

November 2013

# Executive & VIP Aviation International

## OEM Special Report

Embraer | Beechcraft | Cessna | Gulfstream

### FOCUS:

**Kenny Dichter**  
CEO Wheels Up  
Entrepreneur extraordinaire

### Blackhawk Modifications

largest non-OEM buyer of PT6 engines  
Interview with CEO Jim Allmon

### Jetcraft

Chad Anderson talks about the logic  
behind the ExecuJet sales arm acquisition

### NEXUS CEO:

# Abdullah Al-Sayed

On building a global business  
from Saudi Arabia



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### Broadening the base for business aviation

Our front cover story this issue features NEXUS CEO Abdullah Al-Sayed, talking about his company's continued international expansion. We are delighted to be able to bring readers an in-depth interview with the entrepreneur Kenny Dichter, who talks about both his astonishing business career and his second venture into lowering the entry costs to business aviation for a whole new spectrum of passengers. Dichter's Wheels Up, which launches in December in New York, not only gave Beechcraft its biggest ever order for King Air turboprops, 105 to be precise, it also opens up coast-to-coast US executive airplane travel for a vast army of smaller companies and families. We also feature an exclusive interview with Beechcraft CEO Bill Boisture in our OEM Special Report, as well as with Cessna's Brad Thress, Gulfstream president Larry Flynn and Embraer president, Business Jets, Ernie Edwards.

Once again in this issue we have managed to highlight the extraordinary business acumen and entrepreneurial flair behind so many of the aviation sector's thriving businesses. The features range from Jim Allmon's calculated gamble when he launched Blackhawk, with him and his partners taking on personal guarantees for £25 million worth of P&W PT6 engines, to Mark Dankberg's progression from a home-based satcoms business to launching his second \$500 million plus broadband communications satellite, ViaSat-2. Our Avionics Special Reports look at how Honeywell and Rockwell Collins are taking avionics to new heights, no pun intended, and making flying ever safer and more pleasurable for pilots and passengers by blending natural with synthetic vision.

We'll be rebranding in 2014, largely by shortening the somewhat lengthy title of *Executive & VIP Aviation International*, down to the simple abbreviation - more a persona than an abbreviation, actually - of EVA. We have some new content ideas for the new-look EVA so watch out for our Spring 2014 edition!

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COVER IMAGE:  
 Abdullah Al-Sayed, CEO, NEXUS  
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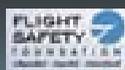
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# Managing growth

Interview with Abdullah Al-Sayed, CEO, Nexus

**N**EXUS Flight Operations Services was launched in 2010 by Abdullah Al-Sayed, one of the most experienced business aviation professionals in the Middle East. Having spent years building and developing his knowledge of the complexities involved in providing flight operations services to commercial airlines and business aviation companies, Al-Sayed launched NEXUS's two main flight operations centres in Jeddah, Saudi Arabia, and in Bahrain in January 2010, and has since been building on that base to grow NEXUS internationally.

Al-Sayed is a former director of flight operations with Saudi Arabia's National Air Services (NAS) and with NAS partner, NETJETS Middle East and the Abu Dhabi-based Royal Jet. The experience with Royal Jet, in particular, gave him invaluable experience in setting up a new flight operations centre, providing a completely integrated view of operational management and customer services. He has since brought precisely that integrated view to bear in the support NEXUS provides to its clients.

"With any business, growth comes through putting in a great deal of hard work and having a good client base to start with. In our region NEXUS is pleased to say that it enjoys an excellent client base. There is a very strong need across the region for exceptional levels of service, and this means doing more than simply providing support services to clients. There is a need to provide a demonstrably superior service not only in ground handling and flight handling, but also in areas such as crew scheduling, customised route planning and catering. You really have to be able to manage all the requirements of a flight department. We have been able to demonstrate this to a high standard and this has been the key to our expansion," Al-Sayed comments. "Understanding the logistical challenges of the airports and countries that go to make up the total flight package, no matter how complex the client's itinerary, is a core part of our service."

He argues that one of the major challenges in flight operations is the ability to provide a complete service to the client, from the initial purchase of the aircraft to ongoing operations, year in and year out.

"As an operator of aircraft we are unique in that we have experience of all aspects of aircraft ownership and operations. We are fortunate in the Middle East in that the region continues to be the largest market for delivery of new long range executive jets, which brings us into contact with new owners and with owners who are expanding their fleet," he remarks.

Al-Sayed points out that owners, pilots and flight operations centres have to take account of changing regulations and new rules as they appear. "NEXUS has studied these changes and we are prepared to meet and exceed the new requirements. While we see the potential for real growth our focus continues to be on quality not quantity. Our clients demand the best, and for our part we want the best clients! Our strength lies in the quality of our client base, which is exceptional."

NEXUS has been actively looking to expand its presence across both emerging and established markets. The group now has a base in Africa which gives it a prime position in the rapidly expanding African business aviation market. "Government's in Africa actively sought us out. They identified us as their preferred business partner as a result of an extensive due diligence exercise carried out to find a partner to develop Africa's first flight services provider that would be owned and manned by Africans. What the government wanted was far more than simply a remote office located in Africa by an established third-party flight operator. They wanted a full service facility that would be 100% African-based, but where staff and management would be able to learn from an expert, established provider with an excellent and proven track record," Al-Sayed explains.

He sees the Africa flight services centre as the springboard for NEXUS to expand its operations across Africa. "The recommendations that come from those who experience our service and the word-of-mouth commentary they provide on the NEXUS quality of service have been a tremendous source of growth for us to date. I am confident that having gained a base in Africa, word of what we offer will generate inquiries from a range of interested parties in neighbouring countries," Al-Sayed comments.

**As an operator of aircraft  
we are unique in that  
we have experience of  
all aspects of aircraft  
ownership and operations**



Abdullah Al-Sayed,  
CEO, NEXUS



Through its practice of always choosing only the most able of partners, NEXUS has been able to extend and improve its services. As Al-Sayed points out, even before the company commenced operations, the board of directors had considerable experience of working with Flight Safety International, the international training company, on previous projects involving flight crew training. "Once NEXUS began operations, a mutual decision was made to engage in a strategic partnership, to the benefit of both organisations," he says. NEXUS brought its in-depth knowledge of the market to the table, plus its understanding of the value of training, and Flight Safety International brought its considerable capacity to mount excellent crew and flight dispatch and operations training courses.

In addition, NEXUS developed a strategic partnership with Wyvern, which specialises in auditing air charter operations. Wyvern is now part of Avinode, which runs Avinode Marketplace, now the largest platform bringing together buyers and sellers of air charter services. "Our aim was and is to establish and build world-class audit services in the NEXUS regions of the Middle East, Africa, India and Asia. Operators and regulators are looking for the highest quality third-party audits to supplement their oversight of operations. In particular, brokers and operators have a natural interest in using

**NEXUS is positioned to provide superior audit capabilities to our customers in a timely manner, and at the most competitive prices**

only the most qualified and proven charter and service providers to protect their VIP customers and aviation assets. With auditors on the ground in the region, NEXUS is positioned to provide superior audit capabilities to our customers in a timely manner, and at the most competitive prices," Al-Sayed observes.

The company prides itself on growing its services and helping its staff to realise their full potential. Al-Sayed points out that NEXUS broke new ground by petitioning GACA, the General Aviation Council of Saudi Arabia, to open the door to female dispatch training. "Following eight months of negotiations between NEXUS, GACA and the Saudi government offices we were delighted to gain approval for the introduction of a major step change. Not only does this prove the value of women in the region, it demonstrates to the world the advances being made in the

region for all our people. This is just the start for women in aviation. I am confident that many new opportunities in customer service and other areas of the aviation field will open up over the next few years," he comments.

One of NEXUS's latest expansionary moves is a partnership with the Sovika Group in India. Al-Sayed points out that NEXUS enjoyed a longstanding relationship with Sovika as the group's local operator in India. The trust and mutual respect between the parties this created led to a joint venture to open up a NEXUS Flight Operations Service in India, with Sovika. "Following our proven global standards for service, support and operational rules, NEXUS India has been a fully operational FOC since November of 2012 and passed the 1,000 flight operations point by July of 2013," he comments. The most recent expansion for NEXUS comes with the partnership with Flytrans International Forwarders. Flytrans is a company based in France with which NEXUS has also enjoyed a longstanding relationship.

NEXUS has additional strategic partnerships with MedAire and SOS International Company, which provides on-board medical kits and equipment, as well as medical training for flight crews and real-time medical support. This can involve medical doctors and professionals providing emergency assistance to airborne flights with direct voice communications. ●

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# The art of going from local to global

A conversation with Ernie Edwards, President, Embraer Executive Jets

**J**une and July 2013 saw Brazil in ferment. The joy of winning the right to host the Football World Cup in 2014 and the next Olympic Games in 2016 had given way to a fervour of mass street demonstrations, with the protestors' grievances ranging from tax increases to poor public services. "We want more than Samba dancing and football," one protestor said, expressing the impatience of many who wanted to see Brazil's modernisation programmes move forward more swiftly. Few though, doubt the potential of this vibrant and resource-rich country. Brazil can point to many excellent examples of enterprise and initiative in its industrial and financial sectors, but one of the most outstanding performances is that provided by the airframe manufacturer Embraer, now recognised as one of the top four aircraft manufacturers globally, with only Boeing and Airbus ahead of it, and Bombardier more or less alongside.

Over the course of the last decade, Embraer has gone from

a local Brazilian company to a global aircraft manufacturer. While the company's real leap forward in the executive jet space, arguably, dates from 2005, the year the company declared its intention to be a major player in the business aviation market, Embraer's history stretches back to 19 August 1969, when it was founded as Empresa Brasileira de Aeronautica, a joint government and private initiative. Its first aircraft was the turboprop transport plane, the Bandeirante. The Brazilian government of the day made no secret of its determination to assist in the development of a strong local aircraft manufacturer. Embraer, as the new company came to be known, benefited from licence production contracts backed by the government. Chief among these was the contract to produce the EMB 326 Xavante, an advanced trainer and ground attack jet, designed by the Italian company Aermacchi manufacture, and assembled under licence in Brazil by Embraer.

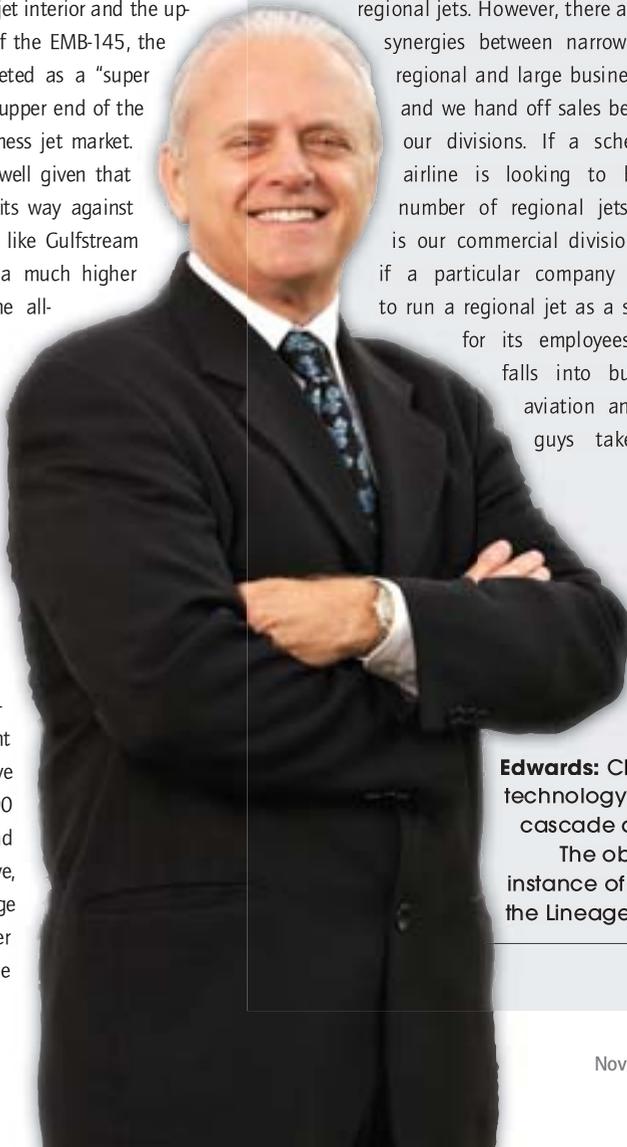
Then, in 1974, building on the success of the Bandeirante, Embraer moved into the regional jet space, starting design work



on its first transport category airliner, the EMB-120 Brasilia. This was a very shrewdly positioned turboprop aircraft with its sights set firmly on the regional market colonised and in part created by the ageing DC-3. The Brasilia offered a 50% increase in speed over the DC-3 and seating for 30 passengers. It won sales from regional airlines around the world but particularly in the US, with the first aircraft entering service with Atlantic Southeast Airlines in October 1985. This laid the foundation for Embraer's continuing success in the US, as well as in the worldwide regional jet market. This early success was reinforced in 2002 with the arrival of the Embraer E-Jet family, comprising the 170 and 190 regional jets.

Embraer's entry into the executive jet market came in 2000 when it announced the Legacy business jet at the Farnborough Air Show. The Legacy was based on Embraer's 37-seat ERJ-135 regional aircraft, first introduced in September 1997, itself a shortened version of the 50-seat Embraer ERJ-145. With an executive jet interior and the updated Mark 1 cockpit of the EMB-145, the Legacy was firmly targeted as a "super mid-size", aimed at the upper end of the small to mid-sized business jet market. Sales went reasonably well given that Embraer had to make its way against established competitors like Gulfstream and Bombardier, with a much higher brand awareness in the all-important US market.

Then at EBACE in 2006 Embraer revealed its "heavy iron" offering in the business market, demonstrating the Lineage 1000, an executive jet remodelling of its ERJ-190. With a business jet interior and additional fuel tanks in the mid-luggage compartment the Lineage 1000 gave potential buyers a 4,400 nautical mile range and a larger cabin alternative, with more square footage of cabin than any other aircraft in its price range



# Q&A: with Ernie Edwards

**Q: Can you tell us a bit about how Embraer is structured, with respect to its military, regional jet and business jet portfolios and what the interaction is between them?**

**A:** We have three separate divisions in Embraer, namely the commercial division, the executive jets division and then defence and security. Each is fairly autonomous and the commercial sales team has been having very good success in North America particularly. It's a big continent, well supplied with airports and constitutes an ideal market for regional jets. However, there are real synergies between narrow body regional and large business jets and we hand off sales between our divisions. If a scheduled airline is looking to buy a number of regional jets, that is our commercial division. But if a particular company wants to run a regional jet as a shuttle for its employees that falls into business aviation and our guys take the

lead for the sale. And if the customer wants to operate a very specific service we look to the commercial team to provide their flight profiling experience, and so on.

**Q: Embraer's history has been shaped by the successful redeployment of regional jet designs into the business aviation market. How much technology cascade is there between the divisions?**

**A:** Clearly, technology does cascade down. The obvious instance of this is the Lineage 1000. The head-up display (HUD) in the Lineage came to us directly from the commercial division. Some of the airlines wanted HUD in their Embraer 190 aircraft and we, that is the executive jet division, were able to piggy-back on that development and to get certification for it on the Lineage.

**Q: You use a range of avionics systems across your portfolio. Can you tell us about that?**

**A:** We use Garmin in the Phenom, Rockwell Collins in the Legacy 450 and 500s and Honeywell in the Legacy 600 and Lineage 1000 at the top end. At the light jet end the avionics that we use fulfil all the dreams and wishes of the individual buyers. We call the Garmin 1000 the Prodigy system. We were the first people to put Garmin into corporate jets when we announced the programme for the Phenom back in 2005. Garmin is, of course, very well known and understood in the turboprop market and the entry level Phenom 100 is a great jet for people transitioning from turboprops. So giving them a cockpit avionics system that they are familiar with in the turboprop market made perfect sense. This decision has been supported by the advances Garmin continues to make in its avionics. We have also proved that our ability to innovate

**Edwards: Clearly, technology does cascade down. The obvious instance of this is the Lineage 1000**



Cutaway showing the interior layout of the Lineage 1000

in this space continues. The first delivery of our Phenom 300s to Netjets introduced the Garmin 3000, which we call Prodigy Touch, which was the first time that a jet aircraft *per se* had a touch screen in the cockpit. HondaJet have also announced that the Garmin 3000 is going to be their avionics system of choice, but they have not brought their aircraft to certification yet. Garmin are in fact doing very well indeed. They have announced that they have been chosen for the new Learjet and for the Citation Latitude, so they are really branching out and growing up in the business jet space. We value our relationship with them just as much as we love our relationships with Honeywell and Rockwell Collins. At the entry level for light jets, with the Phenom 100, probably around 60% of buyers are owner/pilots and they know their avionics and their airplanes back to front.

On the Legacy 500 and 450, one of the reasons why we chose the Rockwell Collins Proline Fusion was the synthetic vision capabilities. Garmin also have this capability. You cannot put a price on anything that gives pilots a better view of the terrain when they are approaching an airport.

**Q: The Lineage 1000 has been very carefully positioned to offer more cabin space than any other aircraft at its price range. Can you tell us a bit about the strategic thinking behind the introduction of the Lineage?**

**A:** We looked at the aircraft available to the market at the US\$53 million mark, taking into account factors such as the aircraft's range, what the cabin was like and what the optimum wings and engines combination would be. Looking at that, our choice was to base the Lineage on either the 170 or 190 regional jet and it seemed clear that the 190 had more to offer. The 170 would not have

had the fuel range to go the longer distance and the 190 allowed us to put together the best airframe, wings and engines combination to make the Lineage 1000 a true home away from home for its owners. It is not as wide as the Boeing or Airbus business jets, but the fuselage is longer, which enables us to have five distinct cabin zones. So we can make the entrance foyer by the front door and once you are through the galley area, the rest of the aircraft is available for the owner to design as he or she sees fit.

This has given us a tremendous space per price advantage, with very similar running costs to the competition and our challenge now is to gain visibility in our key markets. Wide body ultra-large business jets are not exactly flying off the charts in sales, and the Lineage 1000 is the perfect replacement aircraft for owners of Global 5000s and Falcon 7x aircraft. We did a study that showed us that the owners of the very long range business jets are not in fact using them to fly extraordinarily long distances. They are flying them mainly because they like the cabin size. With the Lineage we are able to say to them, instead of taking five of your friends, you can take 19 passengers and not have them get in each other's way. We are able to offer a very large cabin, but without the cost of the wide body ultra large jets or similar costs to the narrow bodied competitors. If we succeed in getting the word out that we have more cabin size to offer for less cost, with very similar life cycle and fuel costs, this will play very well for us.

Moreover, the 190 regional jet has already sold between 400 and 500 aircraft, so the amortisation of the design costs has already happened. This, together with the buying power that Embraer has, drives down the cost of maintenance for 190 and so, also for the Lineage. There are many similarities between the two aircraft. The Lineage has fuel

(US\$53 million with the cockpit and cabin fully outfitted by Embraer).

As well as competing in the super-midsize and large cabin space, by the early 2000s Embraer was well positioned to challenge the likes of Cessna and Hawker Beechcraft in the light jet market. It had gained vast experience in the light aircraft sector through building Piper Aircraft kits in Brazil for the Latin American market, producing almost 2,500 light planes between the inception of the Piper project in 1974 and 2000. While this project was confined to kit assembly of turboprop light aircraft, it enabled Embraer to build up the engineering and assembly skills that the company was to put to good use later with the creation of the Phenom 100, a four-passenger, entry level jet that had its first delivery in December 2008, with the 100th Phenom 100 sale coming in 2010. The first delivery of the eight-passenger Phenom 300 in December 2009 added a light jet option to Embraer's portfolio.

All of this needs to be set against that decision, back in 2005 when the Embraer Board decided to set its sights on being a lot more than a regional jet specialist with an interest in business aviation. The Board threw down the gauntlet, as it were, to the rest of the business aviation market, vowing to make Embraer one of the top players in this most competitive of markets within 10 years. The odds against it were steep. Players like Gulfstream, Bombardier, Cessna and Hawker Beechcraft had established reputations and considerable brand awareness in the US market. To be sure, by 2005, as we have seen, Embraer had the Legacy and was making sales on the back of the sheer excellence of the aircraft. But from a sales perspective, having a great product is just the starting point. To secure a sale you have to get in front of a prospective buyer and you have to have a professional sales team dedicated to turning a tough potential sale into a signed deal. What Embraer needed was someone who could take their US operation to a

CONTINUED ON P17

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wholly new level and give its sales force the kind of dynamic edge that would allow it to win market share from the high profile competition.

It found that someone in Ernie Edwards. Ernie joined the company in 2005 from the Phoenix Arizona-based Swift Aviation where he served as president. Swift was the launch customer for the Legacy 600 in the US, having placed an order for 25 aircraft in November 2000 and Ernie's relationship with Embraer had developed over that period. Before Swift, Ernie had built up a tremendous record in senior sales management with Gulfstream and Cessna, giving him a deep understanding of the business aviation market. Moreover he understood the product from the

pilot's perspective, being a longstanding holder of an FAA Airline Transport Pilot licence and having multiple ratings on a variety of different jet aircraft.

A Welshman by birth, Ernie started his career as an aircraft apprentice with Hawker Siddeley Aviation in Chester, in the UK, which, as he told one interviewer, gave him a solid mechanical engineering background. "I know how to rivet, drill, make engineering drawings, read drawings, bend metal and paint airplanes," he told the interviewer. His "big break" came when he decided to apply for a job as a trainer for TWA, who had won a contract to maintain Saudi Arabian Airlines and needed to build up its engineering team. While in Saudi

Arabia he met a Saudi prince to whom he refers as his "second father". The prince offered the young Ernie a job selling Cessna Citations in the USA, a position that simultaneously opened the door to an understanding of what is involved in selling multi-million dollar executive jets and to America. That experience has stayed with Ernie ever since, and has had a tremendous shaping influence on his management strategy. You could call it management-by-listening, with an ear to what's being said and an eye for the main strategy. Listen to people at all levels, senior staff, junior staff, customers, suppliers. Listen and facilitate, open doors, enable good things to happen. However, listening also entails acting decisively when





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occasion demands. You are not just listening, you are listening for a purpose, to make the company stronger and to find the most effective ways of achieving your goals, he says.

Under his leadership, Embraer reshaped its sales division into two separate units in the US in order to give the division a tighter focus through the long drawn out – and still ongoing – recovery from the 2008 crash. The one team, consisting of eight sales staff, handles everything from the mid-sized Legacy 500 on down (the Legacy 500 is a maximum 12-passenger aircraft and is due to enter service in the second half of 2014). The other team, comprising five members, handles everything from the Legacy 600 to the Lineage 1000. Both teams report in to a regional sales vice president who reports to the national vice president. “One of the major reasons for doing the split was that we lost momentum for the

larger cabin sales in North America at the beginning of the recession. The sales teams were doing very well in the mid to light jet market where sales lead times are noticeably shorter, but the real challenge is in keeping the sales team focused on the deals that take longer to mature, but have the bigger impact on revenue. The big aircraft are at the top of the pyramid, with fewer customers and bigger ticket prices so a dedicated large cabin team seemed to us to be the way to go – and this is certainly proving true in practice,” he comments.

Embraer is now seeing a slow but steady increase in sales across the board. “Our sales, year-to-date are up on last year’s sales as at end of May 2013, and that is very encouraging. I have said before that I want to see three months of month-on-month improvement before I start feeling that things are really

picking up. But if we have another month or two such as we have just had, I will be very pleased. It is too early as yet to say whether this reflects any real underlying improvement in the global economy or whether it is a factor of the reshaping of our sales force – possibly a bit of both,” he says. Progress in Latin America has been good, though Europe continues to be a slow market. However, Russia and the Middle East continue to be a “honey spot” while some African countries are also looking promising for Legacy and Lineage 1000 sales.

All in all, the Board would be justified in concluding that the target the company set for itself back in 2005, to become one of the big players in the business aviation market, has in fact already been achieved. We’re only just past the mid-way point in 2013 and already Embraer is universally regarded as a top player. ●



**I know how to rivet, drill,  
make engineering drawings,  
read drawings, bend metal  
and paint airplanes**

*CONTINUED FROM P12*

tanks in the belly hold, but from a reliability and cost of parts standpoint the pricing is to airline requirements, not the US\$50,000 per windshield pricing you find on business jets! Airlines just will not pay that kind of inflated pricing and our owners benefit from this market discipline. What we find is that when potential buyers look at the total cost of ownership of the Legacy and the Lineage as against our competitors in the market, then if you get that opportunity to do those comparisons, the rest of the sale is quite simple!

**Q: You took the decision recently not to ship green aircraft for completion elsewhere, but to do all the cabin outfitting to the end user's specifications, at your own completions shop. What prompted that decision?**

**A:** We originally had PATS De Crane doing the completions for us. They were the original installers of Lineage interiors. We would build the aircraft in Brazil, install the long-range tanks and fly it to PATS' Georgetown, Delaware, completions facility, where the designs were done by the UK company Priestman Goode. However, we found that to be an inefficient way of doing things, since the customer had to come down to Brazil to take delivery of the airplane and the De Crane team would have to come to Brazil to do any additional works that were required on the aircraft or to fix any snags. So we decided to take completions 100% in-house, and we made the decision not just for the Lineage, but for the entire fleet. This gives us a tremendous scale through our completions facility and allows us to develop all the expertise that we need, from designers to craftsmen and cabinet makers. We started doing completions in-house on the Legacy in 2006 and our team are highly proficient. Customers still have the option of having a green aircraft delivered to the completions facility of their choice, but so far no one has opted to go that route. The cost efficiencies and quality of work that we provide in-house more than meet client expectations. We've had a few customers start off wanting to take a green aircraft to completion houses in Europe or the United States, but when we price out a green airplane and they add the interior costs from an external completions house to the

price, then compare it to a completed aircraft from us, it just doesn't make financial sense, particularly when you look at the quality that we produce.

**Q: Is the number of planes on the pre-owned market a continuing drag on new sales?**

**A:** That would have been a very appropriate question in 2012, but what we are seeing is a rapid diminution in the numbers of high quality, low usage time, pre-owned aircraft in the mid to large size market. What is left is a large number of lowish quality, high time airplanes that banks are not particularly keen on refinancing. Overall, the pre-owned market is pretty analogous to the used car market. You get some potential owners who will never buy new, some that will only buy new and everyone who will consider a pre-owned aircraft wants the one-old-lady, scarcely driven vehicle - there just are not that many of those about any more.

**The cost efficiencies and  
quality of work that we  
provide in-house more than  
meet client expectations**

**Q: How do you see the future of the business aviation market over the next few years?**

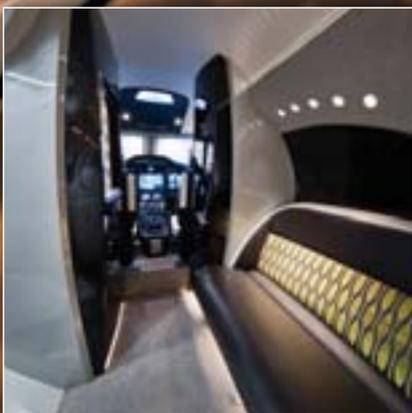
**A:** We are predicting that the economic recovery we have all been waiting for could be in full swing by 2016 and sales of executive jets could be at an all time high by 2017 - that is a conceivable scenario with a good chance of turning into a reality. However, sales are not sales until money changes hands. The OEMs have learned from the 2008 crash that just because they have a full order backlog of two to four years, doesn't mean that all those sales will materialise. Those order books were swollen with speculative purchases that melted away in the economic downturn. One thing that is for sure is that some of those speculators that were flipping orders at the pre-delivery stage and turning a profit on paper transactions will not be invited back to the game. OEMs have become very shy of those sorts of deals - they are the first to bail out when money gets tight! ●



# Cessna

puts the lows  
of 2008 behind it

Interview with Brad Thress, Senior VP, Business Jets, Cessna



**We are very excited about the Longitude. This is a big airplane, at 50,000lb, and it is a clean sheet airplane, having been designed from scratch**



The recession of 2008 and the prolonged economic weakness that followed did Cessna few favours. As Brad Thress, Senior Vice President, Business Jets at Cessna notes, the company went from a work force of 17,000 just before the demise of Lehman Brothers, to around 7,000 at its lowest point. "The whole business aviation industry suffered. Instead of the 480 jets sold in 2008, the industry level for the three years prior to 2012 ran at around 180, with that number improving to 295 in 2012," he says. Moreover, the light jets market has in particular has continued to deteriorate, with each of the last three years seeing declining sales year on year.

However, those days are now behind the company. Cessna kept development going through the downturn and today it has some five publicly announced products. The first of these, at the very light jets end, is the M2. Thress says that the M2 is progressing to certification, with the expectation being that it will certify in the fourth quarter of 2013. "This is a tremendous "move-up-to" airplane for the over 400 Mustang owners out there, plus we are still capturing the typical piston and turboprop owner/pilot transitioning to jets. They account for about half of the advance sales of the M2," he comments. Cessna will be shipping the M2 as soon as certification is complete and the M2 will come with the Garmin 3000 glass cockpit avionics suite.

"We have been very pleased with customer response to the Garmin avionics. They like the interactivity of Garmin, and the functionality. We have opted to go with Garmin not just for the light jets but for our high end jets as well, with the Garmin 5000," he comments. Cessna's second new announcement since the downturn, the new Citation Sovereign, has Garmin 5000 avionics, plus an all new interior, a new wing and winglet, and upgraded Pratt & Whitney PW306 engines. The third announcement concerns the new Citation X which has a slightly larger cabin than its predecessor, and an all-new interior plus winglets. Both the new Sovereign and the new Citation X are in the final stages of certification. Then there is the Latitude, which is due to certify in 2015. Thress points out that Cessna finished the first fuselage for the Latitude in August. The

fact that the Latitude has a 72 inch floor to ceiling height and a width of 77 inches with seating for nine, is generating considerable interest.

Pride of place among the new additions to Cessna's portfolio, however, goes to the Longitude, Cessna's first venture into the 4000 nautical mile range. "The Longitude comes with the new Snecma Silvercrest engine, so that is a very exciting project for us," Thress says. Silvercrest is a radically new departure for both Cessna and the French jet engine and aerospace manufacturer, Snecma, which until now has been best known in the business aviation space for its CFM56 engines, the result of a decades-long joint venture between Snecma and GE Aviation. The CFM56 powers ACJ and BBJ corporate jets but Silvercrest is Snecma's first solo venture into the mid-range business jet market. The fact that it was conceived from scratch to be the best performing engine in its class for the mid-size long-range business jet market, made it a perfect fit for the Longitude, Thress says.

According to Laurence Finet, Snecma's Silvercrest Program Director, the company anticipates some 5,000 jets being sold in the mid to long-range, large cabin segment of the business jet market over the next 20 years and would be "delighted", as Finet puts it, to find itself capturing 50% of that market with Silvercrest. A successful debut on the Longitude will go a long way to helping the company achieve that goal. Silvercrest's advantages are a 15% lower fuel burn than equivalent thrust engines, lower NOX emissions, a better power to weight ratio, low noise levels and ease of maintenance. Being the launch engine on the Longitude is a tremendous success for the Silvercrest project.

"We are very excited about the Longitude. This is a big airplane, at 50,000lb, and it is a clean sheet airplane, having been designed from scratch. It is the fastest airplane in the 4000 nautical mile class, with a cabin that is 77 inches wide and 28 foot long, as opposed to the Latitude's 21 foot cabin, plus there is a walk-in baggage area. However, what is particularly good about the Longitude, from our point of view at Cessna, is that we have around 700 Sovereign and X customers today and until the Longitude, we did not have a longer range airplane to offer as part of our portfolio. So if customers grew to the point where they wanted a long-range jet,

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The Cessna Longitude

we lost them. With the Longitude, we have an airplane with a purchase price of US\$28 million that offers the best value, in terms of acquisition costs and direct operating costs, of any 4000 nautical mile machine," Thress comments. Certification for the Longitude is still some way off, and is expected in 2017.

Above all, the appearance of new aircraft like the Latitude and Longitude demonstrates Cessna's commitment to keeping the Citation portfolio exciting and fresh. "What all this shows is that despite the downturn, we have worked hard to have fresh new products to bring to market as the market recovers," Thress says.

One of the biggest competitors to Cessna as an OEM is not so much other OEMs as the pre-owned market, so this is where the necessity for refreshing the product line and stimulating owner appetite for new airplanes over pre-owned, becomes so important. "Last year there were some 2,300 pre-owned business jet transactions and time and again, when we are selling a new airplane, we find ourselves competing with our own, older pre-owned models as well as against equivalent aircraft from other OEMs. Owners need a strong reason to prefer new to old, and that is what we seek to give them with our new line-up," Thress comments.

Undoubtedly the segment that got hit

hardest in the downturn was light jets. Thress points out that by comparison with the 384 light jets sold in calendar year 2008, there were just 60 sold in 2012, representing a pretty dramatic contraction. By comparison the ultra-large market, where Gulfstream's 650 and 550 play, didn't contract at all and in fact saw some growth. "Between the two extremes the level of market contraction was inversely proportional to the size of the airplane. So this bodes well for a move-up product such as our new Citation X and Sovereign products," he says.

Cessna does all its own interiors with customers free to choose between a range of pre-packaged interiors that offer the best combination of features in the eyes of its designers, or they can customise their aircraft with a bespoke interior in discussion with Cessna. Thress says that he is confident that Cessna can create a bespoke interior for a customer and be substantially more competitive on price than a completions house would be outfitting another OEM's green aircraft. "Doing our own interiors is an overhead, because we have to bear the cost of all the specialist skills required, but you either take this overhead yourself or you let someone else have both the overhead and the profit margin. We like being vertically integrated, and we take this

approach beyond interior completions. For example, we do all our own landing gear and bonding and welding. The real heavy work of interior completions is in direct labour, and the more interiors you do, the more work hours you have to liquidate your overhead across. We can do 500 units of something, not just a handful of units, so that gives us the ability to deliver to the highest quality product and to be cost-competitive at the same time," he comments.

Cessna also has its own cabin management system and in-flight entertainment system, called Clairity. "We had a development partner on Clairity, but most of the deal is in-house," he comments.

The average passenger load across Cessna's portfolio of executive jets is between three and four, with the average trip duration being about seven tenths of an hour. This rises to around 1.6 hours in a CitationX, for example, and shrinks to half an hour in the Mustang.

Thress is confident that investing in new product while the market remains in a fairly flat state is the best approach. "It is not a matter of if the business aviation market will recover, but when. Human beings like mobility and as business strength recovers, business aviation as a corporate tool will once again come to the fore," he comments. ●



**The new Citation Sovereign has Garmin 5000 avionics, plus an all-new interior, a new wing and winglet, and upgraded engines**



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# Gulfstream

An interview with the company's President, Larry Flynn

**W**hen someone is considering a very big ticket purchase, and business jets are nothing if not big ticket, they tend to pay particular attention to the brand strength of the supplier. This is doubly true when the overall global economy is jittery and economic growth is uncertain. These conditions are tailor made for Gulfstream to outperform most, if not all, of its competitors and they go a long way to explain why the company is currently enjoying the lion's share of such new orders as there are in the mid-size market, and why it has had the confidence to make massive investments in its production and assembly capabilities since the global financial crash of 2008.

In what could have been a catastrophic act of bad timing had the company's resolve faltered, Gulfstream had announced its flagship 7000 nautical mile range, ultra-large cabin G650 to the world on 13 March 2008, committing itself to a massive investment and manufacturing programme. Six months later, on 15 September, Lehman Brothers collapsed and plunged global markets into a recession to rival the Great Depression of the 1930s – not exactly an auspicious environment for business jet sales. Nevertheless, Gulfstream followed up the March announcement with a second launch announcement on 5 October, this time of the

G250, later renamed the G280, which it said would have the largest cabin, the longest range and the fastest speed in the super mid-sized class. In this, Gulfstream declared its confidence that the global economy would recover and put the crash behind it

As Flynn says, management decided to stick to its guns and to the seven-year US\$400 million Long-Range Facilities Master Plan that it had announced in 2006, at a time when the business aviation market was booming. That plan included the creation of a new 624,588 square foot service centre, an independent fuel farm and a state of the art paint hanger, plus a new sales and design centre at its manufacturing and service facilities in Savannah. The plan envisaged the creation of 1,100 new jobs for these facilities, plus a new Research and Development Centre (RDC) to accommodate some 750 technical and engineering staff.

"All of this was related to the G650. We went ahead with it despite sales falling away in 2009 plus in November 2010 we announced a further US\$500 million expansion with a plan to add 1,000 jobs. In fact we have already added more than 1,700 since then as part of another expansion and upgrade to our Savannah facilities," Flynn says. The group also took the decision to expand Gulfstream's own service centre footprint globally, adding service centres in Sao Paulo, and doubling capacity in Westfield

Massachusetts. Capacity at Savannah more than doubled as part of the 2006 initiative.

So far, so good, and the results have more than justified Gulfstream's faith in the ability of the business aviation market to ride out this long dull patch in the economic cycle. Gulfstream's parent company, General Dynamics, does not declare Gulfstream's revenue separately, bundling it in as part and parcel of the aerospace group in the General Dynamics Report and Accounts. However, in 2012 the aerospace group achieved around US\$7 billion in sales, while the revenue for General Dynamics as a whole came in at US\$31.5 billion. "Operating earnings were up some 32% year on year and sales revenues were up around 19%, so we have been doing well. Moreover, throughout the period since the crash we have consistently held the number one rating spot in product support, something we are very proud of," Flynn adds.

By mid-September 2013 Gulfstream had delivered 13 G280s and customer feedback has been fantastic, Flynn says. Gulfstream deliberately designed the interior of the G280 to be very similar to that of the G650, giving owners and passengers the same look and feel, and much the same width and height as they would get on the longer range, larger jet. "What is great about the G280 is that it is much more than a coast-to-coast of the USA airplane. When we designed the G280 we targeted a range of



We have already added more than 1,700 jobs as part of another expansion and upgrade to our Savannah facilities



3,400 nautical miles and in fact the range the plane delivers is 3,600 plus, which means you can fly all year round direct from London to the east coast of the USA. We flew from Paris to New York in seven hours and 40 minutes and we've set a whole bunch of city pair records with this airplane, with some 30 records already verified and more pending," he comments. Both the G280 and the G650 were certified in 2012, with 29 G650s delivered so far. According to Flynn, the order backlog has now reached the point where someone signing a contract today can expect delivery in July 2017! Importantly, Flynn emphasises that Gulfstream does not sell to brokers, but only to bona fide end purchasers, be they operators, corporates or high net worth individuals, and there is no queue jumping and hence nothing by way of speculative premiums accruing on the purchase price.

"Both airplanes have proved to be very reliable and this is the smoothest entry into service that we have had as a company. The G650 is proving particularly popular in the current market which favours the ultra-long range jets. It has a 6,000 nautical mile range at Mach .90 and a 7,000 nautical mile range at Mach .85 which brings a huge number of city pairs into the equation for operators and owners," he comments.

One of the G280's selling points is its very good short runway performance. "The wing design on the G280 looks much like the wing on the G550, and our balanced field length

performance is significantly better than on the G200, for example," Flynn notes. As is now becoming standard, passengers can operate the G280 cabin management system and in-flight entertainment via their iPhones or tablets. The avionics on the G280 is from Rockwell Collins, which also provides the avionics on the G150, while Honeywell provides the avionics for the G650 and most of the rest of the Gulfstream portfolio. Flynn says that Gulfstream has an excellent relationship with both providers and has worked very closely with both Rockwell Collins and Honeywell to develop additional software for the avionics. One of the benefits of this, he points out, is that the computer logic is very similar on all Gulfstream aircraft, with the avionics from both suppliers being owned by Gulfstream as its Planeview system. The interiors are all in-house with no option for a new buyer to take a green aircraft and have it outfitted by a completions house of their own choosing. Customisation is slight, since Gulfstream offers many options as part of its standard package. This standardisation, which embraces customisation, enables Gulfstream to deliver on time, on budget and to the highest quality possible, Flynn says. Standardising the options also helps to maximise quality control throughout the aircraft.

Interestingly, Gulfstream announced as far back as November 2005 that it was doing research into sonic boom suppression. At the time

**The G650 is proving particularly popular in the current market which favours the ultra-long range jets**



it built a mobile audio booth to demonstrate its 'whisper' technology to legislators, scientists and environmentalists, and toured the country. The basic idea behind the whisper technology is a telescopic spike, giving a supersonic jet an elongated nose which prevents the wave build up that creates the sonic boom on the ground. Instead all a person would hear as the jet flew overhead at Mach 1.8, or a bit better than twice the speed of sub-sonic business jets, would be a 'whisper'. The roadshow was doubtless an early effort by Gulfstream to see what kind of resistance it would face, assuming it went ahead and built a supersonic jet, in getting the FAA to reverse its ban on all commercial supersonic overhead flights over the continental US - a ban that was put in place 30 years ago in response to Concorde's teeth-rattling 'double boom' when it flew overhead at supersonic speeds. Having recently interviewed Doug Nichols, the CEO of Aerion, the major player in the supersonic space, EVA asked Flynn if Gulfstream had considered partnering with Aerion, which is known to be looking for a major OEM partner. "We know the management of Aerion very well, but we are very inward looking on this supersonic project. There is a great deal of work still to do and we wouldn't be interested in producing a supersonic jet unless we could fly it over both land and water. So there are regulatory as well as technical hurdles to be overcome," Flynn answered. "In my view supersonic is still a number of years off," he added. ●



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# Beechcraft: Phoenix from the ashes

After the ruinous crash of 2008, the renamed company is back on its feet again

In the boom years leading up to the 2008 global financial crash, leveraged buyouts were all the rage among the world's top private equity (PE) firms, and they didn't come much bigger than Goldman Sachs Capital Partners, the PE arm of one of the world's biggest investment banks. Sales of executive jets were booming in 2007, and with the jet market growing at a compound annual rate of 18% Capital Partners decided to get together with Onex Partners, to put together a highly leveraged buyout of Raytheon Aircraft Company, renamed Hawker Beechcraft by the new owners. The deal was welcomed by management as the real challenge for airframe OEMs at that time was finding the funding to ramp up production. However, while the new owners brought around a billion of their own money to the table, the deal also saddled Hawker Beechcraft with a mammoth US\$2 billion in debt which hadn't existed before the PE houses came along.

However, that didn't seem like a major issue

at the time. For those who are unfamiliar with leveraged buyouts, while the debt was large, it was – and still is – the custom in a leveraged deal for the buyer to use the target company as collateral to raise the vast bulk of the cash needed for the transaction. The 'due diligence' that is a normal part of every deal requires everyone involved, particularly the participating banks, to be comfortable that the company can bear the debt and meet the interest payments. With airframe OEMs having 18 months and more of backlogged orders for new aircraft, paying down the debt probably did not seem like too big a task for Hawker Beechcraft. Moreover, the new company seemed initially to be on a roll. The Hawker 4000 super mid-size jet had been certified in November 2006 and this success was followed in August 2007 with certification of the Hawker 900XP, an evolution of the mid-size Hawker 800-series that had sold extremely well. 2007 was also the 75th anniversary of Beechcraft and the company marked the

occasion with celebrations throughout the year.

The American Bonanza Society held their annual convention at Beech Field, flying in nearly 350 Bonanzas and Barons to celebrate this milestone in the company's history. Certification of the Hawker 750 business jet followed in February 2008 a month short of the company's first full year as a private company. On 19 May the company launched the Beechcraft Premier II light business jet, a successor to the Premier IA.

So far so good. Then came the 2008 crash. On 16 September Lehman Brothers filed for bankruptcy and Wall Street went into meltdown. The financial disaster spread around the world. Bank liquidity dried up. Anyone wanting to buy an executive jet practically had to have the cash in their pocket to get the sale to fly. Corporates who had the cash lived in fear of looking as if they were living high on the hog while everyone else was having a tough time, so they stopped buying jets. Order backlogs vanished like the morning dew on a bright summer's day. Sales

fell off a cliff. Suddenly that US\$2 billion of debt that Capital Partners and Onex had loaded onto the company did not look very clever at all. With sales vanishing the company had nowhere to go. No management in the world could have prevented Hawker Beechcraft from sliding inexorably towards administration and bankruptcy once that horrendous deal was inked and the assumption of a continuing economic boom, upon which the deal depended, was proved false.

In 2009 Bill Boisture was named Chairman and CEO of Hawker Beechcraft, succeeding James Schuster who had retired. The management challenges facing Boisture were serious and taxing, to say the least. "All OEMs had to deal with the fact that the large supply of pre-owned aircraft coming onto the market suppressed the price of new airplanes. What was just as bad, the collapse in pricing meant that banks did not know what the real value of aircraft assets was, so that made lending against the aircraft extremely difficult, which paralysed financing for aircraft sales," Boisture notes.

The end took a while coming. In 2010 Hawker Beechcraft lost over US\$680 million, with further steep losses in 2011. The company had put down the equivalent of a large bet on the viability of the super-midsized market, with the Hawker 4000, and the bet had demonstrably crashed. The irony – or the saving grace, depending on your perspective – was that revenues and sales from the remaining, really viable part of Hawker Beechcraft, namely its huge installed piston and turboprop fleet, ranging from Bonanzas and Barons, to the King Air family, were holding up rather well, but being dragged to the cliff edge by the company's efforts to make its jet portfolio fly.

It was obvious that Hawker Beechcraft was in difficulties. The debt load on the company combined with the high cost of continuing to try to bring its Hawker 4000 flagship jet to market took a great deal of the company's remaining resources.

"When it became apparent that a restructuring was inevitable and that we would eventually run out of cash if we carried on down the same road, there was a concerted effort by management at the end of 2011 and early 2012 to produce an acceptable plan to put before the stakeholders. The aim was to preserve the

company's assets as far as possible and to devise a new entity that would have a strong future," Boisture says. A deal was worked out with the company's creditors to swap around US\$2 billion in debt for ownership of the company, and on 3 May 2012 Hawker Beechcraft sought bankruptcy protection. There was a flurry of excitement in July 2012 when it appeared for a while that the Beijing-based Superior Aviation, owned by Chinese industrialist Shenzen Cheng, would step in as a white knight and buy the whole company, jets and all. But while initial talks went well, the Municipal Government of Beijing, one of the principal backers of the deal, reportedly took a very different view of parts of the contract from the position agreed between Cheng's company and Boisture's team.

The differences proved terminal, not least because of the political atmosphere in both China and the US. President Obama was running for a second term, while the Chinese leadership was engaged in one of its periodic leadership

changing processes. But as Boisture points out, Hawker Beechcraft had protected itself by securing a US\$50 million upfront guarantee from Superior at the start of the bid process.

Once the Superior bid vanished, Hawker Beechcraft returned to its primary plan, which involved selling the assets related to the production of Hawker jets and focusing on Beechcraft's traditional base in commercial and military piston and turboprops. "It was simply too expensive for us to keep the Hawker 4000. If you look at the current market demand and the relatively low forecast in the super mid-size market for the next five to seven years, it was clear that even though selling the Hawker inventory and assets was a painful decision, it was the right one. We could not risk the future of the sound parts of the company in such a crowded and highly competitive space. However, we are committed to product support for the Hawker range going forward and that is an integral part of our business plan for our Global





Customer Support business," he comments.

A refinancing package for the restructured entity, henceforth to be known simply as Beechcraft Corporation, was agreed and on 15 February 2013, the new company exited administration, with the Court's approval, with 85% less debt and with the physical footprint of the company having been shrunk by over 35%. Boisture is adamant that the company's successful re-emergence owed a great deal to the fact that it was able to maintain a very good working relationship with its labour unions and retained the loyalty of much of its staff through what had been, in the experience of all concerned, a torrid and highly stressful few years.

"Throughout the process we communicated openly and energetically with our suppliers and our staff, both pre-bankruptcy and post bankruptcy, and that had a lot to do with everyone's confidence that Beechcraft would not only survive the process but would emerge a much stronger company and be well positioned,

going forward, to build on its leadership as the world's premier turboprop manufacturer," Boisture says. Importantly, despite a major hiccup caused by the Obama Administration announcing that Beechcraft would be excluded from the DoD Light Air Support contract, the company's military production has continued to be a strong revenue earner. Boisture successfully challenged the Obama proscription and despite the bankruptcy process the company managed to deliver all the T-6 trainer turboprop planes that it had contracted to supply to the US Air Force on or ahead of schedule. The T-6 is a version of the Pilatus PC-9, heavily modified by Beechcraft and was the company's successful bid for the JPATS (Joint Primary Aircraft Training System) procurement programme which began in the late 1990s.

On 10 May this year the company announced a further contract worth US\$210 million with the US Air Force for a further 35 T-6s, the 19th production lot ordered by the US Air Force and the US Navy. In addition to the military

contracts, before a single King Air is sold Boisture points out that the Beechcraft can rely on getting about 25% of its annual revenue base from the provision of maintenance and parts for its huge, global fleet of piston and turboprop aircraft. There are almost 36,000 aircraft out there for it to sell products into. This is not to underplay the contribution from its military contracts. Since 2000 the T-6 has built a well-deserved reputation as one of the most proven and cost-effective primary aviation training systems available, with sales going to NATO, the Hellenic Air Force, the Israeli Air Force, the Moroccan and Mexican Air Forces and even the Iraqi Air Force.

There might be at least a tiny gleam of an idea of Beechcraft getting back into jets at some time since the company has retained ownership of its TCs in the Hawker 400 and Hawker 125 series aircraft, which have a large installed user base, but you won't hear Boisture saying anything like that. The story going forward is largely focused on the turboprop. "We were very encouraged by the fact that the King Air market had stayed a lot more stable than the jets market through the downturn," Boisture recalls. The King Air market suffered like any other from a glut of pre-owned stock coming to market through the downturn, but that has now been sold down and the numbers of planes in the pre-owned market is back down under 10%, a level that is generally regarded as constituting a 'healthy' state for the market to be in.

Boisture singled out the company's relationship with its staff and unions as a key factor in the company's ability to emerge from Chapter 11 in such good shape. "We enjoyed the cooperation of the union throughout the restructuring process. The continuous improvement we have been able to make in our manufacturing processes is in large part due to the knowledge and talents of many of our staff. Employee morale



is good and we are having significant success in attracting some key engineering talent to replace the skills lost during the bankruptcy process," he says.

Beechcraft's strategy from here is to continue to make improvements to the King Air across a range of factors, from avionics, to the power plant and the interior. The aim is to really differentiate a new King Air from the large installed base of aircraft out there. "Our biggest competition comes not from another manufacturer but from a pre-owned King Air, so the more desirable and different we can make the new airplane, the better," Boisture says. Designing in and building significant difference will be a lot easier for the new Beechcraft, since all the R&D money will not be siphoned off into R&D on the Hawker jets, which had been hogging all the R&D budget!

A good part of the reason why the King Air market has been so strong through a lackluster recovery is that the King Air is a great business

airplane. It can carry six to eight passengers and has a good deal more capacity than a light jet to haul luggage and equipment along with those eight passengers. It is also much cheaper to fly. "The King Air can carry far more than a light jet, complete with a full fuel load

**It was clear that even though selling the Hawker inventory and assets was a painful decision, it was the right one**

out and still get airborne from very short airfields and land on unimproved fields. This is an absolute differentiating factor, while the interior is everything a business jet user would expect," Boisture notes.

Beechcraft has already announced that it

is looking into a new single engine turboprop that could be brought to market at the price points currently occupied by the King Air, and that if it was to produce such an aircraft, it would be very competitive against the single engine turboprops already available. "We're continuing to do the design work, but we have to be sure that an airplane at a price point like this will be worth risking all that non-recurring development cost on. At the moment the market is not in a condition that would make this a particularly good idea," he notes.

Beechcraft has a strong relationship with both Rockwell Collins on the King Air turboprop planes and with Garmin on the piston aircraft, and intends to keep its aircraft very current with new cockpit technology. "There is no doubt that our aircraft and the owners and pilots who fly them will benefit greatly from the new synthetic vision capabilities and other features coming through in avionics," he says. ●

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B L A C K H A W K

# Why engine mods work

Anthony Harrington talks to Blackhawk CEO Jim Allmon

There are not that many low cost entry points to the aerospace game. But when Blackhawk founder Jim Allmon went back home after a chat with Pratt & Whitney and broke the news to his wife that he and his partners had just signed personal guarantees for £25 million worth of P&W PT6 engines – 24 to be sold in five years or else – that must have been an interesting conversation. It was, Allmon admits, a difficult business to get off the ground. Some 14 years later, with Blackhawk the world's largest non-OEM buyer of PT6 engines, a deal for 25 engines in five years is small potatoes. Blackhawk's most recent contract with P&W was for 1,275 engines over seven

years. But at the outset, with no other company like Blackhawk in existence, the deal looked terrifying to everyone but Allmon.

"Getting finance was next to impossible. When you got into conversation with bankers they wanted you to be able to point to some company somewhere that was doing what you wanted to do, and making money. And there wasn't any Blackhawk equivalent out there to serve as a reference point. That made potential funders really uncomfortable," he recalls. So what made Allmon think that there was life and legs to a business based on modifying engines? The answer, really, is obvious and is inherent in the way an engine manufacturer puts together the spec for a successful engine.

"The manufacturer is going to do his research and put together an engine that meets the specifications of the solid majority of customers," Allmon explains. What the manufacturer is not going to do is to base the engine design around the wishes of the most demanding users near the top of the design envelope. That would skew calculations of performance versus cost away from the 'norm' that the engine manufacturer is shooting for. Rather, the aim is to appeal to the largest customer base at the lowest price point.

So there are going to be a significant number of owners who will find that revenue-generating opportunities will accrue from fitting a more powerfully configured engine, one that can climb faster, work in hot lands in temperatures that would ground 'normal' engines, and that can provide greater luggage carrying capacity and additional speed. An obvious example, Allmon points out, is a sky diving business. "We have a number of sky diving businesses who have fitted our engines on the Cessna Caravan. They find they can get four jump loads in over the course of an hour, where they could only get two and a half jump loads before, because they can climb to jump altitudes significantly faster. That equates to a 35% to 40% revenue increase for them," he comments.

A bush plane charter business that runs operations out of high altitude airports bought a Blackhawk mod for its Cessna Caravan and found it could go into high altitude, dirt strip landing sites carrying three to four more passengers than with the standard engine. Again that impacts revenue directly, so that company has already

put a second modified Caravan into service and is looking at adding a third modified Caravan early in 2014. Examples like that abound.

"Going for a Blackhawk mod can cost as little as the same as an overhaul in some cases on an older King Air 200 to anywhere from two or three times more than a standard engine overhaul, but for companies where we can make a real difference to their income, the payback is rapid," Allmon notes. There are also, of course, a significant number of enthusiasts who simply want the pleasure, safety and convenience of having more power and faster climbs.

So far, Blackhawk has completed 490 airplanes since its first mod in the year 2000. "This is not always an easy sell, but the value is there and you just have to help the buyer see where that value can impact their business or enhance their flying experience," Allmon says. Getting the first sale away was tough going. Allmon and his partners had to buy a pre-owned Cessna Conquest themselves, modify it and then prove that the resale value of the modified plane would be increased sufficiently to generate a

reasonable profit margin. "What boosts the resale value is that with our engine upgrade, you are creating a different airplane, one that can do missions that the original simply couldn't," Allmon says.

"The biggest challenge we faced was that we were creating a market that had not existed before. We were trying to put together an entirely new industry. There were a few companies that had some STCs to install upgraded engines but they weren't particularly serious and the one company that really did try before us had a very poor reputation and went out of business in a year and a half leaving their few customers with no support and few options. So we had to convince potential customers that the resale value of their upgraded aircraft would be good to excellent, and that the new engines really did add value and that we would be around to support them should something go wrong down the road. By buying the Conquest, painting it and making it look great, we were able to attract a potential customer. He wasn't sure that the engine would perform as we said it could, so we flew to his



**There wasn't any Blackhawk equivalent out there to serve as a reference point. That made potential funders really uncomfortable**

location at our own risk and cost, took him up to see the performance for himself and we came back with a contract," Allmon recalls. This "hands on" approach is still one of the strongest ways Blackhawk has of convincing potential customers that an engine mod is a good idea.

Of course, the team had to move beyond the Conquest. Allmon points out that with the

upgrade increasing the speed by 25-30 knots, they were guaranteed to wow the owner/pilots, but the problem was that there were only 236 Conquests built. "We are now at 22% of that market upgraded, and most after sales companies would think that getting 15% of a particular aircraft base was about the best that could be hoped for," he notes. Two years into the programme Allmon and his partners were at airplane number 11, or 22 engines into the deal, with just two engines to go and three years to sell them, in order to fulfil that initial contract with P&W. By then the personal guarantees had long since ceased to be a scary factor.

"Once we started rolling we knew we would meet Pratt & Whitney's requirements and we were doing so well that departments inside Pratt were competing to get our business!" Allmon remembers. P&W created a whole new department, the CEP department, or Converter Engine Programme, specifically to meet the new market that Blackhawk helped create. "P&W were so pleased with what we were doing by way of acting as a sales channel for their engines that they tried to go out and recruit other companies to do what we were doing. That didn't thrill us particularly, but it didn't come to much. This is a specialised business that requires a lot of hands-on labour and a very in-depth understanding of multiple aircraft performance platforms. Not many companies

**What boosts the resale value is that with our engine upgrade, you are creating a different airplane, one that can do missions that the original simply couldn't**

can master that to the level that Blackhawk does," Allmon observes, with some satisfaction.

There was, however, a pressing need to find another candidate aircraft for a programme of engine upgrades. Ed Swearingen had helped P&W to design the PT6-135 by working through P&W's inventory of parts, picking this gearbox and that compressor to get an outperforming PT6A. Once he had the perfect engine, he completed the STC for PT6A-135 on the King Air E90. Allmon went to see Swearingen with a view to buying the STC. "We spent a day going through his original drawings and calculations – real old school slide rule stuff, with the numbers all written in pencil. We brought the STC home with us and it required a lot more modification work," he explains. The Taurus mod was approved for 700 horsepower on take-off and Beechcraft did not like that much take-off horsepower in the King Air 90 series, arguing that it stressed the airframe too much. So Allmon decided to back off the power for take-off and use the residual horsepower as a plus

at cruise altitude. Beechcraft approved of the new mod and Allmon and his team reconfigured the engine to make it a simple bolt-on fitment instead of the complicated fitting that had been required by Swearingen.

"We went back to Pratt & Whitney and they said, 'All right, it's a new model, so there's a new price'," he remembers ruefully. The new price added US\$50,000 per engine and the new contract was for 200 engines on the same terms, still with personal guarantees. From there Blackhawk Modifications never looked back. Six more aircraft were added to its modifications programme, including King Air 200s and Cheyennes. In 2009 came the order for 1,275 engines, and today the company has completed 490 airplanes, or 980 engines, with two or three years of the contract left to run. P&W no longer requires personal guarantees from Allmon and he is confident that if the company needed to extend the sale period P&W would be happy to oblige. After all, Blackhawk, as we began by saying, is now the world's largest non-OEM buyer of new PT6s.

"We enjoy a very strong relationship with P&W. We involve them from the start of a new project to design a new model engine for an airplane. We do our engineering right and then P&W puts the numbers into the computer and gives us a pretty good idea of what the performance is going to be when that modification is fitted to the airplane we have designed it for. Pratt & Whitney makes sure that what we are doing is not hurting their engine, that our redesign of the air inlet system on the Caravan for example, is providing enough cooling air, and so on. They help us with a lot of the brainstorming work and in figuring out what will work in the market. When they are doing something new, they bring us in to find out what we think, so it is a very symbiotic relationship and works well for both sides," Allmon considers.

"We also enjoy a very close relationship with Beechcraft Corp with them selling our engine upgrades through their factory-owned service centres. We also work together on numerous engineering projects so it's nice to have 'mother Beech' behind you when you need her."

So what is next for Blackhawk?

"The King Air 350 could use a little more speed don't you think?" ●





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# Transforming the model in business aviation

Taking a look at Kenny Dichter, CEO of Wheels Up

**W**hat do T-shirt printing, tequilla distribution, sports music CDs, gyms and executive jet travel have in common? The answer? They all presented Kenny Dichter, entrepreneur extraordinaire, with highly profitable business opportunities which he seized and exploited to the full. Dichter revolutionised the fractional ownership of executive jets with the introduction of the Marquis jet card, which offered a 25-hour share of an executive jet for \$8,000 dollars an hour, instead of the

\$300,000 dollar price for a 1/16th share of a jet, plus the far from insignificant hourly per-flight charges, required by a fractional ownership provider like Netjets or Flexjet. That innovation brought executive jet travel within the reach of large numbers of smaller businesses and individuals. Now Dichter has done it again. Having sold Marquis to Warren Buffet's Netjets, his latest business, Wheels Up, which has its formal launch in New York on 17 December 2013, offers Wheels Up members 25 hours in a King Air 350i, configured internally to rival any business jet, for under \$4,000 an hour.



The basic idea is to have a national fleet of King Air 350i aircraft located at up to seven regional centres, providing plenty of capacity for an 'on-demand' service for Wheels Up members. While the precise charges have still to be announced, media speculation suggests that the initial joining fee for members will be around \$15,750, with an annual fee of under \$10,000 plus hourly flight charges. Dichter anticipates members spending around \$100,000 to \$200,000 a year on trips totalling between 25 and 50 hours.

The beauty of the Wheels Up concept is that it repeats, in some ways, the proven formula embodied in the Marquis Jet Card that worked so well for Dichter and his partners. And once again it does so by broadening the base of executive jet travel by lowering the entry price – this time significantly below the Marquis entry level price. Does it matter that the 'jet' in question is a turboprop aircraft rather than a jet? Dichter believes not. The King Air 350i interior design used by Wheels Up is a match for any of the narrow cabin light jets, while the aircraft has more baggage capacity, at 1,150lb, than an equivalent light jet. The 19 foot six inch cabin is a tad more spacious than most light jets, with a height of four foot nine inches and a width of four foot six. The King Air has a range of over 1,700 nautical miles with four passengers, and in its Wheels Up seating configuration, can take a maximum of nine passengers.

Take-off field length is just 3,300 feet with a landing length of just under 2,700 feet, bringing a vast range of short field gravel strip airports into play. The product, in other words, is the equivalent of a business jet in terms of comfort and styling, at a substantially lower cost, and travel times are pretty equivalent to that achieved by light jets over the same routes.

The truly audacious thing about the whole Wheels Up concept is the scale that Dichter

has gone for from the outset. Launching a new venture with a potential \$1.4 billion price tag (the cost of the proposed King Air fleet of 105 aircraft plus maintenance and support infrastructure) requires considerable business acumen to bring off. Dichter's track record shows he has that in spades. "My history in business really started to take shape in my student days. I was always starting businesses, mostly in the services sector, and I've stayed with that. I never really had an official job that I didn't create," he commented to EVA. As a student he started a T-shirt printing business, a venture that taught him several very important lessons, not least of which was the power and excitement that comes from upsizing a venture and really letting it acquire some scale.

Around two decades later, already deep in the Marquis Jet Card venture, Dichter reminisced about his college business and the route to Marquis Jets, for the benefit of a group of MBA students at Baruch College, trying to sketch out for them the entrepreneurial lessons and skills he's picked up along the way. (This really is a 'must see' presentation – to find it search on 'Dichter' and 'Baruch College'!) His t-shirt printing business began back in the days when you could use school names without a licence. He'd print up the college name and sell the T-shirts door to door through the dorms. The shirts and printing would cost him \$3.50 and he'd sell them for \$10. The first and major lesson he learned was how to upscale his distribution capabilities through a network of resellers. Then he used the 70,000 seater college football stadium and college football games as an occasion, selling off tables to the crowds coming in for the game.

He found himself grossing \$500 to \$800 per table or around \$5,000 a game. That alerted him to the fact that he was on to a real market, but he needed a workshop and office. This was his second lesson in business. He signed the lease on some office premises without really grasping that he had just committed himself to paying \$2,000 a month for five years. If the T-shirt business had faltered, he would have been in deep trouble! "We had quite thin margins so you needed high velocity to make the business work. We ended up opening two or three other locations and I operated them in addition to being a full-time student," he recalls.

**Dichter anticipates members spending around \$100,000 to \$200,000 a year on trips totalling between 25 and 50 hours**

The college authorities were worried about poor attendances at games and since Dichter's business at the games gave him a high profile, they asked him if he could come up with something to boost attendances. "I didn't have an idea to start with, but one of my mottos at the time was 'fake it till you make it', so I told them I'd give it some thought," he said. Dichter came up with the idea of a sports marketing plan. This was a pre-paid card, which gave students entry to a whole range of college sporting events for a set fee. Attendances shot up, but more to the point, the seed of the idea of a card based membership service had been sown.

Dichter looked into getting sponsors for the 'Bleacher Creature Card' as he called it and found a number of local businesses who were interested and who became sponsors. "People, successful entrepreneurs, generally want to help others. If you have a good idea and good energy, they will see you, but when you get in the door, you have to realise that you probably have only that one shot and you need to make it count and put the best case you can," he advises. That operation was *pro bono* and didn't net him a dime, but it taught him a lot. "It showed me that if you have a good idea and go at it with incredible energy, you can get anything done," he recalls. The Bleacher Creature Card is still running at the University of Wisconsin.

The T-shirt business took another onward leap when he met the father of one of his friends, who happened to run a US\$25 million clothing business. "He was 10 levels above where I was and he showed me how do take my concept to retail outlets. We went into the mass market with two new lines printed on the T-shirts. One was 'Why work?', which we thought was a nice twist on over-working America, and the other was 'Street Buzz'. That saw us to US\$5 million in sales, which was a nice business for a young man, but not much as businesses go," he comments.

Serendipity, inevitably, has a role to play in business. Opportunity wanders past. If you have vision, you see it, if you lack that eye for the half

chance the moment is gone and your star don't shine! Dichter's next business venture came when he met Jesse Itzler, who was a minor celebrity, having written the theme song for the New York Knicks. "We talked and I pointed out to him that his business was not monetising the popularity of his theme song. So we came up with the idea of a sports CD, back when people actually paid for music. We took all the team songs, with great highlights from the games," he comments. He and Itzler took the Knicks CD and bargained for the

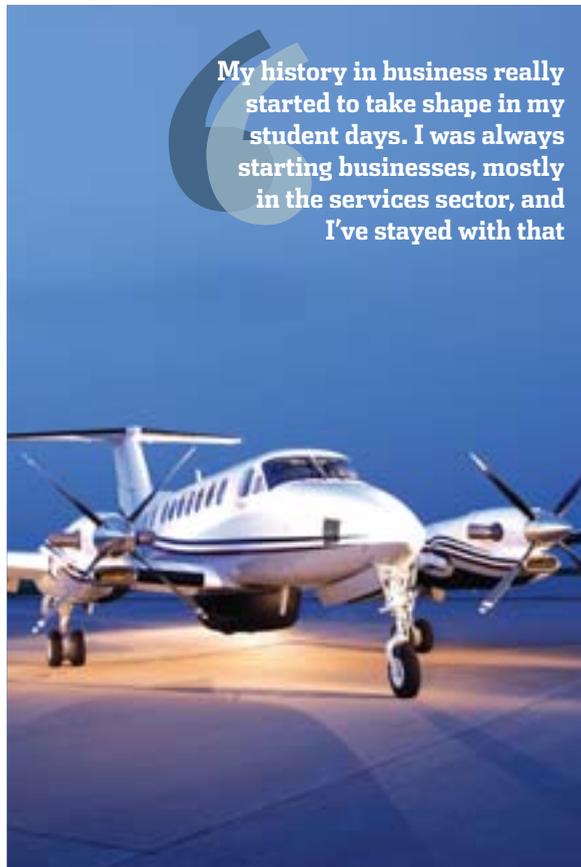
ourselves. We're going to find a way of taking this money to the next level'," Dichter says. They then looked to get exclusivity with the NFL and with major league baseball and their sports music CD business was really off and running. The \$1 million order quickly turned into a \$7 million business.

They got a call from Bob Sillerman, who was then building a conglomerate targeting companies in the live entertainment and sports business who had a good product but no national chain or efficiencies of scale. "Bob had bought up some 74 companies, spending around \$1 billion between 1998 and 2000, so once we'd done our due diligence it was clear that SFX would be good for us," Dichter said. The lesson here is, be pragmatic about your business. Sell when the time is right.

"Bob made us an offer that we couldn't refuse so we joined SFX. Straight away we were meeting people with vastly more business experience than we had so we double timed our efforts and went out of our way to get to know the management inside SFX and to learn from them. This was also when we first got exposed to private aviation as the team were jetting about all over the place looking at prospects and doing deals. If we heard someone was flying to Detroit, say, we'd say, 'hey, we're going there anyway' - even if we weren't - just to get exposure to the business guys on the jet," he laughs.

The jets, too, won him over. "I was with guys going from the car park to the plane and taking five hours to get to California, door to door, instead of the nine hours by scheduled commercial carrier and I said: This is the real deal. This is a must have in today's business climate." Dichter did his due diligence and rapidly discovered that there were just three options: own your own plane, charter a plane as needed, or buy a fractional share in a jet. He also discovered Richard Santulli, the man who pioneered the fractional jet market with Netjets and Warren Buffet.

"Fractional ownership was a fantastic concept. There are 8760 hours in a year and you're selling just 100 of those hours in a fractional



**My history in business really started to take shape in my student days. I was always starting businesses, mostly in the services sector, and I've stayed with that**

rights to do an exclusive retail distribution deal. "We did 40,000 CDs at \$7.50 each, a \$300,000 order. So I said let's do the same thing in Chicago with the Bulls," Dichter remembers.

The exclusive order this time, as stipulated by the two sports CD entrepreneurs, was 150,000 copies. Then they went back to New York and negotiated an exclusive distribution with a nationwide retailer and this time round got a contract for \$1 million. "We were dancing around waving this cheque for \$1 million and I said to Jesse, "No way are we distributing this to

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share, using the jet just 1% of the time. Santulli is a math professor from Brooklyn so he worked out the numbers beautifully. Itzler and me worked out a new idea. Why not bring fractional ownership within reach of a hugely larger market by offering just 25 hours at a time, but selling the jet to a much larger number of owners?" he recalls.

They took the idea to Santulli, who gave them four minutes of his time and then showed them the door. "Not interested," he said. That might well have been that, and the Marquis Jet Card and Dichter's latest Wheels Up venture might have never been, but Santulli's partner, Jim Jacobs, gave them a call a week later. "He told us to re-pitch: if Rich had really not been interested he'd have slung you out after thirty seconds, not four minutes," Jacobs told them. They got 12 minutes from Santulli for their second pitch before they were once again shown the door with a 'Not interested' from Santulli. Jacobs phoned them back two weeks later. "Change a few things in your presentation and have another shot," he said. This time Santulli showed interest. After a few more meetings he said: "OK, we'll give it a shot, we'll test this idea with you." This was in February 2001. Dichter and Itzler had to invest \$500,000 each of their own money into the new venture. Santulli wanted to make sure they had some 'skin in the game', but with that \$1 million plus \$5 million investment

from friends and family, they were in the card fractional jet business.

It took six months to get FAA approval for the idea. Another stumbling block was how to pay for the first aircraft. In the end Santulli 'spotted' them the first plane, taking the leasing paper onto his books. "Between June 2001 and December 2001 we sold 27 cards, or US\$3 million of sales, all by working our own contacts network. Then it went to 360 cards or \$45 million of sales and in 2002 we opened a London office, which did another \$15 million in sales. By 2003 we were selling 850 cards, or US\$150 million in sales. By 2004 they were selling 1600 cards with an aggressive sales target of 2,500 for the next year. "The key to success in America is to go at your idea hard, make good decisions and have honesty and energy - and then build fantastic customer relationships. You also need to have a business model that puts the odds of success on your side. There are 400,000 households in America

with net worth of \$10 million or more. Less than 1% penetration of that with Marquis gives us a half billion dollar business. Now, with Wheels Up, we have hugely increased that base of potential members and we are going to be going after that base with maximum energy," he comments.

Already, with Wheels Up still to launch, Dichter has a second string to the Wheels Up bow, namely Wheels Down, a 'concierge' type service for Wheels Up members that will add value to the brand and to the members by putting together a programme of great sporting and cultural events through the year, plus exclusive breaks, golfing holidays in exotic locations and basically anything the programme managers can think of that really will add appeal and open up new prospects for enjoyment for the Wheels Up membership.

Dichter's most recent announcement is a deal with fractional jet provider VistaJet, which will see VistaJet providing 12 of its Global 5000 and 6000 jets to Wheels Up for members who want to fly domestic and/or intercontinental flights between the US and Europe. The operator for the VistaJet contingent will be Jet Aviation and GAMA will be the operator for Wheels Up's US national fleet of King Air 350i aircraft. 2014 is shaping up to be a very interesting year as we all get to see how fast and fluently Dichter's latest venture spreads its wings. ●

**If we heard someone was flying to Detroit, say, we'd say, hey, we're going there anyway - even if we weren't - just to get exposure to the business guys on the jet**

# Jetcraft buys ExecuJet's sales arm

A conversation with Jetcraft CEO Chad Anderson

In August, Jetcraft Corporation and ExecuJet Group announced that Jetcraft had acquired ExecuJet's business aircraft sales division. The rationale for the deal was simple: it would benefit both organisations' clients "by offering the largest selection of quality new and pre-owned business aircraft from around the globe". In many ways ExecuJet disposing of its sales arm simply followed the trend of large FBO/aircraft management businesses deciding to focus on their core revenue generation activities and free up senior management time from the complexities of selling into a difficult environment. We have seen this theme before with TAG Aviation and others. Unlike ExecuJet, Jetcraft specialises solely in new and pre-owned sales and the deal now makes it the largest aircraft brokerage on the planet.

**Q: When did the idea for this acquisition occur to you and how long did it take you to agree the deal?**

**A:** The idea was originally floated in a meeting between Niall Olver and my team earlier in the year. We got serious about it in May when we met in Montreal to go through some specifics about a possible deal. There was no doubt that ExecuJet was going to make a change, it was just about which road they were going to go down. We both did a lot of work to ensure that the deal would work, within reason, for both organisations. In all it took about 60 days from the time we got serious to the moment we announced the deal to the world. It is clearly more efficient for any multinational aircraft management company to leave sales to a specialist organisation. Selling is very resource intensive if you are going to do it well and it is hard to integrate into a long-term business plan if you have other strong revenue generating lines of business. There is also some perceived conflict of interest if you both manage and sell aircraft. Owners like an arms length relationship between the two activities. Taking advice on the sale from your management

company is one thing. Having them make a profit from actually doing the sale could, in the eyes of the owner, be seen as compromising the independence of the advice.

**Q: You have now almost doubled your sales team, do you have much by way of an overlap in the combined presence globally?**

**A:** We have a little bit of overlap, but in good areas, where, frankly speaking, we needed more resource anyway, such as Dubai, where the two principals out there really complement each other. There is some 'overlap' in Europe, but it's not actually an overlap when you look at it. We have offices in Zurich and Basel, but we had no presence in London and Paris, and ExecuJet gives us that, which is great. There might be a slowdown in Europe, with the flat economy, but there are a tremendous range of sellers across Europe which we can feed in to the rest of the world. So even when things are down in one region from a buying perspective, the selling side might be very strong. North America has been busy, Asia

is busy and Russia is busy, so we have plenty of demand for any supply we get from Europe.”

**Q: What impact have the down years and the flat years since the recession had on the aircraft brokerage market?**

**A:** Everyone always wants a bargain, that’s a given, and there are still plenty of deals out there that favour buyers. But the sellers are doing a very good job of ensuring competitiveness, be it from a pricing standpoint or from a flexibility over the deal gymnastics that are required to get a deal to fly. Price volatility continues to increase as you go down the scale from large jets, where prices are pretty stable, down to mid-range and lower. Part of the silver lining in this recession is that sellers, before they even contact us now, have been educated by their own due diligence efforts and their price expectations are much more realistic. Then they get the final push from our side and they can see that



we are giving them good, credible advice. Of course we want to sell as quickly as possible, but it does us no good to drive down prices.

**Q: What impact does the arrival of new jets, such as the Gulfstream 280 and 650, have on the market?**

**A:** Gulfstream really hit the sweet spot of the market in both the mid-size and the ultra-large with those two jets. Basically we love the arrival of new product. Any new aircraft such as Cessna’s Latitude and Longitude, creates a buzz in the market, and something has to happen to the aircraft that owners switch out of to buy the new product. The G280 is a successor to the G200, and a nice G200 will trade in the \$5 million to \$10 million bracket, way down from the \$25 million for a G280. So they are at a very attractive natural discount, being less than 50% of the new product. Annually the pre-owned market, in terms of the number of sales, is now about twice the new deliveries market. It was a great deal higher but inventories of pre-owned aircraft in the US have been falling over the last few years. So in today’s market we generally expect about two pre-owned sales for every new sale. ●



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# Expanding in-flight services

Mark Dankberg, CEO and Chairman ViaSat, talks to Anthony Harrington

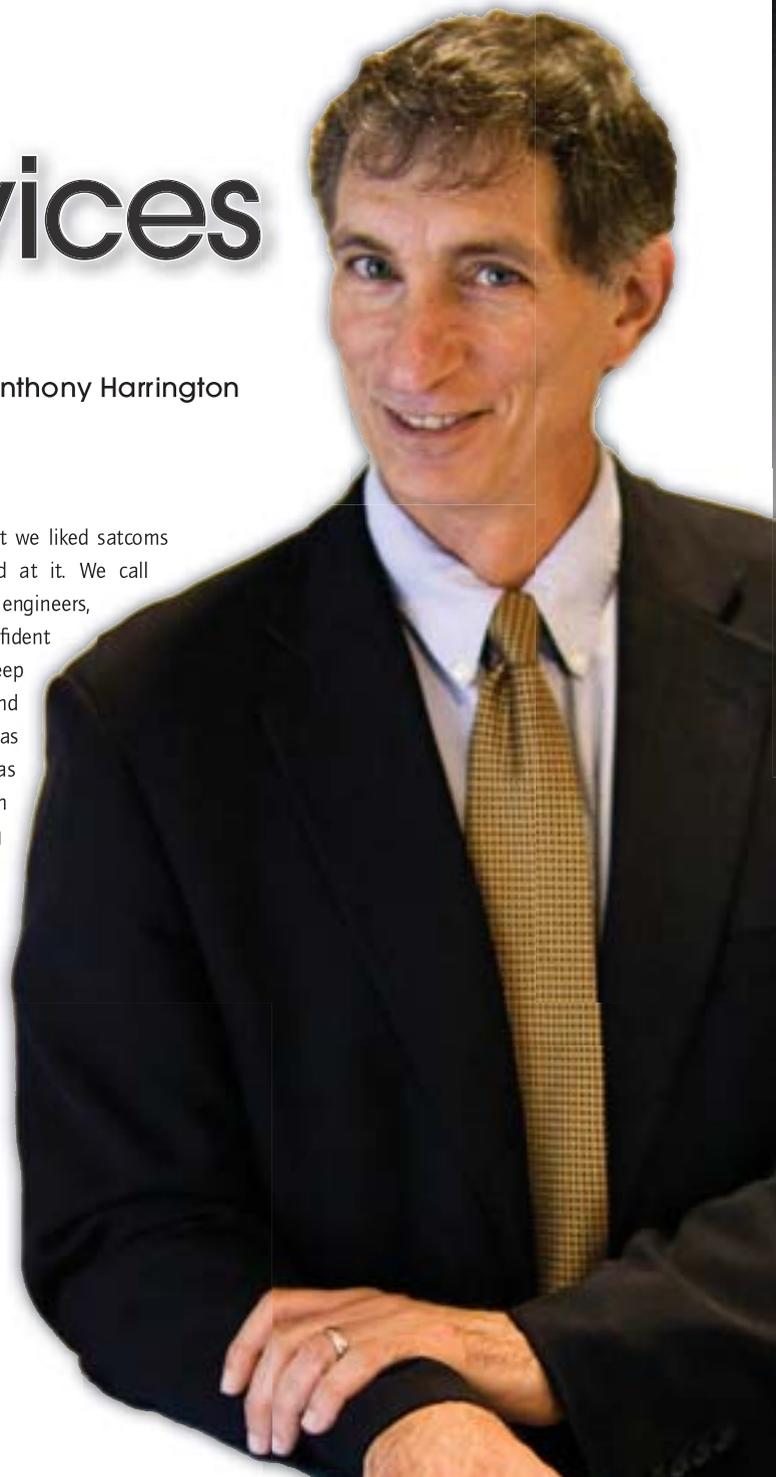
**T**here is no shortage in the US of entrepreneurs who made a fortune from businesses started off in their basement, garage or spare bedroom. But the number who went on to launch their own satellites and have their own continent-wide distribution capability can be counted on one hand, the few examples being Mark Dankberg, along with his two colleagues, Mark Miller and Steve Hart.

The three started ViaSat in 1986, working from Dankberg's home. "We started as technical specialists in satellite communications and we've grown pretty steadily ever since," he recalls. ViaSat is now a \$1 billion company employing 2,900 people. Dankberg was satellite industry executive of the year in 2004, and was voted Visionary of the Year in 2012, in the satellite industry. An investment of \$10,000 in ViaSat shares in 1996, when it went public at \$9.00 a share, would be worth some \$620,000 today, despite three major stock market crashes over that period.

"We didn't know what we were going to do

when we started ViaSat, but we liked satcoms and we felt we were good at it. We call ourselves propeller head engineers, which meant we were confident that we had a pretty deep grasp of the technology and some ideas about where it was going," Mark says. ViaSat was started with no big infusion of venture capital funding and simply grew very steadily through organic growth until its IPO in 1996. The initial focus was on VSAT networks (very small aperture networks) for military and commercial customers.

"We expanded into Ku-band networks and broadband in the late 1990s. Our biggest customer at the time was the US Department of Defence (DoD) which





had a range of requirements that suited our technology skills," Dankberg recalls. Then in 2000 and 2001 ViaSat began working with Boeing who were involved in trialling the Connexion broadband service for airliners. "We did the ground stations and the airborne networking for Connexion by Boeing, and from there we moved into the in-flight connectivity market for business jets," Dankberg says.

Around 2007 the US government got very interested in high-speed satellite-based airborne broadband and ViaSat worked on a number of projects for the DoD. Dankberg and his colleagues managed to come up with a way of designing and manufacturing a satellite that would have enormously more bandwidth than anyone had been able to offer before. Until then various companies had done satellite

broadcasting for narrowband networks, but not for high-speed data transfer or broadband. The problem was that the restricted bandwidth available on satellites at that time meant that the per-user cost for broadband connectivity would be exorbitant - way out of whack with the cost of terrestrial broadband. So instead of being a benefit to users, in-flight broadband could easily become a bone of contention between the owner and the operator or the satellite connectivity provider.

"Starting in 2008 we started a programme aimed at dramatically improving the bandwidth that a satellite could provide. Our solution provided our first satellite, ViaSat-1 with 140GB of bandwidth, more than ten times the biggest broadband satellite then in orbit," he comments. The satellite was built for ViaSat by SSL (Space Systems/Loral) and was launched from Kazakhstan in October 2011, coming into service in January 2012. The total cost to ViaSat was around \$500 million and Dankberg and his team decided to buy an existing retail facing satellite services provider, WildBlue Communications, for

a further \$500 million, bringing the total outlay to get the company's new satellite services on-stream and in operation to over \$1 billion.

With the purchase of WildBlue in 2009, the company moved for the first time in its history into owning and operating its own satellite, while providing a range of services to other satellite owners.

"WildBlue was very interesting to us because they already had two satellites in operation and had an established retail customer base of around 400,000 customers. The total bandwidth available to them from their two satellites was less than a tenth of the bandwidth available from ViaSat-1, but they understood the retail business and had all the infrastructure, including call centres, customer support and so on," Dankberg recalls. The attractions of ViaSat-1 services to retail customers were the cost and the quality. It broadened the satellite services market, making it a real alternative to cable, rather than the only - and expensive - option for people who couldn't get cable. "Before we bought the company, WildBlue would provide



**Our ViaSat-2 service is scheduled to begin in 2016 and this will give masses of capacity. We will see at that point if it makes sense to increase the speed, or simply to sign up more customers**

satellite-based broadband to customers at a cost of \$50 a month for 1,200Kb download. We could give customers 12Mb download, or exactly ten times the bandwidth, plus 3Mb upload, and all for the same price," he notes.

The maximum retail demand that ViaSat-1 could handle would be around 1 million users, but Dankberg wants part of the bandwidth, at least, to be available for in-flight use in the business and commercial aviation markets. In fact the company has already signed deals worth \$20 million with JetBlue Airways to help the company offer a free "Fly-Fi" Internet access capability to passengers, powered by ViaSat's Exede Internet service. While JetBlue will be paying ViaSat a usage fee for each flight the whole deal is cheap enough, in the airline provider's view, to justify offering it as a freebie to passengers to enhance their travel experience. "JetBlue's take on this is that it offers a free bag of peanuts and a soft drink to enhance its offering in the eyes of passengers, so offering free Internet

connectivity gives it another powerful drawing card," Dankberg says.

The service uses the Ka-band, accessed via ViaSat-1, and it means that passengers will not be competing with each other for very limited bandwidth during the flight. The service from ViaSat-1 is fast enough for every passenger to have quality broadband at their seat. Another US carrier, United Airlines, has also signed up for the ViaSat service. "Demand from business and commercial aviation is likely to total no more than 1% or so of our capacity, so we are free to sell to residential customers without compromising our service either to them or to our business aviation customers," Dankberg says. The footprint for ViaSat-1 is the continental US, with some coverage in Hawaii, Alaska and Canada.

ViaSat's earlier business aviation customers, principally Bombardier and Gulfstream, along with a number of US government aircraft, have been broadband customers for a while on a

different Ku-band based service. ViaSat's Yonder Internet for business aviation uses the company's near-global Ku-band network and is the fastest business aviation service available. Recently, the company also announced a new tier of service called Yonder VIP for transport-size aircraft.

Ka-band coverage is not extensive enough right now to serve global business jet flyers, so the company remains committed to improving and optimising its Ku-band network for that market. But Dankberg and his team are busy making long-term plans to migrate customers across to Ka-band, including ViaSat-1 and future, even more powerful Ka-band satellites.

In May 2013 ViaSat announced that it had started building its second satellite, ViaSat-2, with bandwidth economics that will be more than twice as good as its predecessor, ViaSat-1. The footprint for ViaSat-2 will be the whole of the continental US, down to the Gulf of Mexico, the Caribbean and across the North Atlantic to Europe. "Our ViaSat-2 service is scheduled to begin in 2016 and this will give masses of capacity. We will see at that point if it makes sense to increase the speed, or simply to sign up more customers," he comments. The company's second satellite looks likely to carry about a 25% higher capital cost than ViaSat-1, but the bandwidth increase will be so much larger, Dankberg says, that the economic case for the additional satellite really makes itself. Funding will come from a combination of equity and debt and the company has had no difficulty to date in tapping the markets as required.

Moving to being a satellite owner and provider has been a huge move for ViaSat but it has once again proved the strength of the vertically integrated business model that Dankberg uses. "The way we have grown is to develop 'adjacent services', things that logically follow from what we are already doing, even if they require us to invest in more skills," he says. Looking back Dankberg reckons that the whole journey has been really fun and deeply satisfying, and the best is still to come. "We have a tremendous and growing consumer market. The in-flight market is now really picking up and the government market, too, is going exceptionally well. We feel that we have tapped into a very good market and it's a really fun time for us," he concludes. ●

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# Forward march

Aircraft and avionics technology has made a steady, and in the last few years, dramatic, progression from the electro-mechanical instrumentation that was all-pervasive 20 years ago, to electronic flight information systems (EFIS). As Craig Peterson, Rockwell Collins Director, Avionics and Marketing, notes, "Very swiftly, over the course of relatively few years, we moved from the initial step, which involved putting all the instrumentation onto CRT-based displays driven by computer systems, to HSI and ultimately, to moving maps. The latter completely transformed the pilot's positional awareness as to where the aircraft was relative to the final destination."

He points out that the first commercial airliner to be equipped with these new systems was

the Boeing 767, in the mid-1980s. In business aviation, the Beechcraft Starship was the innovator. The Starship was a twin-turboprop six-to-eight passenger business jet which saw its first flight in February 1986. From there, the evolution of EFIS systems advanced to the point where CRTs started growing in size and functionality, adding information that went beyond the basics of air speed, attitude and position navigation, such as pressure and temperature as well as data on the aircraft's pneumatic systems and power systems. "We started to integrate these display feeds into systems state-awareness displays that helped the crew in the running and oversight of multiple systems in the aircraft," he says.

Through the late 1980s and early 1990s the underlying technology shifted from CRT-based displays to LCD displays, which brought real benefits in terms of lower weight, lower cost,

lower power and the ability to go up in size without a massive increase in weight and cost. Today's cabin displays can be upwards of 18-19 inches, and the orientation has switched from portrait to a more natural, landscape display. The sheer number of data sets on these displays has exploded, so they now have the ability to switch back and forth between all manner of visual aids to assist the crew in monitoring various elements of the airframe and the aircraft's progress.

Today's systems are a kind of synthesis of the external world, and the databases holding the various geographical and informational data sets. "The power of today's computer processors and their internal bus structures allows an almost virtual reality-like depiction of the outside world, showing the geophysical features of the terrain in ways that are intuitively easy for the pilot to grasp. The data sets make it possible



### Executive & VIP Aviation talks to Rockwell Collins about the latest developments in avionics

to show political boundaries laid over the geographic terrain, the point where you would be crossing into another country's airspace and so on." Moreover, as Peterson points out, all this information is available regardless of the external weather conditions. The aircraft could be travelling through heavy cloud and the pilot would have all the terrain features displayed for him/her.

Along with the development and transformation of the cockpit displays the biggest change has been the migration of heads-up displays, or HUDs, from commercial airliners to business aviation jets. "The truly intuitive thing about a HUD is that the pilot is seeing this synthesis of the outside world and geometry, plus key flight data while looking through the HUD at the outside world," he explains. HUDs have a long history and are still evolving, with



newer display technologies emerging all the time. However, one of the early and still crucial features of a HUD is collimation, a technical process which takes the projected image and makes the light rays parallel. This might sound technical but what it does is to remove the need for the pilot's eyes to refocus when switching between viewing the HUD and scanning the view outside the cockpit window. Because the light rays are parallel, the focus is at infinity, which is where the focus is when you look into the distance through a window. So the projected image seems to be "out there" and both the image and the scene beyond the window are in sharp focus for the pilot. The HUD display is very precisely aligned with the three axes of the aircraft, so projected runway lights, for example, align very precisely with real runway lights as the plane approaches.



The HUD concept was developed and commercialised by a subdivision of Rockwell Collins, originally called Flight Dynamics, which started life as an independent company in the 1980s. The company called the HUD its Heads-up Guidance System (HGS®). It was certified on the Boeing 727 in 1985 with CAT III operational approval in 1987 and was put into operational use that same year. "What the HGS system initially did for the industry was to fill a void for airplanes of an older generation who wanted the advantages of being certified for Category III (CAT III) automatic landing system minima." The HGS introduced by Flight Dynamics was recognised by the FAA as enabling hand-flown CAT III approaches, since the HGS provides the pilot with the necessary electronic guidance to land the airplane in the absence of true outside visual references. The HGS uses guidance cues from the airport's ILS system and the crew have sufficient warning, if a safe landing is in doubt, to be able to abort and come round again. This ability to get to CAT III made the HUD very popular with 'feeder'

airlines and it saw a rapid take-up from regional jet manufacturers. One or two business jet OEMs also saw the benefits and were early users.

Dean Schwab, one of Rockwell's experts on HUD technology, points out that the company now has some 4,500 HUD systems in active use on about 42 different aircraft models. "The

approaches where there is very little by way of visual clues to help the pilot find the runway." A long, straight-in approach at night over featureless terrain to a brightly lit runway is a classic instance of the black-hole approach. Pilots know that they cannot rely upon their physical senses when approaching with minimal visual clues. Any time the human eye is going faster than the conditions it evolved in, ie a walking speed of three to four miles per hour at ground level, and more so when the perspective is high in the air, visual miscues abound. The HUD eliminates the problem by 'cueing' the pilot with flared dashes highlighting the correct approach to an accurate, electronic graphic of the runway while simultaneously displaying speed and altitude.



primary benefit to the crews is safety. The pilot can see very quickly what the state of the aircraft is and can maintain the aircraft's stability and adherence to the correct flight path in the approach to the runway. In particular it added a huge margin of safety to so-called 'black-hole'

The huge danger in 'black-hole' landings is that instead of a pilot following a normal three degree approach path, and allowing the angle of approach to the runway to steepen, there is a compelling tendency to keep the visual angle constant. If you do this, you actually fly in on the descending arc of a circle with its end point a few miles short of the runway, with very unpleasant

consequences. If this description puzzles you try drawing a diagram, with two sides of the triangle being the three degree approach and the runway, then draw lines from the end of the runway to various heights on the glide path – you’ll see the angle steepening through the descent. HUDs eliminate this problem through providing a different set of visual clues, namely the glideslope reference line, which keep the pilot flying a proper flight path and orienting to the real end of the runway. From a safety perspective, it is hard to overemphasise the difference, which can literally mean the difference between life and death for everyone on board. (For an excellent article on the black-hole phenomenon see the article by Linda Pendleton (April 2000) on AVweb: [www.avweb.com/news/airman/182402-1.html](http://www.avweb.com/news/airman/182402-1.html))

For operators and owners of business aircraft the HGS system can be very important since it is the only system that allows aircraft to take off with under 500 feet of visibility. “For scheduled airlines

and regional airlines the impact of not being able to fly because you do not have a system that will let you take off when visibility drops to under 500 VR, can be huge. You can get ripple effects in your schedule that run on for days if you cannot get the aircraft away,” he comments.

**We started to integrate these display feeds into systems state-awareness displays that helped the crew in the running and oversight of multiple systems in the aircraft**

Rockwell Collins sees HGS systems moving rapidly over the next few years from a nice to have option on the flight deck, to becoming an absolutely integral part of the aircraft’s avionics system. The technology too, is changing and developing. Rockwell now has a substrate wave guided system

for its HGS that is filtered down through the glass, eliminating the need for a projector.

The future of avionics as a whole is for more and more information to be synthesised onto the display in an entirely intuitive fashion. “The continual march of information and data, and now synthetic vision with input from infrared external cameras, for example, is now just part of avionics. Hi-res maps will simply increase in fidelity and granularity. We are also seeing technologies beginning to help flight crews in decision-making processes, computers that analyse traffic in the vicinity, that look at environmental threats and hazards – there is so much that could make things easier for pilots,” Peterson says. Ultimately the march seems to be towards utilising unmanned aerial vehicle technologies to enhance the overall safety of the aircraft and to bring further refinements to pilot situational awareness, to the point where flight crew sizes may well reduce, he suggests. ●

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# Q&A:

## The future of avionics

Interview with Victor Valente,  
Vice President, Business and  
General Aviation, Honeywell

**Q:** With the onward march of the glass cabin we are in a very different world from the old analogue instruments that used to crowd the flight deck. Honeywell has been at the centre of much of that change. What has it been like?

**A:** If we cast our minds back 10 to 15 years we go back to a world where the cockpit was made up of individual black boxes, each performing a specific function. As an avionics supplier you competed on reputation and by reducing the weight of each individual box

while extending its reliability and accuracy. But the cockpit of that era was a real pain. When you wanted to upgrade a box or modify or add functionality, you had to remove a physical piece of hardware. In the late 1990s Honeywell started work on our Epic Avionics suite which was very different from the collection of boxes, since it was the first integrated avionics suite. Instead of federated boxes we concentrated the system into avionics racks, each performing functions that could be shared. This gave us much more versatility. We could take a systems approach

to driving the radar, the displays, the radio, all from the central rack, and it was much easier to provide duplicate racks for failsafe systems for certification purposes. This was a major transition, even though we were still in some respects in the analogue instrumentation world. It gave us a very stable avionics platform that was able to multi-task across various systems and functions, and it could be grown and enhanced in a much easier way than by stripping physical black boxes out of the cabin and replacing and rewiring them through the aircraft. Getting out of that messy world was a huge advantage. We could add more input and output cards to the avionics rack, or more power cards, and you weren't having to disturb the aircraft interior to do so.

**Q: How did the move from federated boxes to integrated avionics play in the business aviation world?**

**A:** We were the first to introduce integrated avionics in the early 2000s. Gulfstream and Embraer were among the early adopters, with Embraer taking EPIC for its 170 and 190 regional jets. Dassault, Cessna and Hawker Beechcraft also adopted the system. We then adapted EPIC to make it a cost-effective system for lighter executive aircraft, and we had Pilatus as a customer for the Pilatus PC12.

**Q: What was the transition from building out the concept to having certified systems being used daily in aircraft like?**

**A:** It was eventful! Things took longer to certify than we had anticipated and required various iterations and integrations to work the bugs out of the system. However, that is not unusual for such a radical departure from traditional practice. When you think of it, both ourselves and the certification authorities were breaking new ground. At the same time, there were significant new factors for avionics to take account of. The Future Air Navigation System (FANS) added a number of new features and it wasn't the only transformation the industry was going through. However, this is where the integrated avionics approach of EPIC demonstrated its power. We were able to add capabilities with relatively little perturbation of the base platforms. Synthetic

vision is another transformation which benefitted hugely from this approach. Adding synthetic vision via huge terrain data sets is a massive change in pilot situational awareness but it is simply a software program, easily loaded. So you have a tremendous change in capability being condensed down into just a software upgrade, which is a deceptively simple way of looking at a revolutionary change in the cockpit.

I was responsible for the certification of EPIC on the Embraer 170 and 190 aircraft. One of the truly remarkable things was that despite the fact



**Victor Valente,**  
VP of Business and  
General Aviation  
at Honeywell

that we had been working on EPIC for six years, with a team of hundreds of engineers, when I flew down to Brazil to deliver the software, all I had was a stack of twelve CDs.

**Q: The business aviation market divides into light, medium and heavy jets, with turboprops overlapping the light jet category. Historically, aviation has taken a horses for courses approach there, with lower cost, functionally 'lighter' systems at the lower end. What has Honeywell's approach been there?**

**A:** You need to segment the avionics market in various ways. In the general aviation market we are re-launching our Bendix King product line. The big improvement for light aircraft, such

as cylinder props and small turboprops up to larger turboprops, is WAAS, the Federal Aviation Administration (FAA) program which adds further accuracy to GPS satellite positioning to provide pilots with much more precise position information and approach information. At present WAAS is only available on the continental USA, since it consists of multiple ground reference stations located right across the US. There are two master stations on the East and West Coast, and they collect data from the reference stations and use it to clean up the GPS signal to remove errors caused by a variety of problems, from disturbances of the ionosphere to satellite orbit errors. What all this boils down to is that a WAAS-enabled display in the cockpit of a light aircraft gives the pilot a highly accurate view of where they are relative to where they want to go. Other regions of the world are developing their own solutions. Europe has the Euro Geostationary Navigation Overlay Service (EGNOS) for example, and Japan has the Multi-Functional Satellite Augmentation System. So avionics is getting very good for light aircraft, but this is very different to the huge terrain datasets and synthetic vision of top-of-the-range avionics systems. A fully integrated avionics system, by way of contrast, requires significant infrastructure and has a great deal of development and design cost behind it; that would simply not be appropriate on

a Cessna 182 or a Beechcraft Bonanza. There you need less sophisticated equipment, with a much lower price tag, that relies on fewer components. Garmin, Universal and Avidine play in that space and our Bendix King range is there as well.

By way of contrast, EPIC and APEX are very different. We took a great deal of trouble to adapt our integrated avionics approach to the lower end of the business aviation market, and they have been very successfully taken up by the likes of the Pilatus PC12 and PC24. The big advantage that our APEX system brings to this specific market space is that in concept and design it is very similar to EPIC, but it allows us to provide a very attractive price point and the operational requirements demanded by that

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**A fully integrated avionics system, by way of contrast, requires significant infrastructure and has a great deal of development and design cost behind it**

market. Importantly, it offers synthetic vision capabilities just as EPIC does, using the same terrain database that we have in EPIC, certified to DO200A, which attests to the fidelity of that terrain database. We have close to a billion hours of operational experience across the spectrum of business aviation for our avionics products and APEX is able to rely on that level of integrity. It was announced for the Pilatus PC24 last year. Where we see that particular roadmap going is towards getting credit for the accuracy of the database by having the authorities grant a lower landing minima for the system. We are working towards a 150 feet minima decision, as opposed to the 200 feet of visual contact with the runway that is required at present. Giving pilots an extra 50 feet of allowable minima will avoid a number of aborted landings, saving fuel and time while maintaining strict standards of aircraft safety. We think we will achieve this with the synthetic vision system we have in place at the moment,

and this is without the addition of any real-time cameras or infrared feeds to integrate real-time external feeds with synthetic vision. Clearly the end goal that we are driving towards here is the ability to do away with minima altogether, so that planes can land and take off safely regardless of external visibility conditions. But that is still years away.

Fusing real-time imagery and data with synthetic vision is tremendously powerful. The next step on our roadmap is to fuse microwave radar, for example, and infrared camera feeds with the synthetic vision system. What you have is a square showing the runway as a real-time real but enhanced image with the synthetic imagery blending seamlessly with the edges of the "real" square on the display. The real-time imagery will show the pilot if an airport vehicle or an animal, for example, has encroached on the runway. We expect to be able to get minima down to 100 feet once this system is in place. ●

ExecuJet has grown quickly since it began operating in the nineties but always emphasized a high level of quality in its offering



Gerrit Basson,  
COO, ExecuJet

# When scale matters

ExecuJet began life in Europe in 1994, with a base at Zurich Airport, running the Zurich FBO and managing a small number of business jets. The Zurich base became the company's international headquarters in 2001 as part of a very successful international expansion programme. This expansion built on ExecuJet's initial establishment in 1991 as an aircraft management company at Lanseria International Airport. As ExecuJet COO Gerrit Basson notes, the company is now one of the leading global 'full service' business aviation organisations, offering a wide portfolio of services ranging from aircraft management to charters, FBO operations, maintenance and completions management services. Until

mid-2013 ExecuJet had one of the world's largest pre-owned and new aircraft sales divisions; however, as Basson explains, the group sold its pre-owned business to the US-based Jetcraft in August (see the story on page 42 of this issue) in order to focus on its operations and management lines of business.

The company now manages some 150 business jets worldwide and is developing a very impressive network of FBOs. As an operator it has seven regional civil aviation-issued air operating certificates (AOCs), giving it a truly global presence. Its first AOC, at Zurich, was rapidly followed by an expansion into Denmark and by 2000 the Group had established bases at Dubai International Airport and Sydney Airport, which became home to ExecuJet Australia. The company received its UK AOC in 2008 with a base at Cambridge Airport. "Our fleet in Europe now comprises 53 aircraft, about 80% of which are large jets, making us one of the biggest operators of large aircraft in Europe. We have Global Expresses, Falcon 7Xs, plus Gulfstream 450s, 550 and 650s and we are working very hard at winning the trust of big jet owners," Basson comments.

Scale is important to an operator, since the more trust and breadth you gain in the market, the more that word-of-mouth recommendations among owners works for you. However, scale also imposes considerable challenges, Basson notes, since this is not a market in which you can afford to drop your A game for an instant. High net worth individuals are accustomed to the highest standards of service and mistakes do not sit well with them. "We have an exemplary safety and performance record and we work very hard to maintain this. We train all our staff continuously to ensure that we deliver service excellence around the clock. A team of key account managers maintain the personal contact with each owner."

Being in a position to take your A game to customers day in and day out depends on systems as well as training, and in many ways the ability to score highly on customer satisfaction audits is a function of the investment that the operator is prepared to make in its support systems. "We have invested very significantly in computer processes to ensure that we have a totally integrated



**This is the way we are looking to advance our A game, by bringing a higher level of professionalism to the aircraft management business**

system across our entire global enterprise," Basson says. Building on this, ExecuJet has just introduced a new app for the iPad which gives owners access to relevant information held on the main ExecuJet system.

As Basson points out, this means that an owner can see at a glance everything relating to that particular jet, where it flew to last week or last month, whether it was on charter or flying the owner's family. "This is the way we are looking to advance our A game, by bringing a higher level of professionalism to the aircraft management business," Basson concludes. ●

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# Global parts

Interview with Troy Palmer, president and CEO, and Malissa Nesmith, vice president, COO

One of the astonishing things about business is the way seemingly small opportunities can roll onwards and upwards, until what starts off as a small, one- or two-person operation running out of a garage or a spare bedroom turns into a substantial company. When, in 2003, Troy Palmer found an OEM that was simply providing parts on demand, he saw the opportunity for a little add on margin profit. "My first purchase was about 75,000 dollars and that took about six credit cards, max'd out to \$10,000 each and a further \$15,000 off my parents," he recalls.

Buying in bulk, Palmer was able to sell parts as single items to owner pilots at a mark up. After a year of trading in this ad hoc way, he'd managed to build up a sufficient track record to go to the banks and start lines of credit with them, using the inventory that he was building up as collateral. In the early days, Palmer's operation sold the parts about as fast as it managed to get hold of them, using his network of contacts and also selling online through eBay. Then he got the opportunity to take on a distributorship from Raytheon. "We were initially given only a very narrow distribution list by Raytheon, with the focus being on a single model. The idea was that we would focus on the legacy parts while the OEM focused on sales of the

newer production parts for the Hawker 4000, the 987 and so on. That gave us a great platform to launch our distribution company and since then we have worked to expand our offering to other OEMs," he comments.

After two and a half years of building up a solid performance history as a distributor, Raytheon gave Palmer the right to distribute parts across a range of models. "We were given a quota of sales to hit as a distributor, and you had to buy the inventory that you had committed to. It was up to us to shift it. I had to keep building my credit with the bank as the scale of our inventory commitment grew," he observes.

What made Global Parts.aero different from the outset, Palmer explains, was that his competition consisted of repair stations whose primary revenue stream was servicing and repair. By definition a repair station only needs the parts that it requires to do a specific job or series of jobs. Palmer's operation was set up on a different scale from the start. Malissa Nesmith, chief operating officer at Global Parts.aero, adds: "We were creating the infrastructure required to service and support customers solely through distribution at that stage, so we went for volume from the start and that worked well for us."

By early 2005 the company had decided



to invest in a major IT system, upgrading to a Microsoft Sequel Server database in 2006, which held the company's entire parts inventory. Then, in 2007 the company got a major break when Hawker Beechcraft, as Raytheon had become, gave Global Parts. aero the opportunity to buy the legacy spares division. "This was when we really beefed up our IT and distribution capabilities and brought on 64,000 line items. In effect we went from being a small brokerage to being a big distributor overnight with this deal," Palmer comments.

The business had moved into offices on the campus of a municipal airport with a small stockroom. To accommodate the vast increase in inventory, Palmer added a new building with around 100,000 square feet of warehouse space. Over the last 12 months Global Parts. aero has expanded beyond its core business of distribution, adding a Part 145 repair station and an EASA Part 145 certification for its repair station, as well as a manufacturing facility. This has allowed it to add a specialist line of rotables (more complex assemblies which are switched out in their entirety during a repair, with a complete replacement assembly being swapped for the old one). "To make these kinds of repairs, you have to have the technical capabilities and be able to prove to the FAA that you are competent to make those repairs," Nesmith explains.

In 2013 Global Parts.aero added a manufacturing capability that allows it to machine in all five axes, allowing for complex part creation in hard metals. "We can now build direct for OEMS, and that is becoming a significant selling point. There are a huge range of OEM parts, from airframe parts to brackets and specialist pieces. It is very much a build to print operation," Palmer explains. With these capabilities established in-house there is nothing stopping the company from moving on to do reverse engineering of end of line parts or to support the aftermarket in parts. Another addition has been the purchase of a powder coating company, which has been added to the manufacturing side. "Our business model has been to keep adding one capability after another and it has been a fundamental part of our growth," Palmer comments.

The company now has some 64 staff, with the bulk of the workforce being located at Wichita. "This really is the air capital of the world and it is a great place to be. It allows us to meet with all the OEMs in the Wichita area and that has been a real plus for us," Nesmith adds. After exponential growth in the early years, the company is now growing at between 10% and 20% a year, which both Palmer and Nesmith say is more than fast enough. "As you go up the scale, new challenges emerge, not least being the need to keep on finding and

attracting the right, qualified individuals. We need these people on both the manufacturing side and on the repair and overhaul side. We are ISO AS9120 and ISO AS9100 certified on the distribution and manufacturing sides respectively and that commitment to the highest verifiable standards has definitely been a strong plus in our growth," Palmer enthuses. Becoming ISO certified requires a very significant up-front investment, but it has definitely been worth it. "There is no substitute for being a reputable company in aviation," he concludes. ●

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# Cabin completions

Interview with Jaime McGrath, Director, Cabin Completions, Rockwell Collins

Producing a complete, hi-definition cabin management system, including in-flight entertainment (IFE) that is future-proofed against the rapid advances that characterise the digital consumer entertainment space, is not a simple matter. Rolling out such a system across multiple aircraft types adds a further non-trivial level of complexity. Rockwell Collins first introduced its Venue hi-definition system early in 2007 and as the company's director, cabin completions, Jaime McGrath, notes, the system has already catered for substantial advances in digital technology, and is well placed to handle further innovation.

To date the largest aircraft Rockwell Collins has installed Venue on are the Boeing BBJ 737 and the Airbus 319. "We had one client with 35 in-seat touch-screen monitors, while one of our most recent projects is a 45-seat aircraft with a crew rest area, a lounge area and higher density seating at

the back," he comments. The challenge posed by larger aircraft in terms of the installation of a cabin entertainment and management system is not the switching panels, which can be clustered off an Ethernet loop, but the number of screens and wireless audio visual streams the system can handle simultaneously. "Venue is designed with a very lightweight fibre optic cable loop under the floor. It is a 67 gigabit system, which is a tremendous bandwidth, not just for today, but for what might be on the horizon in the next seven to eight years," McGrath says.

One of the developments that could challenge cabin management systems and In-Flight Entertainment (IFE) systems over the next few years is the move by the entertainment industry and TV executives to push beyond hi-definition TV. As McGrath points out, at this year's Electronics Consumer Show, displays and video walls were getting larger, driving the need for higher resolution imaging. Visual data sets are increasing in

complexity, putting massively increased bandwidth demand onto the backbone of any in-flight network. At the same time, end-user expectations for crystal clear images are being set by today's generation of smart phones and tablets, and when high net worth owners and passengers settle back in their seats to watch an in-flight film of their choice, they are increasingly going to expect the picture quality to be ultra-high definition. Instead of the 1080 pixels of hi-def TV, the screen resolution could four times that within a few years.

"If you are delivering uncompressed content, the demands made by a next-generation monitor could be 12Gb per second. An owner might have to wait twelve months or more to take delivery of a jet and another 12 to 18 months if it is being delivered as a green aircraft to a completions centre. You can see some real breakthroughs happening in the IFE space over that time and if your new jet cannot support the next best thing that comes along, you are going to have

a dissatisfied customer. This is where the kind of future-proofing that we provide to our customers becomes crucially important," McGrath says. On this point, as can be seen from EVA's conversation with Gulfstream president Larry Flynn in this issue (p. 24) a buyer ordering a new Gulfstream 650 today will not get delivery before July 2017 - more than enough time for radical change in the entertainment and broadband space.

Right now today's HDTVs, which have set the standard in IFE on the larger business jets for a few years now, can display 1920 by 1080 pixel video, but what you actually see depends on the source data, and whether you are viewing 1080i or 1080p content. The 'i' here stands for interlaced, while the 'p' is for 'progressive'. The real broadcast speed for 1080i is 30 frames per second, not the 60 frames per second advertised. For technical reasons, namely to make hi-def less demanding on bandwidth, each full frame is broken into two 'passes' of 1950 x 540 pixels, so you get the top half scanned first, then the bottom half. This is too fast for the eye to see a flicker and the picture quality looks hi-def. Progressive does the whole frame on a single pass, and for the viewer, this just looks crisper, particularly if a lot is going on in your movie at that moment.

McGrath points out that today the only time a Venue system on a business jet is likely to be streaming 1080p to a monitor is if the user is playing a movie using a Blu-ray player or playing a high-definition video game system. Ordinary TV and most wireless content can stream at 1080i, which is a complicated way of saying that Venue can deal with streaming 1080i live TV to some monitors and handle up to 15 of the more demanding 1080p streams at the same time. That is a lot of bandwidth.

Venue also comes with a wireless Internet loop for compressed data, which isn't a great way to stream to a large screen HDTV, where you want native uncompressed datasets to eliminate latency and generate the best image, but is ideal for viewers using tablets and smart phones. In today's 'bring your own device' world, IFE has to be open to just about any device that a user wants to bring with them on the flight. "With compressed data to a tablet, when someone is viewing on the ground over the normal Internet, the best quality they are getting is probably about 8Mb to 12Mb per second. We can handle a high

**We have to keep our finger on the pulse of the consumer market and understand what could be making its way out to an aircraft, and what really will be a valuable addition**

number of streams of that quality simultaneously so capacity is not a problem," he says.

"In addition to business jets of all shapes and sizes, Rockwell Collins is also developing an IFE system, called PAVES, to market to regional transport jet operators. "We have a full in-seat video solution that does hi-definition at the seatback monitor," McGrath says. In the single-aisle air transport jet market, particularly in South East Asia and China, IFE is a necessity. Passengers simply expect it."

For light jets, most solutions are based around a server streaming wirelessly to the passenger's own tablet, so that is a much simpler solution, and here too, Rockwell Collins has an offering. "We get calls from a whole range of potential customers, from end users to designers and modifications houses and we talk them through the technical merits of the various solutions we have to their specific requirements," he comments. Rockwell Collins then trains staff at its authorised distributors on the installation. "We bring our 20-plus years of experience of the industry to the table, particularly on issues such

as the wiring and where the best position is to house our boxes. Once the design specifications are frozen we provide the hardware and write the software to drive the IFE. The modifications house and the end-user can come to our laboratory and interact with a complete replica of their system that has a look and feel that has been customised to them," he explains.

Minor changes are accommodated within the quoted price and testing of the installed system takes around five or six days. "We make sure that no unwanted surprises occur late in the completions process. With legacy IFE systems, even a small last-minute change by the user could be huge, with dramatic cost implications, but with Venue we can often accommodate small changes inside the same day since it is all software driven," he notes.

"We have to keep our finger on the pulse of the consumer market and understand what could be making its way out to an aircraft, and what really will be a valuable addition. For example, we have a proprietary solution, Skybox, that can wirelessly distribute Digital Rights Management (DRM) content and this has been in the market for over a year now," he says. Rockwell Collins has been awarded a further five VIP narrow body contracts for Venue in the last 10 months, so McGrath is confident that the company is well positioned in what is, after all, one of the most hotly contested markets in business aviation. ●



Sony's ultra hi-def TV offerings: just one of the challenges ahead



# Connecting buyers and sellers

Interview with Niklas Berg, founder and CEO, and Oliver King, managing director

Looking at the iconic, huge, white-with-a-splash-of-green Avinode stand at EBACE 2013, it is something of a stretch to believe that this global business started as a university project by three Swedish university students, Niclas Wennerholm, Per Marthinsson and Niklas Berg. But then Avinode is quintessentially a technology company, with a technology that, in the words of managing director Oliver King brings together buyers, suppliers and sellers of business jet charter services globally, and as Silicon Valley has proved again and again, IT companies have the capacity to expand mightily from very modest beginnings.

Avinode now claims to be the leading global charter market, with over 3000 aircraft accessible via its online marketplace. Thousands of aviation professionals log in every day to buy and sell charter flights all round the world. The company's CEO, Niklas Berg and Oliver King, who joined Avinode three years ago, spoke to *Executive & VIP Aviation* about the original rationale for the company and its progress to date.

"The three of us, the founders, were all college students at Chalmers, a technology university, which is well known for the Chalmers School of Entrepreneurship. The kernel of the idea came from a friend of ours, Max Lieberman, back in 2001," Berg explains. At that time Eclipse had

announced that it was going to change business aviation by producing thousands of light jets. We thought great, let's start an IT service that simplifies this emerging air taxi service market. But it was just after September 11 and the attack on the Twin Towers, plus the dot.com collapse was still very fresh in people's minds," he recalls. There was not a lot of money around to back anything that combined IT with aviation. Nevertheless, the three started to look at the way operators market themselves to brokers. "We quickly saw that the entire market was based on static information," Berg says. They were convinced that in the era of the Internet, there had to be a better way for the charter industry to match buyers and sellers.

Previously Avinode brokers found flights for customers by looking at paper lists and getting on the phone to operators. The fax and the phone book were the prime tools of the trade. The number of options and permutations that they could trawl through to find the best fit for their clients was hugely limited, even with their best efforts. The client generally needed answers on price, aircraft availability and suitability in pretty short order and the broker had a tough job finding answers fast enough to clinch the sale before the client got impatient and called a rival broker.

The three students found a flight time DOS-based system run by Per Johansson that was used across Europe. "We built a quoting system on top of this. The broker input routes and times into the system and it returned quotes. We took it from a client server DOS platform and put it on the Internet and added some Danish brokers. What we found when we looked into it was that there were numerous sources of supply dotted around Europe, all the aircraft management companies that looked to charter unused hours on the owner's aircraft, and there were numerous buyers. The silver bullet, that no one had got right yet, was to bring the two sides together by creating an online marketplace with near instant quoting," he comments.

From the outset, Avinode's founders took the decision to use as much proven, off-the-shelf technology as possible. They built their database of available aircraft and operators in Microsoft Sequel Server, which had proven scalability. Scalability and speed are crucial to the system, since the number of permutations

that could be involved in satisfying a client's requirements can multiply exponentially. Each additional requirement, such as route, time, seating capability, preferred aircraft type, interior options, catering, crew, price, airworthiness checks, adds yet another dimension to the matrix of options that have to be searched. "It is not at all unusual to find that the system is doing upwards of 1.3 million calculation points in order to produce the quote," King says.

That figure alone shows that the system is doing a lot more than merely taking a load of work off the broker's shoulders. It is giving the broker a powerful tool to provide the client with a much more exact fit to their specific requirements, thus increasing client satisfaction and helping to build and strengthen the relationship between the client and the broker. It also makes it extremely easy for the operator

to reach out to virtually the entire community of brokers and to keep them informed as to the moment-by-moment availability of their portfolio of aircraft. Looked at like this, all the early fears from brokers and operators, namely that an online system would somehow cut them out of the loop, vanish. The real problem Berg and his colleagues had when they tried to get Avinode off the ground was in convincing brokers that their system would be comprehensive enough, that it really would include all the information that the broker would otherwise be garnering through the telephone. To win that battle they needed to bring a large percentage of the operators on-board as fast as possible, and to get the operators disciplined in keeping their aircraft information bang up to date.

What they brought to the table, from the broker's perspective, was an enormous increase



**We thought great, let's start an IT service that simplifies this emerging air taxi service market**

**Niklas Berg, founder and CEO, Avinode**

in the speed with which the broker could give the client a firm quote. "Before Avinode, it could take a broker 24 hours or more to develop a firm price, and even then there was no certainty that it really was the best price available. It was merely the best price the broker could obtain from the calls that he or she managed to make," King explains. With Avinode, the broker can reach a firm price in five seconds or less. That leaves plenty of time for the broker to add further value by attending to some or all of the plethora of 'concierge services' which the client might want, from hotel bookings to limousine travel arrangements.

"Brokers knew the operators they worked with regularly but they would have no visibility of which aircraft just flew into which business airports, or that a particular operator has an aircraft with two days' availability while it waits for an empty-leg flight. We stepped in with empty-leg information and empty transient availability. It was a classic application of technology to a

problem that is too complex to solve with pen and paper," King notes.

Avinode's major rival was the US-based CharterX, headquartered in New Jersey. In 2006 Niklas Berg went out to Miami to open up Avinode's assault on the US market and that brought Avinode into direct competition with CharterX. "The US market was very different from the European market, but we had a great deal to offer. For a start, we brought buyers in Europe that were looking for trips to the US, so US operators and brokers had something to love us for!" Berg says. In a shrewd marketing move Avinode also teamed up with Netjets in the US, who were looking for a convenient way of sourcing jets outside their own fleet.

"We competed hard against CharterX in the US and grew to be about the same size as them by 2010, at which point, after six months of discussions, we acquired all the outstanding shares of CharterX and merged their platform

with ours," Berg says. That acquisition gave Avinode a dominant position in the US market to complement its dominance in Europe. "We have work to do still in Latin America, and the US still has a lot of potential," Berg informs.

The CharterX acquisition brought two additional companies into the Avinode fold, namely the safety auditing and safety data management company Wyvern ([wyvernlimited.com](http://wyvernlimited.com)) and the web-based aircraft and crew scheduling system, SchedAero ([www.schedaero.com](http://www.schedaero.com)). "Wyvern is still largely a US company so we have some great opportunities over the next few years to expand Wyvern's global capabilities," Berg comments.

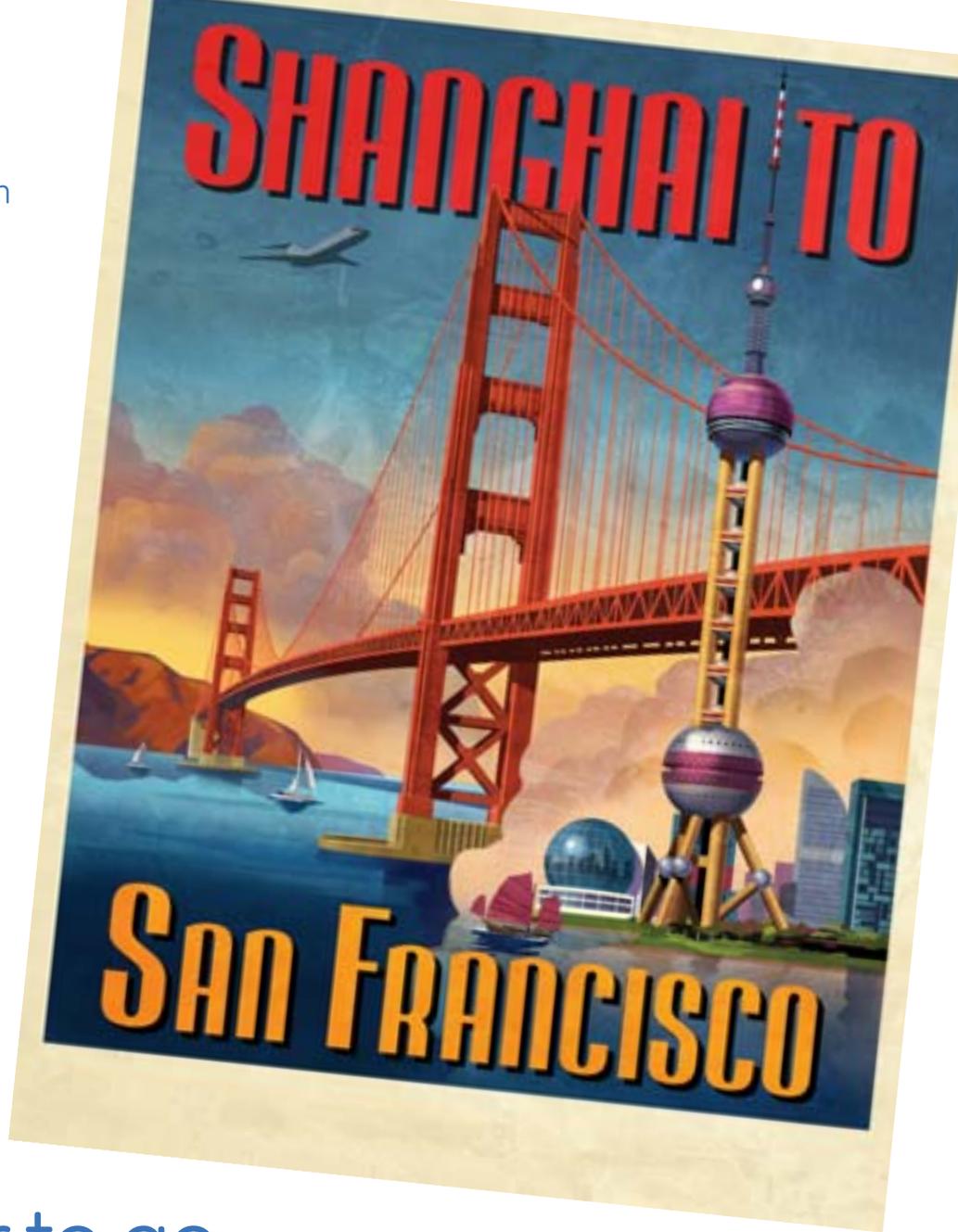
The future for Avinode looks busy. The group now consists of three companies, Avinode, Wyvern and Schedaero. The management team will be working to expand the footprint of all three companies in Latin America and Asia while looking to add additional functionality wherever that seems appropriate. It has just launched a complete sales management system for brokers, complete with CRM and fully integrated with the Avinode marketplace. It has added helicopters to SchedAero's existing fixed-wing jet content and is looking at adding a luxury limousine side to provide brokers with a ready made address-to-address service for their clients. "As we grow there are plenty of opportunities for combining information on the system to deliver services. The regional jet operators, for example, have spare capacity that they could charter and to date there has not been a good way of connecting the regional jet operators and the business and leisure charter markets, so there is plenty to do," King concludes. ●



Oliver King,  
COO, Avinode

**Before Avinode, it could take a broker 24 hours or more to develop a firm price, and even then there was no certainty that it really was the best price available**

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