I returned, he fired me. I registered my own company, AICO, concentrating on cocktail tables and upholstery.

Q: What happened with AICO?

A: At the time, there was a 25-store furniture chain famous for returning goods to the manufacturers (a customer buys it, doesn't like it or it has a slight defect). One manufacturer wanted to get rid of these returned goods and I offered to buy them. I figured I could repair them and sell them as AICO furniture. I bought everything they had in their warehouse, rented a small space with Lily, and fixed everything: I changed parts, repacked them, sold and delivered them. The customers said,





Amini at age 11: receiving a silver award from one of the highest ranking five-star generals for winning a swinging championship, that took place in the presence of the Shah of Iran

► "Where are these from?" I said, "You buy it from this company for \$1,000 but my price is \$450." I used to sell what I fixed the night before. Then I bought my first container from Taiwan, and Lily and I shared a bigger warehouse.

Q: Were you married to her then?

A: The first year we just worked together, and then we started dating. At that time she was working in the office answering phones and taking orders for both companies, while I was outside selling. One day after seven years she said, "I want to close my company." I offered to buy it. I did, and all of her inventory. We then worked together at AICO and grew over 100% every year for many years. We sold occasional tables, dining rooms and then started with bedrooms.

Q: Were you basing these designs on what you thought the public wanted to buy?

A: It was based on what I liked and felt was the right thing to make. I searched the world for inspiration and tried to design what was in my mind, what I think is sellable, and what I thought would beautify other people's lives.

Q: Can you give an example of some place in the world that has influenced what you've created?

A: In France, I visited all the palaces. Versailles has truly impacted my creativity as well as Austria, London, Kensington Palace, St Petersburg and Moscow.

I'm in love with the art and creativity of the 14th, 15th, and 16th Centuries, and sometimes feel I should have been born then, that I'm a little too late. I love what's been created - not only the furni-

ture, but the wall art, the lighting, the chandeliers, and the flooring; I admire the creators, designers, and carvers. That's what drove me to create a palace for every person to live like a king or queen, but in an affordable way.

We try to make it possible for everyone to live the way they deserve to live in a financially possible way. Our furniture, while not super-expensive, has a very, very high perceptive value. We've had furniture on the TV show *The Price is Right* for the last five years. When they ask people on the show how much one of our dining rooms is worth, they say \$30,000, but it's actually only \$10,000. I'm very proud that we can create beautiful furniture for the right price and right value.

Q: How many employees do you have?

A: We have 200 employees here in Pico Rivera, and about 10,000 people making our furniture in different parts of Asia.

Q: How did you and Jane Seymour happen to work together?

A: Jane Seymour was a Bond girl, and remember, I was in love with Roger Moore in *The Saint*. She's also an artist and her paintings sell for thousands of dollars. We met through one of her associates and really connected. I suggested we create a category as collaboration, and within four months, came up with three collections, including one of our bestsellers, 'Hollywood Swank'. We're working on two other collections. The groups with Jane feel like old Hollywood: mostly upholstered bedroom and dining room with a lot of crystals, bling, and glamour.

Q: Do you mind people calling you the King of Bling?

A: Actually, Jane calls me King of Bling because I brought crystals back to the furniture industry. I figured if ladies like to buy shoes and purses with crystals, why not furniture? That's how Hollywood Swank was crystallised. Then we came up with more collections with sparkles, now a major category, and which, basically, I created.

Q: Where do you go when you travel for your work?

A: All over the world! I travelled 199 days in 2015 and I think this year will probably be even more. I go to Asia,

to our factories in China, Vietnam, Indonesia, and the Philippines. I'm going to Cambodia, Myanmar, India, and anywhere there's a potential of manufacturing better furniture at better cost. China is becoming a little bit more difficult in terms of cost and regulations, and of course, the labour force has been challenging, but it is still the best place in terms of talent, skills and components.

Q: When you fly, how do you fly?

A: When I go international such as Asia, I fly commercially because China and Vietnam, and some other countries, are not very easy to get in and out of privately; there's a lot of red tape. A year or so ago, in some countries, if you wanted to take off with a private aircraft, you'd have to file your flight plan a couple days in advance and they imposed huge expenses on private aircraft in terms of landing fees etc. Plus, my schedule changes by the hour, so flight plans would be a problem.

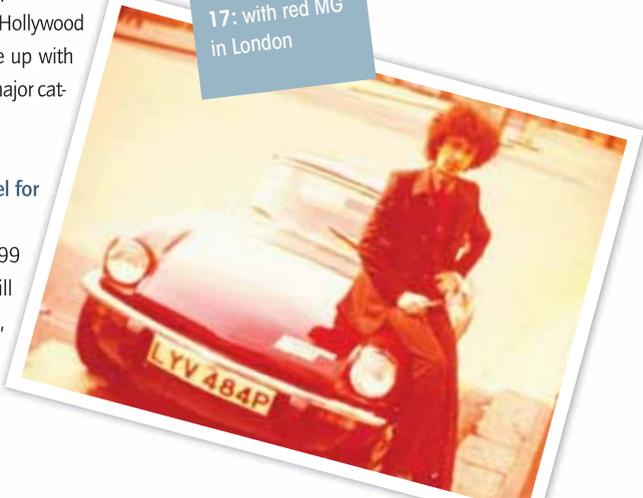
Q: Why did you buy your Citation 10?

A: I travel all around the US, Canada, Mexico, the Caribbea and South America, and it is the best, most efficient, and most comfortable way of travelling to destinations that are less than six hours away. We can go to four different meetings in four different states in one day. Without it that would be an impossible task.

Q: How often do you use your jet?

A: Every month, and sometimes three times a month. We have eight trade shows in the US, so I travel with my executives in the aircraft. On vacations, I use it to take my family to Hawaii, Costa Rica, Dominican Republic, St Thomas and Florida. Sometimes I travel with customers and also with Jane Seymour for different events. ►►

Amini at age 17: with red MG in London



LEARJET CHALLENGER GLOBAL



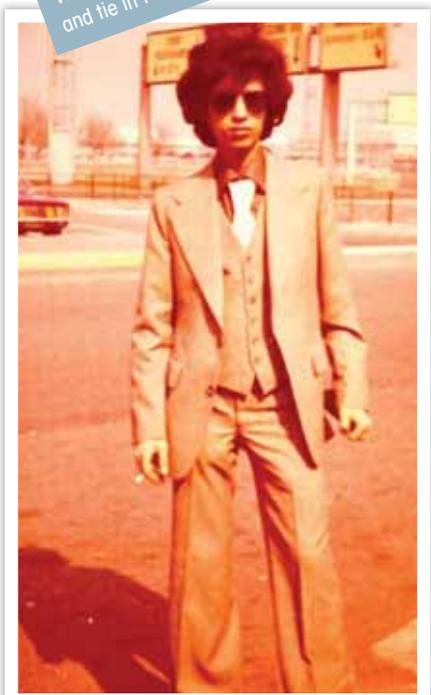
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Amini at age 17: in 3-piece suit and tie in Paris



► **Q:** How long have you had your Citation 10?

A: For 11 years.

Q: What made you choose it?

A: At that time I wanted the fastest of everything; I think I still do. I bought it because it was the fastest passenger jet in the sky. I like to buy fast cars; anything that's fast. I guess it is because of my very fast lifestyle.

Q: If you were going to move or upgrade from your existing Citation, which model would you be most likely to move to?

A: I love Gulfstream 650 because of its size, range and speed but there are so many wonderful jets out there; I've looked at the Challenger 605 and I love the fact that it's such a wide body, so open. Frankly, with my lifestyle right now and the fact of how much I use my plane; I think I don't need to go any higher than Challenger 605, or probably Gulfstream 450. I love Falcon. I saw a brand new Falcon not too long ago that is gorgeous; it's beautiful. But, I think in terms of range, cost and size, Challenger 605 would be the best fit for now. If I decide to fly to travel abroad with it, I will certainly consider Gulfstream 650.

Q: When you're visiting a new destination, do you leave the decision of which FBO you're going to arrive at to your flight ops team, or the pilot, or do you have your own preferences?

A: I leave that to my chief pilot who has been with me for the last 11 years. He's very analytical, knows what I like and don't like, and chooses whoever can give us the best service at that time, one which is better in terms of fuel cost and other things. I leave it up to him to pick - we haven't gone wrong yet.

Q: Do you have preferences for onboard catering on longer flights, or do you leave that to your team to decide?

A: We don't travel too long; normally our flights are a maximum of five, five-and-a-half, six hours. We don't have the time to go through a feast because normally we have a lot of meetings. When I have so many executives travelling with me in an atmosphere in which nobody can get up and leave, and nobody can make or answer a phone call, I have a captive audience to discuss and get a lot done. Plus, we're usually going somewhere where we'll be hav-

ing a nice dinner with dealers, so we don't need to go through a detailed eating session on the plane.

Either my wife makes something at home and packs it, or we cater from a nice place which my chief pilot chooses - sandwiches or something quick so we can get back on track to business.

Q: How much of a concierge service do you expect from your flight department as far as hotel accommodations, transportation, and other logistic issues are concerned?

A: I have a wonderful assistant who has been with me for 15 years and does all the hotel arrangements for us. My pilots pick their own hotels; normally so they can stay close to the airport. The chief pilot picks the cars because he does a great job of getting cars waiting by the time we land, or at

times we are picked up from the FBO by our associates upon landing.

Q: Is the aircraft managed for you by a third party?

A: The chief pilot does that, and he is one of the best I've seen in the industry, very experienced.

Q: Do you put your aircraft out to charter?

A: Yes, because I travel a lot internationally and we don't want the plane to just sit there. My pilots are all staff pilots, employed full-time. My chief pilot says when I get bored at home, my wife says, "Come on, get up and go to the airport, to feel better and come back." Now that is funny. We have to keep the pilots busy and keep the airplane flying. I don't do it often, but whenever I'm on an extended trip and the executives don't need the plane, we charter it.

Q: When you charter, which charter operator do you use?

A: From the beginning, we've used a charter company called JFI Jets.

Q: And which FBOs do you frequently fly from?

A: My hangar is in Atlantic Aviation at John Wayne Airport, Orange County, California and we're happy there. We used to be in Long Beach for a long time but we moved the plane to John Wayne, which happens to be better and closer to my home and the homes of most of the people who fly with me on regular basis.



Q: How close an eye do you keep on expenses? Do you scrutinise bills, or do you take the view that if the maintenance or running charges fall within an expected range, it's fine?

A: I have a lot of trust in my pilots, especially my chief pilot who manages the aircraft. Sometimes he stands there when they are servicing the plane or fixing something. He keeps a very close eye on things. From time to time, I look at the bill and if something is a little too high, I ask questions; but normally it's not necessary.

Q: Which company does your aircraft maintenance?

A: We're very loyal customers to the people we work with, whether suppliers or furniture manufacturers. SoCal in Long Beach takes care of the aircraft for normal maintenance, changing parts, and some other services. If it's major service or something more detailed, we fly the aircraft to Phoenix or Wichita to Citation Center.

Q: When you bought your Citation, which completion centre did you use?

A: The one in Long Beach.

Q: Did you design your airplane interiors?

A: When I first got it, I did just a little bit. I was so excited to get the plane that I didn't pay attention to anything else. But I'm also an interior designer, so after a few years, I picked a new carpet, the walls, the interior, and customised the seats with Citation, with my company crest on the headrests.

Q: What do you do in your free time?

A: People ask, "Do you play golf?" I say, "Yes, when I'm dreaming." I have no time. I love what I do so much that I feel as though I'm always on vacation. My only hobby is to travel every summer with my family and spend time with my wife and two boys, the joy of my life. We sometimes spend a month, sometimes two. If somebody asked me, "What would you do right now to really enjoy your time?" I'd say, "Give me an empty house, and let me see what I can do to make it beautiful."

A working session with Jane Seymour

Q: What are you most passionate about?

A: Creating. I eat, drink, sleep, and dream beautiful creations. I have many ideas about creating clothing both for men and women and creating ladies' accessories. I'm presently working on creating Michael Amini perfumes. I am passionate about creating a brand people can enjoy. People don't think of furniture as a fashion industry, but it is. The

fact that people used to buy furniture and use it 20, 30, 40 years and live with it all their lives, and then hand it to their children, is truly contrary to what I believe - I think those eras are over. I think people should change their furniture based on their time and lifestyle, today's fashion, and colours. Life is too short to live with the same product all your life. My passion is to provide that for all. ■

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In the air... & in touch

A conversation with Michael Skou Christensen, Director of Business Development Asia for Satcom Direct International

Q: Let's begin with the latest offerings from Satcom Direct...

A: Two things spring to mind immediately. Last year's big buzz was our Satcom Direct Router (SDR), which was huge for us since it provides the platform that enables us to get new technology and functionality and new developments onto the aircraft very rapidly. The other really important announcement was our Global Voice and Text (GlobalVT) offering. This allows clients on board the aircraft to place and receive calls using their own caller ID, rather than the aircraft's ID. We provide a full GSM-like service, which is of great benefit to our clients.

Q: Is there anything different about your approach to GSM that differentiates you from other providers offering GSM services on business aircraft?

A: The biggest differentiator for us is how easy it is to get our product onto the aircraft. All you need is the GlobalVT app installed on your phone, the SDR and an applicable SATCOM Satcom system installed on your aircraft. There are competitor offerings out there that basically create a GSM cell inside the aircraft, but it is very hard to certify such a solution. As everyone knows from

their own flying experience on commercial airlines, with all those warnings about switching off mobile phones, there is considerable regulatory nervousness about GSM signals interfering with aircraft systems. With our approach, there is no GSM signal inside the aircraft. The calls inside the aircraft work over the wi-fi and Internet network in the aircraft. The calls are transferred via the SDR over the SATCOM

system to our ground infrastructure, where it is terminated into the GSM network. Moreover, because our solution is Internet based, you have coverage within the entire footprint of the satellite system installed in the aircraft. Our solution is also not subject to the same restrictions that apply to GSM picocell solutions, which are not allowed to operate in certain airspace, such as China for example.

Another important aspect of GlobalVT is the proprietary voice vocoder that our engineers developed, which gives you crystal clear voice quality, and limits the delay that is characteristic for satellite phone calls.

Our GSM offering supports the vast majority of manufacturer handsets, including Apple and Android devices. All the user needs is to have global roaming enabled with their usual mobile phone provider and they are contactable wherever they are in the world.

Q: Is this an expensive application?

A: The SDR is competitively priced compared to other router platforms. When you look at how feature-rich the SDR is, I personally think it is a steal. For exact installation cost, customers should contact their preferred installation/maintenance facility to ask for a quote. The GlobalVT app itself is free for our customers.

Q: What are you seeing by way of demand?

A: We already have a very solid install base flying with the services today and continue to see it expanding. The market is clearly taking the idea of a reasonably



priced GSM service with voice and text messaging very well.

The SDR also brings other features that are new and unique to the industry. Key here was the introduction of our GOIP service, or Global One IP service. This provides a seamless way of transitioning the client between the various satellite networks. So for instance if the aircraft has both Viasat Ku band and Inmarsat SBB, the SDR will seamlessly, and without any connection disruption, transfer the client from one satellite system to another.

This means that a user who opts for a communications package that gives him or her the fastest connectivity available at all times, the service handles all the network transitions seamlessly in the background. If they were on the ground the service would be delivering connectivity through the GSM network, because that is the highest speed, lowest cost option; then in the air it would switch to the Ku

band and if it was outside Ku band coverage, it would switch to swift broadband, and all this without the user losing connectivity.

We have a client in Asia, for example, who trades commodities and it is absolutely vital for him, while he is in flight, to be able to retain his trading links. No matter where the client is he has to have seamless coverage.

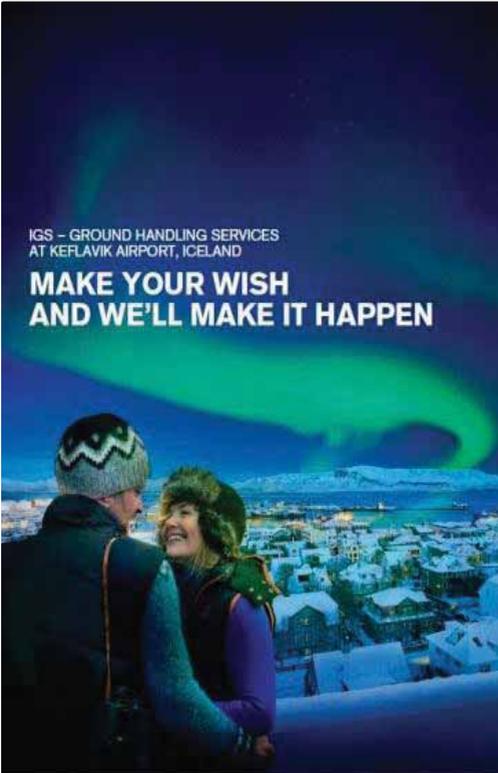
Q: How popular has your SDR 3G solution been?

A: This has been and continues to be a very popular service. We have negotiated some very good data plans around the world. When in their home territory, people would connect directly from their phone to the 3G network through their own provider, as usual. But if you fly to Dubai, say, suddenly one megabit of data downloaded costs you £4, so that is a real disincentive. With the SDR and our data plans, we are able to offer customers much

better download rates than that, across a range of countries and destinations.

Q: Anything else that is new?

A: One of our most recent developments, which we announced at NBAA, is SD FlightLogs. This is a new web-based service, powered by our FlightDeck Freedom datalink service, that allows you to automate some of the inputs that would otherwise have to be manually entered into the flight log by the pilot. So, for example, it will collect data on flight times automatically, which eliminates a lot of the human error that creeps in to these records. SD FlightLogs creates an efficient, single access point for all operational users from pilot to maintenance and scheduler, revolutionising the way aircraft movement events are accessed and recorded, and keeping flight personnel in sync with their aircraft anywhere in the world. ■





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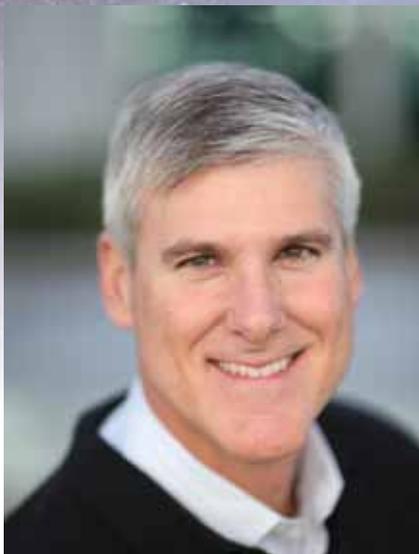
James Person, ViaSat Head of Business Aviation Services strategy, talks to *Anthony Harrington*

When it comes to designing satellite systems, ViaSat is hyper-focused on bringing enough capacity to meet long-term user demand for affordable internet services. This concept has put the global broadband services and technology provider in a class of its own. Its next generation of satellite platforms will not simply be more powerful than any competitor's; they will be orders of magnitude more powerful. It seems a safe prediction that this huge edge will give ViaSat a dominant position in the global connectivity provider space as well as making the much talked-about 'office in the sky' on business jets pretty much the equivalent of the office on the ground. We shall see....

Q: ViaSat has made a couple of far-reaching announcements lately, including revealing in February that it plans a new global constellation of three satellites. What does this mean for ViaSat and business aviation?

A: We have indeed made two major announcements that affect Europe particularly as far as the global aviation connectivity market is concerned. The first announcement unveiled our ViaSat-3 constellation, three satellites positioned to provide total global coverage. Each of the three satellites will have over 1,000 Gigabits per second (Gbps) of capacity. This means that each of them will have more capacity than is contained in all the commercial satellites that are operating today.

It is worth looking at how things have pro-



gressed in this respect. When we launched ViaSat-1, it had 72 spot beams. ViaSat-2 will have several hundred spot beams and ViaSat-3 will have thousands of spot beams per satellite. The first member of the ViaSat-3 constellation will launch in 2019 and will be over the Americas. The second will cover Europe, Middle East and Africa while the third is planned for the Asia Pacific market. ViaSat-2 will be launched within the next 12 months by our launch partner, Arianespace. We expect Arianespace and SpaceX to share the launch duties for the ViaSat-3 constellation.

Looking at capacity comparisons for ViaSat-3 – we have a significant advantage. For example, Inmarsat's Ka-band satellites each have six Gbps of capacity against 1,000+ Gbps of capacity for each of our ViaSat-3 satellites.

The additional capacity and coverage with ViaSat-3 ensures we can offer every device on an aircraft the necessary broadband speeds for advanced connectivity and video streaming capabilities as well as future bandwidth-intensive applications. Others talk about speed, but the real need is for capacity – and lots of it at the right economics – to serve hundreds if not thousands of users in the same geographic area, or in this case, on the same aircraft or airspace at a cost that is affordable.

Q: This is a tremendous amount of capacity per satellite. Are you just keeping up with demand or getting well ahead of it?

A: Demand has been growing at a tremendous rate and there is no sign that this hunger for bandwidth will hit a ceiling any time soon. It is amusing now to recall that when we launched ViaSat-1 our stock price dropped dramatically because many financial analysts said it was futile to put so much capacity in space. No one would ever need it! Today in the commercial airline space we are delivering terabits of data to just three airlines in the U.S., so consumption is huge, with the potential demand being even bigger. With all the business jets we serve, demand continues to mushroom!

Q: And the second announcement?

A: Our second big announcement is that we have agreed to form a joint venture with Eutelsat, in which we have a 51% ownership stake in the retail services business and a 49% interest in the wholesale services business. Eutelsat will contribute its current European broadband



We design the satellite, build key portions of the satellite payload as well as provide the ground stations, the aircraft antennas and terminals

business including the KA-SAT satellite and for future capacity, the partnership will expect to use the ViaSat-3 platform once it is in service in 2020.

We already have a strong partnership with Eutelsat, as we provide the broadband technologies for KA-SAT gateways and terminals.

Q: Although it has nothing to do with business aviation directly, your direct-to-homes retail business has the capacity to be a real cash generator for ViaSat does it not? Is it mainly for rural areas or does it play as well in the metropolitan markets?

A: There is no doubt that the consumer business is very strongly positive as far as cash generation is concerned. We have nearly 700,000 users in the USA already. When we launched, we expected to appeal virtually exclusively to rural homes where there was no easy access to fibre based internet. What we found, however, is that we have at least as many users in metropolitan areas, which is very pleasing. We expect to build up our European retail services business substantially through the Eutelsat agreement and we will be looking to extend our direct-to-homes service with partners in other markets, as well as across the Americas, in due course, once ViaSat-2 and ViaSat-3 become operational.

We also have very strong appeal in large countries with far-flung rural communities. In fact, we worked with Australia's nbn™ to provide our ground-based communications equipment. Our ground stations were built in specific locations across Australia to maximise both the availability and capacity of the system. The nbn



satellite/ground station system was designed to deliver broadband services to more than 200,000 rural and remote homes and businesses with wholesale download speeds of up to 25Mbps.

Earlier in the year, we signed a memorandum of understanding agreement with Qantas Airways to bring fast, high-quality in-flight internet connectivity to their domestic fleet by using our single, hybrid Ku/Ka-band antenna. By using our hybrid antenna, we can offer internet service across our global Ku-band network and nbn's Sky Muster™ high-capacity Ka-band satellites.

Q: How much of the network do you provide? For example, with Inmarsat's KA Band system, Honeywell is providing the antenna for

commercial and business aircraft.

A: That is a great question. We are a vertically integrated broadband internet services company, which means we do the whole thing. We design the satellite, build key portions of the satellite payload as well as provide the ground stations, the aircraft antennas and terminals. This vertical integration gives us tighter control over the quality of the broadband network we provide and means that we can provide a very high standard of service to all our clients.

Q: What is the investment required for a new satellite?

A: If you take the build, launch and insurance costs into account, the total cost for a new satellite, is about half a billion dollars. However, where we gain is that if you take our three generations of satellites, ViaSat-1, 2 and 3, the third generation, ViaSat-3, is about the same investment as ViaSat-1 or ViaSat-2, even though it has vastly more capacity.

Q: What are you busy with right now, with the launch of ViaSat-2 being imminent?

A: From a business and commercial aviation perspective, we are very busy providing new radomes for our OEM partners. A radome is the antenna housing on the aircraft, and the new radomes will be transparent to both the Ka and the Ku bands. My own personal responsibilities are in the large business jet space and the ACJs and BBJs. Plus we work with MROs around the world to ensure that they have the skills to install the in-flight entertainment systems that will use our connectivity capabilities. ■



Wi-Fi: Don't leave home without it!

Anthony Harrington talks to John Wade, Executive Vice President and General Manager, Gogo Business Aviation

While 2015 was not a great year for many companies in the business aviation sector, IFE (in-flight entertainment) and connectivity specialist Gogo Business Aviation has turned in another really solid performance. The company saw record fourth-quarter revenues of US\$137.8 million, up 26% year-over-year, while service revenues for the last three months of 2015 grew at 29%.

As John Wade, Executive Vice President and General Manager at Gogo Business Aviation points out, the company reached a new milestone as far as revenues for the whole of 2015 were concerned, reaching half a billion dollars for the first time. Gogo's President and CEO, Michael Small, said that in addition to

becoming a half billion dollar revenue company, Gogo also installed nearly 1,900 broadband and wireless entertainment systems through 2015. Gogo's activities and product sets cover both business aviation and commercial airlines, and include both IFE and in-flight connectivity (IFC) solutions.

Q: You seem to have done very well through 2015 both on the commercial aviation front and with business aviation. Are you pleased with the results?

A: We are doing really well on both fronts. We have won a number of new airline customers and now have 12 airlines taking onboard IFE and IFC solutions. We are working on products and deals with satellite companies that are going to enable us to deliver hundreds of mega-

bytes of data per second to commercial airline sized aircraft, and we now have over 6,500 business aviation aircraft using our products.

Q: You are now combining satellite and air-to-ground services. How much drag is created by putting an externally mounted satellite receiver on the fuselage?

A: There are three flavours when it comes to satellite receivers, known as high, medium and low-gain receivers. The low-gain receiver is about the size of a hockey puck and really does not create much drag. The high-gain receivers are substantially bigger and can be six feet long, a foot or so wide and a few inches in height. So they will add some drag to the aircraft. However, when you set this against the advantages of having high-speed connectivity

services delivered to the aircraft, there is no comparison. Today, we frequently see even aircraft that are just about to be sold having our connectivity products installed since it has a tremendously positive effect on the resale value – and not having connectivity in the cabin really hurts the residual price.

Q: What kind of speed are you delivering now to the cabin?

A: The download speed varies considerably. The benchmark, of course, that is set by most people is whatever speed they can get at home. Today in the USA, 15Mbps is basically table stakes on the ground. You can't play as a broadband provider if you can't deliver at least that. However, a lot of services are up to 100Mbps to the home, mostly via cable. We can't match a home-based 100Mbps service in the air yet, but we can generally deliver 3Mbps and if you only have five or six devices on the aircraft, or less, as is commonly the case in business aviation, then each of those devices is going to be getting plenty of bandwidth; 3Mbps delivered to a modest number of handsets is a significant step up on anything business jet passengers have had in their hands before now.

Q: What are clients – i.e. the passengers – actually looking for from wireless capability in an aircraft?

A: The big thing with this increased bandwidth is whether or not you can do streaming.

That is the Holy Grail at the moment and truthfully, it is the major reason today why we need more and more bandwidth to the cabin. Web browsing and email take up much less than 5Mbps.

Yet even if you could get movie streaming, when you factor in the cost of a service plan that would include movie streaming, as with Netflix, for example, the bill would be absolutely prohibitive on today's data plans for aviation. A high-definition movie is going to be around 5Gb, which could easily work out to several thousand dollars. By way of contrast, with our in-flight entertainment service – Gogo Vision – we charge approximately \$10 per film, which is stored in solid-state storage in the aircraft. We get these films on the same day they are released to DVD and we update the movie store in the aircraft wirelessly whenever it is on the ground in one of the FBOs that we have a contract with, or when it is back in a hangar set up to deliver the service. It is a tremendously cheap and easy way to keep the in flight entertainment as up to date as possible, without someone having to come to the aircraft with some kind of portable storage device to update the movie database.

Q: Can you run through your latest offerings with us?

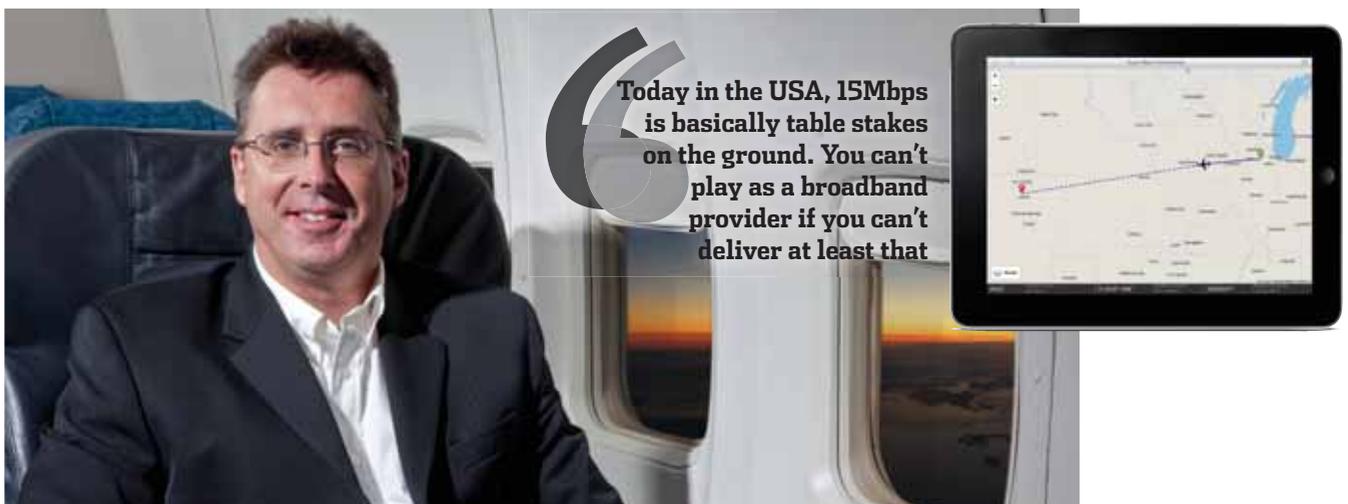
A: Our big news was the launch of Gogo Biz 4G for North America. This is an evolution of our air-to-ground (AtG) product. The previous peak connectivity we offered on our AtG service was 3MB per second. We now offer

10 Mbps. To achieve this, we upgraded our ground network and we combine two data channels to the aircraft. This gives us a much more stable performance. It means we can balance the load between the two channels dynamically, and that provides an improved user experience.

We also have a very nice service, called Gogo Text and Talk, that uses Wi-Fi in the cabin along with an app we provide to use the service. So instead of using the cellular network, you make use of the aircraft's onboard Wi-Fi. Moreover passengers use their own mobile phones and their own numbers, not some unique aircraft identifier number, so it's seamless. Anyone calling you does not have to know where you are. They don't even know that you are in an aircraft. You launch the app and people dial and call you just as they do on the ground.

Q: How do you price this service?

A: The app is free, of course. The hardware in the aircraft starts at around \$35,000 and our top-of-the-range server is \$120,000. The service pricing ranges from pay-as-you-go to a monthly fee, but we cap that fee at \$4,000. The average user will probably pay around \$2,500 a month for the service. We think that is a very reasonable cost. Wi-Fi today is as essential to a business aircraft as pilots and propulsion. For anyone who flies a business aircraft for reasons of productivity, having Wi-Fi is absolutely essential. ■





EVA talks to Don Hamilton and Steve Scarlata, principals at sound specialist ALTO Aviation

Sounds right. Is right!

For nearly 20 years now, ALTO Aviation, founded by ex-Bose sound engineers Don Hamilton and Steve Scarlata, has been installing high end sound systems into business aviation aircraft cabins. EVA talked to the founders about their approach to getting near-perfect sound in the air and on the ground.

Q: What led the two of you to found ALTO Aviation?

A: We were both audio engineers at Bose, focused on audio systems for cars. In the years leading up to the founding of ALTO, in 1997, we were doing some special projects for Bose. One of these involved installing a sound system on a Gulfstream G4. Doing this showed us that there was a real market for bringing high-end audio systems to business jets. So shortly after that we left and started ALTO Aviation, targeting this market specifically.

Bose also saw this sector as a valuable market and signed us up to do all the required engineering and manufacturing to try to grow Bose's business in this sector. From Bose's standpoint, their contribution, apart from the systems side, was on the marketing front. We handled the installation and implementation as well as the engineering required.

Q: Implementing a sound system in an aircraft that can play classical music to the satisfaction of an enthusiast is a very different proposition to installing a home hi-fi set. What are the challenges?

A: It is absolutely right to say that the two environments are completely different. However, the living room has its challenges as well. You

do not know where the people are going to be in the room when they are listening. An aircraft cabin has fixed seating, so you can optimise the sound for particular seats. You have a lot of control over where to place the loudspeakers to get maximum advantage from them.

An aircraft cabin is basically a long tubular structure and you know that from the outset. However, the speakers are going to be up high on the SUPSU rails or on a side panel, which is not usually an ideal position for them. If you simply sold the parts for the sound system to the customer and let them or a completions house install it, turn it on and hope for the best, you can be pretty sure that the results would be far from optimum.

Our first step is to focus on designing the system to achieve an optimum sound. Then we go on site and onboard the aircraft to ensure that all the speakers are installed properly, in accordance with our design, and that they are correctly wired. After that we go to each seat and measure the output from all the speakers. We take exceptional care with the designated VIP seats, but we also ensure that all the seats are served with the best possible sound for that position in the aircraft. You have to adjust

the sound contour coming out of each speaker to get a perfect balance.

Q: Jets – even the quietest – are intrinsically more noisy than a lounge environment. How do you solve that problem?

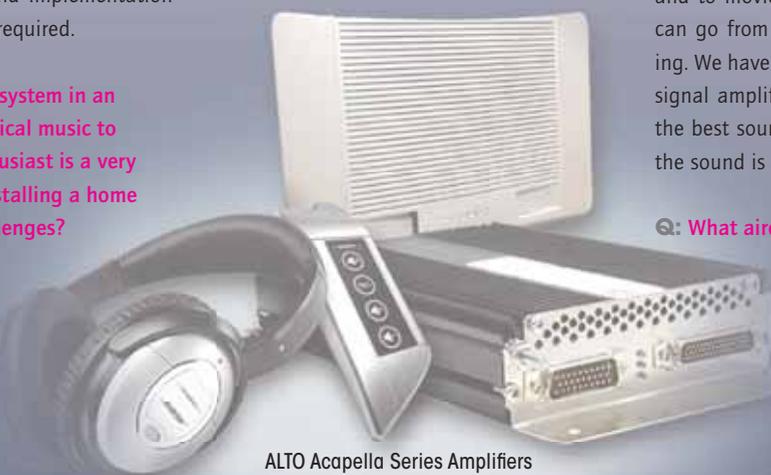
A: It is definitely the case that there is more sound even in the quietest of jets than you will find in a home environment. On the other hand, the systems that we put into business jets have much more power and can play at far higher volumes. On the ground you might think that the system is over-powered if you turn the sound all the way up, but in the air, with the background noise, you need plenty of volume to hear it right. When we do the design we take care to ensure that the system will meet the owner's expectations. In the air you want to listen in the top quarter of the volume slider to get balanced audio and to have the system performing at its best.

Q: Aside from power and volume, what else do you need in a business aviation aircraft system?

A: We have a compression feature that is very useful for listening to loud and soft music and to movie dialogues where the characters can go from speaking in a whisper, to shouting. We have a dynamic range algorithm in the signal amplifier that makes sure that you get the best sound quality irrespective of whether the sound is a whisper or a yell.

Q: What aircraft are your systems on?

A: We are on a range of OEM products. We are on the entire Dassault Falcon range and on all Gulfstreams, plus all Cessnas that have the Clarity CMS system. We are



ALTO Acapella Series Amplifiers

also on the Embraer lineup, except for the Phenoms. We are part of Honeywell's Ovation CMS and the Rockwell Collins Venue CMS. We have done quite a few Sikorsky helicopters for audio, and are standard for the PA in the S-92 and S-76. We're also on a whole range of after-market and refurbished smaller aircraft, ranging from the smallest of the King Airs, all the way up to VVIP 747s..



range of jets, it is becoming more and more common for customers not to go with complex CMS and IFE installations, and instead they prefer a more cost-efficient solution and are happy to use their own personal iPads, iPhones or Android devices to play whatever they want to play. We can do the speakers for this kind of approach at a very reasonable cost and via a much simpler installation.

Q: How long does it take to install one of your systems?

A: It varies tremendously. With some customers and some sizes of aircraft, they can order in the morning and we can ship the system in the afternoon. Some systems, for example, are simple, direct replacements for the sound systems they are replacing. For an older OEM system, we may well have ALTO speakers that fit directly into their old speaker slots. So we

could see an install finished inside two days. A 747 completion will probably take two years, so we will specify the system at the start of the completion process and it will be two years before we go back to the aircraft to install and sound-test the finished system.

What we are seeing, however, is that on a

Q: Smaller jets and turboprops are a lot noisier than mid-range business jets. How do you overcome that disadvantage?

A: In a smaller environment you can get a lot more sound pressure out of the audio system, so that helps to compensate for the fact that you are installing in a noisier aircraft. We have done very nice, clean installations in smaller Embraer aircraft, for example. It is all up to the customer and what they want! ■



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Astronics PGA Avionics has been involved in innovative engineering and electronics for the aviation sector for decades. The company's major areas of interest consist of the engineering and manufacturing of in-seat motion systems (such as that which allows the conversion of a seat to a flat bed, for example) plus seat lighting and in-flight entertainment systems. It provides solutions for both commercial airlines and for VVIP and business jet aircraft.

As Marc Piaulet, Sales & Marketing Director at PGA Avionics explains, the company's in-seat motion systems are specifically designed for first class and business class seating. They consist of linear or rotary actuators, a control module and a range of custom wiring harnesses, all of which satisfy the latest standards for B787 and A350 aircraft. Seat lighting systems are customized to accommodate various lighting scenarios for reading and ambiance, and designed to suit a broad array of décor.

As a leading manufacturer for the corporate and VVIP aviation market, PGA's full-HD audio/video in-flight entertainment and cabin management system solutions are flexible and convenient with a user-friendly interface. This gives the user control over all in-cabin features from lighting to the hostess call function, door



closure, satellite TV, security camera, moving-map systems, and power management systems. The system provides full HD streaming capability to up to 30 personal electronic devices throughout the cabin.

Astronics PGA Avionics is a subsidiary of Astronics Corporation (NASDAQ: ATRO), a leading supplier of products to the global aerospace, defense, consumer electronics and semiconductor industries. Astronics' products include advanced, high-performance electrical power generation and distribution systems, lighting and safety systems, avionics products, aircraft structures, engineering design and systems certification, and automated test systems.

"PGA first entered the business aviation market in 1995 with an order to refit Dassault Falcons, removing the old, outmoded passenger control units and replacing them with new modern equipment. Then we developed a full system with audio and visual on demand (AVOD) display systems and touch screens, which enabled us to become the European leader in VVIP IFEC/CMS systems," Piaulet says.

Products are internally designed by a team of multi-disciplinary experts who aim to ensure the best in class product design and reliability. "The company has state of the art test and simulation equipment to make sure our products are compliant with latest Airbus/Boeing certifications regulations," he notes.

"We also invest a lot in R&D spend to enable us to be at the cutting edge on the latest technologies. The consumer electronics market is incredibly fast moving and this impacts the IFE market directly. We regularly see client expectations being set by new developments for the consumer market such as ultra high definition TV, faster connectivity and so on," he adds.

On the lighting side, PGA is a well known provider in the field and has over 25 years of experience in Lighting Systems, technical quality, durability and manufacturing, with an emphasis on meeting tight delivery time scales. "We are a big supplier of aircraft cabin lighting and major airlines and VIP seat





manufacturers have been using our lighting systems for years," he comments.

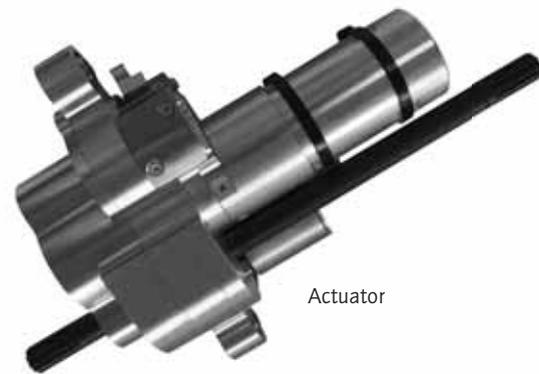
The company's portfolio includes a full range of standard lighting products but PGA also has the ability to enable customers to create on-off designs to match a specific requirement, and it can provide a very rapid turnaround on these bespoke solutions, Piaulet says.

"Our innovations team is always happy to make the customer's dreams a reality. Our designer and technical experts will work with the customer to build the project and to provide customers with fast prototyping and production. Moreover the team is always available for

any questions or help needed for technical, ergonomics or design issues. The company has to continuously monitor the passengers' attempts and the technological developments," he adds.

On aircraft seating, Piaulet points out that PGA is a long standing supplier to the aircraft market. "We have equipped the major airlines for the last 20 years. All our motion systems are optimized for efficient energy use, easy integration and ease of operations. Astronics Motion Systems are designed for Premium Economy Class, Business Class, First Class and VIP seats. They consist of Linear and Rotary Actuators, Control Units with Power Supplies,

Pneumatic Units, Air bladders, and a range of custom Harnesses. PGA's Motion Systems are also used to operate all the moving elements in the cabin such as beds, tables, partition dividers, minibar, divan, pop-up TVs and much more. Moreover, Piaulet notes that everything that is provided is compliant with the latest Airbus and Boeing certification requirements. Support is provided globally through Astronics PGA Avionics locations in US (FL, WA), France and Ireland. ■



Actuator

Established in 2003, ATSD is an on-site professional partner and FSP (flight service provider).

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Design Nobility

Roger Soler Palau, Segment Manager, General and Business Aviation, AkzoNobel, talks to *EVA* about the challenges that come with the latest VIP design schemes

Q: How complex are the latest VIP business jet design schemes and how much of a challenge are they to designers, paint houses and paint manufacturers? How does the relationship between the three work in practice?

A: We are seeing a real diversification and some very ambitious design schemes in the business jets arena. There is everything from a broad range of inconspicuous finishes (which may, however, be very sophisticated in the detail) to eye-catching and very elegant designs. With today's rapid cultural and technological advances, aircraft owners expect more from the aircraft aesthetics and often have very specific requests. We are seeing some jet livery designers transforming into real artists and their creativity, coupled with the expectations of the aircraft

owner, is constantly pushing the boundaries of creativity and feasibility.

All these concepts and ideas are turned into reality by the skilful hands of paint applicators. They bring years of expertise to the challenge, combined with the continuous improvement and enhancing of their skills through learning new techniques and technologies, all of which is constantly enlarging the bounds of the possible.

Finally, the coating suppliers, by which I mean AkzoNobel and our competitors, have to provide coatings that are capable of bringing into the realm of the real, whatever final finish has been envisaged by designers. At the same time our coatings have to be able to adapt to the application techniques and processes of the paint house. Only in this way can we all ensure

the best results in terms of the aesthetics of the final design, the durability of the paint job and, of course, the long-term protection of the aircraft itself.

The rapid advances of technology bring new effects and performance improvements while reducing paint-job time to the point where it is now possible to apply designs in multiple colours to create a stunning final product that would not have been imaginable some years ago. The more complex the project, the deeper the collaboration between designers, painters and coatings suppliers needs to be.

For these types of special projects, it is key to have constant communication between the parties to ensure that concepts are understood and that the processes to execute the design are appropriate for the task.



At AkzoNobel, we have had some great collaborative experiences on designs and new exclusive colour creations. In 2015, for example, we co-created with designers a specific corporate colour that featured an incredible shift from red to gold. The finished design could have come straight off one of the latest supercars. The paint house was, of course, a key player in all phases of the project.

Q: What technical support can AkzoNobel provide to paint shops?

A: There are multiple layers of support. Perhaps the most visible and most immediate for customers is that provided by the technical consultant. These are expert painters, with a background in paint shops, who combine application expertise with a deep practical knowledge of our coatings, so they can make the right adjustments to paint and/or application to get the desired result. These technical consultants support paint shops with trainings on our products, along with providing process consultancy. Where something is not working properly, they will be there to solve it.

AkzoNobel support labs are present in all regions. They help us to provide a fast reaction to any situation and also enable us to work more closely with customers on collaboration projects in order to improve the overall process and efficiency.

Additionally, the knowledge and experience of customer service and account managers is always there as a first line of support, solving the FAQs or connecting internally to the right team to support the paint shop.

Q: How much new technology is there in aerospace coatings today? What is new and different by comparison with, say, a decade or so back?

A: Technological advances in aerospace coatings are increasing dramatically. Materials science is making huge advances and new materials and processes are coming to light all the time. However, the speed of changes in aerospace is more conservative than it is in segments such as the automotive or consumer electronics industries, due to the need to comply with layers of safety regulations, certifications and approval processes.

Today, base coat/clear coat systems are in regular use for most types of aircraft, allowing shorter application times for complex designs and higher durability. Pigments, resins and colour techniques have all improved in recent years. We have captured these advances in our Alumigrip® base coat/clear coat system, which (compared with the traditional single-stage top-coats) provides a wider colour range, including special effects, with excellent appearance and

durability while potentially reducing thickness and weight.

Another significant change has been the appearance of chrome-free systems for corrosion protection, which is an instance of the industry adapting to regulatory demands. Our latest move in this field was the introduction of the 'active' primers Aerodur® 2111 and 2118. These products extend the protection of aluminium substrates and additionally have a self-healing property that enables them to keep protecting the surface of the aircraft after external damage.

Another example is how colour itself is being handled in this digital and information era we live in. We now have rapidly accessible colour databases to a colour formula upon a colour measurement or chip selection. In fact, this year we will be launching a new version of the 'Mixit-Cloud' system that will enable paint shops and designers to find the right recipe for more than 10,000 colours.

Q: How much carryover is there for aircraft coatings from other areas, such as marine coatings?

A: AkzoNobel is present in many industries and it is now increasingly common to look to incorporate best practice across industries. Also internally, our expertise across these highly demanding markets allows us to leverage the capabilities in different areas and also improves our solutions for aerospace coatings.

For instance, colour technology is more advanced in the automotive world, and we are seeing some of the pigments, knowledge and data management now coming through to aerospace. Drying times are being improved using technologies from mass production electronic devices.

On the other hand, aerospace coatings requirements for performance, durability and corrosion protection are among the toughest. The need for extreme durability and performance gives aerospace coatings a unique character and achieving this requires coatings in this sector to be uniquely aerospace solutions.

Of course, the toughness and durability of coatings in the aerospace sector are known to other industry sectors and we see these coatings being requested by some automo-



Technological advances in aerospace coatings are increasing dramatically. Materials science is making huge advances and new materials and processes are coming to light all the time

QATAR EXECUTIVE

tive OEMs or yacht builders to improve the protection of these assets. For instance, we are working now with some OEMs to leverage our aerospace active corrosion protection technology and colour durability for the automotive and marine markets.

Q: Where owners have very idiosyncratic or very specific colour requirements in the paint job for their aircraft, what can AkzoNobel offer the paint shop to make life easier for them in meeting these types of request?

A: We have an extensive colour range able to satisfy most of the project requirements in our single-stage topcoat and base coat/clear coat system. In the second half of 2016 we will be launching a system offering more than 10,000 colours and shades. There will also be a set of tools that will facilitate the selection of colour samples and assist in finding any desired colour from the database.

This should cover most special requests while keeping lead times short. Where the owner's request cannot be satisfied with the existing colour range, we can match the colour of any sample provided to us. To date we have colour-matched paint to the colours of all kinds of objects, including shoes, cars, ties, handbags...

We can also create an entirely new colour design. For these special projects we like to work closely with all the parties involved from the very beginning, so the paint house and AkzoNobel can provide guidance and advice to the owner and help them to achieve the best result.

Q: Weight is always a factor in business aviation, since there is a constant trade-off between weight and range. What can paint manufacturers do to produce lighter, more durable coatings with longer intervals between paint refreshes?

A: Weight reduction in coatings is mostly driven by the use of more efficient paint systems, thus minimising the overall volume of paint for the aircraft. In order to do that, the new resin systems and pigmentations for base coat systems



It is key to have constant communication between the parties to ensure that concepts are understood and that the processes to execute the design are appropriate for the task

provide the same hiding power with lower film thickness as traditional topcoats. In some cases the raw materials used also have lower specific weight, resulting in a significant weight reduction. Additionally, improvements in the additives for rheology control (the way a liquid spreads or flows) allow a better application control that avoids overspray in certain areas and thus eliminates unnecessary weight. For durability, the use of a clear coat like the Alumigrip 4450 on top provides a layer specifically designed for protection, wear and resistance to UV rays and strong chemicals like Skydrol or hydraulic fluids. Even if transparent to our sight, this layer contains a lot of highly cross-linked polymers and UV filters to protect the bottom layer and provide a factory-new look for many years.

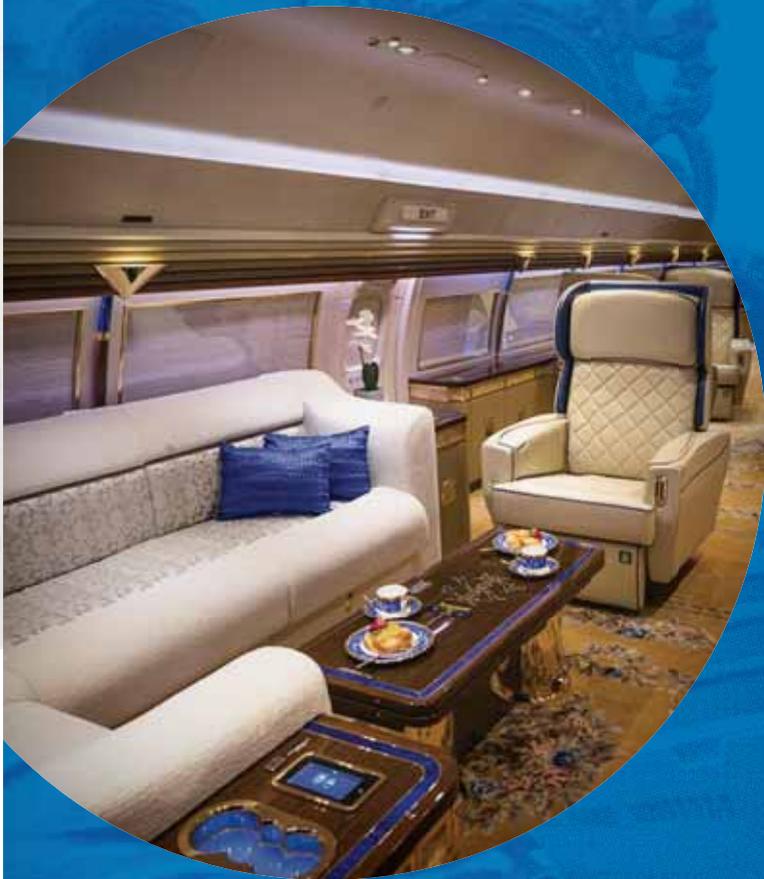
Q: Is it important to have a global network of distributors or can you run out of one or a

couple of locations just as well?

A: Both approaches can be good depending on the needs of the specific customer. However, a good distributor network is important. Distributors provide a service and are the link between end customers and the different suppliers for aerospace products, including paint. Their stocks are held closer to customers and so allow better lead times for efficient supply to repaint houses scattered across regions and geographies. In fact, we are expanding our network to improve coverage in some areas.

On the other hand, some customers, like major OEMs, completion centres or paint facilities, have the infrastructure and willingness to be in direct contact with paint suppliers. In these cases, we serve them directly from the different support centres we have on a global scale and in all regions. Ultimately, paint supply requires a mix of local and global levels. ■

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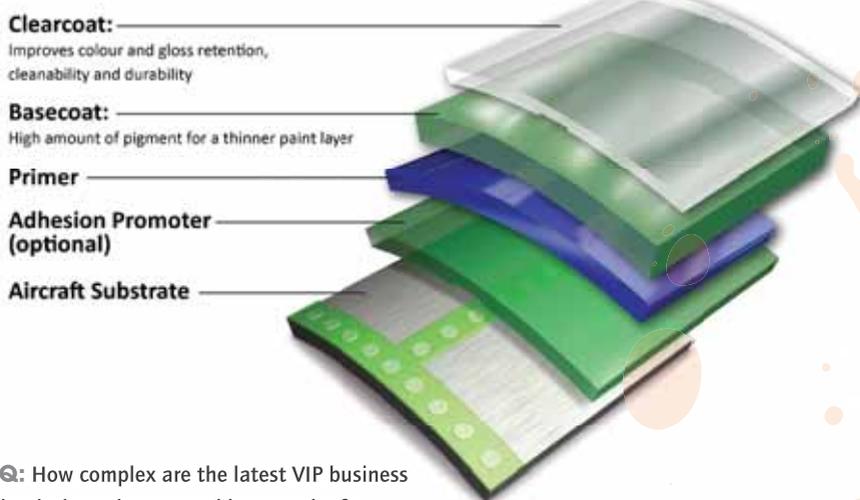
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No challenge too tough

EVA talks to Mark Cancilla, PPG Global Director, Aerospace Coatings



Basecoat-Clearcoat System



Q: How complex are the latest VIP business jet design schemes, and how much of a challenge are they to designers, paint houses and paint manufacturers? How does the relationship between the three work in practice?

A: The complexity of design schemes, liveries and colours continues to increase. While this can present challenges to designers, paint houses and coatings manufacturers, this also offers opportunities for all three groups to grow technologies. PPG has significant presence in the aerospace and automotive coatings industries. Both these sectors have evolved to create new colour and special-effect capabilities that appeal to airlines, individual aircraft owners and car owners. New mica and other special-effect coatings including ANDARO® pigments by PPG offer a wider array of design options than were found not long ago. Now, when designers, paint houses and coatings manufacturers work together to create a new livery, often we find that the expectations of the customer can not only be achieved but exceeded.

Q: What technical support does PPG provide to paint shops?

A: We have an active, vigorous and knowledgeable field technical services team of more than two dozen coatings application specialists. They operate around the world to provide on-site training and guidance for painters, suiting up and operating equipment alongside them. They typically are called on when a customer is working with new products or encountering an especially complex application. Because they visit the paint shop and can see the conditions under which the painters work during the application process, such as high humidity and high temperatures, they are able to demonstrate how to overcome them. This guidance enables the painters to maximise efficiency for the best finish possible.

Before going into the field, the technical service specialist will work with our product development organisation to optimise appli-

cation characteristics of our products in paint spray booths. We have paint spray booths with temperature and humidity controls within our development laboratories that enable us to simulate paint shop conditions anywhere in the world where our coatings could be applied. Once the technical service specialist knows the optimum application conditions, he or she will then go into the field.

Our growing field technical services team reports to our global technical services manager, Ben McCoy, who has paint application expertise gained over years as an aircraft painter.

Q: How much new technology is there in aerospace coatings today? What is new and different by comparison with, say, a decade or so back?

A: Exterior topcoat technologies have transitioned to base coat-clear coat (BCCC) systems as the automotive industry had done previously. The new aerospace BCCC products offer much longer service life, better appearance opportunities, faster application times and lighter overall weight than the previous direct-gloss products. Commercial and general aviation airframe manufacturers are qualifying BCCC products to their respective specifications, and coatings manufacturers have qualified their products to the SAE International's Aerospace Material Specification 3095 for airline exterior paint, which is endorsed by most original equipment manufacturers. Painters and aircraft owners and operators around the world are increasingly using PPG's BCCC product, DESOTHANE® HD base coat-clear coat system, in all climates and all conditions. It is already a huge success.

As mentioned previously, the aerospace ▶▶



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► coatings colour palette has also increased significantly over the years. In the past, airlines and business jet owners generally incorporated only solid colours into their aircraft liveries. Today, you find as wide a variety of colours and special effects in aircraft as you see in the automotive world, if not more so. This can stress the ability of the aerospace coatings manufacturers not just to produce the materials but also to ensure that they can be applied with robustness and repaired if needed during the application process. The best aerospace coatings manufacturers have been able to navigate these challenges well.

The industry has also begun to move away from hexavalent chrome as the traditional corrosion inhibitor. Critical elements in primers and pretreatments, corrosion inhibitors are intended to protect the metal structures within aircraft. Even though many new aircraft are moving toward composite structures and away from heavier metal parts, a very large number of metallic parts still exist in aircraft that require corrosion protection. Coatings manufacturers have developed technologies



Solar-heat-management coating technology by PPG is modeled after the eggplant, which naturally remains cool to the touch even when exposed to intense sunshine. The eggplant's dark purple skin does not absorb near-infrared radiation but transmits it to the white interior flesh, where it is reflected and transmitted out through the skin.

that replace hexavalent chrome with more eco-friendly corrosion inhibitors. PPG has introduced the DESOPRIME™ CF primer product line and AEROCRON® electrocoat primer to eliminate hexavalent chrome. Multiple corrosion-inhibitor technologies have been developed, and AEROCRON electrocoat primer not only eliminates chrome, but it also offers other benefits. AEROCRON primer introduced the dip coating process, which has existed in the automotive and industrial coatings industries for many years, into the aerospace coatings market, offering significant application cost savings and weight reduction, and we believe the best chrome-free corrosion-inhibiting technology in the industry today.

Developed specifically for aircraft application, new solar-heat-management coatings are giving airlines and aircraft owners more freedom to choose colours. These coatings reduce aircraft exterior skin temperatures by up to 25 degrees Fahrenheit/14 degrees Celsius to help keep aircraft passenger cabins cooler by 5 to 7 degrees Fahrenheit/3 to 4 degrees Celsius. Airlines and aircraft owners no longer have to avoid dark colours, which can absorb as much as 90 percent of solar energy that in turn heats the interior when a plane is on the ground. In fact, with solar-heat-management coatings, the darker the colour, the greater the difference there is in total solar reflectance.

PPG solar-heat-management coatings tech-

nology is based on development of novel pigment dispersions, or stainers, that increase transmittance of near-infrared energy, or heat, through a dark coating and increase the subsequent reflection from a white underlayer. The technology is modelled after the eggplant, which naturally remains cool to the touch even when exposed to intense sunshine. The eggplant's dark purple skin transmits near-infrared radiation to the white interior flesh, where it is reflected and transmitted out through the skin. PPG's innovative coatings technology works the same way.

Q: How competitive/crowded is the aerospace coatings market? What are the keys to success in this sector?

A: The aerospace coatings market is very competitive, although the number of competitors has not changed significantly over the years. This market demands high levels of technology to compete effectively, supported by in-depth knowledge and required products and components, and this is realised only after many years of participation. Industry suppliers invest heavily in new technology, experience long product development and qualification timelines, and manufacture products designed for application to aircraft that see a wide range of conditions. Aerospace industry suppliers must also anticipate changes, which recently have been many. ■

SPECIAL-EFFECT COLOURS are being used increasingly for aircraft exterior topcoats by airlines and general aviation aircraft owners as a creative option. Coatings with ANDARO® special-effect pigments by PPG have visible light reflectivity of about 90 percent, compared with traditional mica aircraft coatings that have about 30 percent. Three Andaro colours from PPG's palette are, from top, Andaro Ming blue metallic, Andaro turquoise metallic and Andaro gloss yellow.

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EVA talks to Julie Voisin, Global Product Manager, Sherwin-Williams Aerospace Coatings



Giving permanence to designer dreams

On 24 February this year the aviation paint manufacturer Sherwin-Williams Aerospace Coatings introduced a new basecoat paint technology, which the company says, is designed to deliver a consistent and colourful solid, mica or metallic finish. Called the SKYscapes General Aviation (GA) Basecoat 855 Series, the new high gloss finish is something of a game changer for the sector, the company claims. EVA asked Julie Voisin, Global Product Manager at Sherwin-Williams about the rationale for bringing a new paint technology to market and about the current state of the market.

Q: Why the new basecoat technology, and why now?

A: We are always looking for opportunities to improve productivity for paint shops. The more aircraft they can paint in a year, the better it is for their profitability. At the same time, if the paint shop can shave days or weeks off a paint job, then that creates more slots and makes it easier and faster for customers to book their jets in to be painted.



Q: How did the new basecoat technology come about?

A: We took some inspiration from our vehicle fleet paint products and drew on some of that technology to take it across to the aviation sector. The key attraction for us was that our automotive products had been developed

to cater for the need for faster drying times and a very smooth coating. Developing these products for general aviation gave us the ability to offer the market a product that was easier and faster to apply.

Q: Apart from application speed and the ease factor, does the new product bring other advantages to aircraft paint specialists?

A: We have been able to add a large number of colours and special effects, such as micas and metallics to the product line. Our customers will all be very familiar with our mainstream product lines, but now when they want a unique look to the paint or a unique colour scheme, the SKYscape product will be their first choice.

Q: From a technical perspective, what is different about this basecoat product?

A: The real difference lies in the resin technology that underlies the paint. We put in a lot of technical work to ensure that we produced something that would dry faster when applied in smaller areas. You wouldn't use it to paint the whole fuselage of a large cabin jet, but you would use it on a helicopter or a light jet, where

you will have the proper balance between a fast drying time and the need to cover a specific area. It is a tremendous choice where the customer has specific colours that are being laid on to the design, such as stripes or overlapping areas of colour. Thanks to the resin technology that forms the body of the paint, it is very smooth to apply and it produces the outstanding, high gloss finish that many customers are looking for.

Q: What does the process of applying the paint entail?

A: The basecoat goes on first, which is the colour system, and then, when the basecoat layer is complete and the full design that is going on the aircraft is in place, the clear coat is applied over the top. The result is a very stylish and very hard wearing finish that can take the tremendous transitions from hot to very cold that a business aircraft endures as it transitions from the runway to a cruise altitude of, say 51,000 feet. (Above 30,000 feet the temperature falls to around -50 Celsius and gets progressively colder as you go higher).

The main point is that there is a lot of options for designers to work with, in this new product. Whether it be working with multiple colours or with micas or metallics, they have a wide choice.

Q: What is the drying time for this new paint?

A: A normal brand of paint for the aviation sector, will dry in around two to three hours. Our new product dries in 90 minutes. This is very important when the client has a design for the jet that has a number of colours, since otherwise you would have to lose time waiting for the underlying colour to dry before continuing. One of the helicopters I saw at the recent exhibition had 17 colours on it. Waiting for each of those layers to dry would be hugely time consuming for a paint shop, so this again, goes directly to profitability.

Q: Does it make the paint more costly when it involves developing special resins?

A: No. The thing that really drives cost in paints is not the body of the paint but the colour pigments. Some of these are very expensive. The



more exotic colours, involving deep shades of reds, yellows and oranges requires very expensive pigments, and if you add in special effects like micas or metallics, that drives the cost up still further. White is our number one best selling colour and it is also the cheapest, since the large amounts we sell mean that we make it in extremely large batches, which helps to drive down costs.

Q: You see a large number of paint shops. How busy is the paint side of things at present?

A: What we see is that the paint shops we work with are full, with customers waiting for slots to get their aircraft painted. I was at the recent Helicopter exhibition, and everyone there was talking about how busy the sector is right now. Also, you have to keep in mind the fact that one of the primary objectives in painting an aircraft, apart from giving it a fantastic, original look, is to protect the aircraft against corrosion. Repairing an aircraft once corrosion has set in is a far more expensive proposition than any paint job. ■





To be the best

EVA talks with Claudio Lasagni, CEO, Air Service Basel



Q: It is now two years since you last spoke with EVA. How have things been and what do you think the prospects are for 2016?

A: Well, to be honest, we are never totally satisfied and there are good reasons for always wanting to be better and do better in this industry. But we are very happy with the progress that Air Service Basel has made in the last few years. We have established ourselves at a good level and we have done it not by trying to be a low cost solution, but by constantly striving to deliver the best price performance ratio.

This is a tough thing to do, especially when there are competitors out there with the intent on cutting prices to unsustainable levels. We take a measured view on our pricing as we are offering a tailor made solution. We are not able to participate in pricing competitions with organisations that offer and require the bargain solution. We are trying to sell a very good service at a very

good price and clients see what they get for their cash. We develop partnerships which engage in joint business objectives ensuring a high level of mutual benefits and services. This brings long term commitment and understanding from both sides. What happens with suppliers in this sector that come in with rock bottom prices is that they end up not being able to provide the level of service that the client expects and that leads directly to unhappy clients - which of course, creates opportunities for us to grow our business.

Q: How much price pressure is there in your various areas of business?

A: We cover a number of sectors. In addition to our FBO here at Basel, we do some aircraft management and charter, and we provide an MRO service for our own fleet and for some clients. There is no doubt that there is over-capacity in the market and it is all about being clear about how you ▶▶

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▶ are going to compete. On aircraft management, for example, we are not going to get into heavy competition with major players who manage dozens or even hundreds of aircraft. We have some Falcons and Challengers that we manage for our owners but we do it for a good fee and we provide a high level of service. We are not charging the clients thousands of pounds for nothing. We see to it constantly that they get the best results for their money.

We are definitely not interested in being the biggest on the market. There are big FBO chains. That is not our interest. We are proud of being an independent operation, which is also a big selling point that is very much appreciated by our customer base. I see more and more clients that are very disgruntled at being caught up inside a big organisation that is just focused on being the biggest, and where the client really does not feel that they are getting the personal attention that you would expect when you ask someone to look after a multi-million dollar asset for you.

Q: The general consensus seems to be that business aviation generally had rather a disappointing start to 2016. What is your take on the current state of the market?

A: Whenever conditions get tough, you see over-capacity generating price wars, and there is now significant over-capacity in both the MRO sector and in aircraft completions and refurbishment. Particularly in the latter field if you do not have a strong pipeline of work already in place, the probability is that you are going to have huge problems. You do not want to be competing against new players in the sector setting up in Eastern Europe with a very low cost

base. You cannot beat them at that game and it is not our intention to try. I say: if you want to be a bargain player, then go for it, but that is not us. We are focused on a niche business that provides services to clients that want the highest quality of service and are prepared to pay for it, and this includes both high net worth individuals and corporate clients.

Q: What do you see as growth opportunities for you?

A: A year ago we started a ground handling business in a joint venture with CAT Aviation in Zurich. We have a 50% stake in that business and that was very much a new development for us. It has gone very well and has taken us into a new area. We will do this kind of venture again at some future point, in other locations if we see an opportunity to partner with an organisation of the quality of CAT Aviation, and if there is a clear strategic objective to the venture.

Q: What are clients saying and feeling about the current difficult market conditions?

A: There is a lot of concern out there. Our clients span a wide range. Those with a high net worth are not that concerned and indeed, some see opportunities in the current conditions. However, business clients that have just one or two aircraft, and where the last digit on the invoice really matters to them, have considerable anxiety about the future. Between these two extremes you have the middle range of clients for whom things still look fairly healthy. When conditions get harder, some corporations feel that it is not quite politically correct for them to be using the corporate jet, so they charter a lot more – and that is also good for us! ■



If you do not have a strong pipeline of work already in place, the probability is that you are going to have huge problems





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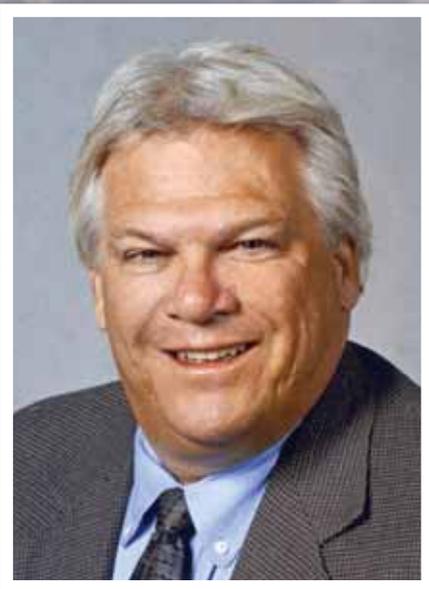
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Rebranded ALOFT soars on



EVA talks to John Martin, President and CEO of ALOFT AeroArchitects



PATS Aircraft has built up an enviable reputation for engineering excellence down the years, but that doesn't carry much weight in the VVIP aircraft interior design stakes. Rebranding it as ALOFT AeroArchitects has been a shrewd move to highlight the fact that the company now has 16 successful VVIP completions to its name.

Q: PATS Aircraft was such a well-known brand in the industry that it must have taken considerable courage to rebrand the company afresh. How has it gone?

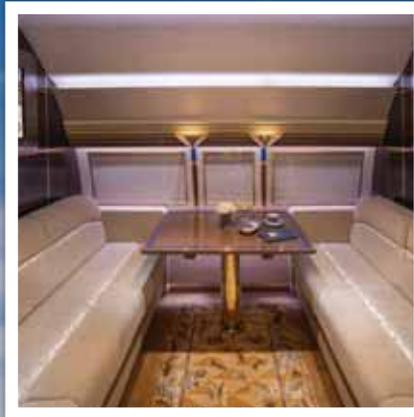
A: We have had a tremendously favourable reaction from the market to rebranding. We have kept the PATS brand for the auxiliary fuel tank business, because that is where it works well. But rebranding the company as ALOFT AeroArchitects highlights where we see a major part of the business going forward, which is in the VVIP completions space.

As PATS, we got started in the completions business because we were getting all these green aircraft delivered to us to have auxiliary

fuel tanks installed in the belly, then they'd fly off elsewhere to get other engineers, designers and completions centers to spec out and build the interior for them. We looked at the aircraft leaving our hangar, and we thought, hey, we could do that too. Why not? However, as we performed more and more completions, we noticed that people were still thinking of us as PATS, as an engineering company and a fuel tank company, not as a top-of-the-line completions house. So that had to change.

Q: Can you take us through the way the completions business developed in a bit more detail?

A: Sure. Our founding father is Harvey Patrick, an entrepreneur who began engineering special applications and products for the aviation industry in the early 1970s. For three decades PATS provided a range of aux fuel systems to the retrofit market. Then, in 1998 Harvey was asked if he could design an auxiliary fuel system to be fitted into the belly of Boeing (and Bombardier) business jets to provide these larger business jets with more range. So,



we were awarded the sole source contract for providing these auxiliary fuel systems, which we maintain to this day. Boeing also indicated that it did not want to redesign their aircraft assembly systems to install the tanks in place while the aircraft was in production. So they asked Harvey if he could find a hangar and accomplish the installation, if Boeing flew the jets to PATS as they came off the line. Harvey found a hangar nearby in Delaware, so that is how PATS got into the hangar and installation business. We are still installing the auxiliary fuel system on every BBJ today.

In 2002, we developed the idea of expanding PATS Aircraft by bidding for the completions side of these aircraft that were being flown to us. When we work on a green aircraft to install the auxiliary fuel systems, we have to remove the floorboards and the entire interior to put the tanks into the belly, and we had most all of the engineering skills required. All we needed to do was to develop the design and rendering capabilities, and build our relationships with the best monument providers in the business aviation space. We went about

this with the same precision that we brought to our engineering work generally, and we found we were able to design, engineer and build some of the very best interiors for VVIPs and Heads of State.

The result is that we have just delivered our 16th Boeing BBJ to a very satisfied customer, the Sultan of Johor. We have built up a very solid reputation as a company that can do a tremendous job for a VVIP or government customer on the completions front.

We have a furniture and interiors group in-house, and we could have carried out all the monument building and cabinetry in-house if that was what we wanted. But the problem with going down that route is that you have to add to your skilled people in-house, and then when the market goes through one of its inevitable down cycles, you struggle to keep everyone busy.

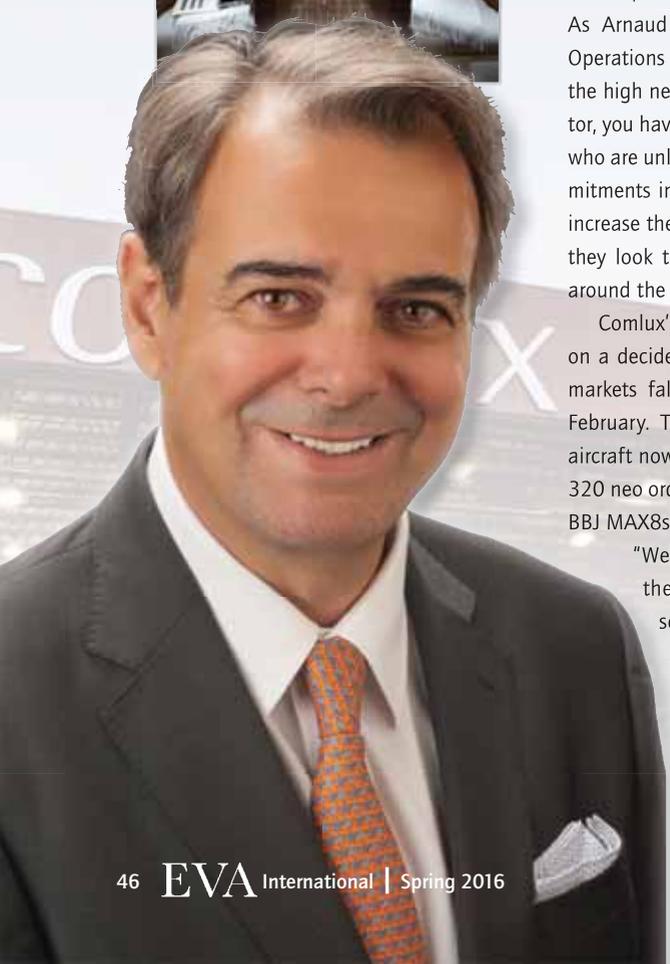
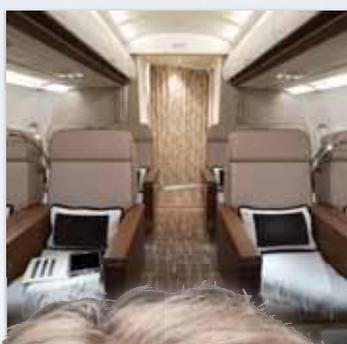
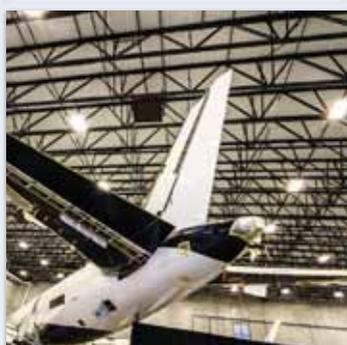
Our approach is to specify exactly what our design calls for, then we leave it to the best furniture builders in the sector to provide the finished articles for us, which we then install and certify in the aircraft. We do an excellent job of

project managing the whole completion project, so the owner does not have any concerns or issues about what we do in-house and what we contract out.

Q: What happens when the owner has his or her own designer?

A: In many cases, the owner will indeed have their own designer and if that is the case, we will very happily work with the owner's chosen designer. We know most of the interior designers in the industry, and we are quite at home working with them as opposed to doing it all ourselves.

One of the really important features of our service here at ALOFT is that, with our FAA-awarded ODA (Organization Designation Authorization), we are able to completely certify all the work that we do (via STC issuance). We have about 60 engineers on board the ALOFT team, and we also employ some really great project management people. That helps us to stand out above the competition.... thus, fully supporting our new name, ALOFT AeroArchitects! ■



Faith in the future

Anthony Harrington talks to Comlux Aviation's Arnaud Martin, Executive Vice President, Operations

For many companies in the business aviation sector, 2015 turned out to be a disappointment. The slowdown in China, the continuing collapse in the price of oil and heightened volatility in global equity markets prompted many potential corporate buyers and high net worth individuals to delay spending on private jets. However, some players in the sector are opting to look on the positive side and build for the future with orders for new VVIP aircraft.

One of the boldest moves has come from Comlux The Aviation Group, which, in February 2016, placed an order for three Airbus ACJ neo aircraft, with green deliveries starting in 2019. As Arnaud Martin, Executive Vice President, Operations notes, if you are solidly focused on the high net worth and high-end corporate sector, you have the benefit of working with clients who are unlikely to cut back on their travel commitments in a downturn, and who may in fact increase their requirements for private flying as they look to capitalise on falling asset prices around the globe.

Comlux's order comes despite 2016 opening on a decidedly wobbly note, with global stock markets falling sharply in January and early February. The company's order book of VVIP aircraft now stands at six aircraft, with the ACJ 320 neo orders adding to orders for two Boeing BBJ MAX8s and a Bombardier Global 7000.

"We are positioning ourselves with these new products to be ready to serve our customers. This is all about being ahead of the market and the new green deliveries will give our completions centre in Indianapolis a tremendous pipeline of work," Martin says.

Of course, Comlux is also giving itself the option of being able to sell on 'ready-to-fly', highly desirable, long-range luxury VVIP jets at a premium price at a time when high-end buyers seeking new VVIP jets are likely to be facing a wait of three to four years before they could take delivery of a green aircraft. As Martin says, it's all about being ahead of the market. "What we are doing is looking to optimise our business around all the skills that we have in the group, which includes aircraft transactions, VVIP operations, high-end charter and completions. These orders go directly to all these aspects," he adds.

Martin acknowledges that current market conditions are challenging. "For years now the economies in our major markets have been making very slow progress. There is cause for concern in the Middle East with the very low oil price, but that is still one of our more lively markets and one where we are very well established. It continues to be a very good market for us, and this is why, despite the difficult economic climate, in January we announced the launch of a new VIP Service Centre in the Middle East," he comments.

The new service centre is a joint venture with Texel Air, which is based at Bahrain International Airport. Comlux will look after system upgrades and cabin modifications for VIP clients, while Texel Air provides hangar, maintenance and certification services at its 3,200 square metre facility. Texel Air has a Bahraini Part 145 approval and is expected to get EASA Part 145 certification by the third quarter of this year.

"Ramping up our MRO and servicing capabilities in the Middle East with Texel Air is very important for us. We have a lot of customers in Asia and the Middle East, and if there are no ►►

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► alternative MRO facilities for them other than to fly to our centre in the US for maintenance, that's not good. With Texel Air, we can do any VIP cabin upgrades that a client requests. We will fly in a specialist team from our Indianapolis centre, which gives us both a local presence with all things MRO related, and the ability to add specialist skills as they are required," he notes.

Comlux is working hard not to allow itself to get trapped by sluggish market conditions. "We – and business aviation generally – have had a difficult context to work with for years now, but we have put our company in shape to deal with a difficult market. So we are not counting on any sudden rebound. Instead, we are actively looking for opportunities, and we are also backing new products over old," Martin says.

The 320 Neo, for example, he points out, is much better than existing products in its category. As such, as this becomes obvious to the market, it will energise sales. "It is reasonably certain that we will see a group of existing owners of jets that will want to upgrade now the Neo is available. Because we have our completions centre in the US, with an established

reputation for doing green aircraft completions on ACJs and BBJs, owners know that we have the skills to design and complete a unique aircraft for them," he adds.

While Gulfstream has done very well so far with G650 orders, Martin argues that the BBJ MAX and the ACJ Neo deliver levels of space and comfort that cannot be matched by a G650. Range is a more complicated comparison. The G650's range is 12,960 kilometres, which comfortably outclasses the ACJ 320 Neo's 7,800 kilometres and is more than a thousand kilometres further than a BBJ's 11,840 kilometre range (the comparisons assume eight passengers in each case).

"I think a lot of potential clients will choose comfort over the additional range provided by the G650. For most passengers any trip of 6,000 kilometres will be one of the longer missions they would expect to do in their lives," Martin comments.

For commercial airlines fuel efficiency is an important consideration when choosing a jet, and if fuel efficiency were the clincher, then the G650 would win handsomely. But as Martin notes, if you are only flying 500 hours a year, the fact that the ACJs and the BBJs are about

15% less fuel efficient than the G650 does not provide enough cost savings to be a decisive factor for potential buyers.

Another strong plus point for the ACJs and BBJs is that both Boeing and Airbus are developing better features, such as lower cabin altitudes and greater airflow. "To this we can add air purification systems at the completions stage, so that the jet really does become an apartment and office in the sky," Martin adds.

So what is next for Comlux? Martin says that given the recent major moves the company has made, the ensuing months will be mainly about capitalising on the investments and initiatives made so far. This will not hinder plans to expand the aircraft management and charter operations side of the business. "We are always looking for opportunities to add managed aircraft to our charter fleet. We're not looking to grow to the size of Lux Aviation, with 250 aircraft in its managed fleet. Our target is to aim for around 45 aircraft, specialising in the WVIP market, with large jets, and run a boutique service for clients. As such we expect to increase our managed fleet steadily," he concludes. ■



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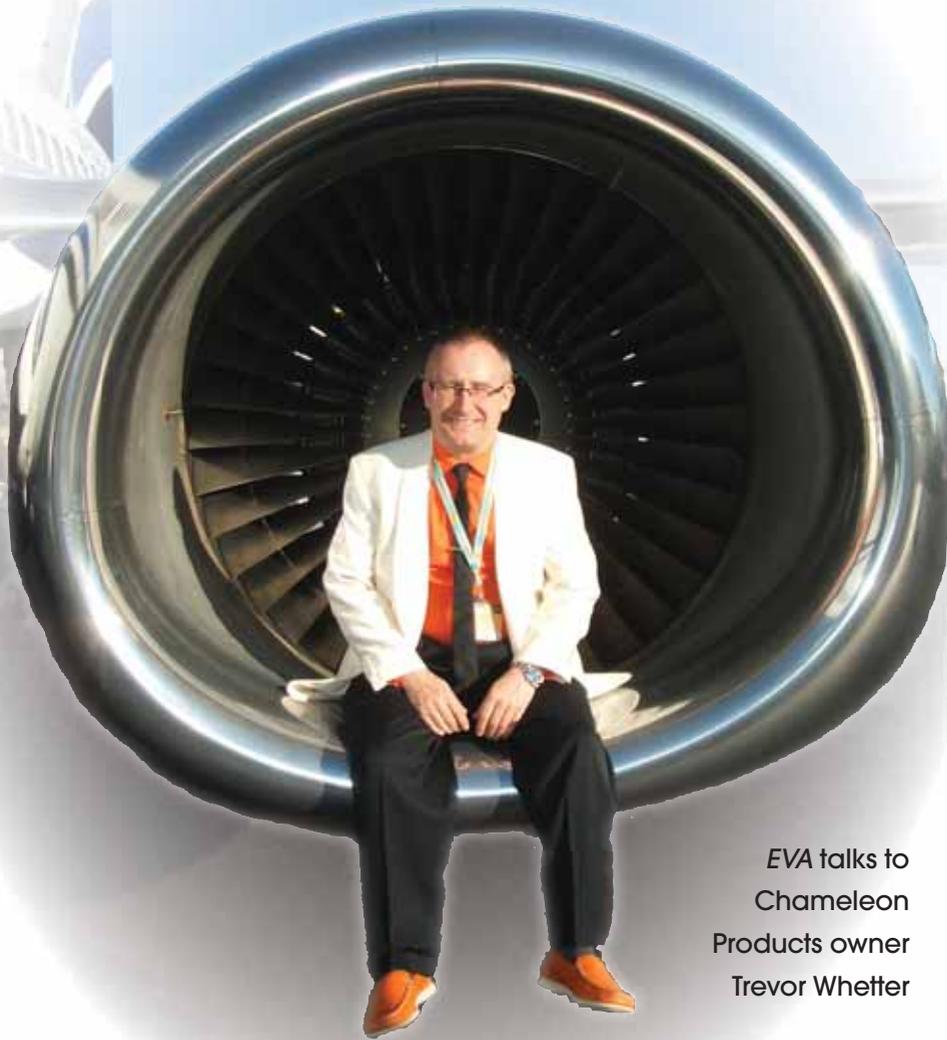


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EVA talks to
Chameleon
Products owner
Trevor Whetter

Skin deep beauty

Q: How long has Chameleon been going for, and what do you offer completions houses?

A: Chameleon Products was founded in 2000 with the aim of bringing a very high level of technical innovation to both the business aviation and the commercial airline markets. Its unique contribution, which underpins much of our product portfolio, is the ability to take any product, however complex the shape, and enhance it by applying a pattern to the entire surface. We do this using the Chameleon water-and-ink-based transfer system, and the pattern is then sealed with a hardened lacquer, which gives it durability and longevity.

Q: Everything that you put into a business jet during the completions process has to be approved and certified. How do you deal with this side of things?

A: Our process involves creating what is effectively a painted and printed surface. What aviation authorities are looking for from that kind of product is to be satisfied that the flammability test properties of the coated product meet the regulatory requirements for the aircraft. The best way of approaching certification, then, involves negotiating a test programme with the relevant aviation authority before you start the completions process. We

We'll work very closely with customers to help them satisfy the regulators, by providing either test specimens or flammability reports as required

have already carried out detailed testing of our processes to the latest FAR 25 853 requirements for flammability, toxicity, smoke density and OSU on the most usual materials to which our product is applied. These include composite board and polycarbonate.

Basically our testing shows that our processes have very little additional effect on the flammability values of the original surfaces. We'll work very closely with customers to help them satisfy the regulators, by providing either test specimens or flammability reports as required.

Q: It sounds like an extremely versatile coating product. What options does it open up for designers?

A: Because weight is such a critical factor for aviation, being able to put any pattern, be it a wood-like surface or a finish that looks exactly like marble, on any surface, creates a huge range of options for designers. With the hard lacquer finish, you can't easily tell that it is not the real thing. So this enables designers to create very luxurious-looking finishes with a fraction of the weight budget that they would otherwise incur.

We have also recently added texture to the process so we can actually make the product feel like wood, with the grain raised. We really score with this product over the real wood veneers that have dominated the industry until now. The problem with real veneers is that over time the veneer either cracks or it suffers bleaching from the sun, which lowers the tone of the aircraft interior enormously.

As a result, we have several projects ongoing at the moment that involve stripping out ageing veneer surfaces and replacing them with our technology. Where the underlying veneer is ▶▶



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Our latest product is called Famoskin, a product that feels like very soft leather and has excellent durability and strength, despite being just 0.8mm thick

▶ still in good shape we can apply our decoration directly over the original veneer. This refreshes the whole aircraft and gets rid of the problem once and for all.

Q: What's next from Chameleon?

A: In addition to our printing and coating processes, we are constantly working to develop new, innovative materials for completions houses and designers to work with. Our latest product is called Famoskin, a product that feels like very soft leather and has excellent durability and strength, despite being just 0.8mm thick. It works well as a soft covering for seats or where you might use leather as an upholstery option on interior monuments or side walls.

Once again, we have had the product comprehensively tested, and it has passed the CS25.853(a) 60-second and 12-second vertical burn, and smoke emissions testing. So getting it certified for business aviation will be very straightforward. It is cheaper than conventional leather.

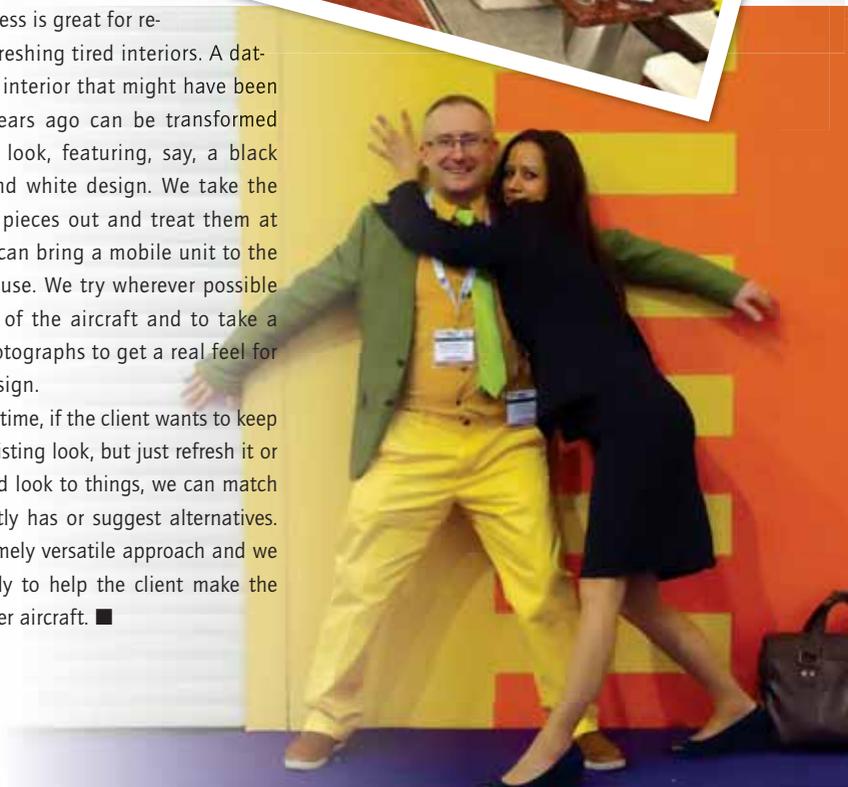
We are also developing a new product called Famotex, a foam replacement product. Standard aircraft foam is not a very healthy or environmentally friendly product. Our foam replacement system allows air to flow through it, which helps the product to absorb body weight really

well, and makes it ideal for crafting seating, for example. It is also flame retardant, when used in combination with the right fabrics. Famotex is undergoing testing at present.

Q: Is your process used only for new jets or does it work on existing furniture and monuments?

A: Our process is great for renewing and refreshing tired interiors. A dated wood-based interior that might have been in vogue 20 years ago can be transformed into a modern look, featuring, say, a black carbon fibre and white design. We take the veneer-covered pieces out and treat them at our site, or we can bring a mobile unit to the completions house. We try wherever possible to do a survey of the aircraft and to take a great many photographs to get a real feel for the existing design.

At the same time, if the client wants to keep the aircraft's existing look, but just refresh it or add a new wood look to things, we can match what he currently has or suggest alternatives. This is an extremely versatile approach and we are always ready to help the client make the most of his or her aircraft. ■



Training gets creative

The dramatic drop in oil prices and the scaling back of offshore oil and gas exploration has had a predictable ripple effect on helicopter sales and operations. Meanwhile, the business jet sector continues to look for the elusive upward trend against a gloomy global economic forecast. To help fill their classrooms and simulators, training companies are getting creative with new ideas to improve pilot and maintainer skills.

FlightSafety International has developed and bundled four new advanced training courses into a Master Aviator certificate programme, modelled after its popular Master Technician scheme which has produced more than 3,000 graduates. The four one-day courses include Rejected Take-off Go/No-Go, Crew Resource Management/Human Factors Line-Oriented Flight Training (LOFT), Energy Management, and Upset Prevention and Recovery Training (UPRT).

"The Master Aviator courses are about rounding out the knowledge of the pilot," said Steve Gross, Vice President, Commercial. "You really have to understand the basic airplane first." An initial type rating in the aircraft and at least one recurrent training session are required before enrolment.

"We took a long look at some of the major issues that are causing accidents, not only in business aviation but in the commercial world," Gross noted. For example, on the go/no go issue, one manufacturer found a significant fatality increase for pilots who tried to stop after V1. "We train them to get the airplane airborne, get it cleaned up, get it back around and on the runway, typically within 90 seconds."

The LOFT "is taking CRM to the next level". It might involve an ocean crossing with loss of pressurisation, perhaps at a time when the aircraft must descend through the flight 'tracks' followed by commercial airliners – "pretty critical because the spacing is so tight. You have to work together as a crew to be successful."

The energy management course is getting back to basic physics, kinetic energy, aircraft mass, pitch angle, and planning ahead for stabilised approaches.



The UPRT course, which is also about understanding aerodynamics but in a crisis circumstance, is currently available only for the Gulfstream GV and G550 aircraft, but Gross told EVA that FlightSafety is working with OEMs to incorporate the capability on other types.

In the rotary arena, New York-headquartered FlightSafety will offer Level D simulator training for the Airbus Helicopters EC145 at Metro Aviation's Helicopter Flight Training Center in Shreveport, Louisiana. They have also received US Federal Aviation Administration (FAA) approval for a Level D Sikorsky S76C+/C++ simulator in Singapore.



Goose Creek, South Carolina-headquartered TRU Simulation + Training, Textron's new de facto provider of simulators and training services for Beechcraft, Cessna and Bell Helicopter aircraft, is rapidly expanding the offerings at its ProFlight training centres in Carlsbad, California and Tampa, Florida. By the end of 2016, it plans to add a Cessna Citation CJ4 simulator at the West Coast facility as well as Citation CJ3+ and Citation M2 sims on the East Coast. The Tampa site, opened last year, is also the first pilot training centre to offer instruction on the new Rockwell Collins Pro Line Fusion-equipped King Air 350i aircraft.

Ian K Walsh, TRU's new President and CEO, told EVA: "Our strategic focus right now is to build the simulator portfolio we need to support the current Textron product lines. We are positioning simulators geographically around the world to support our customers' training in a regional environment."

TRU has provided a CJ3 full-flight simulator to business aircraft operator Star Wings in Dortmund, Germany. TRU is also producing a Bell 429 simulator destined for Valencia, Spain later this year.

In Wichita, Kansas, TRU took a page from the FlightSafety business model – a Part 147 maintenance training centre. The 35,000 square-foot facility opened in December with courses for the King Air 350i. This year, TRU plans to add

courses for King Air 250 and C90GTx, Beechcraft Baron and Bonanza, and the Cessna CJ series, as well as McCauley propeller courses.

CAE has done "a complete review and refresh" of its business aviation general courses, according to Camille Mariamo, Vice President and General Manager, Business Aviation, Helicopter, and Maintenance Training. The number of alternate recurrent courses has been expanded from 26 to 41 modules, and includes such topics as rejected takeoff, fire in flight, cockpit distraction management, and operations in polar regions and areas of magnetic unreliability. Mariamo said many of the courses are qualified to International Standard for Business Aircraft Operations (IS-BAO) criteria.

CAE is apparently ignoring the downward trend in oil and gas. In March it received Airbus Helicopters' blessing for its Oslo, Norway facility as an approved simulation centre for H225 recurrent training. CAE is the first independent simulation training provider to receive such distinction.



Nearer to its Montréal, Canada headquarters, CAE will operate a new helicopter training and research and development (R&D) centre in Mount Pearl, Newfoundland on behalf of the Hibernia Management and Development Company (HMDC) consortium of large offshore oil

firms. A Sikorsky S92 simulator will feature the first approved night vision training capability in Canada. HMDC helicopter service provider Cougar Helicopters will train its pilots at the centre, which will be located adjacent to the new offshore safety and survival training centre of Falck

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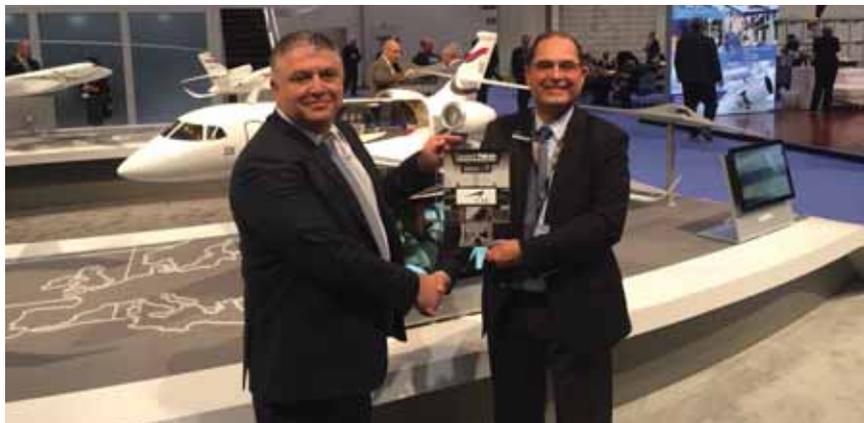
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Safety Services Canada, which includes a wave pool to train safe exit of workers from helicopters in various environmental conditions.

A new civil helicopter full-flight simulator manufacturer sprang up this year in Europe. Reiser Simulation and Training, headquartered in Berg, Germany, is building its first Level D device for the Airbus Helicopters model H145 (formerly Eurocopter EC145T2). The simulator will be deployed at the Helicopter Emergency Medical Services (HEMS) Academy, which was started several years ago at the Bonn-Hangelar airbase by the air ambulance arm of the German automobile club, Allgemeiner Deutscher Automobil-Club (ADAC). ADAC operates more than 50 helicopters.

Reiser is a 25-year-old, 200-employee family business which started by doing cable harnesses and other aircraft components and more recently avionics test equipment, simulator components, full-scale helicopter maintenance training rigs for the NH90, and flight training solutions for the Pilatus PC-21 turboprop and Eurofighter Typhoon.

Rather than purchase pricey OEM data packages, Reiser has opted to do its own data acquisition and flight modelling. "We decided that in order to provide the utmost in realism and also provide a cost-effective solution for the long term, we would develop our own data model of the aircraft," said CEO Roman Sperl. "We performed comprehensive data acquisition through an extensive series of flights on a specially equipped H145. Our team of experts put the helicopter through a full range of flying scenarios under a wide spectrum of conditions and mission situations."

The H145 simulator will feature Quantum3D's Independence IDX 8000 visual system

for out-the-window and night vision capabilities, driving 15 visual channels. The sim is scheduled to be installed at the ADAC HEMS Academy in 2017 and will operate on a 'power by the hour' model, with ownership retained by newly-formed subsidiary Reiser Training Services.

Thales has achieved European Aviation Safety Administration (EASA) Level D approval for its Airbus Helicopters H225 (Eurocopter EC225) Reality H helicopter simulator in Stavanger, Norway. Thales' launch customers include Blueway Offshore Norway AS and Dancopter in Denmark.

The simulator will train pilots on multiple missions such as oil and gas or search and rescue (SAR) in the North Sea. "We want the training here to become a gold standard for any operator wishing to have their pilots ready for any mission in the harshest and most challenging environments imaginable," said Jean-Jacques Guittard, Thales Vice President and General Manager of Training and Simulation.

Thales opened its first helicopter training centre in Albertville, France in 2014 with a full motion Level B Airbus AS350 AStar simulator. The next Thales centre will be launched in Australia, although no aircraft type nor date have yet been made public.

Frasca International, based in Urbana, Illinois, has developed a couple of innovative technologies to improve the training effectiveness and efficiency of pilot training for light helicopters. A unique 6-inch stroke mini-motion system (compared to the typical 60-inch stroke system of Level D full-flight simulators) is being applied to flight training devices (FTDs). CEO John Frasca told EVA, "With this small motion platform, we can put an onset cue on when it should be there - when the pilot's mind is expect-

ing it to happen." The first short-stroke system is on a Bell 206L Level 7 FTD for Air Evac Lifeteam in O'Fallon, Missouri.

The company's other new twist, SimAssist, is a software programme that can provide automatic assistance to the student in real time by adapting to the student's task proficiency. "SimAssist dynamically monitors how the pilot is flying, and if he's doing really poorly it stabilises the helicopter," explained Frasca. "It's much like a flight instructor guarding the controls or taking over when things get out of control."

Frasca has enjoyed wide-ranging success in the helicopter market recently: an R44/Schweizer S300 convertible Level 5 FTD for Xilin Fengteng GA's Guanghang, China facility; an AS350B Level 7 FTD for HNZ Group, to be installed at Edmonton airport; a Bell 407 GX full-flight simulator to the Bell Helicopter Training Academy in Fort Worth, Texas; and a Bell 407 flight and navigation procedures trainer (FNPT) II to Horizon International Flight Academy in the United Arab Emirates.

On the fixed-wing side, a Frasca Cessna 172S Level 6 FTD with Garmin G1000 avionics and G700 autopilot, installed at the Korean Aerospace University flight training centre on Jeju Island, is being used by Korean Air Lines for its initial pilot training programme.

Elite Simulation Systems in Dubendorf, Switzerland, is developing a new helicopter training device in the advanced aviation training device (AATD)/FNPT II category, but with a sophisticated visual terrain database developed in-house and based on a powerful gaming engine. The visuals will reflect the wide variety of mountain, valley, and urban areas encountered by Swiss and European helicopter operators, as well as the extremes of weather conditions. Elite is working with Next Generation Flight Training GmbH in nearby Cham on an aeronautical decision-making course for pilots.

Finally, SimCom Aviation Training Centers has expanded its simulator base. A Citation Mustang simulator is being installed this year in the Phoenix, Arizona area. A Level D Citation XLS sim is delivering training in Orlando, Florida. And there's a Garmin G600/GTN-750-equipped King Air B200 simulator at the company's Dallas location. SimCom currently operates 57 simulators at its three US sites. ■



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Delivering on a promise

EVA talks to Sami Samola, Manager of Business Flights FBO and Head of Apron Services at Finavia Corporation, based at Helsinki Airport



Q: What is it that passengers and jet owners want from an FBO?

A: The primary thing we see is that a rapid response to handling requests and the delivery of high-quality services are the key points in making customers happy. Passengers want to be sure that everything goes smoothly when choosing the FBO and business jet owners want their aircraft to be in good hands. We believe that all customers want and expect to get honest responses to their inquiries. So a very strong principle of ours is, "Do not promise until you are sure you can deliver!"

Q: How important is catering for passengers and flight crews to your FBO philosophy?

A: High-quality catering is important to every flight. It is the final topping to a top-class customer experience. Whether it is the passengers or the flight crew it is very important to provide tasty in-flight meals.

We try to encourage our customers to order some local specialties when visiting Finland. We can always provide standard high-quality catering but why not try something different? For example, hot smoked salmon is one of the Finnish specialties that is difficult to get from other locations.

Q: What are the logistical challenges in providing a completely seamless one-stop service for operators and their clients?

A: Our goal is to provide a smooth and easy combination of services to our customers. All services are provided within a short distance. For example, border control and Customs are on-site in our own terminal to ensure that it is easy for clients to arrive or depart at any hour.

Perhaps our biggest and maybe the only serious challenge we face is providing a rapid service during Helsinki Airport's rush hour.

Helsinki Airport is open 24 hours a day, but it is a busy airport and rush hour is really busy. If customers need to depart during rush hour, our staff have to be on top of the situation to make sure that everything goes as smoothly as possible. In this matter we believe that honesty is what the customer needs. We always tell our customers if there is the possibility or likelihood of any delays that could impact the time of their planned departure. This way they can adjust their schedule to avoid any inconvenience.

Q: How do you go about building up relationships with operators, charter companies and owners? What is involved in promoting the FBO to the world?

A: The best way to build up good relationships with our customers is to provide high-quality services every time. They need to feel that they are really being taken care of. We need to consider everyone as an individual and cater for their specific requirements. There is no one size fits all in business aviation.

To market Finavia to the world we focus on attending shows and expos, which is a great way to meet our clients and potential clients in person. We also see the importance of advertising in the top business flight publications to get our services well known within the industry. But far and away the best advertising is the service itself.

Q: How can an FBO enhance its reputation and standing with clients?

A: The simple way is to provide the services requested to a high standard and to give the

customer just a bit more than they expected!

Q: How important is the external and internal appearance of the building? Should the FBO flight lounge facilities, for example, aim to be palatial or simply smart executive? Is it important to have a hotel dimension so that VIPs can sleep over if necessary, or is that just adding a prohibitive cost level to the business?

A: The appearance of the facilities is important but it is even more important that the FBO building functions efficiently in daily use. In our experience, passengers are not looking to spend any extra time in the FBO building. In Helsinki, the distance between the aircraft and the limousine can be as short as 60 metres. For those occasions when passengers need to stay at the FBO, we have high-class VIP lounges which we can make available for an additional charge. This way we can keep standard prices at a very reasonable level.

When it comes to sleepovers, our airport hotels can provide the high-level accommodation that our customers need. It is better for FBOs to focus on the services they know best and to leave accommodation to the specialist hotel chains.

For the flight crews we try to provide a service level that makes them feel almost like they are at their home base. We have crew lounges, refreshments and relaxation rooms for the crew members to use.

Q: What have been the major challenges in growing Finavia's standing and services for the business aviation sector?

A: The biggest challenge is to make operators in both the East and the West aware of the perfect global location and excellent 24-hour service provided by Finavia Business Flight Centre. ■



Keeping momentum

Michael Perodeau, Vice President, Marketing at Pratt & Whitney Canada, talks to *Anthony Harrington*

Q: The new year has not started well for business aviation. In mid-February Bombardier announced it was laying off a further 1,000 workers, this time at its Belfast airframe assembly plant. How do you read the prospects for 2016?

A: When a company is facing those kinds of financial challenges, workforce reduction is a normal response. The whole industry, not just business aviation, is trying to adjust to what low oil prices mean. What we are seeing, really, is the continuation of the uncertainty that has been plaguing us all for a long while now. One of the big missing ingredients as far as the business jets sector is concerned, is the return of business confidence. People have to be confident of their forecasts and their view of their markets before they make the necessary decisions about committing to capital investment in new business aircraft.

On the plus side, we are definitely seeing some recovery in the US market, which, as we all know, is the biggest global market for business jets. That recovery is long overdue and very welcome. But overall, the world still seems to be uncertain as to where economies are going.

Q: The PT6 is now in its 53rd year, having celebrated its 50th anniversary in 2013. There has been a major announcement from GE about its new Advanced Turboprop (ATP) engine, supported by the fact that it won



the competition to power Textron's next-generation single-engine turboprop aircraft. How do things stand now?

A: As always, we continue to invest in new technology for the PT6, continuing its evolution. We announced, at NBAA in November 2015, the new PT6A-140A turboprop engine and the PT6A-140AG variant - bringing the world's most popular turboprop family to more than 70 engine models strong. The new engines set the benchmark for performance and fuel efficiency delivering 15 per cent more power and five per cent better specific fuel consumption (SFC) We have an active competitor in GE and we are

certainly not going to let GE nibble away at our market without competing strongly. In fact, we have always had competition on the PT6, though the strength of that competition has waxed and waned over the years. John Saabas, our CEO, has made it clear that no one is asleep at the wheel here. Competition is, of course, a good thing for the industry. It keeps everyone on their toes.

Q: Let's turn to the PW800. What is the progress there?

A: The PurePower® PW800 engine programme is going very well. We now have three aircraft up and flying and we are past the 500-hour flying time mark with those three aircraft. This represents more than 1,000 engine hours, given that these are two engine aircraft. The rate at which we are racking up flight hours shows that things are progressing very well.

The PW800 was designed from the start with ease of maintenance very much in mind. We have focused very intensely on factors such as reliability, durability and accessibility. There is a very large access panel, for example, that lets the service engineers look right into the core area of the engine. We have put steps on the lower fan hatch doors to make the mechanic's life that much easier. The engine has very powerful FADEC™ and engine monitoring, plus extensive in-flight diagnostics and health monitoring. Ground-based services that use

and analyse this data to spot proactively where problems may be building up will be part of our service capability for the PW800.

I would add that we already have the world's largest service network for engines in our market. We have a global footprint, between our own facilities and those other players that are affiliated with us, which means we are available anywhere in the world for our customer base.

The other great thing about the PW800 is that it is an on-condition engine, which means that service and maintenance milestones depend on how the engine is used. If operators are using normal levels of thrust and operate the aircraft in typical environments, we expect the engine to stay on the wing a very long time.

Now that the flight test programme is in full swing, we are able to carry out an extensive validation of how the features we put into the engine are working in practice. So far everything is panning out very well and we are getting great feedback from Gulfstream, as the launch customer, on how well it is working on their test aircraft.

We are quite well prepared now for its ultimate entry into service. We are busy putting in place the training packages for aircraft on ground (AOG) support, and setting up Maintenance, Repair and Overhaul (MRO) capabilities so that everything is in place when deliveries begin. We have already started training our field service network, so the infrastructure is in place to provide seamless support.

In parallel with training up the ground teams we are working on fleshing out our ESP® PurePower® PW800 engine service plan, and we are working with Gulfstream as we formulate the services that we add into the service plan package. We are talking to some Gulfstream customers and to the company itself, with the aim of establishing the most comprehensive service plan in the industry. Clearly, our goal is to set new benchmarks for service there too.

Q: Pratt & Whitney Canada has launched a number of new engine programmes down the years. How many of these new programmes have there been?

A: In terms of new engine programmes, we have actually launched a total of 100 new engines over the last 25 years. This includes a



combination of clean-sheet, new engines, and derivatives of these engines. It is worth emphasising that a major derivative could well be considered a new, clean-sheet engine in its own right. I suppose, in summary, you could say that we have launched several new families of engines and dozens of new centre-line and major derivatives of those engines.

Q: What generally prompts or inspires P&WC to embark on a new, clean-sheet engine?

A: There is always an ongoing dialogue between our technical development folks and our market strategy people. This is a continuing process and what we are looking for is to identify the point at which technologies that our engineers are playing with in the lab have reached the maturity point where it makes sense to launch an actual, new engine product. The technical things we play with can include aerodynamics of the engine, size, thrust levels and bypass and pressure ratios. We try to balance all that against Original Equipment Manufacturers (OEM) considerations about weight and range and speed, along with the engine's 'green' pedigree and its fuel efficiency. Then you try to put together an engine with the best balance and combination of features for a particular segment of the business aviation market.

Where we are fortunate is that a lot of the basic technologies can go on many different types of platform, and some of the engine architectures can cross over from one segment to another. For example, the PurePower® PW800 core leverages Pratt & Whitney's latest technology introduced on the geared turbofan technology. The PW814GA core is the heart of the C Series engine and also the Embraer 195-32. Basically, the more you are in a position to leverage and reuse your technology and architectures, the more you can make things happen that would otherwise be cost prohibitive.

Q: One final question: what impact do you think the new jets that are close to being rolled out into the market will have? Will they stimulate sales?

A: There is no doubt that the market tends to be buoyed up by the introduction of new aircraft models. The Latitude, from Cessna, has been doing very well. There are good sales and we are very pleased with that. The medium and light segments are now showing some signs of life, and that is very pleasing. The Phenom 300 continues to sell well and Dassault with the Falcon 8x, which is certifying this year with our engines on board. Dassault has a very active flight test programme in hand that is going very well, so there are actually a lot of positive things happening in the market. ■

New models just keep coming



EVA talks to Tom Perry, Textron VP of Sales, Europe

Q: We are now just about through the first quarter of 2016. What is your take on the year so far?

There is no doubt that the market could always be better, and that is certainly true of current circumstances. However, we are quietly optimistic. We don't have any major concerns about being able to deliver what we are manufacturing this year. In 2015, which wasn't the easiest of years, we succeeded in delivering everything that we needed to, and we expect to be able to do the same across our jets and turboprop portfolios.

Q: What have the highlights been for you and Textron so far?

A: Obviously we were delighted that the Latitude received EASA certification in February, having been certified by the FAA in the middle of 2015. We had already begun deliveries in Europe prior to this, though these were not on an EASA registration. Of course, the owners might choose to convert across to EASA now.

It was very exciting for us that we managed to deliver 16 Latitudes by the end of 2015. It is interesting to note that clients are definitely motivated by the latest products. If we look back at all the aircraft we sold in Europe in 2015, some 70% of that sales book consisted of models that had been certified during the course of the last three years. Some of

A photograph of a Citation Longitude aircraft on a runway, viewed from a low angle. The aircraft is white with blue accents and is positioned on a long, straight runway that stretches into the distance. The background shows a green field and a clear sky.

We unveiled the Longitude at NBAA last year. This has a 3,400 nautical mile range with the first flight expected in the summer of this year

these might have a pedigree, such as a Sovereign becoming a Sovereign+, but the new features are definitely what make these models attractive.

We are very proud of the fact that we have certified eight new aircraft models over the last few years, including a couple of turbo-props. This is very much a feature of Textron's strategy: to work constantly at bringing new models to market. We have a proven capacity to get new aircraft certified and to do it in a very fast time frame. The Latitude, for example, took just three and a half years, from the date of the announcement of the project, to achieve certification.



Q: What does the Latitude bring to the market?

A: Given the size of the cabin, the Latitude is an extremely efficient aircraft. It has the same wing as the Sovereign+, which gives it a high cruise speed and a range of 2,850 nautical miles with four passengers. The full fuel payload

is 1,000 pounds, but the really important point is that it can operate off runways that are less than 3,600 feet in length, which opens up a very large number of airports around the world. Importantly, it can operate into La Môle airport in Saint-Tropez, an extremely popular holiday resort

with a very challenging approach.

We are looking to get certified to operate into London City in the coming months. This last is a formality, really, as the only model in our line-up that cannot do the steep approach demanded by London City is the Citation X+. ▶▶

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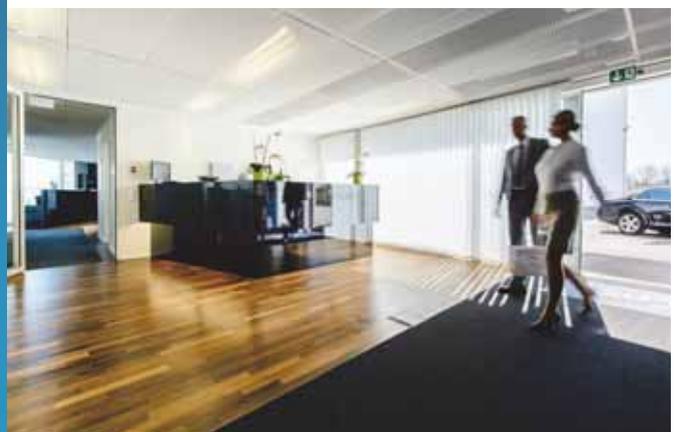
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► **Q: What is the current state of play on the Longitude?**

A: We unveiled the Longitude at NBAA last year. This has a 3,400 nautical mile range with the first flight expected in the summer of this year. It has a Honeywell power plant, the HTF7700L turbofan, and we expect entry into service in 2017. The aircraft has a double club interior configuration and an in-flight accessible baggage compartment that is twice the volume of the competition. It is going to have the lowest altitude pressurised cabin of any aircraft in its class and is capable of reaching anywhere in the US from Western Europe, with a single stop. It has plenty of range to get from anywhere in Europe to Dubai and similar city pairs.

Our CEO, Scott Ernest, has pledged that Textron Aviation will spend a large portion of investment dollars every year to sustain new model production.

Q: And your latest announcement, the Citation Hemisphere?

A: The Hemisphere will have a range of 4,500 nautical miles, which gives non-stop easy access to the United States from anywhere in Europe. It takes us into the US\$30 million price bracket, which puts it up against the Challenger 650 and Dassault's Falcon 2000X. These are very worthy competitors to go up against, but the market has demonstrated an appetite for the additional features that a new model brings to the table. There

is a real demand for modern avionics, quiet interiors and new features. For their part, the regulators want new levels of automated communication and navigation. These are expensive items to retrofit into existing models and an aircraft that is designed afresh from tip to tail, that incorporates and embodies these features from the outset, has clear advantages. Good as the competition is, these aircraft were designed when the features that will be standard in the Hemisphere were just dreams.

The Hemisphere has a cabin cross-section of 102 inches, which gives it the widest cabin in its class. We have not revealed the height yet, but I would point out that the Latitude and Longitude have a six-foot cabin height with a narrower cross section, so a height of greater than six feet is on the cards.

Q: How is the M2 doing?

A: It is generating an excellent response from the market. This is not exactly a surprise. Its heritage among the other CJs is huge. It is a developed version of the CJ+, with an all-new Garmin flight deck. The M2's flight characteristics are enhanced by its winglets and the aircraft can be flown by any pilot with a CJ type rating. It is a single-pilot aircraft, so it can be flown by a very large population of professional and owner pilots.

The M2 has a club seat configuration, with a side-facing rear seat for a fifth cabin seat and a

sixth seat that is a belted toilet seat. Since many owners will fly this as a single-pilot aircraft, there is arguably a seventh passenger seat in the cockpit. The range is about 1,540 nautical miles with a top cruise speed of just over 404 knots.

Q: What can you tell us about the new single-engine turboprop (SETP)?

A: We have not yet announced anything on the SETP beyond the initial performance data and the power plant, which will be GE's advanced turboprop announced at NBAA 2015. We are working on various mock-up configurations, aiming at a cruise speed of around 280 or so knots and a range of 1,500 nm, along with a best-in-class cabin. We'll have more to say about it through the course of 2016, but it is a very exciting project.

Q: What was the inspiration to go for a new single-engine turboprop?

A: Not having an SETP is a gap in our product line-up, without a doubt. The Caravan is a much-loved single-engine utility aircraft with an unpresurised cabin and a great reputation. However, what it gains in terms of lift, it loses in terms of altitude. So there is a gap to fill there with a high-performance single-engine turboprop. There is an undoubted demand for such an aircraft, as we can see from the success that other OEMs are enjoying in this space. It looks like 2016 is going to be a very interesting year. ■



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