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CREATIVE DIRECTOR

JANE STANBURY
GLOBAL LUXURY CORRESPONDENT

WWW.BIZAVLTD.COM

For all enquiries,
please contact Max Raja
at max@bizavltd.com
or on +44 (0)203 865 3736

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MORE STUMBLING BLOCKS?

For those of us who simply want to see global trade flourishing, so that societies can prosper and business aviation can finally get some sustained forward momentum, President Trump's decision to initiate a trade war with China is hard to see as good news. Quite how this will play out remains unclear.

US airframe and engine OEMs have to be at least somewhat concerned by news in April that China is proposing slapping a 25% tariff on US business jets. China's senior executives now have serious global aspirations and have discovered that business jets are an essential tool to get those international deals happening with increasing frequency. This in turn has contributed to China's business jet fleet, currently standing at 339 jets, growing at a faster pace than the fleets in neighbouring countries. A 25% price hike could well take some of the steam out of that growth rate.

Then there is the fact that jerking up tariffs between some trading partners and not others skews the playing field. European aircraft manufacturers Dassault and Airbus are being careful to stress that trade wars hurt everyone, though suddenly finding that your product has become 25% cheaper than a competitor's product has to be at least some sort of a plus. Whether that plus point will be completely eroded for those companies by the general turbulence a trade war stirs up remains to be seen.

This last point is worth emphasising. Markets hate uncertainty and 2018 was getting off to a very promising start before President Trump's latest gambit. One can only hope that some trick of fate will enable it to have the same, unexpected, positive outcome that his spat with North Korea appears to be producing. Who would have thought that we'd see North and South Korea shaking hands and that a friendly meeting between Trump and Kim would be conjured out of thin air? These are not just interesting times we're living in, they're damn strange times.

Does it all add up to more business jet sales, or less? Your guess is as good as mine. On the positive side, this is a dynamic, resilient industry that we are in, and makes some of the most desirable, beautiful and highly functional products on the planet. What we need is a growth cycle that doesn't get derailed every time it gets up some momentum. Not too much to ask for, surely?

We're holding our usual EBACE AfterParty on the Wednesday evening at Le Baroque Club. I hasten to add that this go round it is a "by invitation only" event aimed at rewarding BAM's sponsors, advertisers and their guests. And of course, a huge vote of thanks from us all to our sponsors, whose generosity underpins this AfterParty. Our heartfelt thanks then, to JSSI, Academy 147, Design Q, Finavia, Fly Aviation, Jean Boule Luxury and Sun King®.

As always, we wish all our readers a great and productive time at EBACE.

ANTHONY HARRINGTON

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THINKING BIG IN IFE



Dr. Wassef Ayadi, CEO IDAIR, and Alan Cumming, CFO, talk about IDAIR's VVIP IFE solutions

Established in April 2011, IDAIR is a joint venture (JV) between Lufthansa Technik AG and Panasonic Avionics Corporation. The aim, from the outset, was to develop and manufacture Inflight Entertainment (IFE), Communications and Cabin Management Systems (CMS) for VIP aircraft as well as custom products for VIP and commercial operators.

Q: IDAIR specialises in winning connectivity and IFE contracts from VVIP and Head of State customers with BBJs, ACJs and airliners that they have bought green and converted to business jets or head of state usage. What's your "edge" here over the competition?

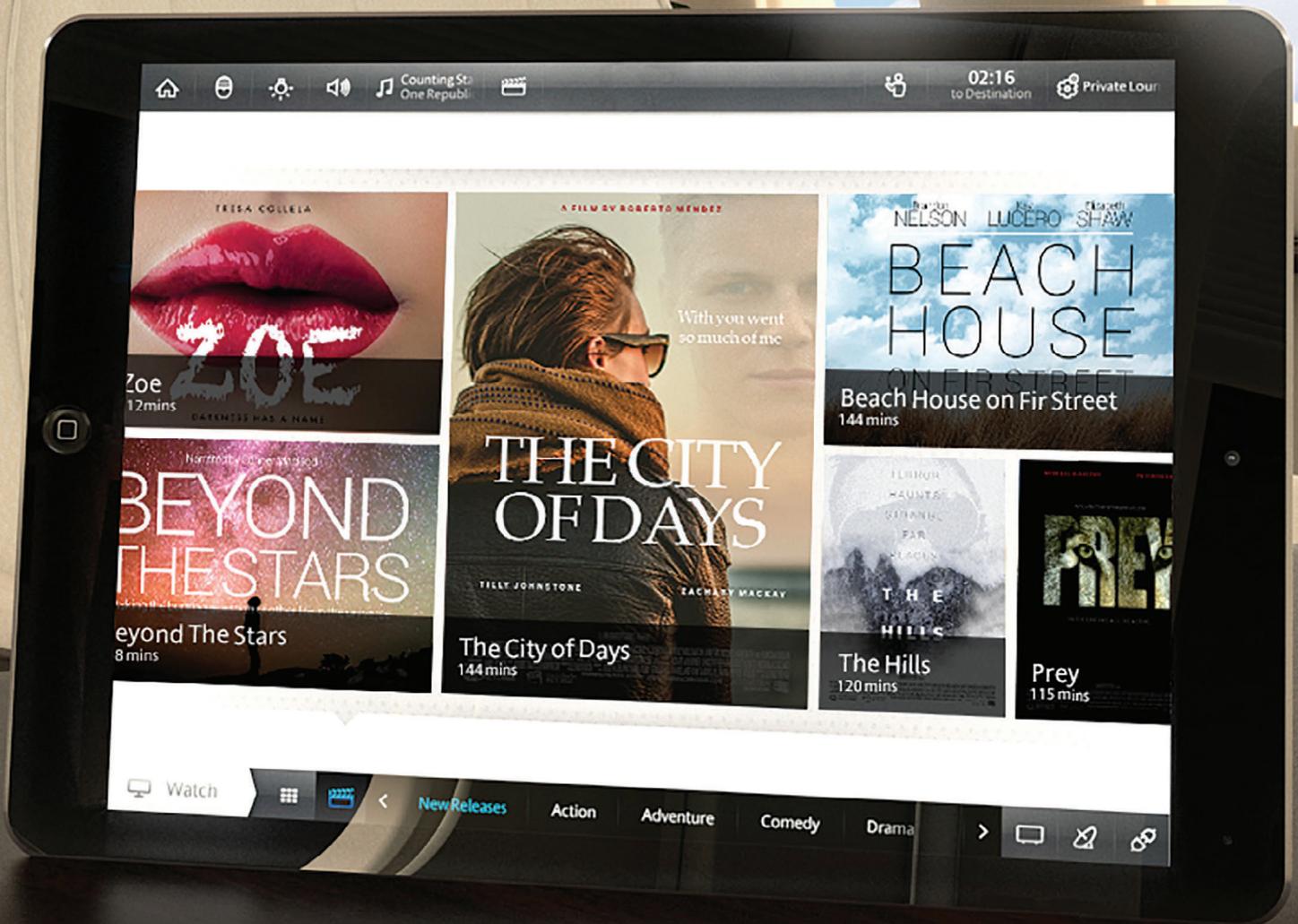
A: With extremely high-end contracts, word of mouth and your previous track record are absolutely key to driving future sales. As to why we are able to compete at the highest level, it boils down to a combination of our reputation and our ability to deliver technical excellence. Both partners

in this JV, Lufthansa Technik and Panasonic, have proven reputations in their own right in the aviation industry and working together in the JV we are able to bring the deep technical skills of both businesses to the table.

Panasonic, of course, is a household name in the television and electronics market and has a world-wide reputation for providing connectivity and cabin entertainment solutions for commercial airlines. Lufthansa Technik's Original Equipment Innovation (OEI) group, has received widespread recognition for the quality of its ultra high-end cabin management and entertainment offerings for large business aviation jets.

What we have proved since the venture came into being is that together we could provide a much stronger portfolio

“ When you provide a bespoke, ultra-high end IFE system, the next question that people have is about content...”



of products and services in the connectivity, IFE and cabin management space, which perfectly meets the needs of our customers and is at the top end of the market.

Q: Looking back on 2017, how was business? Were you happy with what you achieved in what was, for many, a very difficult year.

A: We completed three major VVIP projects in 2017, which involved one BBJ 737, one Boeing 777 and another Boeing 787. We also worked on two further 787 projects last year. That made it a good year for us,

but we recognise that the last two years have been very challenging for the completions industry, which has definitely shrunk over that period. Some companies have found it unrewarding and have exited. The opening months of 2018 were promising. We are receiving more enquiries with increased demand regarding narrow body aircraft.

Q: In September you announced the introduction of a Media Service exclusively designed for VVIP aircraft. What is that about?

A: When you provide a bespoke, ultra-high end IFE system, the next question that people have is about content, so it made sense for us to look into how we could best meet the needs of our VVIP customers with respect to content.



What we have done is to partner with Lufthansa Systems and Touch Inflight Solutions to provide a great collection of top rated movies, including major Hollywood and regional Blockbusters, in a range of languages. The content includes new releases, classics and TV shows as well as music programming taking into account the client's preferences and cultural distinctions. The frequency of the updates and the content volume per update can be individually customized, all directly delivered on board.

Q: How do you intend to deliver this content to the aircraft?

A: In the first instance, we are using portable content holders, which we provide to the operator or the owner's agent. This is loaded onto the aircraft when it is on the ground. The content is all bespoke, and so is the refresh rate for the content. Clearly, this presents us with fairly complex logistical issues, since it frequently means sending personnel to the aircraft or to its home hanger. It also takes time to have a successful media load when you are talking about blockbuster films that can be several gigabytes in size.

A better solution for us will be to use a cloud-based approach. The ideal would be where we can download the material to a portable loader at the aircraft's home base, at the touch of a button. They can then take the portable device onto the aircraft.

The next stage beyond that will be a "zero-touch" service where we download content directly to the aircraft using wireless technology. Using the connectivity of the aircraft it would be perfectly feasible to see media updates being delivered dynamically to the aircraft.

Q: How far off do you think this "zero-touch" approach to refreshing content is?

A: I would expect to have this service up and running somewhere around early 2020. We are currently working on upgrading our customers' fleet to the new Panasonic high throughput network (HTS). Once we have a faster inflight broadband connectivity available, it becomes easy to provide the new services.

Q: How is the wideband network coming along? When will it be fully in service and how does it compare to your current broadband network?

A: Many of our VVIP customers today are on Panasonic's wide-beam network, which provides them with up to six megabits per second of committed download speed. At the end of this year (2018) or early next year, we expect that our first customers will be making the move to the hi-throughput network, which will improve their network speed by a factor of around four.

This is a really significant step up in the size of the bandwidth we can deliver to the aircraft. The plan is to provide customers with additional capacity using HTS spot beams and have both HTS and wide beam networks working in parallel. In effect, additional capacity will be put where it is most needed, in areas with major and high-density air routes. We are focused on adding capacity in such a way as to add value to the overall network, providing our customers with better service.

Q: How are orders going for the Media Service?

A: We added another customer to the service at the start of 2018 and we have another four to five serious requests in the pipeline. The latest customer who signed up has a 747-8 aircraft and we have a Boeing 777 owner as well. One is a charter operator, the other is a Head of State aircraft. You must remember that as IDAIR, our focus is solely on BBJs, ACJs and private airliners such as the Boeing 787 and Airbus 320s.

Q: What would a good year be for IDAIR in terms of new installations of your IFE systems?

A: A reasonable target for us would be to have five or six of these large aircraft projects a year. Our focus is very much to continue striving for new business on the completions side. However, we are also now looking very much at the retrofit market, where we think we have a tremendous solution for owners of BBJs and ACJs who want to refresh the in-flight capabilities of their aircraft. We are able to offer them a fresh IFE experience without them having to spend large sums of money upgrading the entire aircraft.

We are already seeing considerable interest in this retrofit proposition from completions houses. So, to recap we differentiate between two market segments, new completions, where owners and operators want to buy green Boeing 737 Max or 787 aircraft, and the retrofit market where owners and operators want to refresh their cabins. In servicing these markets we are very driven by innovation. The people we have as customers want nothing but the best and we have a very innovative solution for the green aircraft completions market in particular.

On the retrofit side, we have a product that can be fitted in some instances without the need for any interior work at all. In other cases, there might be some minimal work required to fit additional wireless access points through the aircraft. But in both cases, there is no need, with a retrofit, to pull out wall panels and monuments to run complex cabling. Everything is done wirelessly.

We see this as an interesting market for us. Owners of older BBJs and converted airliners are now flying their aircraft longer than before and there is an increased need for upgrading the passenger experience onboard. |BAM



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COMLUX SCOOPS FIRST EVER BBJ MAX 8 COMPLETION

Comlux Executive Chairman and CEO, Richard Gaona, on a new dawn for the completions market

Richard Gaona joined Comlux a decade ago with the aim of transforming the company into a market leading aviation group, providing charter, completions, MRO and aircraft management services to aircraft owners globally.

AH: How has business been since the start of 2018?

RG: We are very pleased to be able to announce that Comlux is going to be carrying out the completion work on the first ever Boeing BBJ MAX 8 to roll off the production line. It is leaving Seattle shortly to have its fuel tanks fitted and should arrive at our hangar in October or November this year.

AH: That really is a great coup for Comlux. What was involved in winning the order?

RG: The owner, who is a private individual who wishes to remain anonymous, had his people put together a tender. There were four or five other completions houses bidding for the contract, but our bid proved to be successful, which was very pleasing. This will undoubtedly help to position Comlux as the leading completions house for the steady demand Boeing is enjoying for MAX 8 private jet orders.

We are also taking delivery ourselves of a Boeing BBJ MAX 8 in January 2020. We want to have a good line of Max 8 aircraft booked or going into our hangar through the course of 2018 and 2019. This year we will also get our first Airbus ACJ320 neo as a green aircraft for completion and we have two more neo's booked to come to us in July and September 2019.

AH: That represents a very good order book indeed. You must be thrilled.

RG: There is no doubt that it is good to be busy. But I am being careful. This is a very cyclical industry and we have seen completions houses get themselves into difficulties by oversizing during the good times and then having to cut staff and rationalize their position in a hurry when the markets get more difficult. We have seen the number of top-of-the-line completions houses

“ This will undoubtedly help to position Comlux as the leading completions house for the steady demand Boeing is enjoying for MAX 8 private jet orders.

shrink from around 13 two years ago to just six or seven today. You can say that the numbers have halved.

This can be a very tough industry in lean times and my strategy here is to take a conservative view and not to attempt to take on more business than we can comfortably manage.

AH: How are the completions going that you are currently working on?

RG: We will be delivering the first wide body Airbus A330 completion in December. That is our own aircraft and is currently scheduled to join our charter fleet. However, we are receiving a number of enquiries from parties interested in buying the aircraft once it is finished. Obviously, although it





would make a great addition to our charter fleet, it is for sale at the right price. The great advantage for any buyer is that they will have a fully fitted out aircraft with a tremendous, high spec interior, without having to wait for an aircraft to free up on Airbus's production schedule.

For the BBJ MAX 8, the completion work will take place at Comlux Completion Center, in Indianapolis and we aim to make this one of the shortest completion cycles ever. Scott Meyer, our CEO of Comlux Completion, says his team intends to finish the interior work within ten months. The fact that we have already ordered the aircraft gives the team the optimal amount of time to complete the design, engineering and custom fabrication phases prior to the aircraft's arrival.



AH: Looking back over 2017 and the first quarter of 2018, what kind of shape would you say the industry is in?

RG: The plain truth is that 2017 was still another difficult year for business aviation globally. However, on the plus side, for some time now we have been seeing a steady increase in demand and the market right now is very active. A lot of aircraft owners are actively looking either to upgrade or, at the other extreme, to exit the market altogether. This is generating transactions in both directions for our aircraft sales division. And at the same time as we are handling sales from people who have decided that it is too expensive for them to continue to own a private jet, we are seeing buying opportunities for new, first time owners. And, of course, there are a number of existing owners who want to upgrade to bigger jets.

The level of demand is showing up nicely in Boeing's BBJ order book. They sold a total of 19 BBJs through the whole of 2017, and they have already sold 16 BBJs this year so far. The Airbus neo is doing well too.

AH: Do you get a sense that the airframe OEMs are discounting new aircraft strongly to drive sales?

RG: No, I do not believe they are discounting heavily. They have to take an aircraft from their commercial airline production line to designate it for a BBJ or an ACJ customer. So there is no incentive on their part to try to push BBJ and ACJ sales when they have commercial airline production orders to fulfil.

AH: How is your charter business going?

RG: We are seeing very good demand for charter flights. We have a full fleet of 20 aircraft that we manage for owners and charter out. Plus we have a 777 and a 767 on charter at present. The 777 is chartered on behalf of Crystal AirCruises and is doing very well. It only has First Class seats, and a spacious VIP dining area which is great for both a company chartering it for a group of executives, or for sports teams. There is no politicking over who gets which seat since they are all First Class. We have already received charter bookings to fly a number of football teams to the Football World Cup in Russia.

AH: Some charter companies like to promise an owner that by chartering they can have the charter income cover their entire running cost for the aircraft. What is your view?

RG: The numbers simply do not bear that out. In general, a private owner will fly some 200 to 300 hours a year in their aircraft. That leaves roughly the same number of hours available for charter. If you get 200 hours of charter, it will defray a fraction of the running costs, but it will not pay for all the costs.

If for example, you are flying a Falcon 900 or a G450, there are so many aircraft like that on the charter market that unless a potential traveler is very close to where you have the jet, the costs of repositioning the jet are going to make your quote for that person too uncompetitive. There are so many aircraft in Europe and the US that are available for charter that you cannot pretend to a customer that you can guarantee them 600 hours of charter income. That just won't happen.

AH: How is the market in Europe right now, versus the US?

RG: The European market is still definitely lagging the US market as far as the pick up in demand is concerned. There are too many complicated situations in Europe. The Russian market too, has been blighted by sanctions. At the same time, North America is very strong and we are also seeing strong demand in China. So you have to be open to the idea of having locations in multiple jurisdictions. You have to be where the customer is, but at the same time, you have to take care not to overextend your business. It is a very absorbing business problem and one we ponder every day. |BAM

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REAL DIAMOND LUXURY

By Anthony Harrington



JEAN BOULLE LUXURY

The Jean Boule Group has a long history of discovering and developing innovative materials. Its successes include patented technologies for the production of magnesium and nickel/titanium alloys used in the automotive and healthcare industries respectively. More recently, in collaboration with AkzoNobel, the Group has pioneered an extraordinary new finish for business jets, supercars and superyachts. It is called Sun King® Diamond Coating.

BAM spoke to Bertrand Boule, CEO of Jean Boule Luxury about the concept of and the successful execution in infusing microscopic gem diamond crystals into AkzoNobel's Alumigrip clear coat for aircraft.

AH: Bertrand, how did this concept come about and what does it do?

BB: The Boule family has been involved in the diamond industry for many years and we had seen the aesthetic effects which could be achieved from the crushing of specific types of gem diamonds. However, we saw that nobody had ever developed this idea or created a process for working with diamonds in this way.

Diamonds reflect and refract the sun's rays better than almost any other material due to their very high refractive index, which is substantially greater than other materials. It is also a question of projection, what we call 'fire' in the diamond business. When you are several metres away from an aircraft or an automobile with metallic paint, the glitter, the 'fire' is lost. With our Sun King® Diamond Coating, the fire is apparent from several metres away so long as the sun's rays illuminate the diamonds. That is why we chose the name Sun King because when there is a low level of sunlight, Sun King "sleeps" and the underlying paint returns to normality.

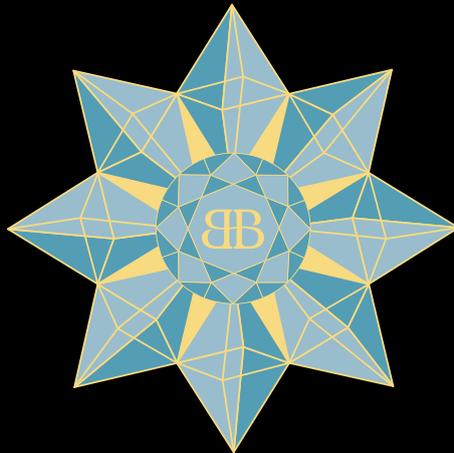
Our approach was therefore to invent a process using natural gem quality diamonds from the Group's offshore diamond mines in Namibia, and transform, sort and filter them into tiny, shape and colour specific fragments. This is a highly demanding technical and patent-pending process. AkzoNobel then infuses our diamond crystals into their special clear coat to manufacture Sun King® Diamond Coating.

The important point in having our prepared gem diamond crystals in the AkzoNobel Alumigrip clear



“Diamonds reflect and refract the sun’s rays better than almost any other material due to their very high refractive index, which is substantially greater than other materials. It is also a question of projection, what we call ‘fire’ in the diamond business.

“When you are several metres away from an aircraft or an automobile with metallic paint, the glitter, the ‘fire’ is lost. With our Sun King® Diamond Coating, the fire is apparent from several metres away...



SUN KING® DIAMOND COATING

coat matrix is that a diamond is one of the most stable materials known to man. This means none of the AkzoNobel protective properties or warranties are affected. Indeed the diamonds will outlive the AkzoNobel Alumigrip by many hundreds of thousands of years!

Another great benefit of having Sun King® in the standard AkzoNobel Alumigrip clear coat is that it enables the product to be applied retrospectively to aircraft, yachts and automobiles. It is also relatively easy to repair any surface damage because the diamond crystals in the Sun King® are applied in the clear coat on top of the paint and do not have to point in the same direction as metallic or mica flakes have to.

AH: I have to ask, how many diamonds do you need per gallon?

BB: This is an entirely bespoke high end product, so the quantity of diamond particles can be tailored to the kind of effect the designer, or the owner, wishes to achieve. It can be up to hundreds of millions of diamonds per gallon and it makes for an absolutely unique finish. In general terms, one carat of diamonds produces 1 million crystals.

In the absence of sunlight, the clear coat looks much like any clear coat but once direct sunlight refracts with the diamonds in the matrix above the paint, it can be seen in its full beauty; it absolutely transforms and enriches the underlying colour.

AH: Does it require specialist skills to apply?

BB: A skilled aircraft painter who has experience working with metallic or similar coatings should have no difficulty applying Sun King.

By their nature, diamonds are heavier than the AkzoNobel clear coat, so the diamond crystals will settle at the bottom of the clear coat. It therefore needs to be constantly stirred during the application. Other than that, application is not more complicated than mica or metallic based products.

AH: Can you tell us about some of the success stories so far?

BB: Most recently we announced a co-operation with Sun Reef Yachts to diamond coat a custom built multihull power boat with Sun King®. At EBACE last year and at the Dubai Air Show in November we showcased a Bombardier Global Express which had been finished completely with Sun King® Natural Gem Diamond Coating. The complete aircraft, except for the belly of the fuselage and the bottom of the wings, was coated in diamond by Satys at their facility in Lelystad, the Netherlands.

Another great first for us was the superyacht builder Oceanco painting a scale model of its Lumen concept with Sun King®. The scale model, which was displayed at the Monaco Yacht Show is currently on display in the Dubai Mall. Its hull is

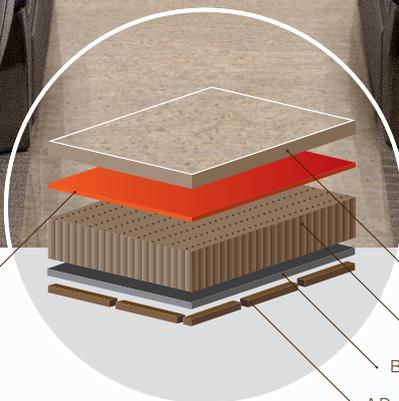
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painted in a striking orange colour and the multi-chromatic Sun King® effect is just fantastic. We are also in advanced discussions with two well-known superyacht builders about prospective projects.

To give our partners complete security, we are working with Lloyds of London to offer a tailored insurance policy to protect clients when Sun King® is applied onto a superyacht or indeed an executive jet or supercar.

AH: So what does the future hold for Sun King®?

BB: Well, we have an awful lot of work in progress at this moment and some highly promising sales conversations underway with multiple parties. We will invest in the product and will be developing it with universities to amplify and protect our patent.

AH: Patenting in one country is not that expensive a prospect, but patenting on three continents takes a very significant investment as you have to pay to have the patent approved country by country.

BB: Yes, but we are well accustomed to the patenting process. Our principal, Jean Boulle, was involved in the discovery and development of a world first in medical technology – a new type of heart valve which was successfully patented. Technologically demanding products and mining, particularly diamond mining, is very much part of the DNA of the Group.

AH: You have explained that each time you produce a batch of Sun King® for a client it is bespoke. How

does the client get to form a view as to the quantity of diamonds he wants in the mix?

BB: This is a good question. We provide the client with large samples. For the plane, for example, we produced a two by three metre panel so the owner could see if that was the degree of refraction they required. It also gave an excellent opportunity to successfully do a spot repair test after we deliberately damaged the panel.

If the client already has an aircraft or a yacht with a base coat/ clear coat, we can take off the old clear coat layer without damaging the colours in the base coat. Then we apply Sun King® and the finish is perfect, as it was with the Classic Bentley at Top Marques Monaco which so enthused Prince Albert.

AH: I assume you have a great relationship with AkzoNobel since that is key to future Sun King® sales.

BB: Absolutely. We enjoy an excellent relationship with them, and their worldwide network of distributors and clients is hugely beneficial for us. One of our most recent sales is to a luxury catamaran yacht owner, a really cutting edge craft that can do over 60 knots. It is going to look fantastic with a Sun King® finish, and the sale came through Akzo's distribution network.

To a great extent, Sun King® Diamond Coating is a perfectly normal product but when the diamonds light up, that's when owners sit up and talk. You have to see it with your own eyes as cameras don't yet have the capacity to show all that refraction, all that fire staring back at you! |BAM



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Academy147
Aircraft Maintenance Training

BUILDING AIRCRAFT MAINTENANCE ENGINEERS FOR THE FUTURE

Andy Trincherro, CEO, of the Malta-based Academy 147, talks to Anthony Harrington about solutions to the industry's pressing people problem

AH: There is currently a worldwide shortage of pilots and aircraft technicians. The need for skilled people is going to grow and grow. As a training provider, what are your thoughts on this?

AT: Clearly, developing more training courses, available to a worldwide audience, must be at the heart of any solution. Business Aviation is no exception to the rule. There are great shortages of skilled people to fill safety critical roles worldwide. When we first started the company, our Training Manager and a key founding member of the company, Mario Cassar, mentioned this to me. He said that in Malta and abroad that the industry was facing a great challenge when it came to attracting the new generation to do hands-on work. Maintenance can be a very rewarding career, giving technicians the ability to travel the world and earn a good salary. I often try to explain this to youngsters entering the workforce. Recently, I spoke at a local Aviation Maintenance School in my hometown in the USA and it seems they are facing the same challenges. We are working hard to play our part in this.



Since we launched in 2014, we have been focused on filling the skills gap by providing the business aviation industry with much needed, certifying engineers. Our particular focus is on aircraft maintenance type training for business jets, which is a niche sector. A major differentiating factor for us is that we provide on-location training, with our staff going to the client's site to run courses for them. Since we launched we have seen tremendous demand for our training services and we have grown into one of the leading providers of on-location EASA Part-147 maintenance training for business aircraft.

Our clients include leading MRO organisations, aircraft operators, airworthiness inspectors and civil aviation authorities, as well as special mission operators and government flight departments. We also see demand from other ancillary service providers such as ground handling and consultancy companies.



AH: 2017 was a tough year for many companies in business aviation. How was it for Academy 147?

AT: Exactly, the opposite. We actually had an excellent year. We implemented an extensive growth strategy in 2017 and this generated a worldwide increase in business for us. The added investment in resources has proven to be really worthwhile, with the company achieving exponential growth across multiple product lines in 2017/18. Our team has worked tirelessly to achieve this growth.

In fact, looking back, 2017 was all about building on and expanding our capabilities. In addition to delivering high quality instruction for our clients, we focused on hiring new employees and brought on a number of certified aircraft maintenance engineers as instructors. Plus, we recruited additional regulatory and support staff, invested in new equipment such as a setting up a professional print shop in-house and investing in new technology such as advanced project management and training software to help us scale up our operations. This investment helped us fulfill the increased demand that we have seen late last year and so far in 2018.

“We implemented an extensive growth strategy in 2017 and this generated a worldwide increase in business for us.

We also extended our training scope to cover more aircraft types which were widely underserved in the industry. We broke new ground, developing bespoke Maintenance Differences courses between similar variants of aircraft, plus producing new Cat C Training (Level 1) and other courses, many of which were not previously available for business jets.

Offering on-location training has enabled us to create a market that did not previously exist domestically in Europe for these types of aircraft. Going to the client's site has some really important benefits, not least because some clients would find it difficult to obtain visas to send staff abroad for training. With on-location training, much needed resources stay in the same region and time zone. Although their time is focused on training, they can still be available to discuss ongoing or recently completed projects and answer any questions their colleagues may have. The company does not lose its manpower while employees travel back and forth. This is not to mention the cost

savings that our customers benefit from. It makes more sense for us to send one instructor to them rather than a company sending 4 or 5 employees out for training. They usually also have the aircraft available on-location which allows us to mix Theory with Practice.



AH: You have expanded your team. How do you feel about your business as it stands today?

AT: I am delighted with the way things have gone. Our team today has the right balance of energy, business experience, and industry know-how to provide the highest standards of training and customer service. It is a very diverse team with a broad range of skill sets, and is well versed in regulatory and product knowledge, including a deep knowledge of the aircraft themselves from a maintenance standpoint. Seeing the company grow has been a dream come true. We have worked very hard to get where we are. Having the right team is what made this all possible. I also try to maintain a fun and exciting work environment with flexible work hours, where employees are encouraged to innovate and bring forth new ideas. It also works to our advantage as we usually have courses running in multiple time zones and we can offer the instructors support day and night.

In order to better serve our customers, we have built up an extensive base of full and part-time Instructors strategically positioned worldwide in close proximity to customer locations throughout Europe, the Middle East, Asia and North America. This has given us a much wider footprint and enables us to provide more flexibility for customers.

AH: You have positioned yourself rather uniquely in this sector. Can you expand on that?

AT: It is very clear that our success is based on the way we have positioned ourselves as a boutique firm with a business aviation mentality, while maintaining a lean company structure that continues to be focused on giving customers special attention. Customers having direct access to decision makers has also been

key, as has being open to innovation in the way we present and deliver our services. Originally, coming from California's Silicon Valley, I believe that a company must always be innovating and looking for new ways to 'do it better'. This has been very much part of the company's DNA, and although we are now well past the start-up phase, we continue to strive to maintain the core values upon which our success has been based.

Undoubtedly, Malta has also been a big part of our success. In recent years, we have seen Malta establish itself as a commercial and financial hub with a strong business aviation presence. Our organisation has grown in tandem with the local business aviation industry. It has been a collective effort and we are lucky to be located within a stone's throw of many business aviation companies. Malta has a particularly business-friendly climate and is strategically located between Europe, the Middle East and Africa. It's also a wonderful place to live in general."

The other day I was speaking with one of Academy 147's instructors, Christophe Gonnet who was previously a Senior Aircraft Leader with a major maintenance organisation in Europe. He made the point that after completing one of our courses, students emerge fully equipped and confident to work on the aircraft, which generates an immediate return for the organisation that has sent them on the course. This is because we strive to blend Theory and Practice to give students a real-world view of maintaining aircraft. Christophe pointed out that he and the other instructors share their experience with students when it comes to complex troubleshooting scenarios. This kind of discussion is especially valuable since students tend to add to the discussion by sharing their own maintenance problems and solutions. Our instructors always leave the door open to students if they have any questions, even after the training is complete. Chris added that he really enjoyed that kind of discussion, which is very much part of the boutique, friendly approach that characterizes our teaching at Academy 147.

AH: And the future?

AT: Academy 147 seeks to stay the course and to focus on growing in a sustainable manner while delivering training that combines an ideal blend of theory and practice. The company is constantly on the lookout for new talent and new market and regional opportunities, while adding to our ever-growing portfolio of training courses, available worldwide. **BAM**



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INNOVATING TO STAY AHEAD

Anthony Harrington talks to Luxaviation's Chief of Client Service, Jana App-Sandering, and Abi Nolan, Marketing Manager, ExecuJet Europe.

AH: Luxaviation has found a fairly unique way of adding to its charter revenues via the arrangement it recently announced with luxury villa specialist, Art de Vivre. How did that come about?

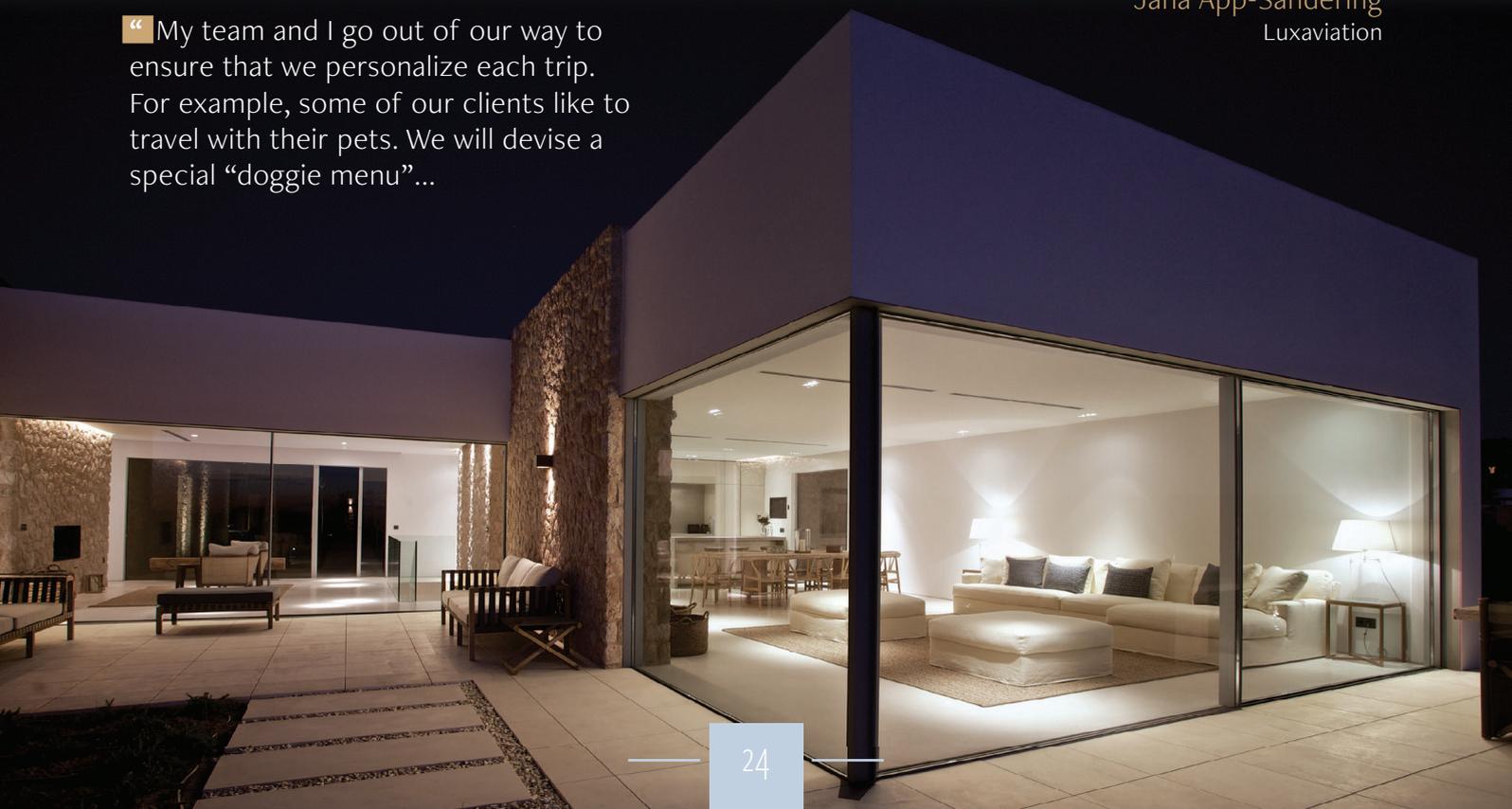
Abi: This relationship actually has quite a long pedigree. It began some time before ExecuJet was acquired by Luxaviation in May 2015. I met with Julie Gauthier, the founder and director of Art de Vivre when we were both attending a conference on "Doing Business in Switzerland". We got talking and there was an obvious synergy between the clientele who are interested in Art de Vivre's collection of designer villas and chalets around the world, and the high net worth and C-level executives who are our charter customers.

The relationship has now matured to the point where, on World Design Day 2018, our Group CEO, Patrick Hansen, and Julie, announced a formal collaboration and partnership where Luxaviation will provide charter travel to Art de Vivre properties for our clients.

“My team and I go out of our way to ensure that we personalize each trip. For example, some of our clients like to travel with their pets. We will devise a special “doggie menu”...



Jana App-Sandering
Luxaviation





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In announcing the partnership, Patrick Hansen pointed out that bringing together the philosophy of top quality service that underpins the Art de Vivre brand with Luxaviation's elite private jet service was simply a natural evolution. Both organisations share the same values of impeccable standards of service combined with the personal touch. The Art de Vivre catchphrase is: redefining the art of travel, and of course, that plays directly to what we do.



AH: What kinds of properties does Art de Vivre have in its portfolio?

Abi: They literally have properties all over the world, which is another reason why the fit between our two organisations is so good. For example, clients could choose a villa in the Seychelles, or a castle in Scotland. One of their properties is the Castello di Reschio, in Umbria, which stands in its own 1,200 acre estate. Or there is the Domaine de L'Ansa, set in one of Cannes' largest private estates. This is a 43,000 square metre villa that sleeps twelve and has panoramic views of the Côte d'Azur. Flying with us in a Cessna Citation XLS that seats up to nine passengers, a client could be landing in Cannes in two hours from London's Luton Airport.

AH: Jana, you oversaw a complete redesign of a standardized uniform for Luxaviation's cabin staff two years ago. How is that working out?

Jana: We introduced the new uniforms in April 2016. The idea was to bring back the glamour age of luxury flying in the new design.

However, this was just part of the continuing effort we make on all fronts to provide clients with the highest standards of service. What I constantly reiterate to our cabin staff, whether I am training new people or talking to people who have worked with us for a number of years, is the importance that every flight is seen as an event that is required to go just as well, if not better, than the last.

AH: Can you elaborate a bit on the thinking behind the design?

Jana: We really wanted to come up with a design that would be reminiscent of a time when air travel was synonymous with glamour and luxury. In creating the look I went back to Dior's iconic 'New Look' hourglass silhouette for inspiration. Frankly, I have been delighted with the response both from our cabin crews and from customers.

The idea was to present an "upscale private jet experience" for customers, both owners and charter customers. Our female cabin crews look both gorgeous and glamorous wearing them. They enable us to provide a really high standard when we welcome and say goodbye to customers. Importantly, the high heels that go with the look are replaced by flat ballet shoes during cabin service. Also the uniforms themselves are of a comfortable, durable material that can withstand long working hours in the air. This frees cabin crew to focus on what really matters, providing outstanding customer service.

AH: Are the new uniforms just for a select part of the Luxaviation operation?

Jana: No. The new uniforms are an important step towards a common look right across the Group. We followed this up with new pilot uniforms, which follow the same inspirational design.

AH: Following the acquisition of ExecuJet, Luxaviation has one of the largest global fleets of jets available for charter. That must keep you extremely busy.

Jana: Yes. We have some 150 aircraft in all the major markets apart from North America on charter, out of a total of 270 managed aircraft. But we treat each and every flight as if it was our only responsibility. My team and I go out of our way to ensure that we personalize each trip. For example, some of our clients like to travel with their pets. We will devise a special "doggie menu" for their pet, assuming it's a dog. It is these little touches that make a trip special for each person who is travelling. **|BAM**



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PUTTING THE SHINE BACK

Anthony Harrington speaks to Werner Kartner, CCO at F/LIST, on demand for aircraft refurbishments

Strong demand for business jet aftermarket services has resulted in a tremendous first year for F/LIST GERMANY, the German subsidiary of Austrian business jet interior manufacturer F/LIST. Increased demand paved the way for a very healthy start to the subsidiary's aftermarket operations, which began in April 2017, and greatly stimulated F/LIST's long-established aftermarket segment. Looking back over the year, the company has chalked up a number of successful projects, including two large-scale interior refurbishments.

As Werner Kartner, Chief Commercial Officer at F/LIST explains, F/LIST GERMANY, is the result of the F/LIST parent company taking over the business operations of OHS Aviation Services, based at Berlin Schönefeld Airport.

At a stroke this deal gave F/LIST an established presence in Germany, and included OHS' EASA Part 145 Maintenance Organization Approval. It also gave F/LIST a highly skilled team of more than 30 experienced professionals, with specialisms in joinery, the interior and exterior cleaning of aircraft, and the replacement of carpets and upholstery work.

“Just as important, this acquisition served as the inspiration for a sustained expansion effort in aircraft refurbishments. In the course of just one year, our network of potential customers and suppliers has grown remarkably. The capacities and possibilities available to us are now larger and more extensive than ever before,” he says.

Werner points out that aircraft owners and aircraft management companies are increasingly keen to work with a single partner capable of providing a comprehensive range of services. “This is a trend F/LIST is keen to serve, and not just in Berlin. We now have locations on three continents from which we provide a broad range of aftermarket services,

“ In the course of just one year, our network of potential customers and suppliers has grown remarkably. The capacities and possibilities available to us are now larger and more extensive than ever before.

from small touch-ups to retrofits of entire aircraft cabins. So we are well able to accommodate customers’ desires beyond the boundaries of Europe,” he notes.

In Dubai, for example, F. LIST MIDDLE EAST FZCO at Dubai International Airport extends the company’s aftermarket strength to the Middle East, in cooperation with major MROs at the Dubai aerospace hub. F/LIST GERMANY’s knowhow and expertise gives the recently launched Dubai subsidiary a solid depth of experience and skills to call on. “The joint capacities of Berlin and our HQ in Thomasberg provide a deep resource capability. Plus we can transfer cabinets and components between the individual locations in order to optimize resource allocation. It allows us to add considerable flexibility to our operations,” he comments.

This is particularly important in the service sector, where demand for touch-ups is particularly strong and where customers are looking for a fast turnaround. F/LIST’s customers include operators with significant numbers of jets for charter who want to avoid cancellations. Flexible mobile repair teams are in constant demand.

Dennis Neumann, responsible for sales at F/LIST GERMANY adds: “One of our customers in Berlin is NetJets Europe. At



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least once a week we carry out small ad-hoc interior repairs on wood and leather. Our craftsmen are highly efficient and we can usually keep down-time to just three or four days, which is really important for the client.” F/LIST’s mobile teams can be dispatched worldwide and on short notice.

Touch-ups, however, are just one aspect of the aftermarket services the company provides. “What really excites us are the comprehensive refurbishment projects that customers bring to us. These involve the reworking or replacement of complete cabin interiors,” Werner notes.

In summer 2017, F/LIST GERMANY carried out its first large-scale refurbishment project in Berlin on a charter jet, restoring the jet to “as-new” splendor. The project included new upholstery, linings and carpets and all the wooden

“Our craftsmen are highly efficient and we can usually keep down-time to just three or four days, which is really important for the client.”

surfaces were reworked. The refurbishment was completed during a maintenance check conducted by Lufthansa Bombardier Aviation Services.

AIR-X sales manager Debbie Camenzuli was so delighted with the refurbishment of their Challenger 850, she went onto LinkedIn and proclaimed: “It happened!! BOO’s been revamped!” (The Challenger’s registration is 9H-BOO and is one of six CL850s in their fleet).

The refurbishment was undertaken in cooperation with Lufthansa Bombardier Aviation Services in Berlin Schönefeld. All the seats were re-upholstered with elegant cream-colored leather, to match the chic new fabric of the divan. New linings on the ceiling as well as on lower and upper sidewalls and new PSU panels added to the clean and elegant overall look. A newly installed grape-colored carpet



covering the entire cabin floor offers a sophisticated contrast with the otherwise light, cream refurbished cabin. The elegant matte oak surfaces of the galley, sideledges, bulkhead and partition were reworked to give the interior a completely new and sophisticated touch.

All the interior work was performed over approximately six weeks at F/LIST GERMANY's EASA Part 145 approved upholstery & joinery facility in Schönefeld, while Lufthansa Bombardier Aviation Services conducted mandatory fuselage and engine checks. Werner added: "Shortly after bringing 9H-BOO back into service, Bernhard Wallner, CCO of AIR-X, said: 'Our thanks to the F/LIST Team for their great work. The result is amazing. Our customers love the new interior'. Obviously, we were delighted."

Another extravagant project which has made F/LIST GERMANY's first year especially remarkable was the thorough refurbishment of a Challenger 604 for an undisclosed customer. This involved cabin design changes, reworking of materials, leather and upholstery work, installation of a new carpet and linings and the certification of all the changes. Werner comments: "The owner's opinion upon inspecting his aircraft was: 'Wonderful, everything's just as good as new.' What these refurbishments demonstrate



to our clients is that with the right partner, even the most worn and outdated cabin interior can be transformed into a modern and elegant new masterpiece," he says.

In his view, the prospects for the next few years are more than positive. "The aftermarket sector is growing strongly and we expect to grow with it. "F/LIST is now engaged in establishing a North American service network centered in Montréal, with a location in Florida and another one planned in Colorado. These moves will consolidate F/LIST as a major player in the global aftermarket business," he concludes. |BAM

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RUSSIA RISING

Sirius Aero Commercial Director,
Eugenia Pokrovskaya talks to Anthony Harrington

AH: Can you tell us about the early years of Sirius Aero and perhaps shed some light on the development of business aviation in Russia?

EP: After several years as an air broker, in 1999 Sirius Aero became an operator, acquiring its AOC that same year. At that stage, around the end of the 1990s into the early 2000s, some 90 per cent of the business trips we flew were on our TU134 VIP configured aircraft. For example, from 2000 to 2014 we carried out regular air charters for top management in oil and gas companies. These flights accounted for around half of our total traffic.

We started flying clients on the TU134 and today we operate the latest OEM models. We began replenishing our fleet in 2008 and brought on new aircraft types, to the point where our fleet now includes the HS125, 700/750/850 and 1000. In 2016 we purchased our first Embraer Legacy 600. We followed this in 2017 with purchases of two new aircraft types, a Challenger 601 and an 850. Clearly, the dynamics of world business aviation development obliges business aircraft operators to renovate and extend their fleets on a systematic basis. This is something we work at constantly.

During the last 10 years the business aviation market in Russia and neighboring countries has made great strides. This is now an important, independent industry with great prospects. We have a good business aviation infrastructure here, along with professional operators with modern fleets, up to date flight and dispatch centers and a number of maintenance companies, training centers and executive caterers.



“During the last 10 years the business aviation market in Russia and neighboring countries has made great strides. This is now an important, independent industry with great prospects.”





Generally speaking, after twenty years of continues development. Russia is now a very promising general aviation market.

AH: You have a number of Hawkers in your fleet. How well are they performing? Are you going to phase them out or do they have a well-deserved place?

EP: Our fleet is constantly increasing. We constantly monitor the market and look to identify the best solutions. We are committed to adding aircraft that are in high demand in the market. At the present moment Sirius Aero consists of twelve Hawkers – 2 Hawker 700s, and 6 Hawker 750s, plus 2 Hawker 850s and 2 Hawker 1000s. In addition we have 4 Embraer 135 Legacy 600 aircraft and a Challenger 850, plus the Challenger 601. We also operate three bizliners – 2 Tupolev Tu-134s and a YAK-42.

Hawkers have an important and well-deserved place in our fleet. The biggest advantage, in our view, is the cabin size, which is almost on a par





with aircraft that are a class above. It can accommodate up to 8 passengers very comfortably and offers a very sizeable luggage compartment, as well as a forward galley and a roomy lavatory.

AH: How are the newer editions to the fleet, such as the Embraers and the Challengers being received by your client base?

EP: As I said, the first Legacy 600 joined our fleet in 2016. This aircraft is one of the most successful jetliners ever produced for the business aircraft market. The three zone cabin is a tremendous convenience for passengers, as is the in-flight accessible luggage compartment, which is the largest in its class.

We opted for the Legacy 600 in order to satisfy customers who were looking for a larger cabin. It is a great aircraft for corporate flights and can accommodate up to 13 passengers. It is also very comfortable for family holiday flights.



AH: Are you seeing demand increasing for international charter flights?

EP: Over the last few years, demand for international flights has seen growth. This has been driven both by the market, but also because of the aircraft types we have added to the fleet. However, domestic business trips are where we excel and where our competitive edge lies. The bulk of our charter flights go to Russia and CIS countries.

AH: What is it like being based at Vnukovo 3? Is it a good airport for business aviation? What are the facilities like?

EP: The business aviation center at Vnukovo 3 is the biggest and one of the best complexes in all of Russia, and has all the necessary facilities we and our clients require. The complex infrastructure includes two business terminals (international and domestic) for VVIP passenger use. Vnukovo 3 has an apron with 60 parking spaces and several servicing hangars, with the most modern aircraft maintenance equipment especially for business jets.

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short distance away from both Moscow city center and the business district.

Another advantage, in addition to its convenient location, is that private jets can operate in bad weather and bad visibility conditions at Vnukovo 3, due to its new instrumental landing system which allows aircraft to approach in minimal visibility. Private arrival and departure halls provide all the discretion that VVIP passengers expect and demand.

AH: How important is aircraft management to your business?

EP: We already have five aircraft under management. These include two Legacy 600s, a Challenger 601, one Tu-134 and the Yak. We are about to take on another Challenger 850.

The main advantage aircraft management offers an operator is the fixed income, which comes in monthly from the management fee. This provides a steady cash flow, which is very important. The main advantage from the customer's

perspective is that they are guaranteed to have alternate aircraft for their flights if their aircraft is undergoing planned maintenance or in the case of an AOG.

AH: How are your pilots responding to the introduction of EFBs. Are you close to moving away completely from paper documentation as far as the flight bag is concerned?

EP: At the beginning of this year we began using the Electronic Flight Bag (EFB) on our Legacy 600, Hawker 750 and Hawker 850XP aircraft. During the test phase we used both paper and electronic media. Now the Legacy test period is over and we fly without paper. We are planning to switch to an all-electronic format on our Hawkers in the Summer. By the end of the year we expect to have moved away from paper docs on all aircraft.

AH: The Yak-42 is an unusual aircraft to be included in a charter fleet line up. I am guessing that it plays the role of a group charter, regional aircraft for you?

“ We are one of the oldest Russian business aviation companies with the largest commercial fleet in Eastern Europe.





EP: The Yak 42 is one of the aircraft we have under management for a private owner. It has a VIP configured salon. The main customers are sport teams.

AH: How does Sirius Aero compare to other Russian-based business aviation operators?

EP: We are one of the oldest Russian business aviation companies with the largest commercial fleet in Eastern

Europe. The company is a multiple prize winner of the National Award “Wings of Russia” in the “Business Aviation” category. We have EASA Part TCO Authorization.

At the beginning of October 2017 Sirius Aero successfully passed the audit of the International Business Aviation Council (IBAC) and received the IS-BAO Stage I certificate. [BAM](#)

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CLOSE SUPPORT



Bombardier Business Aircraft Vice President and General Manager of Customer Experience, Jean-Christophe Gallagher, talks about what it takes to support the company's installed base of 4,700 aircraft and close to 100 customer support locations worldwide

Q: What kinds of change, if any, are you seeing in the MRO and aftermarket space?

JC: The business aviation industry, and our world at large, is undergoing tremendous change, and from my vantage point this also represents a huge opportunity. The single most important theme I see emerging, is customer centricity, and all of the integration that it brings. Customers must be at the heart of everything we do – all business would cease to exist without customers.

At Bombardier Business Aircraft, it's really this philosophy that has driven the redesign of our aftermarket business, which I've had the privilege to lead for more than a year now. The transformation the team and I have worked on together has yielded increased productivity and reduced aircraft downtime – and our collective laser-focus on the customer continues to be a huge part of the success we are seeing from this programme.

Q: Operators, particularly those with larger fleets, will be a hugely important constituency for you, I imagine?

JC: One thing that is perennially apparent – and perhaps obvious – is that operators deeply value both expertise and efficiency, and while it may sound simple, striking this balance can be challenging. As both an OEM and provider of aftermarket support, we have worked hard to shape our offering to make sure we are a one-stop-shop for our customers. We know Bombardier business aircraft – we design and manufacture them, which means no one is better positioned to support and maintain them. From training to parts; from 96 and 120-month inspections, to upgrades, in-house landing gear capabilities, and engine MPI





“ The transformation the team and I have worked on together has yielded increased productivity and reduced aircraft downtime – and our collective laser-focus on the customer continues to be a huge part of the success we are seeing from this programme.



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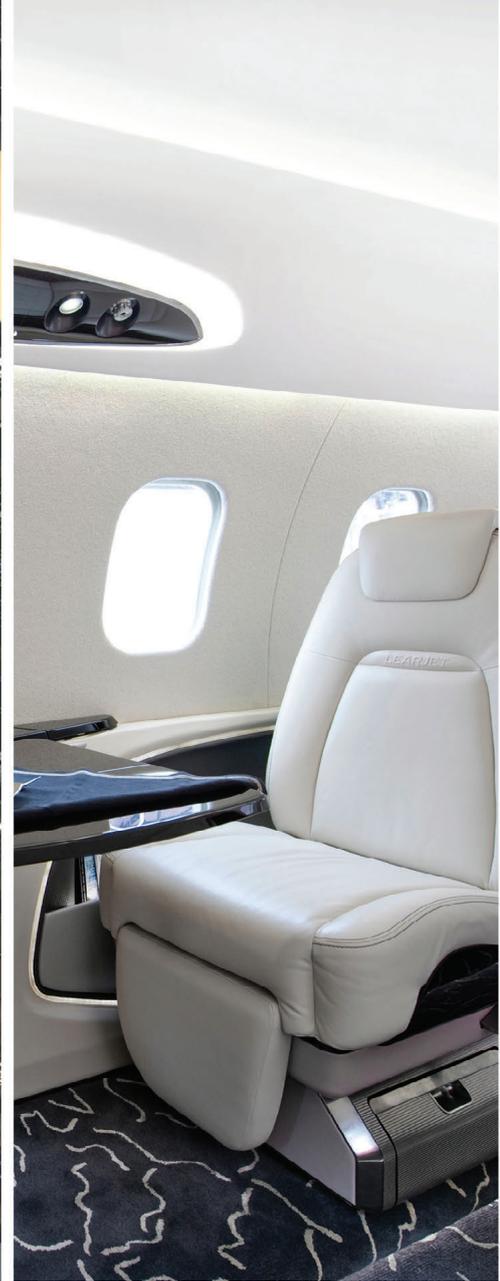
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capabilities; from our service centres to our line maintenance stations to our mobile response trucks around the world; our in-depth product knowledge and our global support network allows us to add value to the ownership experience.

Q: What is the role of your existing partners, for example, the operators and aircraft management companies, in all this?

A: OEMs and operators share the same objective: we both want to get the customer's aircraft back in the sky as quickly and as safely as possible. Our recommendation to customers and to whoever is managing their aircraft for them, is that whenever the aircraft is scheduled to come in for a service

event, have a conversation with your project manager and brainstorm about how best to maximize your maintenance. For example, are there service bulletins you should consider adding during this particular event? Is this the time to add any interior work you have been considering? Are there avionics upgrades that would make sense at this time? Planning is key, and your service provider is here to help to make it successful for both the customer and Bombardier Business Aircraft.

I always liken a maintenance event to going to the doctor: you want to leave having enhanced your overall health as much as possible, reducing the frequency of visits to the doctor's office, and ultimately increasing the quality of your

“Our recommendation to customers and to whoever is managing their aircraft for them, is that whenever the aircraft is scheduled to come in for a service event, have a conversation with your project manager and brainstorm about how best to maximize your maintenance.



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life. In the case of your airplane, your service provider should be adding value throughout its entire lifecycle.

In Bombardier Business Aircraft's case, this approach to service has meant moving closer to our operators to be where they need us, opening new facilities, most recently in London and Tianjin. We have also taken steps to enhance our expertise through hiring additional technicians across our network to support this expansion. All these technicians are certified and factory-trained to work exclusively on the

airplanes we build. We make sure our expertise is a tightly knit network, connecting our techs with experts across the organization, and applying the same engineering, tooling, and processes used in the design and build of new aircraft. These teams perform nearly 10,000 maintenance events each year around the world and have earned consecutive Diamond Awards of Excellence for the last seven years. My bottom line objective is that my team supports the entire aircraft lifecycle. It is not always an easy gig, but is certainly one that we are thrilled to take on every day. |BAM

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THE REGULATORY CHALLENGE IN CYBERSECURITY

Gogo's Mike Syverson, senior VP of Technology and Operations, and Doug Young, VP of Software Architecture, talk about the cybersecurity challenges posed by the European Union's General Data Protection Regulations (GDPR)

AH: If we are focusing on the impact of various regulatory initiatives on cybersecurity issues, I imagine the European GDPR is key here?

MS: There is no doubt that the GDPR is top of mind right now, not only in Europe, but far beyond because it is global in its impact. GDPR requirements apply to each member state of the European Union, aiming to create more consistent protection of consumer and personal data across EU nations. Simply put, the GDPR mandates a baseline set of standards for companies that handle EU citizens' data to better safeguard the processing and movement of citizens' personal data.

The purpose of the GDPR is to impose a uniform data security law so that laws are consistent across the entire EU. In addition to EU members, it is important to note that any company that markets goods or services to EU residents, regardless of its location, is subject to the regulation. In other words, anyone with a presence in the EU has to comply, whether they are based there or not, so it will have an impact on data protection requirements on a global scale.

AH: What does this mean for cybersecurity?

MS: From a security standpoint the GDPR is kind of a hybrid between cybersecurity and data privacy. What you are seeing is a coming together of those two topics. What the regulatory bodies are tending to do is to wrap guidance around the need to protect people's information, and that clearly includes both dimensions since they are interlinked. For GDPR, more specifically, it is about the ability to protect the consumer from anyone unwittingly or deliberately learning about that person.



“In particular there has been a concerted effort by both the FAA and the European authorities to update their air-worthiness certifications to incorporate cybersecurity.” - Doug Young



“From a security standpoint the GDPR is kind of a hybrid between cybersecurity and data privacy.”
- Mike Syverson





For a long time in the US we have had rules around personally identifiable information, things that would enable someone to steal your identity via credit card and banking information. What GDPR does is take that and extend it even further.

There are strong parallels here to what happened when Sarbanes Oxley was introduced in the US. There was the law, then there was the interpretation of the law and finally, we got some case law and people understood how it was going to be implemented. From there, best practices developed, and everyone was more or less comfortable again with their understanding of how to do business under Sarbanes-Oxley. Implementation requirements are often best illustrated when the regulatory authorities pursue non-compliance, and that then establishes best practices and everyone settles into it. Right now, there is a lot of work being done across businesses of all types around the globe to become compliant with GDPR.

AH: What about data breaches? As we have discussed in the past, if you get some State-sponsored hacking group attacking your systems, how difficult is it to keep them out?

MS: It is not so much that I think organisations can be completely bullet-proofed from State actors. That doesn't pass the reasonableness test across the board. But what is reasonable is that you have to do detailed analysis and ongoing monitoring, and exercise extreme care in protecting information from what I would call the casual attack. What does the casual attack look like? I would class those kinds of attacks as say, denial of service attacks, or someone trying to find back doors into your network. It's the people who do not have the millions of dollars of equipment they can bring to bear to crack your network, but who are using some tools they've downloaded off the internet.

AH: What has this required you doing, in practice?

MS: At Gogo, we are vigilant about security and data privacy – we have been from the beginning. As an example, we execute table-top exercises that simulate a data breach or security event to test our processes and systems. These exercises allow us to

model our responses and make adjustments to better protect our customers from these types of events.

AH: What else is going on as far as regulatory issues are concerned?

DY: I would like to paint a high-level picture of the approach we are taking at Gogo. At the highest level, what we have embraced is the NIST Cyber Security Framework (CSF). NIST is the US National Institute of Standards and Technology. The CSF provides a high-level framework for us as an enterprise that we have embraced and deployed for cybersecurity across our enterprise.

One goal of the CSF was to normalise the many different standards on cybersecurity that were emerging. For example, there is the ISO 27001 standard as well as COBIT 5 and NIST 800-53, so they wanted to find the commonality between all of those. CSF provides a good common framework. While you can certify to any particular standard, CSF is a very useful over-arching abstraction.

Here at Gogo we are aligning ourselves with the ISO 27001 framework as a business enterprise. But in addition to our corporate responsibility, we own and operate a network for business aviation, and that is the responsibility of the FAA, so our products are of course certified by the FAA for airworthiness.

In particular there has been a concerted effort by both the FAA and the European authorities to update their airworthiness certifications to incorporate cybersecurity. There is a body of documents that has been informing aviation security for a while, and these are in the process of being updated. Gogo is very much a part of that effort.

The standards are being taken on by RTCA, which is a non-profit organisation and is the working body to update and evolve those documents, which are basically recommended ways of complying with certification authorities. Gogo participates in SC-216, which is the international effort

to update and harmonise both ED-203, the European version, and DO-356, which is the US version. This effort is not just updating them for current best practices, it is also harmonising the two.

All of this is being largely driven by the airframe manufacturers in the US, Europe and South America, and the result will be one single, harmonised guidance document, ED-203A / DO-356A. Gogo is taking an active role as a provider of technology to the airframes. We are being as pro-active as possible in integrating what will come out of these documents into our practices, and we will be compliant with them.

The RTCA's effort, it is important to emphasize, is really focused on the front of the plane, the flight deck and safety of flight. ISO 27001 is more about the back of the plane and what occurs in the corporate IT world. We isolate ourselves completely from the cockpit. Our systems could never be the backdoor to hack the flight systems.

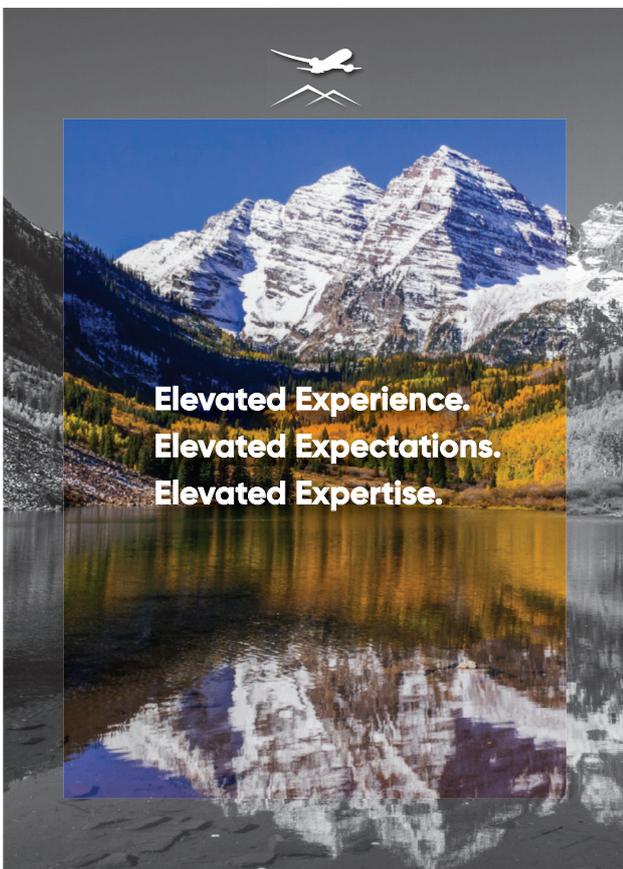
AH: So, what are some of the “nuts and bolts” things you have to do?

DY: An example would be, incorporating threat assessments and threat mitigation into our product lifecycle, from inception. And that is what we have been doing at Gogo



now for the past several years, so it is not a new thing for us. We were very pro-active with our processes to bake this kind of data security into our products. This is now very organic and we are all speaking the same language, from the technical teams to the marketing teams. This is very important. Cybersecurity really is a team sport. It has to involve the whole enterprise, as well as your critical business partners.

The customer, as a result, has confidence conducting their personal and business affairs on the ground and in the air, using Gogo. |BAM



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Q: Can you tell us something of the airport's history?

MG: Bern Airport was founded in 1929, as Alpar Airport, a name that reflected its proximity to the Swiss Alps and the Bernese Oberland, as well as to the river Aare. The first flight from Alpar was on June 8, 1929, when a Fokker F XI took off to serve the route Berne—Biel—Basel. This service ran three times a week with connections to Paris and London.

Today, Bern Airport has an attractive, modern infrastructure. It has a paved runway of 1730 meters (TORA), with separated Schengen and non-Schengen areas. There is customs clearance in situ and the opening hours are from 7.00 in the morning to 22.00 hours, with a slight time difference on Saturdays and Sundays. The great thing for business aviation

travellers is that it is a slot-free airport. This is tremendously convenient for business jet passengers who are free to travel at a time that is convenient to them, between the airport's opening and closing times.

In addition, there are two helicopter companies based at Bern Airport, namely Mountainflyers and Swiss Helicopter, both of which make it very easy for passengers to enjoy smooth and stress-free transfers to nearby cities. There are also two maintenance companies, Airmatec and RUAG, who provide services in Berne.

Q: What kind of passenger throughput does the airport see in a year?

A HISTORY OF SERVICE

Mathias Gantenbein, CEO of Bern Airport, talks about the Airport's development and its services for commercial and general aviation

“The advantages for business jet passengers are clear: apart from the absence of any slot restrictions and the long opening hours, from 7h to 22h, Bern Airport is located in the heart of Switzerland.



MG: Some 200,000 passengers pass through Bern Airport each year as their starting and arrival point for scheduled, charter and business flights. This summer, Helvetic Airways and SkyWork Airlines are offering regular and charter flights to 25 destinations in Europe.

Q: What about the additional advantages for business jet travellers?

MG: The advantages for business jet passengers are clear: apart from the absence of any slot restrictions and the long opening hours, from 7h to 22h, Bern Airport is located in the heart of Switzerland. This enables easy transfers to business destinations such as Fribourg, Neuchâtel, Lausanne or Montreux; as well as ready access

to world-famous leisure destinations, such as Interlaken, Grindelwald or Gstaad.

Also important is the fact that as a Swiss regional airport Bern Airport provides the familiar Swiss atmosphere of friendliness and efficiency, with a very rapid transit between the car park and the ramp. It takes passengers no longer than five minutes to get from the car to the aircraft, passing through security along the way.

Q: What other services does the airport offer?

MG: We can point to a range of factors, such as the convenience of having the two local helicopter companies on site, as well as having customs and border guards in situ.

Bern Airport has its own FBO, complete with a crew rest area and facilities, plus refuelling and catering services. There are also de-icing facilities.

The airport is EASA certified, ILS CAT I (restricted) and is rated at fire category 4-6. In terms of the size of aircraft, Bern Airport can accommodate aircraft up to the size of a Boeing 737-800 BBJ.

Helvetic Airways and SkyWork Airlines, which offer scheduled and charter flights from Berne, operate from Bern Airport with Embraer E190, Fokker 100 and Saab 2000 aircraft.

Q: What are the connections like to other parts of Switzerland and Europe generally?

MG: Bern Airport is conveniently located for onward travel to all the most “important” destinations in Switzerland: Berne, the Swiss capital city, is only 15 minutes away from the airport. Other Swiss cities such as Fribourg, Lausanne, Montreux, Neuchâtel, Grindelwald or Interlaken can be reached in less than 75 minutes by car. Even Geneva and Zurich are close. By car it only takes around an hour and a half to get there from Berne. By helicopter, Gstaad, Verbier, Andermatt and Zermatt can be reached in 30-35 minutes.

Q: Are there business jets based at Bern Airport?

MG: Berne is proud to be home to the business jet fleet of the Swiss Government, as well as to a few privately owned business jets. Plus, we are regularly visited by large and small commercial business jet operators. There are plans to expand the airport and once this is achieved, we expect to be able to base more aircraft in the region.

Q: What are the plans for the airport as far as future expansion is concerned? I imagine there is strong local opposition to any expansion of the runway or significant increases in traffic.

MG: Plans for further development of the airport are now well underway. Major projects include a new satellite-based approach procedure (GNSS), plus the refurbishment of the runway and tarmac system. The plans include provision for a new business aviation centre and an entirely new development, the “Fourth Expansion”, with hangars and facilities with a specific view to general and business aviation to be built in the southern side of the airport.

Actually, in order to realize the “Fourth Expansion”, we are seeking investors interested in participating with this development phase by either building a hangar for their own or third party use, or by participating as a shareholder in an airport affiliated real estate company.

Q: How seasonal are business aviation aircraft movements to and from the airport?

MG: Because of its location, Bern Airport is a preferred airport for “winter sport travellers” – so, leisure business aviation is rather seasonal with peaks over Christmas/New Year, in February and March. Once again, world-famous ski regions (e.g. Adelboden, Grindelwald, Gstaad, the Jungfrau Region, Verbier or Zermatt) are very close to Berne. The numbers of business aviation passengers travelling for business purposes rather than for leisure, tend to be stable throughout the year. |BAM

“ Plans for further development of the airport are now well underway.





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NO LESS REAL THAN THE REAL

Steve Gross, SVP Commercial Sales, talks to BAM about the company's ground-breaking techniques that differentiate its latest generation of simulators

FlightSafety International was founded in 1951. Today, FlightSafety's fleet of cutting edge simulators and its close collaboration with the vast majority of OEMs, make it the training partner of choice for large numbers of operators and aircraft management companies.

Q: Steve, take us back to where it all started.

SG: Al Ueltchi, the founder of FlightSafety, had been flying for Pan American Airways for some ten years prior to starting his pilot training company at New York's LaGuardia Airport. He had a very early introduction to the fledgling business aviation sector

after the 2nd World War, in that he became the personal pilot of Pan American Airways President and Founder, Juan Trip, whose aircraft of choice was a converted World War II military aircraft. He noticed that pilots coming into the corporate jet sector weren't getting anything like the quality of training he'd received as a professional pilot for Pan American, so there was a clear commercial opportunity there.

FlightSafety's first training device, the Link GAT 1 Trainer, was acquired that same year, in 1951. Link trainers were the first ever aircraft simulators, and were invented by Ed Link back in 1929. They were useful in their time and some





Our new FS1000 simulators, with electric motion and control loading, all-instructor instructor station, and VITAL 1100 visual system has taken a lot of the experience we gained designing and building more than 800 simulators for military and commercial aircraft.



500,000 US pilots trained on Link simulators through World War II. However, if you leap from the Link GAT-1 trainer to our latest generation of trainers you are going from a museum piece to a space age simulator.

Q: So when did FlightSafety start building its own simulators and can you sketch out briefly how things have changed?

SG: We entered the sim business in 1978 with what were then state of the art simulators. At that time we began what has been a very rewarding and mutually beneficial partnership with Dassault, when we opened a training center

in Paris, at Le Bourget Airport and installed one of our first simulators there, for the Falcon 20.

Today, our new FS1000 simulators, with electric motion and control loading, all-instructor instructor station, and VITAL 1100 visual system has taken a lot of the experience we gained designing and building more than 800 simulators for military and commercial aircraft. So, the experience we can give to a pilot and crew of how a particular model of aircraft will perform over a huge range of conditions, is just amazing, and the simulator will faithfully reflect the characteristics of the aircraft it is designed for.

As you know, with a Level D qualified modern simulator a professional pilot can be certified directly out the simulator and go straight to flying the jet – and be comfortable with it. What we can do today is to provide a visual and physical experience inside the simulator that is virtually as good as being in the cockpit. The military have very stringent requirements on the clarity and quality of the image in the simulator and on the extensive nature and detail of the terrain database, and we have brought all that into the FS1000 simulators.

In addition, many of our new simulators use our new CrewView glass mirror display instead of a mylar display. This is hugely important for giving pilots in the simulator a clear, crisp edge to edge view with no edge distortions. Simulators that use mylar film (a highly reflective aluminum film vacuum sealed to glass), to reflect the image from an



The simulator will faithfully reflect the characteristics of the aircraft it is designed for.



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overhead projector through the cockpit window, suffer from distortion effects at the edges. They get “roll-up of the image at the top edge and “roll-down” at the bottom. The runway itself can appear mildly skewed. This is far from ideal, but it was a nice, lightweight solution for previous generations of simulators.

Today, we use collimated glass mirror displays, which means that the light rays coming back from the image outside the cockpit are parallel and appear to meet at infinity. This creates a very crisp image, whether the pilots are looking to the extreme left or right of the field of view. It all helps to create a totally immersive experience.

At the same time, the laser overhead projectors that we use to create the pilot’s view enable us to go into fantastic levels of detail, down to individual leaves on trees. And of course, we can create every kind of weather, as well as a whole range of challenging flight situations. When pilots come out of a four-hour simulation session they really do feel worked over.

Q: Getting the simulator to perform precisely like the actual aircraft requires working very closely with the OEM, I imagine?

SG: Very closely indeed. For example, our full flight simulator for the Gulfstream G500 has already received an interim Level C qualification from the FAA, while the G500 itself has still to complete the certification process. The simulator was qualified in January this year and is currently being used in the aircraft certification program. Pilot training will begin once the aircraft is certified.

We began working with Gulfstream while the aircraft was in the early stages of development.

Q: Can you tell us a bit about how you integrate simulator training with classroom training?

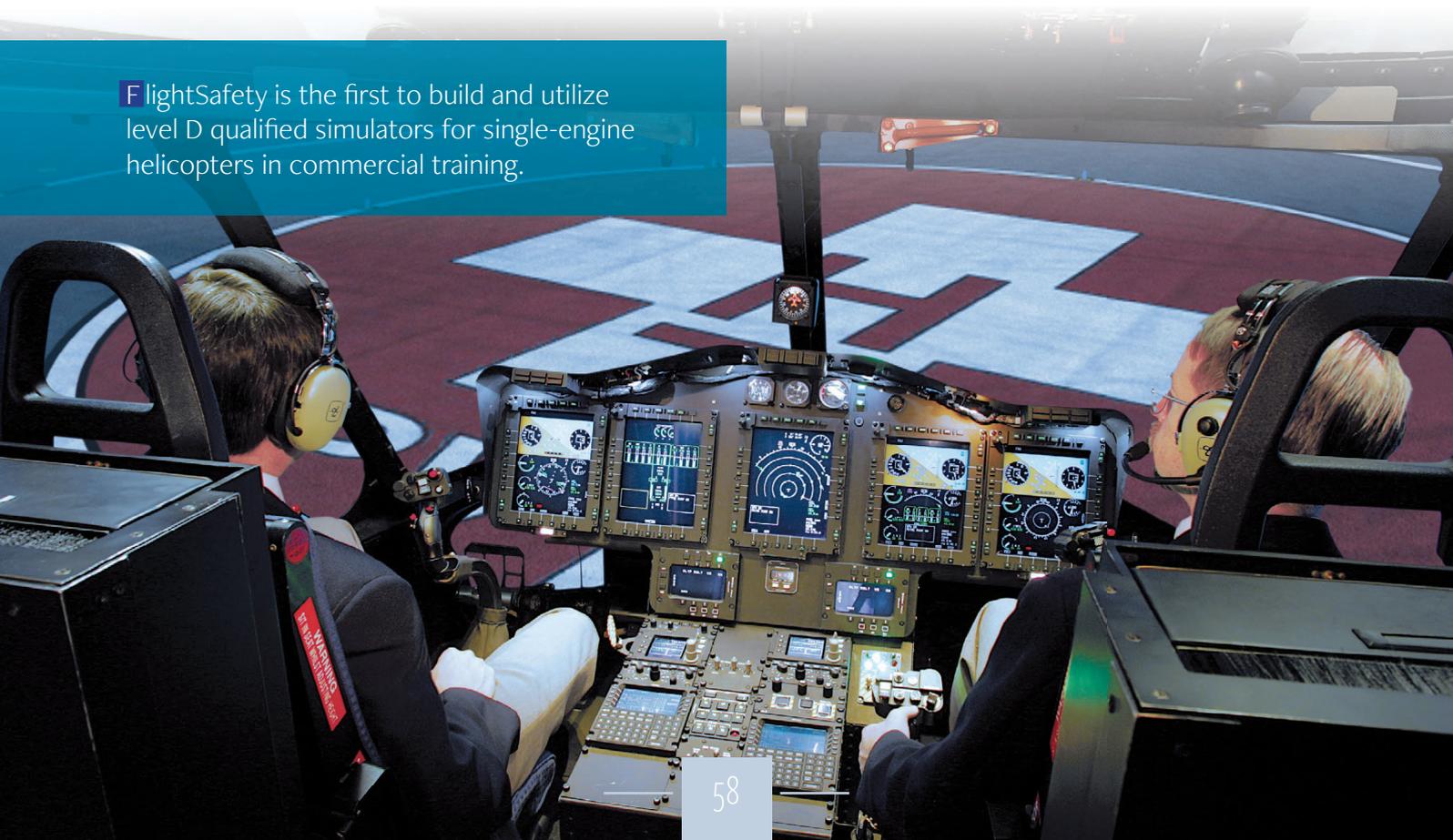
SG: Our training programs feature our new MATRIX integrated training devices. With MATRIX the same code running on the simulator runs on the student’s desktop PC, and it also runs on the graphical simulator. This is a two seat, screen based system that replicates the flight deck and helps the pilot and co-pilot get completely familiar with all the controls before they set foot in the simulator.

The graphical flight simulator typically has six panels of hi-res video screens that represents the cockpit. All the avionics are there. It is a totally touch screen environment. We want to give the pilots as much information as possible so that their time in the simulator is as rewarding as we can possibly make it.

Q: I understand you now have highly realistic helicopter sims as well?

SG: FlightSafety is the first to build and utilize level D qualified simulators for single-engine helicopters in commercial training. This is what we can now provide, and it gives up to 300 degree by 60 degree field of view, which is essential for helicopter pilots because they need to be able to see the ground coming up at them through the ankle or chin windows. What we found was that helicopter pilots were ecstatic that they could finally train doing full auto-rotations all the way to the ground. It would obviously be very dangerous in a real helicopter to try to practice auto-rotating to a safe landing. Now they can do it in the simulator and they absolutely love that they have a chance to master this essential, life-saving skill without putting their lives on the line!

FlightSafety is the first to build and utilize level D qualified simulators for single-engine helicopters in commercial training.





Q: So, we've talked about the new glass mirror displays, what else is new?

SG: In our training facility at Le Bourget we have now integrated Dassault's Falcon Eye synthetic vision technology into the simulator. This overlays and combines actual infrared images taken from external cameras on the aircraft, with the detailed Enhanced Vision Display synthetic terrain database. So a pilot can see, for example, if there is some animal that has wandered onto the runway as they are coming in for an approach. In a purely graphical system, the runway will look clear and inviting when in reality there are a couple of deer or cows crossing the runway. Again, this is building more and more safety features into the simulator, mirroring the safety features that are now appearing in the latest generation of business jets.



The bottom line for simulators is that this is all about making flying safer. We now do a series of advanced training courses for pilots in our simulators. They include Upset Prevention and Recovery, Rejected Takeoff Go/N0-Go, Energy Management, and CRM/Human Factors Loft. The feedback we have got from pilots who have had incidents is that they felt comfortable dealing with the situation, because they had trained to deal with exactly that issue and knew exactly how to resolve it and bring things back to normal. We love to hear those accounts. Safe flying is what it is all about. |BAM



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WOMEN IN AVIATION

René Banglesdorf, CEO Charlie Bravo, on attracting more women into business aviation

AH: René, you have been one of the major voices in the sector promoting the importance of having more women in business aviation. What's happening on that front?

RB. I recently began a new term with the International Aviation Women's Association. For the last two years I have served as Vice President, General Aviation Industry, and now I am beginning a two-year term as VP of Communications and Events with the IAWA. The Association has members from 38 different countries and there are some 400 current members. They come from all sectors of the industry.

AH: How tough is it for woman to get into business aviation and then to get on when they are in?

RB: I do not think that barriers to entry are the reason why there are not many women in the industry. The main reason, to my mind, is that the industry is not actively recruiting women. I am not the only person who thinks this. Recently, two US Senators, both women, one a Democrat, one a Republican, have proposed legislation called "Promoting Women in the Aviation Workplace Act."

You have to remember that there is a shrinking workforce in aviation so getting more women into the sector matters immensely. We have heard many discussions about pilot and mechanic shortages. Commercial airlines have

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been seeking to recruit women for about ten years. By comparison, business aviation is really lagging, so we have a big job to do. If we are not recruiting Millennials, which is 60% of the available work force, and women which comprise 55% of the available work force, then in total we are missing around 75% of the working population, which does not bode well! Look at all the grey hair in the room at business aviation conferences. I was the youngest person on my panel at the CJJ Conference recently and I am 48!

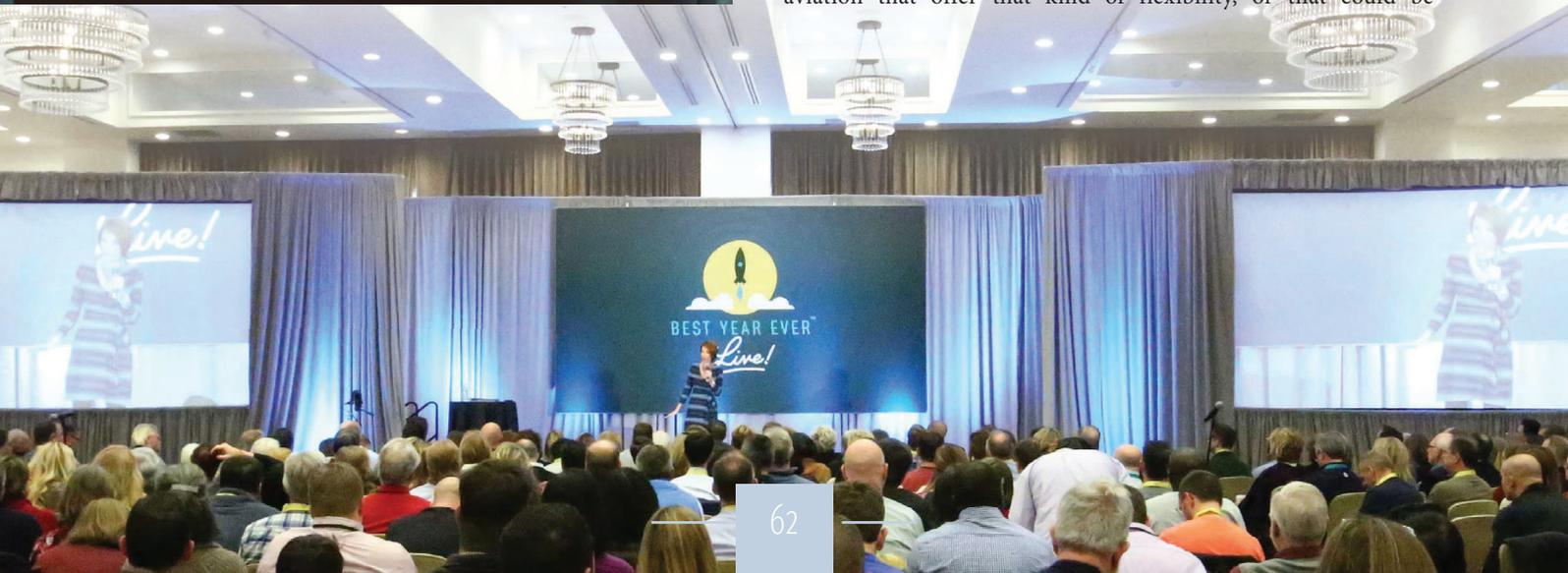
“ The industries that are successful at retaining women are those industries that are managing to accommodate a woman’s desire to also raise a family at the same time as she pursues her career.

AH: It does not, on the face of it, look like an industry that would favour someone who wants both a career and a family.

RB: I think that we absolutely need to do a better job of making this an industry that is not in conflict with raising a family. The industries that are successful at retaining women are those industries that are managing to accommodate a woman’s desire to also raise a family at the same time as she pursues her career. There are some things that airlines in other countries are doing and I think that we need to try to do that here.

Basically, just about all the career roles could be made more attractive for women by building in more flexibility on the hours. You might think that being a woman aircraft broker would be a real stumbling block. But speaking from my own experience, that has never been in conflict with my role as a mother. I might be taking a conference call at 5.00 am or at 11.00 pm. But if my daughter has a volleyball game at 6.00 pm on a Thursday, I can arrange my schedule around that. If I am going to go to her school for three hours on a Friday morning to volunteer, I can arrange my schedule around that. My schedule may be erratic, but I set it.

Moreover, there are a number of professional positions within aviation that offer that kind of flexibility, or that could be



adjusted to offer it. The point is, if you want women in your organisation, allow some flexibility. For instance, take a pilot's schedule. A pilot in general aviation may be on-call all of the time. The owner can decide where and when he or she wants to fly. So, the days of being on call 24 x 7 every day of the year may have to be a thing of the past if we want women in the industry. But that is not so hard. If you look at corporate flight departments, they do a good job of having days when you are on-call and days when you are not.

Owners and aircraft management companies too need to realise that if they want to attract and retain crew, then it is all about being considerate of their crew having a life outside of flying. This is going to be necessary in the future both if you want to attract pilots to work for you and if you want to attract women pilots to work for you. I had a young woman on a panel recently who flies donor organs for a living. She is on call every other week, 24 x 7 for that other week, but her family knows the schedule and they can support this. So, both sides need to have good communication and agreed-upon boundaries.

AH: So, more flexibility is required. What else?

RB: The other thing we need to do is to promote the value of having women in key jobs. There is a tremendous amount of research that shows that the companies that have women

sitting around the board table, and sitting in executive seats, outperform their competitors. If you have diversity on the board and on your executive staff, you are much more likely to be profitable, have better EBITDA, be in better control of risk and have lower employee turnover. These are things that absolutely matter.

AH: How would you explain the improved performance of companies with a mix of men and women on the Board?

RB: I put it down to the fact that diversity brings a better balance to the organisation. Men can be brilliant, but women think differently. If you have a balance of cognitive thinking, of employee management and risk management, through having a good mix of male and female on the Board, you build a great company. I could never work at a company with all women! But I think that the balance is exceptional when you get it, and the numbers are there to prove that it works.

AH: Can you see the pendulum swinging the other way, so that the sector – and industry generally – becomes woman dominated?

RB: Aviation will never be female dominated. Take a woman with three children, two boys and a girl, an airplane flies overhead, the two boys will look up, the girl looks around. Girls are not, in general, as immediately attracted

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to things that move. But if they are introduced to the sector, amazing things happen. My daughter never thought about a career in aviation until we gave her a discovery flight. Now she's at Flight Safety Academy in Vero Beach, Florida, training to be a jet pilot and she's totally focused on flying jets. Women make great pilots, but it is probably not the first career they think of when they are kids.

I have to say from my experience giving talks at colleges and schools, that when girls are introduced to the idea of a career in business aviation they are fascinated. They say, "we didn't even consider that as an option. We did not know that it was possible."

To see what happens when a girl gets focused on aviation, look at Dreamsoar.org, headed up by a woman named Shaesta Waiz. She is a young Afghan woman who went to the US as a refugee as a child and decided she was going to be a pilot. She began pursuing it, ended up going to Embry Riddle, and flew a Bonanza A36 solo around the world last year. She stopped in around 20 different cities and spoke to some 3,000 women all around the world. It is a phenomenal story.

AH: On a more personal note, how did you get into the industry? About half the people we interview in the mag tend to have come into the industry through blind chance. The other half had family already in the sector.

RB: I came in to aviation with both of those characteristics. It was just a freak of chance. My husband decided to sell planes. He said, we need some marketing, you are good at marketing, come market for us. Then he said let's start our own company, so almost exactly ten years ago we formed our own company.

AH: I find it hard to imagine that your husband went on to say, "Hey René, how about you be CEO?"

RB: No. That came about because in the US there is an incentive for companies to work with suppliers who are majority owned and run by women. We sold a plane to Lockheed Martin, one of the biggest defence contractors. Our contact there said it would be so beneficial to us as Lockheed Martin if you were certified as a woman-owned company.

What we found was that when you go through the certification process it is not a case of: OK, René, you own 51% of the company, here's the certification. In reality, you also have to have the highest title and the highest compensation in the company, and you have to be able to show evidence that you are the one that runs the company. It is not about owning it, but running it. So, I said, OK, I can do that. It probably took about three years of me growing into the CEO role, and I depended on mentors both inside the aviation industry and outside. But today, you could ask anyone in the broker community and they will tell

you, René runs Charlie Bravo. So, I fell into this role by accident, but I grew into it and I love it. It is such an exciting industry. That is one of the things that I love about this young woman, Shaesta, she had the grit and determination to see what she wanted and to get there.

AH: So, we are not saying, come into the aviation industry, girls, because it's easy?

RB: It's not easy. But then, what worthwhile things in life are easy? It is a challenging industry, but if you can survive in it you will have character and job skills and opportunities to see the world that you would not have in other industries. It is a very good place to be.

AH: The women who decide to come into the sector, what are the career paths and the growth paths for them?

RB: Oh gosh, there are all sorts of routes in. There were two women at the CJIC who work for Jet Aviation, and they came in at entry level jobs for Jet Aviation. Today, they manage the maintenance requests for clients. When an aircraft comes in for maintenance they give the quote and they manage the process all the way through. They are dealing with technicians, with internal management at JA, and with corporate flight departments or high net worth individuals, so the communications skill sets that they have to have are phenomenal.

It is such a diverse industry. There are professional jobs in legal and in finance. There are professional sales careers, selling aircraft parts, or whole aircraft, or aircraft insurance. You can schedule and dispatch aircraft. There is ground handling, concierge travel services. There are some design jobs in this industry. Aircraft interiors are so huge. There are some very exciting things going on with OEMs in robotics and 3D printing, and drone development. There are some really cool cutting-edge technology jobs in aviation that are not even public yet that will be tremendous. And of course, you can earn your wings and fly.

AH: So how is Charlie Bravo doing right now?

RB: We are doing great. Light and mid-sized jets have traditionally been our focus, but I have four large jets under contract right now. My existing client base is upgrading and as they go to larger aircraft, they are taking us with them.

We do aircraft ownership consulting every day, and we publish a quarterly market report on 53 different types of aircraft. Lots of things are changing in the industry right now—the communications preferences of clients for instance. We used to talk only on the phone, then it shifted to email, and now it's shifted to texting and WhatsApp. Life in this sector is about change and growth and both are happening all the time. That is what makes it so exciting. I never have two days alike. **BAM**

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DESIGN WITH A DIFFERENCE

BAM talks to Ulf Seehusen, Senior Project Manager Specification & Design, VIP & Special Mission Aircraft and Wieland Timm, Senior Director Sales, VIP & Special Mission Aircraft about new completions orders and the latest Lufthansa Technic Mercedes Benz Style (MBS) design.

Q: You have recently announced your first completion order for a Boeing 787-8 aircraft. What can you tell us about this order?

A: The contract is with an undisclosed customer and will feature an elegant design to the customer's own specific requirements. The rear of the aircraft will have delegate seating in different classes, while the private section includes a representative office area, a bathroom and bedroom. We have already garnered considerable experience with the 787 in the fields of modification, maintenance, repair and overall – all of which has deepened our knowledge of this aircraft and puts us in a great position to do a tremendous job for the client.

Q: So this order is to a design specified by the customer? You are also announcing at EBACE the latest incarnation of the unique design you have produced in partnership with Mercedes Benz Style. Have you shown this design to customers yet?

A: No, we are just about to unveil it, but we have spoken of it with customers and there is a great deal of interest in this design. While some owners of narrow and large body aircraft will want their own custom design, perhaps reflecting the design schemes they favour in their yacht or mansion, others are very attracted by the ultra-modern designs coming out in the latest top-of-the-range automobiles, and Mercedes Benz has excelled in this space.





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Q: You unveiled the original design that came out of your partnership with Mercedes Benz around two years ago. That design was very well received. What made you go for a Mark II version?

A: We believe we have really moved the design forward again. At EBACE we will have the official lounge section on display, which will give us an excellent opportunity to showcase it to customers. We have done a lot of exercises on the design to see how we could adapt it from its current 737 narrow body configuration to accommodate clients who want to have it on a Boeing 787 or an Airbus 350.

One of the defining features of the design is the helix twist that we give to it and in a wide body configuration there is so much more space to achieve really good things with that concept. We believe we have done very well with it in its current narrow body configuration but there are a great many challenges that you have to resolve to get the spiral shape working with a narrower body.

Q: Does it make things more expensive or less expensive for an owner to pick your design over having you build to their own unique design?

A: There is definitely a premium price on the Mercedes Benz Style design. What makes this design unique is not just the black and grey thematic, but the fact that there are no sharp corners. Everything has to be pre-formed, all the

panels, and that comes at a price. Everything flows through the design, creating a calm, relaxing feel to the whole interior, from the bedroom and bathroom areas to the main lounge. There are no flat panels anywhere. Everything works to move the eye onward in a very relaxing way.

Q: Other completions companies we have spoken with lately have made the point that the last two years have seen a considerable shrinkage in the completions market. Has that been your experience?

A: We have done very well over this period. Our order pipeline has been full and we have done number of completions and a number of refits. But there is no doubt that companies have been exiting the completions business. If you go back a few years, this market was very overcrowded. Then we had a hiatus in new aircraft deliveries as potential owners sat back and waited for Boeing and Airbus to deliver the BBJ Max and the Neo respectively.

Now, we are going to see the first Neo delivered later this year, and our best guess is that we will see Airbus designate between three and five A320 Neos for the business aviation market, and probably rather more Max's from Boeing through 2019. The main deliveries will be in 2020 and 2021, so it is very important for us to build a very solid position as one of the best completions houses to go to for green aircraft completions. |BAM



“ At EBACE we will have the official lounge section on display, which will give us an excellent opportunity to showcase it to customers.



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AMAC AEROSPACE

Q: This year AMAC celebrates its tenth anniversary. You did not exactly choose the most propitious moment to launch, immediately following the global financial crash. How have things been for you?

WM: We began with an emphasis on delivering the highest standards of service to our customers in everything that we do. We focus on narrow and wide-body completions and maintenance for business aircraft. I think it is fair to say that AMAC is now one of the most respected companies in the industry, with an extensive client base. Our philosophy of putting the client first has seen us grow year on year and we have now carried out over 20 VIP and VVIP completions and refits.

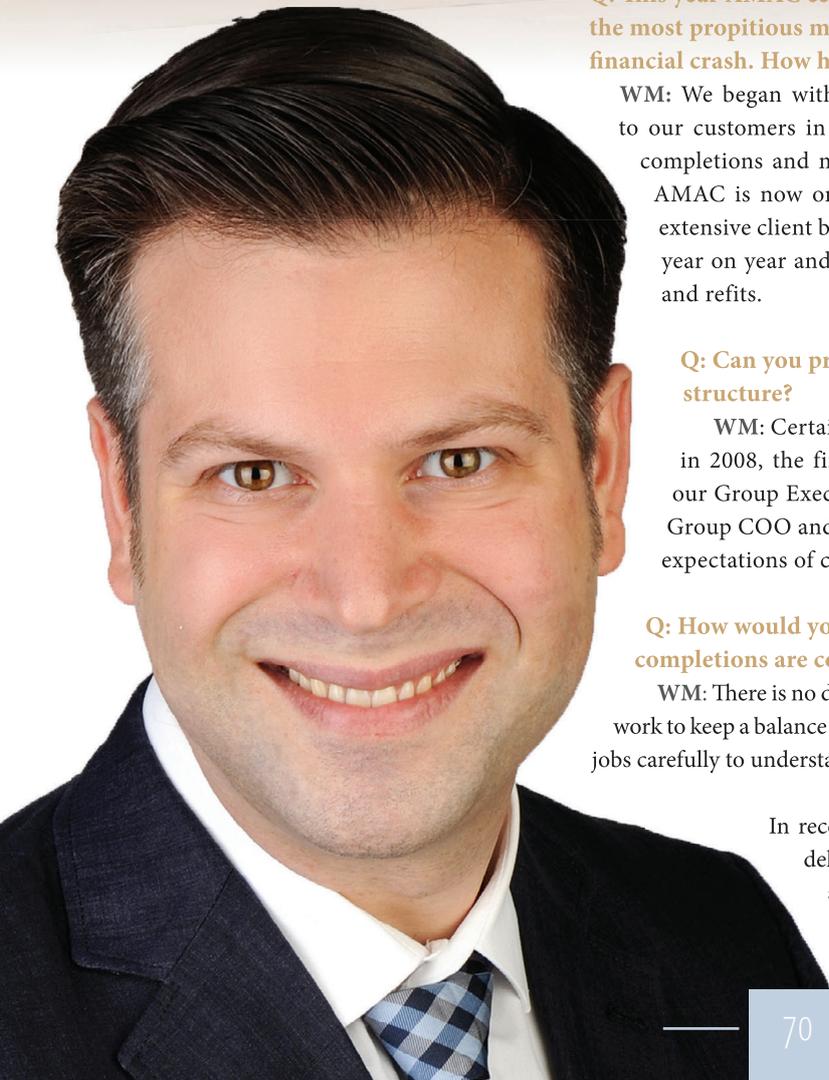
Q: Can you provide a quick refresh on the company's origins and structure?

WM: Certainly. It was founded in Basel, Switzerland, in 2007. 10 years ago, in 2008, the first hangar was completed. AMAC is led by Kadri Muhiddin, our Group Executive Chairman and Group CEO, with Bernd Schramm as the Group COO and Mauro Grossi as Group CFO. Our aim always is to exceed the expectations of clients, airworthiness authorities and OEMs.

Q: How would you characterize today's market as far as MRO and completions are concerned?

WM: There is no doubt that it has been a very difficult market for some. However, we work to keep a balance of what comes through our hanger doors and we analyse incoming jobs carefully to understand their impact on our schedules and work load capacities.

In recent years, where there has been a marked slowdown in new jet deliveries we have benefitted from our reputation in the refurbishment and maintenance space. Owners and operators have been looking



HAPPY 10TH ANNIVERSARY AMAC

Waleed Muhiddin, VP Strategic Operations and Business Development at AMAC, talks about the company's Tenth Anniversary and its successes to date



to extend the lives of older assets and we have enjoyed a number of refurbishment orders, refreshing tired cabins, putting in the latest avionics and in-flight entertainment and connectivity solutions. The first Bombardier Global Expresses, for example, have been coming out of their ten year warranty periods. Some require heavy maintenance and others need new interiors or partial refits. The same can be said for Gulfstream and the other OEM's models. In the large jet space we have seen refresh orders for Airbus and Boeing business jets.

Q: How important is the MRO side for AMAC, as against the completions?

WM: Wide body maintenance service has become ever more important for us in recent years and this is a trend that we see continuing strongly into the future. So it is definitely one that we are devoting resources to. However, it is a parallel line of business with completions, and the two are complementary, since often an operator or owner will choose to use the downtime involved in a period of heavy maintenance to carry out a cabin refresh or avionics upgrade at the same time.

Q: AMAC has been expanding quite vigorously lately, with the acquisition of JCB Aero in May 2016, and with your new facility in Bodrum, Turkey. How is that going?

WM: JCB Aero has been a leading player in the French and European luxury aircraft/ rotorcraft interior design and completions market, with a 25 year history in this market. The acquisition enabled our Swiss operation to expand its

completions,, engineering and production services. JCB's home base is near Toulouse, in Auch, France, on a private airport with 5,000 square metres of hangar space and 6,127 square metres of office and workshop space.

In May 2016, we signed a contract with the Turkish Airport Authority to acquire some 6,400 square metres of premium land at Milas Bodrum Airport, Turkey. In our view Bodrum has a bright future in the business aviation market and we have built a large hangar there, strategically positioned next to the main taxiway. This enables us to provide both line and base maintenance and it means we have the only MRO at this location. The hangar comprises 4,626 square metres of shop floor and can accommodate a Boeing B777-200/300 with a second and third aircraft of the size of two Boeing 737s or Airbus A32Fs. To date, AMAC Aerospace are the first to use a mixed business model for this hangar facility where during the winter months, the hangar carries out commercial line and base maintenance. During the summer months, the MRO services flips over to VIP business maintenance.

Q: Looking ahead, what do you see for the next ten years?

WM: We will be working hard to continue strengthening our client base for both completions and maintenance, as well as looking to extend our current services and operations. Key to everything is maintaining the right balance of work-in-progress and new orders in the pipeline without disrupting our client's strict agendas. |BAM



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PAIN-FREE CHARTER PAYMENTS

Per Marthinsson, EVP PayNode & Avinode Americas Managing Director, talks about why Avinode introduced a new electronics payments mechanism

AH: Let's begin with an analysis of the problem. What is wrong with the traditional way of processing charter flight payments, via credit card or bank draft, or any of the usual approaches? What kind of pain do traditional payment methods inflict on the industry?

PM: Traditional forms of processing charter flight payments are slow, inefficient and in some cases both expensive and risky for brokers and operators. For credit card payments, the biggest risk factor is the issue of chargebacks, which can be raised up to a year after a payment has been made. Considering that the average charter flight is \$20,000, the operator/broker can very quickly build up a significant liability position. Furthermore, any dispute/chargeback creates not only an administrative burden, but traditionally the entire charged amount has to be disputed even if the complaint is just in regards to some aspect of the trip, such as the catering on board. This can also result in cashflow impact as the entire \$20,000 transaction is held up, even if dispute is just for the \$500 catering order.

Another issue associated today with credit card payments is that it simply takes too long for merchants to receive the funds after the service has been rendered – after the flight has taken place. Using regular credit cards, pay out currently takes three days in the US; six in the UK; seven in the rest of Europe.

These challenges mean that brokers and operators have to make a judgement call, when a flight request is made, whether or not to take on the potential financial risk and the expense, often in excess of 3 per cent of the charged amount, by allowing a client to pay with their credit card. Due to traditional banking system limitations and the short notice nature of the air charter industry, there are, however, many cases when a credit card is the only alternative available

Traditional payment methods are also, as mentioned, very inefficient – administrative staff must manually match up invoices to bank statements to determine whether a payment has been processed, dramatically slowing workflows.

AH: How did PayNode come about? What are the benefits of using it? What do end users have to do to start using PayNode? And who are the end users? The passengers chartering the aircraft, or the operator managing the aircraft for the owner?

PM: PayNode was born out of a project initiated by Avinode in 2015, to evaluate the payment flow in the business aviation

market. By speaking directly with Avinode's customers, we quickly realised that the payment procedure is a true industry pain point. So, we decided to build the first ever payment platform specifically targeted at the business aviation market.

Launched in 2016, PayNode replaces a highly manual, time-consuming payment process with a simple and secure online system designed to move large sums of money cross-border, regardless of time or geographic location. The system integrates seamlessly with all of Avinode's platforms, though you don't need to be an Avinode customer to start using PayNode, and it's free to sign up.

PayNode offers superior credit card processing for operators and brokers that reduces the cost of transacting, automates much of the manual reconciling, and increases speed of payout. Plus, any chargebacks or disputes made by the passenger do not impact the entire transaction amount. Through PayNode, the bill is itemised, meaning a specific item can be identified and removed without holding up the rest of the payment. Brokers and operators can also offer refunds to the customer within the PayNode system immediately, enabling an instant resolution of any dispute and enhancing service for that customer.

AH: Can you give us some of the history and background of PayNode's introduction in the US and its planned launch elsewhere?

PM: PayNode was launched in the US at NBAA 2016, and was rolled out to Mexico the following May, ahead of a European launch in June 2017. We expect to have over 200 merchants using PayNode before the end of 2018. Expansion in other markets is on our agenda, but timeframes are still to be decided.

AH: What is the next step in the evolution of PayNode?

PM: At present, PayNode offers processing solutions for credit card and AvCard payments. However, we've recently partnered with international payments specialist WorldFirst to improve bank wire transfer payments, which will significantly improve the cross-border, cross-currency wire payments that are common in business aviation.

It will mitigate foreign exchange risk for brokers and operators receiving payments (they are known in payment terms as 'merchants'), plus it will offer competitive exchange rates to payers and enable the high-speed transfer of



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international and domestic payments into merchants' bank accounts. It will also notify merchants that a payment is received so that flights can be operated without delay. We're currently beta testing the wire transfer solution with a group of selected partners, with a view to launch the service to all our merchants at the end of this summer.

AH: How much of a game changer is PayNode likely to be, and how do you foresee working with it in the years ahead?

PM: Customers have welcomed the way PayNode overcomes pain points in their businesses: the need to move large sums of money internationally at short notice and to be confident that payment will be received promptly, and that it triggers notification to the people working with that specific trip. By helping brokers and operators take charge of their revenue stream, PayNode has already changed the game for those using the platform - not just allowing them to sell more, but also reducing the complexity and costs associated with payment transaction.

Within the Avinode Group, we operate a do-measure-learn philosophy, and also leverage feedback from our customers to pinpoint areas for development. This means that as PayNode evolves, we will be doing so in a customer-centric, efficient and effective way. At present, this means expanding into the wire transfer space; in years to come, we will continue adding those payment processes that make sense for our customers.

Now, using the PayNode system from the opening moments where you enter flight details, to hitting 'send' to the customer, takes less than 60 seconds. Compare this to the industry average of 30 minutes. As we develop, we will, above all, ensure that PayNode remains quick and simple to use.

AH: What are you seeing by way of demand for charter services in the market? Are things improving?

PM: The demand for charter is certainly increasing. Flight requests made through Avinode have grown year-on

year since the global financial downturn of 2008. Plus, with the introduction of the millennial traveller into the market, we are seeing new forms of charter emerging - from 'all you can fly' memberships, to empty-leg apps - which are also helping to drive requests. Looking ahead, we will see a boost in requests with any technology that brings down prices far enough to open the industry up for new client groups to enter the market.

AH: The whole Fintech space is booming at present, with new payment systems appearing all the time. How is that going to impact PayNode?

PM: The wider landscape of fintech holds so much potential for the industry, and we carefully monitor all new developments to see how they might be of use to PayNode. Analysing these systems is constructive to our own evolution, and it's an exciting time to be in payments. For instance, some brokers and operators are now accepting cryptocurrencies as a payment option for their services. This willingness to adapt to new ways of doing business is an encouraging step for business aviation, as our industry is typically seen as a late adopter of new technologies. However, the fact remains that the value of cryptocurrencies is far more volatile than traditional currencies, so while we're closing into an existing junction in the evolution of payments, we don't yet consider it a priority to add cryptocurrencies as an option to our PayNode platform.

AH: Let us turn to the Avinode sale and what this opens up for the company.

PM: Since 2014, when World Fuel Services, acquired the majority interest in Avinode, the company has been able to more aggressively invest in some larger initiatives like PayNode, by leveraging expertise and technology from our new sister companies while still maintaining our entrepreneurial drive. Every year we have strengthened our position as a leading technology and data partner for the business aviation industry, and will continue to produce new interconnected solutions for our members, driving the digitisation of the industry. |BAM

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APPRAISING THE TRUTH

Jason Zilberbrand, President of the aircraft valuation reference guide, Vref, on why business aviation needs accurate aircraft valuations and appraisals

Q: How did Vref get started down the road of providing prices and supporting data on aircraft?

A: The Vref story began roughly 25 years ago. The first Vref guide was published in January 1994. Vref was first published by Fletcher Aldredge, a former analyst at Aircraft Blue Book. He was unhappy with how information and data were being published, collected and updated so he started his own Guide. Fletcher created a platform that was ahead of its time and has the most trusted data in the industry. Vref is used by every bank, financial institution, broker and aviation professional as one of the trusted resources they can depend on for accurate information on aircraft. By providing up to date real time values for helicopters, all fixed wing aircraft, and now engines and commercial narrow bodies; Vref is the predominant force in aircraft value data.

Q: So how did you and Ken Dufour, the CEO of Vref, get involved?

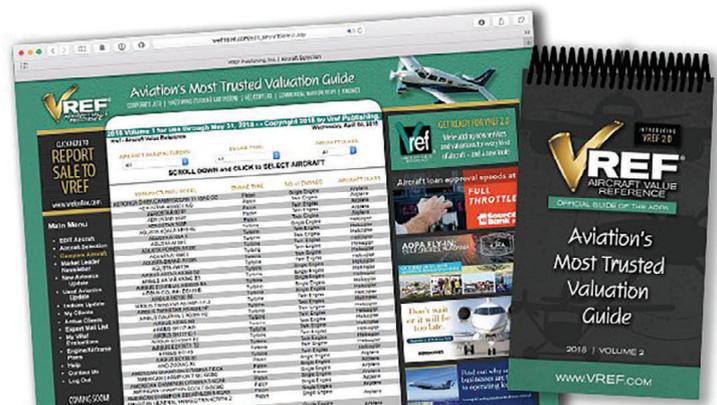
A: Ken and I were brought in to oversee the day-to-day business operations, run the company and implement new services. Ken and I have very different skill sets and backgrounds. I have spent the better part of my life in aviation, having come into the business when I was still in college, when my father started Jet Support Services Inc. (JSSI), which we sold in 2008. For the last 15 years I ran an international aircraft dealership and brokerage.

My time at JSSI was invaluable in preparing me for what I now do at Vref, in that we were myopically focused on maintenance events and costs, and I was introduced to an amazingly diverse network of people in the MRO shops, the OEM community and in the aircraft financing and banking sectors. Buying and selling aircraft further honed my skills, and by applying my maintenance and engine knowledge base to brokerage it created opportunities that I might not have ever been able to identify.

However, when the crash hit on 29 September 2008, a day I will remember forever since it was also the day my eldest daughter was born, we were holding some \$320 million in aircraft inventory, in the form of 23 aircraft that we suddenly had no buyers for. Those



“Vref is used by every bank, financial institution, broker and aviation professional as one of the trusted resources they can depend on for accurate information on aircraft.”



were harsh times for many in the sector as deals dried up all over the place. We were able to reach fair solutions to those positions and moved on. However, what happened over the next few years as companies started shedding jobs was that large numbers of people decided to reinvent themselves as aircraft brokers. Simply by selling one aircraft a year they found they were doubling whatever they had been paid in their old jobs. What was once a career that you were lucky enough to get into or in most cases born into, was now nothing more than a cell phone, website and access to classifieds.

In that environment, being a broker no longer held out much interest for me. I was much more interested in the challenge of how one could go about gathering the data required to put a realistic and accurate value on particular aircraft. I was spending more and more of my time trying to determine where forecasts of values were going and appraising aircraft. It was apparent when I started doing more aircraft appraisals that Vref would be the perfect company for me to grow my career.

Q: I believe Ken came into it from an entirely different route?

A: Absolutely. Ken is without question the foremost expert appraiser of aircraft in the US. He is a Accredited Senior Appraiser with the ASA and he has appeared as an expert

witness in over fifty cases and has helped his side to win them all. I should mention that he has been mentoring me as far as becoming an expert witness is concerned, and I have now appeared as an expert witness in two cases, both of which we won. We now offer expert witness services as part of the Vref portfolio of services, be it via actual court appearances and testimony, or via deposition.

Q: Can you give us something of a flavour of the kinds of cases involving business aviation aircraft that call for expert witness testimony?

A: A very common scenario is where you are acting either for the owner of an aircraft that has sustained damage, or for the insurance company or OEM. What you are trying to determine is what the value of the undamaged aircraft would have been at that point in time, and what its value is now that the damage has been sustained. It is a hugely complicated calculation, with a lot of moving parts. Ken is an absolute master at producing an evidence-based appraisal and his work has never been successfully challenged. That is part of the skill we bring to Vref.

Q: What do you think the current state of appraisal work is like in the sector today?

A: More and more people are now calling themselves appraisers or suggesting that they can carry out accurate appraisals simply because they attended a class. The problem for the insurance companies and

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the banks is that there is a great deal of exposure (monetary risk) based on these appraisals and have very little insight into the depth of experience of any particular “appraiser”, they engage. They just don’t ask enough qualifying questions, nor do they ask for references. Financial institutions have substantial risk, and if they rely on just any appraiser it could pose a problem in the event there is litigation. An expert appraiser knows his knowledge base, and can rely on decades of experience to identify issues that impact value. In general, we wish that more people would research and ask specific questions before hiring an appraiser. Things like insurance are often overlooked until there is a problem. I can’t even begin to tell you how few full-time appraisers carry Errors and Omissions Insurance much less a liability policy; after all, we are gaining access to aircraft and records and the client should always be protected.

It was and is a real concern to Ken and myself to see lots of errors in appraisals. We see banks lending large sums of money solely based on appraisals that significantly overstate the value of the aircraft in question. It is made worse by the lack of transparency in the industry. At the end of the day, Vref is here to bring transparency to the market. We specialise in the real time gathering of data. We have a substantial staff of USPAP Senior Accredited ASA’s and USPAP NAAA appraisers collecting and evaluating the data.



“ It was and is a real concern to Ken and myself to see lots of errors in appraisals.

At the same time, we are getting more and more requests from banks and insurance companies to be more transparent about where the data is coming from. We like to hear feedback about how to improve our software, so by adding footnotes and citing sources it will further enhance the value of our data. Vref is currently undergoing a full makeover and we are launching 2.0 in mid-May, just before EBACE, at which point the service will be greatly expanded. We will have an additional 45 turbine helicopter types included, plus all the narrow body jets from

Boeing and Airbus, and a tremendous wealth of detail on mods and upgrades for all aircraft models. This will include material such as historical issues with airframes and engines.

Q: What of maintenance events, which can be very significant and therefore have to have an impact on aircraft pricing?

A: Absolutely. The aircraft maintenance report will show what scheduled events lie ahead and what has already been completed. On a large business jet a 10 or 20 year maintenance event can be so substantial that you may want to consider parting out the aircraft, since buyers will likely shy away from taking on that burden, and the seller will not want to take the hit. So whoever is valuing the asset needs to have the proper tools to determine fair value. This clearly means knowing where the aircraft stands on its time limited parts – and there will be a large number of these. Vref is here to make this knowledge available in a transparent way.

Q: So how different is the next version of Vref going to be?

A: 2.0 is going to have a totally new look, a new user interface and a range of new services, including a lot of new data. We are also incorporating the stand-alone engine guide. This is particularly important today when owners are trying to decide whether to sell or to part-out an aircraft. Knowing what the engines are likely going to be worth is a critical part of that decision.

We are going to have engine information to include everything from piston engine aircraft to commercial jets, we have hundreds of thousands of maintenance orders, for example, on piston, turbo prop and turbine fan jet aircraft from which we are able to derive pricing.

Vref is the official guide of AOPA, which we take as an incredible honour. There is a tremendous responsibility on us to ensure that we report values accurately, and Version 2.0 of Vref will uphold the tradition of transparency and accuracy and, indeed, take it on to new heights.

In the coming months, we will be rolling out our first ever UAV value guide for commercial drones and there will be many more aircraft models being added on a regular basis.

The service we have not spoken about yet is Vref Verified that assists the aviation professional with their valuation. Vref Verified is a value that an appraiser on staff at Vref has reviewed for accuracy. This should not be confused with an appraisal, as it is not. It simply helps someone with limited knowledge on a specific asset to properly input the correct data and generate an accurate value. Once more owners and operators see the Verified stamp of approval they will ask their broker for it more often. We are super excited about EBACE this year and look forward to the launch of 2.0. |BAM



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