

ISTAT

July 2007

# Jetrader

International Society of Transport Aircraft Trading

Q + A

Robert Deluce  
Porter Airlines

Airbus Targets Appraisers  
007 The Hong Kong Experience  
Renaissance of the Turboprop

A380 World Tour

Bombardier Aerospace Q400



# Who's Who ISTAT New + Rejoining Members

We welcome these recently registered ISTAT members and look forward to seeing them at upcoming ISTAT events.

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**T**imes are good for aircraft financing. There is more demand than product. Most airlines are extending leases rather than returning aircraft and the manufacturers' backlogs make it impossible to acquire new aircraft for several years. When an airline issues an RFP for sale leasebacks on popular equipment they have to assign several managers just to filter all the responses they receive.

It seems like we are all chasing many of the same deals. While it is always fun to see your competitors in hotel bars around the world or walking into an airline CEO's office as you are walking out, sometimes I wonder if this is becoming a commodity business. Other than the relative cost of funds, what separates one bidder in a deal from the next?

My father was a salesman his whole career and he used to tell me that a good salesman could sell anything. While there is a lot of truth to that adage, ISTAT members that spend their time visiting airlines and talking about airplanes have to be experts at what they do in order to distinguish themselves and their companies. Our business requires expertise in both finance and in the products we finance. While there will always be some airlines that make decisions based solely on quantifiable economic differences such as lease rates, I would like to think that at least sometimes there is more to it. Who best understands the airline's business, their route structure, which aircraft are best for the missions they fly, what flexibility they might need in the future, how their maintenance program and regulatory environment affects return conditions. How does an airline's specification requirements enhance their in-flight experience or revenue earning capacity? What role do the various unions play in fleet decisions? Who is willing to tell an airline that they think they are making a mistake with their specification or equipment choice? We have the opportunity to visit with and analyze the business of lots of airlines and that experience and expertise is valuable to our airline clients.

Much of this expertise is learned on the job. The manufacturers do a pretty good job of disseminating information but that information must be evaluated critically. I think ISTAT can do a better job helping our members gain expertise on the products they are marketing. It is my intention during my term as ISTAT President to use the *Jetrader* and our conferences to advance this purpose. When is the last time you saw independent analysts compare the operating economics of competing products on particular routes? What are the true differences in maintenance costs between two different engine choices on the same aircraft on the same missions? Within the ISTAT community we have this expertise. ISTAT is here to serve its members and we can do it by presenting critical analysis. While it is not our mission to endorse products or argue that one is better than the other, we should provide an opportunity to learn, and facilitate the dissemination of information.

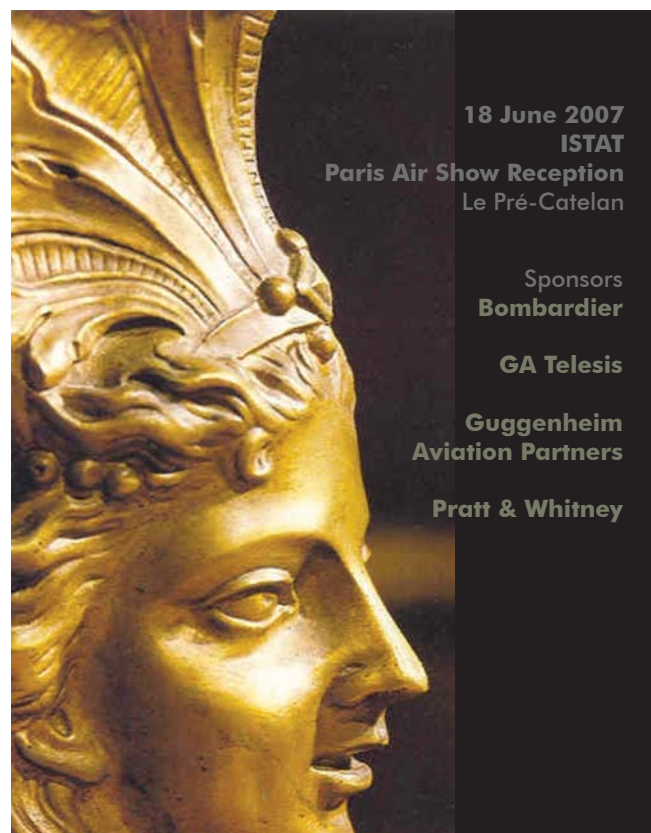
If we can't get you the information you want and need, why should we expect you to read the *Jetrader* or sit through the presentations at the conferences? I am working on this and need your help. If you are willing to share your expertise, just raise your hand and let me or any of our officers or directors know.

*Michael Platt*



## >>>this issue

- 5 007 :: The Hong Kong Experience By Bert van Leeuwen
- 6 Q + A Robert Deluce  
Porter Airlines
- 8 The Renaissance of the Turboprop By Bombardier Aerospace  
Regional Aircraft
- 10 Insurance Trends By Don Kenny
- 11 The ISTAT Foundation
- 12 Airbus targets appraisers on values By Scott Hamilton
- 17 Aircraft Appraisals
  - 1 | **Boeing 777-200ER** by Steve Rehrmann, Morten Beyer & Agnew
  - 2 | **Boeing 767-200ER** by Clive Medland, Senior Vice President, SH&E
- 19 Purdue Aviation Technology  
By Denver Lopp and David Stanley  
—leading the way - Part III
- 20 BIG MOVES +Brief CV  
Siggi Kristinsson Greg May
- 21 Jacques Scheider +  
The Spitfire By Bill Bath



18 June 2007

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# Jetrader

Jetrader is a bi-monthly publication of ISTAT, the International Society of Transport Aircraft Trading. ISTAT was founded in 1983 to act as a forum and to promote improved communications among those involved in aviation and supporting industries, who operate, manufacture, maintain, sell, purchase, finance, lease, appraise, insure or otherwise engage in activities related to transport category aircraft.

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# ISTAT Calendar

**18 June 2007**

**Paris Air Show Reception**

**Le Pré-Catelan** *by invitation*

**30 September - October 2 2007**

**14th European Conference**

**Hilton Vienna**

**11 November 2007**

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**Dubai Creek Golf & Yacht Club**

**9 - 11 March 2008**

**25th Annual Conference**

**Omni Orlando Resort at Championsgate**





# 007 | The Hong Kong Experience By Bert van Leeuwen

No, not the title of a new Bond movie, but the story of one of the first passengers flying the new Airbus A380. F-VWW"JB" (for "James Bond"), the registration Airbus selected for the A380 with the iconic msn. 007. Make no mistake, this plane is not the giant "Skyfleet" jetliner, featuring as the target for villain "Le Chiffre" in the latest Bond movie "Casino Royale". The Skyfleet jet was actually based on a Boeing 747 although heavily modified and as such barely recognizable for the average movie-goer. However, even without the help of the Secret Service's most popular agent, this plane, the real msn. 007 succeeded in conquering its position as a world media star for a few days in March 2007. Airbus A380 msn. 007 was the aircraft Airbus and Lufthansa selected for a number of high profile "Route Proving Flights", all part of the test program for the new giant in the sky. As DVB Bank's Head of Aviation Industry Research, I was one of the fortunate representatives of the financial community to be invited as guinea-pig on one of these flights. Exclusively for ISTAT's *Jetrader* follows a description of the experience of one of the first A380 flights from a passenger's point of view.

It was already late on February 2nd, when an e-mail from "Airbus-events" popped up on the computer screen. Although initially just one of the daily flood of e-mails, the contents of this one immediately got "red alert" status as it turned out to be an invitation for one of three – all equally attractive – flights aboard the spectacular new Airbus A380. The menu offered a flight to New York on Monday, a "weekend special" to Hong Kong and a Sunday trip to Washington (DC). Difficult choice, as NY had the attraction of the first transatlantic passenger flight, Hong Kong the longest flight of the three and the most exotic destination and Washington would maybe give the opportunity to visit the National Air and Space Museum's Steven F. Udvar-Hazy center (would an A380 fit in there in the distant future?) near Dulles airport. The attraction of the exotic gained the upper-hand and Hong Kong it would be.

Friday April 23rd the day of what turned out to be flight LH8946/AIB201 from Frankfurt to Hong Kong started at Amsterdam's Schiphol airport aboard a Lufthansa A319. A smooth flight to Frankfurt followed and during the final approach the A380 in Airbus livery could already be seen on the platform, although not yet anywhere near the dedicated A380 terminal area. According to the instructions, check-in for the Hong Kong flight would be at a dedicated counter. With the usual German efficiency this counter was very easy to find as the entire airport was littered with "LH Route Proving" signs, pointing guests in the right direction. Check-in was friendly and efficient, albeit no Mile & More points for this flight, and the boarding pass indicated seat 23C as well as gate E5, a dedicated "A380 Parking Only"-gate in Terminal 2. The gate area was transformed into a reception area with plenty of snacks and drinks for the nearly 500 expected guests. It turned out that most of the other passengers were either Lufthansa invited VIP-guests, Lufthansa employees or winners of a LH/A380 contest organized by a local radio station. In this crowd of around 500 people however a few familiar faces could still be recognized, other aerospace bankers and representatives of European leasing companies. It was interesting to note that most of the bankers had swapped their pin-stripes and HP's for more casual outfits and big SLR camera's, once more revealing the usually hidden but oh so obvious "toys for the boys" character of our industry. As the scheduled departure time of 15.30 approached, more and more people started to wonder why the big bird was still hiding. Was this to be an attempt to break the record of fastest boarding a commercial airplane? Soon the news broke that mechanics had discovered a minor leak in the hydraulic system and that would cause



a delay. Replacing the damaged pipe should normally be an easy every day routine job, but as Lufthansa did not carry a stock of A380 PMA parts yet, an OEM replacement part had to be jetted in from Toulouse. Surprisingly the news of the delay did not impact the festive atmosphere around the gate at all and – as a solution to all problems in Germany – the hosts quickly arranged additional catering in the form of massive kettles containing .... German sausages.

In the meantime, the A380 had made its appearance at gate E5 and even before all sausages were gone, the boarding procedure started. Contrary to personal fear of a chaotic mass-boarding run, the two jetways (one for the upper deck, one for the main deck) could easily handle the number of passengers, effectively splitting the A380 into two separate 250-seaters. Seat 23C turned out to be an economy seat on the main-deck. To mask some of the author's envy versus the First and Business Class passengers, the argument was found that the qualities of a new aircraft can only be truly experienced in Economy as Business and First are OK in any aircraft type anyhow.

Robert

**Deluce**President and CEO  
Porter Airlines

**JETRADER:** Good Afternoon Bob. Thank you for taking the time to speak to the members of ISTAT and the JETRADER Magazine.

**RD:** It's a pleasure to be able to meet with you.

**J:** Last issue of the JETRADER we interviewed Wolfgang Mayrhuber of Lufthansa, a premier international legacy carrier. Porter Airlines is an interesting contrast as a successful startup. Could you share your operating philosophy?

**RD:** Our operating strategy is to bring back a certain refinement to the industry, restoring some dignity to air travel, to all of our passengers both business and leisure. It starts with a strong brand that includes a stylish livery, a mascot in the form of a mischievous raccoon, easy web booking, convenient shuttle bus service from the city center of Toronto, convenient web check-in, although we have a call in service as well. We have a business class lounge here in Toronto, retro looking uniforms that are a throw back to earlier times when there was a bit more dignity associated with flying. We offer a high end in-flight service which we couple with our new Q400 aircraft which are quiet, spacious and quick. When you add this all up our passengers get a more refined, warm experience than you would typically get on an airline.

From a more technical point of view we operate one type of aircraft, the quiet, fuel efficient, low emissions and fast Bombardier Q400. We operate from one main hub, Toronto, and our destinations are all within 500 nautical miles. We are a low cost airline but without the discount mentality. We cater to a time sensitive business traveler so our yields are higher than typical for this environment. Our service is convenient, geared towards saving people time and not nickel and dime them to death for the little extras that is more typical of many carriers.

**J:** With your unique position at Toronto City Centre is your operating model unique to this environment or is it exportable to other airports?

**RD:** Our business plan is based on Toronto and to access as many cities as feasible. When we go to Chicago we will target Midway Airport and in Washington DC we are looking at Ronald Reagan National Airport. We really attempt to connect city center to city center where ever we can as we emphasize convenience and an upscale level of service.

**J:** How do you see the aviation model changing in the US and Canada over the next few years?

**RD:** Our experience shows that the level of service in our terminals and airplanes pleasantly surprises passengers. They are price conscious but service and convenience are very important to them. We have a couple of carriers in Canada who are dominant but when we run up against them we find our passengers prefer our convenience and the level of passenger experience. When you combine this with good flight schedules and competitive fares we think we have a winning combination. LCCs in some markets are attractive. In Canada, LCCs tend to look like the legacy carriers. True LCCs like Ryan Air, Southwest or an easyJet are not in our market which is dominated by legacies or regionals. In the case of JetBlue we offer services similar to them although we go a little further by offering leather seats and a culture of service. We are a regional carrier serving an upscale market using efficient airports and flying a very efficient aircraft.

**J:** It has been attributed to Ryan

Air that over time fares will approach zero and airline revenues will come from selling all of the other services. How do you see the market for LCC's develop and how does Porter Airlines operate in this environment?

**RD:** The RyanAir model is one thing but is based on a different philosophy. Look at the success of Virgin Atlantic or Singapore Airlines. They have not sacrificed the flight experience in anyway and they have been particularly successful with the highest rated passenger satisfaction. In our case we have very competitive airport and a very efficient aircraft with access to a time sensitive business traveler who is prepared to pay a premium for time saving and efficiency. This unique to our environment and gives us some comfort in terms of what we are providing and how its being received.

**J:** What is your view of Chapter 11 as a business tool to force lower costs and how does that affect the surviving carriers?

**RD:** Using Chapter 11 or CCAA here in Canada, Air Canada went to the wall, left a lot of debt behind and many unhappy people. When that happens, there is a bit of a cloud over you and people don't forget how they were treated all that quickly, whether they are employees, passengers or suppliers. Everyone was pushed to the limit. There are so few carriers to choose from in Canada that when someone with a new, refreshing service comes along and a different view of operating an airline the reaction is very interesting. We are enjoying a very strong reaction to the product we are providing. Chapter 11 or CCAA seems an inappropriate way of sorting out the marketplace. Normally if you are successful you survive, if you are not you don't. But Chapter 11 or the CCAA approach is a bit contrary to the way we are doing business.

**J:** What is your forecast for fuel prices for the next couple of years?

**RD:** When you are dealing with the Q400 you are a bit less sensitive to fuel price fluctuations. The Q400 burns typically 30 to 40% less than your typical regional or narrow body on a cost per seat basis. It gives you a great deal of flexibility to respond to market



conditions. We know that when fuel prices goes up it affects everyone but it hits us a bit less. I can't imagine fuel going down and we are planning for a gradual increase over time and are prepared to pass the cost on to our customers. But we are less at the mercy of fuel prices than some of our competitors.

**J:** What parameters do you use in selecting your aircraft and are regional jets going to play a role in Porter Airlines growth strategy?

**RD:** The Toronto City Centre Airport has a restrictive agreement that precludes the use of Jet Aircraft. So our equipment acquisition strategy was based on finding the most competitive aircraft to meet this requirement and the urban environment we were going to operate from. We came down to looking at the Bombardier Q400, the ATR72 and the SAAB 2000 even though this last one is no longer being manufac-



“ Our operating strategy is to bring back a certain refinement to the industry, restoring some dignity to air travel, to all of our passengers both business and leisure ”



tured. The Q400 was the most competitive from an operations perspective and the fact that it is manufactured here in Toronto did not hurt. As a new start carrier it was not easy to finance new aircraft. So we focused on raising enough capital to buy our first four aircraft outright out of a total 20 aircraft on order.

**J:** Do you see leasing playing a role in your acquisition strategy?

**RD:** We see room for some aircraft to be owned and some to be leased. At the moment they are owned and that is our short-term strategy.

**J:** Is Porter Airlines going to move into the 100-seat market?

**RD:** The Q400 is the core of our equipment and the one we plan on using for a long period of time. It's a new generation aircraft and it is state of the art and meets our operating parameters from this airport. Who knows, there may be a longer version or a bigger

version of this aircraft; there are rumors that Bombardier is looking at alternatives. We are better off right now to add frequency rather than size to our destinations as our loads improve and we get a bigger percentage of the market.

**J:** With the increasing demands of the public for environmental awareness, what impact will this have on the Industry and your company?

**RD:** There is an increasing awareness in Canada, that for certain and we see it worldwide. Europe is a bit ahead of the curve on this issue. We are fortunate to have an aircraft that is technologically advanced. It burns less fuel, emits less pollutants, a six bladed prop that lowers exterior noise and a noise suppression system to improve the cabin environment and these all bode well. We are careful to choose options on the aircraft that help improve its envi-

ronmental friendliness such as the ability to lower engine speeds for landing which lowers the exterior noise level. We will move soon to present ourselves as greener because we have the right aircraft to do that. We will look at other aspects such as carbon credits and other means to ensure we do our part to improve our impact on the environment. On an operational level to improve our reliability and to lower our noise footprint on the surrounding areas we have increased the glide path to 4.8 degree at Toronto City Center instead of the more traditional 3.3-degree approach. That gives us a straight-in ILS approach rather than the more traditional offset approach and it allows us to bypass residential areas. This also allows us to reduce our noise footprint on the surrounding area. We are already quietly changing our operations to address these environmental

issues and will soon start publicizing the more environmentally driven initiatives we have and are undertaking.

**J:** Is Porter Airlines sensitive to the impact the coming Baby Boom Generation retirement will have on the Aviation Industry?

**RD:** Everyone needs to look ahead on this issue as it is going to affect everyone. We have close working relationships with training organizations and universities. Because we work from an urban airport and our employees live in that environment, this has been a plus for us. With the dramatic restructuring of the airlines in Canada, many of the aircrews have been disbursed to Dubai, Hong Kong and elsewhere. So we have been able to give these specialists an opportunity to comeback. That is a good source of recruits but eventually we will have to address their replacements.

**J:** What are the major challenges facing the aviation industry over the next 18 months.

**RD:** We are newly launched even though we have been in the planning for over 5 years. We have an aggressive expansion plan which has us operating 16 to 20 aircraft over the next 3 years. The availability of qualified people is one that concerns us and could affect us at some point. My focus is on growing our market share in a competitive environment where you need to be flexible. One of things we would like to see some better use of biometrics when it comes to putting in place a secure passenger environment where passengers who are well known can have an easier time to move through the system. This is really focused on high users and should allow them to be pre-qualified. The challenge is to work in this high security environment and still offer a superior passenger experience.

**J:** That theme made its appearance at the last ISTAT Conference in Phoenix. I hope you have an opportunity to join us in Vienna for the next European Conference in September and on behalf of ISTAT and its members, thank you for taking the time for talk with the JETTRADER.

**RD:** Thank you for the invitation.

# The Renaissance of the Turboprop

By Bombardier Aerospace Regional Aircraft

**A**t the height of the regional jet boom in the late 1990s and early 2000s, many industry observers predicted that the era of the turboprop was over. And, for a few years, turboprop orders plummeted from a high of 501 in 1989 to 26 in 2002 as operators stocked up on jets.

Canada's Bombardier Aerospace, which manufactures both regional jets and turboprops, realized that the latter needed a new image. Too many people considered them noisy, uncomfortable and old technology. The first improvement was a Noise and Vibration Suppression (NVS) system. A similar system was developed originally by Ultra Electronics in Cambridge, England to make nuclear submarines run more quietly. Bombardier saw its potential for aircraft and worked with Ultra Electronics to adapt it for Bombardier's line of Dash 8 turboprops. In 1996, the Dash 8 was re-branded as the Q Series, the Q meaning Quiet.

The NVS system attacks noise at its source – airframe vibration caused by pressure pulses from the propellers beating against the fuselage. During flight, concealed microphones measure noise levels and propeller vibration and send this information to the onboard computer. This computer continually analyzes the information before sending it to devices called Active Tuned Vibration Absorbers, or ATVAs, which are mounted on the fuselage walls. The absorbers

produce counter vibrations that all but cancel out the original vibrations. The result is a sharp reduction in both cabin vibration and noise, and a remarkable increase in cabin comfort, even next to the propellers. NVS worked so well that one Bombardier turboprop operator painted "The Sound of Silence" on the engine nacelles – surely a first for any propeller-driven aircraft.

NVS was the first step in the renaissance of the turboprop and sales of Bombardier's 37 to 39-seat Q200 and 50- to 56-seat Q300 began a slow climb. And in 2005, turboprops outsold regional jets.

The second step was development of the 68- to 78-seat Q400. Here was a twin-engine turboprop that cruised at 360 knots and with a cockpit at least as state-of-the-art as those found in Airbus and Boeing aircraft. It was the first regional airliner to be certified for a Head-up Guidance System (HGS); it was the first regional airliner to be certified for Cat. III weather minima on a single engine; and it was the first regional airliner to meet Required Navigation Performance (RNP) standards that require pinpoint navigation accuracy. The HGS, Cat. III and RNP were pioneered by Horizon Air of Seattle, Washington, which also operates a fleet of Bombardier CRJ700 regional jets.

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(An article in the January 22, 2007 issue of Aviation Week and Space Technology described RNP as a form of area navigation that employs GPS positioning, inertial reference systems and (in some cases) DME-DME [distance measuring equipment] to contain an aircraft in a narrow corridor of airspace. It includes onboard navigation monitoring to alert the pilot if tight tolerances can no longer be met. With RNP, aircraft can navigate through mountain valleys safely, fly the same ground track with precise turns on each approach, and limit the impact of noise and emissions on communities because the flight paths are more customized.)

The third step in the renaissance was increasing fuel prices, which forced airlines to re-think the subject of jet versus turboprop. Turboprops typically have significant cost advantages over a small- to medium-size regional jet. Aircraft speed was not a factor when the Q400 was considered because on routes out to 400 miles, the block times between the 360-knot Q400 and regional jet are almost identical. Aircraft comfort was not a factor because NVS makes the passenger cabin as quiet and almost as vibration free as that of a jet. So it boiled down to operating economics and the Q400 has extremely low operating costs that in turn can lead to lower breakeven load factors. Assuming an average stage length of 350 nm and a fuel price of \$2.00 per USG, a 78-seat Q400 has a breakeven load factor of only 22 passengers (28 per cent) in North America and 31 passengers (40 per cent) in Europe.

As of January 31, 2007, 19 customers in 15 countries had placed firm orders for 200 Q400 aircraft, of which 143 had been delivered. Japan Air Lines in Japan, Jeju Air in Korea, QantasLink in Australia, SAS in Scandinavia, South African Express and Frontier Airlines and Pinnacle Airlines in the U.S. chose the Q400 over a jet.

Re-orders have come from All Nippon Airways, Austrian arrows, FlyBe, Horizon Air, Hydro Quebec, Japan Airlines, Scandinavian Airlines, and Wideroe and that speaks to the confidence they have in the aircraft.

"The Q400 is the mainstay of our fleet," said Jim French, Managing Director of FlyBe, which had ordered 45 Q400 aircraft as of January 31, 2007. "The Q400 is delivering very low operating costs which have allowed FlyBe to become one of the largest low-cost operators in Europe, competing successfully with narrow body jet operators in our chosen field of operation – Europe region to region service."

Frontier Airlines President and Chief Executive Officer Jeff Potter said when his airline's order for 10 Q400 aircraft was announced, "Only the Bombardier Q400 has the very low operating costs and operational characteristics that we require to develop new flying from our hub in Denver to points in Colorado and the surrounding states. The aircraft's high cruise speed and excellent passenger comfort complete an extremely attractive package. Judging from the experience of other Q400 operators, our passengers are

going to enjoy flying in this aircraft."

Pinnacle Airlines, which operates a large fleet of Bombardier regional jets, ordered 15 Q400s that will be assigned to its wholly owned subsidiary Colgan Air, Inc. Colgan will operate under the Continental Connection banner primarily from the Continental Airlines hub at Newark, New Jersey.

"The addition of the Q400 brings a competitive advantage to Colgan Air and produces an operating environment which provides Continental's Customers with exceptional comfort and reliability and a low operating cost for Continental Airlines," said Philip H. Trenary, President & CEO of Pinnacle Airlines Corp. "Further, adding this versatile aircraft to the Pinnacle Airlines Corp. fleet allows us to provide our code-share partners with a range of aircraft categories suitable to any market."

An astounding 61 per cent of worldwide Q400 departures are either supplementing or replacing existing jet services. About 21 per cent are new Q400 only service and about 18 per cent offer existing turboprop route replacement or supplement.

The historical differentiation between turboprop and jet segments is fundamentally driven by economics and is characterized by stage length. Following 10 years of complementary turboprop and regional jet routes at five major airlines, 36 and 50-seat Q Series turboprop stage length averages 196 sm while that of the regional jet is 480 sm. However, the average stage length of current Q400 flying is significantly greater than that of conventional turboprops at 300 sm.

It is the 360-knot cruise speed of the Q400, which is allowing operators to assign the aircraft to longer sectors. In Europe, FlyBe operates the Q400 between Birmingham and Belfast City Airport (238 sm), providing the convenience of arriving within minutes of the city centre. SAS offers Q400 service on routes such as Stockholm-Budapest (846 miles). In the U.S., Horizon Air is operating alongside mainline jets on routes such as Seattle-Boise (399 sm) and Seattle-Edmonton (558 sm). Horizon Air Q400 aircraft also compete directly with Southwest Airlines on at least a half a dozen routes.

SAS replaced its Fokker F-28 jets with Q400 turboprops throughout Europe; Horizon has also assigned the Q400 to former F-28 routes. Austrian arrows have replaced Fokker 70 jets on lower yield sectors.

At FlyBe, a 78-seat Q400 replaced a 74-seat BAe 146 jet on the busy Birmingham-Edinburgh route. The Q400 burns about half the fuel as the jet and the flight takes only five minutes longer.

In Canada, Porter Airlines Q400 aircraft are based at Toronto City Centre Airport, just a few minutes from downtown. Porter flies Toronto-Ottawa (195 miles) in 56 minutes. The alternative is to travel to Pearson International Airport in the western suburbs, which can take an hour by road. The block time for a jet between Toronto and Ottawa is an hour. On Toronto-Montreal (312 sm) the block time for a jet and the Q400 is identical at 1:10.

Another advantage the Q400 has over other turboprops and jets is its extreme environmental friendliness, a must in today's climate-conscious world. Community noise levels are well below FAR 36 and ICAO Annex 13 Ch 3 requirements. That's be-

**Length | 107 ft. 9 ins.**  
**Wingspan | 93 ft. 3 ins.**  
**MTOW | 61,700 lbs. to 64,500 lbs.**  
**Range | 1,249 nm**  
**Capacity | 68-78**  
**Standard OWE 37,887 lbs.**  
**Fuel cap | 1,750 USG**  
**No. in service | 200**  
 (1/ 31/07)  
**Backlog | 57**  
**Operators | 21**  
**Average age | 3.5**  
**Years mfg | since 1999**  
**List price | about \$25.0 million US (2007)**

Q400

# The ISTAT members that are purchasers of airline insurance know that these are Good Times!

By Don Kenny



“ Perhaps the more important question is whether or not losses will remain at the current low levels

Airline insurance rates are at unprecedented low levels. Decreasing 2003, 2004 and 2005 rate levels only decreased further in 2006. Year 2007 is looking even better yet, if that's possible. The few airlines that have entered the renewal market so far in 2007 are experiencing premium reductions of 20% +++. On a 100% basis, some speculate that **final 2007 global airline written premiums will not exceed \$1.25 billion**. Remember that underwriters are insuring some airlines with individual policy limits as high as \$2+ billion, so a major catastrophe can swiftly consume the entire global book of Airline Written Premium, two times over.

If this keeps up, maybe the 2008 renewal season will find the underwriters paying a premium to the airlines?! When will these *Good Times* ever end? I think we all know the answer to this question.

It's just a matter of time. While there is seemingly no actuarial basis to what these brave insurance underwriters do, at the end of the day, it's driven by a profit & loss ledger. Rates are heavily impacted by two factors – actual loss levels, and reinsurance costs/availability.

Reinsurance costs are the money spent by insurers to get someone to “reinsure” the risks they agreed to originally “insure”. Today, the reinsurers are granting some rate reductions to their insurer customers, but nowhere near the level of rate reductions the underwriters are granting to their airline customers. It does not seem likely that reinsurance rates will slip much further in 2007, so the direct line underwriters will likely face increased risk retention levels.

Perhaps the more important question is whether or not losses will remain at the current low levels. Some would argue that yes, they will. They would say that the whole science and technology of safely

operating an aircraft has dramatically and permanently taken a very positive shift in the right direction.

Maybe the skies really are safer. Maybe all the advances in technology and increased emphasis on training and better enforcement of rigid maintenance standards have permanently altered the entire safety equation.

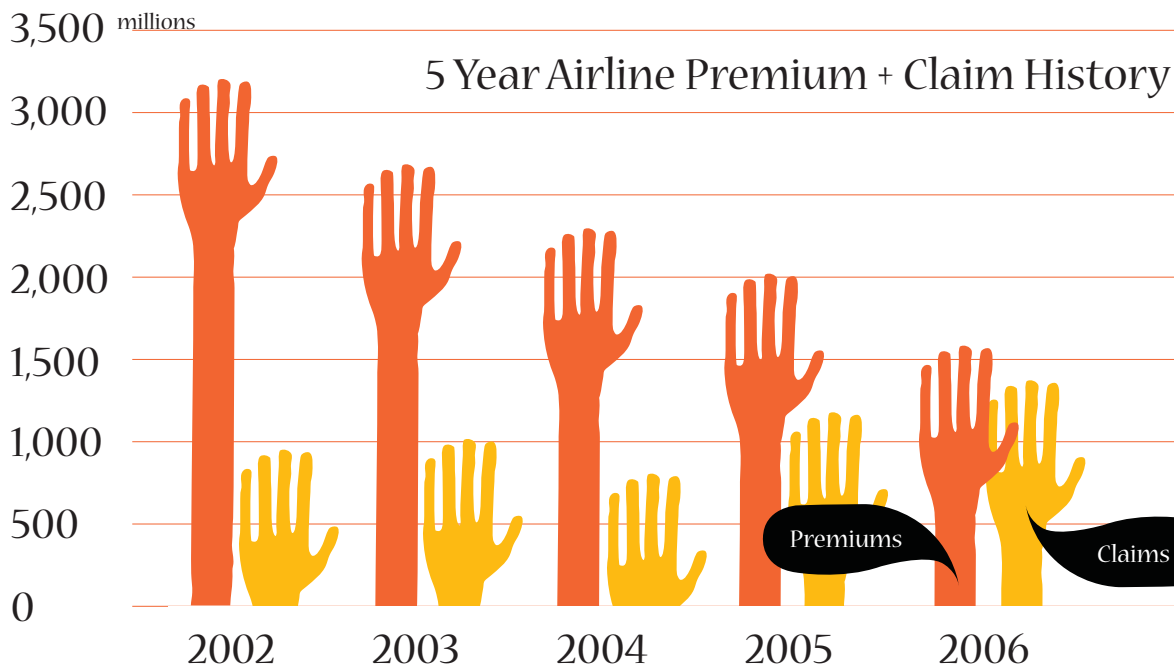
I think they are correct. A recent NTSB document cites that . . . *if a passenger boarded a flight at random, once a day, everyday, it would be approximately 22,000 years before he or she would be killed.* The actual rate of accidents measured by RPKs, # of departures, # of passenger enplanements, etc, has improved, but – the number of flights and the number of passengers carried continues to grow, so while “rates” are down, the actual number of crashes must eventually rise.

And there's the issue of severity. Yes, actual crash survivability rates are also improving, but the potential total claim cost relating to the crash of a fully loaded wide-body aircraft is staggering – and certainly not getting any smaller.

At some point underwriters will be unwilling to drop rates any further.

When this happens, the next normal soft market reaction from underwriters is to either – permit airlines to cancel and rewrite their policies at lower rates prior to the normal policy expiration, or permit airlines to negotiate renewals for periods beyond the traditional 12 month policy period –i.e., “lock in” low rates for a longer period.

So far, we have not seen either of these dramatic actions occur. If or when we see these actions in this vibrant marketplace; you can probably count the days until a market correction occurs.



**So**, be kind to your underwriter as the rates tumble downward and hope he will be kind to you during the ride back up. Today's *Good Times* may soon become the *Good Old Days*.

Don Kenny is Senior Vice President, Falcon Insurance Services

dkenny@falconinsurance.com



As we approach the summer vacation period where business activity tends to wind down the Foundation enters a new phase with the commencement of new terms for some appointed Trustees and Committee members. I am delighted to be able to welcome Jim Morris who has become the Chairman of the Grant Committee and Dana Lockhart of Airbus and Steve Townend of SALE who have agreed to join the Scholarship Committee. I would also like to thank our departing Board colleagues Tom Hiniker and Bill Cumberlidge for their commitment and support over the years. Change always gives the opportunity to review the objectives and strategy of any organization and to build on the foundations that have been laid and the Foundation is no exception.

This year the Internship Program was successful in placing five interns with ISTAT member companies AAR, Automatic, CIT and Northwest Airlines. We would like to thank these member companies for their support of the program and we look to the Intern Committee to continue their effort to grow the Program over the coming years and we appeal to the whole ISTAT membership to consider future requirements and opportunities to provide placements for future intern prospects.

We are fast approaching the time where we will be looking for scholarship nominees and the Scholarship Committee will be commencing that process within the next 30 days. We will be reviewing the criteria for scholarship nominee selection and taking note of some suggestions received from the membership relating to the qualities and capabilities we should be looking for in future scholarship recipients. Whilst we believe that past Scholarship recipients have been more than worthy of the funding that they have received we are beginning to cast our net wider and the addition of Steven Townend and Dana Lockhart to the Scholarship Committee will be of significant assistance in achieving that objective.

I write this column as I approach my first Board Meeting as Chairman of the Foundation and I do not wish to preempt discus-

sions that will take place there. However in preparing for the Board Meeting my thoughts have focused on extending the existing relationships that

we have with industry partners and finding new partners. I believe that the Foundation is uniquely positioned not only to be a supporter of our industry but also a guiding light for the industry as well as a proactive leader within the industry.

I believe that if the Foundation is forward looking and innovative in its approach we will have great success in raising funds and influencing the future of our industry and its participants. At our Board Meeting we will be spending time discussing future programs as well as the Major Gift Programs that will be required to support new initiatives. I hope that in the next issue of *Jetrader* I will be able to share some detailed thoughts and be able to ask for the members' input.





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By Scott Hamilton



**Airbus jetliners have historically been valued less than comparable Boeing products by appraisers and have often rated lower on investor surveys by the trade magazine *Airfinance Journal*. Airbus officials think factors other than technical have contributed to this and they aim to turn this around with a new push to get their message across to the appraisal community.**

photo | Bert van Leeuwen DVB Bank

# Airbus targets >>> appraisers on values

Mark Pearman-Wright, Airbus' Head of leasing and investor marketing, and a director of ISTAT, explained the new approach in an interview with *Jetrader*.

"Airbus has had ISTAT certified appraisers for years now but we haven't been particularly been proactive with appraiser firms," Pearman-Wright acknowledges. "We've run an annual appraiser briefing where we invite them [to Toulouse], but we haven't gone to them. For a number of reasons we haven't felt the need to. In some instances we have seen Airbus aircraft penalized against Boeing and I'd agree with that. But look at the history. We've now delivered 4,000 aircraft; they've delivered 12,000 aircraft. There is a huge amount of historical data appraisers have and they use historical data for the future. They like to do Boeing-to-Boeing, Douglas-to-Douglas and Airbus-to-Airbus but we haven't had that history. We have a star in the A320 but there are aircraft that haven't done well.

"Instead of looking at historical data," Pearman-Wright argues, "it's far more important to look at operator base and sales as indicators of current and future aircraft competitiveness. We have a strong operator base." He notes that the A319 has 1,500 airplanes with 80 operators vs. the 737-700, which has 1,500 with 60 operators. "If I look at the values, we seem to be consistently penalized to the tune of up to \$2 million for new aircraft and \$500,000 for a 20 year aircraft. I don't understand that. They are very similar airplanes. The appraisers will say that's the way the data show. I don't see any particular logic for that."

Fred Klein, president of Aviation Specialists, has a different view. The A320 family has less value, he says, because that's what the market believes and because, "to me, you can



>>> *Instead of looking at historical data, it's far more important to look at operator base and sales as indicators of current and future aircraft competitiveness. We have a strong operator base.*

Mark Pearman-Wright



**As a relatively recent company, there is less transaction data on Airbus aircraft (the first Airbus A300B2 was delivered in 1974)**

**Backlog**

**2006**

**A318/54  
A319/567  
A320/1067  
A321/278  
A330/227  
A340/61  
A380/166**

**737-600/0  
737-700/474  
737-800/984  
737-900/102  
737-200ER/40  
737-200LR/37  
777-300ER/165  
747-400/4  
747-400F/38  
747-81/24  
747-81F/54**

source Airbus

describe it in two words: supply discipline. Airbus keeps the [production] tap open wider than Boeing and cuts prices to move airplanes. In my opinion, cutting on new prices hurts long-term values."

Klein's values for the A319 and A320 trail the 737-700 and 737-800, as do those from Avitas. But the latter's Douglas Kelly, vice president for asset valuation, has a different theory for why.

The 737-800, in typical two-class configuration, carries 162 passengers in the Avitas assumptions vs. 150 for the A320.

"The 737-800 is a bigger airplane than the A320 so you would expect a higher price," Kelly says. "I would [also] expect possibly a little lower pricing on the A320 because Airbus was pricing for market share. Now that they have 50% (for narrow-bodies), you wouldn't expect much differential."

Klein disagrees. Airbus discounting on the A320 not only has been a past practice, he believes that with Airbus boosting production to as many as 40 A320 family members a month to get the cash flow needed to carry the company through the A380 tribulations means that steep discounting will continue. This will depress current market and future values, Klein believes.

Kelly's other theory about higher 737 values has to do with engine selections. The 737 is a sole-source, CFM56 offering. The A319 and A320 offer the IAE V2500 and the CFM56. The engine competition enables price discounting not available with a sole-source, Kelly believes. Furthermore, the Boeing has the advantage to lessors who have a wider operator base with one

engine type than with two.

Thus, Kelly believes price differentials between the 737 family and the A320 family have good, solid reasons behind them and not because of any particular bias against Airbus products.

## >>The wide-body market is another matter

Avitas consistently values the A330-200 at a higher price than the competing Boeing 767-300ER. Aviation Specialists gives the 767 a slight value advantage, even though, Klein notes, the 767 is much older technology. This is because Airbus is offering the A330 at steep discounts that undermine values, Klein says.

Indeed, there have been several reports in the media, some quoting airline officials themselves, about Airbus offering the A330 for \$90 million and as low as \$70 million. One appraiser told Jetrader he has heard of pricing in the \$60 million range and even below. (Jetrader could not independently confirm this.)

There is widespread speculation that Airbus has also "given" the A330 away to A380 customers affected by the two-year delay of this airplane as part of the compensation for the delays.

Pearman-Wright acknowledges there has been use of the A330 for bridge-lift.

"Yes, it's clear there has been some use of the A330 to provide capacity not filled by early A380 deliveries," he says. "The more important driver for residual value and the A330-300 is that this is the best aircraft in the market." The A330-300 seats 336 to 400 in high density layout with a range of 5,500 miles, making it a good trans-Atlantic and intra-Asian airplane, he says. Finnair selected the A330-300 for this reason, Pearman-Wright says. The 777-200ER has a 7,000 mile range, which Pearman-Wright says is head-to-head with A340. "If a 7,000 nautical mile range is not vital to your operation, the A330-300 has by far the best economics," he says.

## >>Pearman-Wright says the A330 has a solid future

"The fact is that Aercap has just signed up for 20 A330-200s and not the competition, CIT has acquired A330s and other deals all should point to the investor market as to their belief for a strong valuation for the A330," he says. "Perhaps Airbus has done a better job with the leasing companies as to what the investment strategy is."

There continues to be a market view that the A350 XWB will obsolete the A330. Pearman-Wright and others at Airbus don't think so.

"The A330 does not compete with the A350. The A330 is a 5,000-6,000 mile aircraft. The 350 is an 8,000 mile aircraft. They are complementary. This continues to be our sales strategy with the A330 and clearly it is the aircraft of choice in that market. The 777 has been selling in the -300ER version but the -200ER backlog has shrunk. The A330 will continue alongside the A350," Pearman-Wright says.

"The early incarnations of the A350 were based on the A330, but as we stepped away and made the A350 bigger and more capable, the role of the A330 is more clearly defined," he says. But he acknowledged that this message hasn't gotten out well.

As for the A340, Avitas' Kelly notes that the market has clearly made its preference clear for the 777 with two engines vs. the A340, with four engines.

A Boeing official told Jetrader that working against A340-300 residual values is the lack of a cargo program that would support the values. (This official actually thinks the A340-300 is a pretty decent airplane, but he has no use for the A340-500/600, which he says are highly fuel inefficient.) No A340 P-to-F program is contemplated for at least a couple of years, Airbus says. Still, "Federal Express loves the idea of a 340-300 freighter: 65 tons over 5,000-5,500 miles," says Pearman-Wright.

## >>And that's the way it is

Not surprisingly, Boeing has an entirely different view on the valuations of the 737s and A320s. Officials believe that their airplane is simply better on all matrixes, and that's just the way it is.

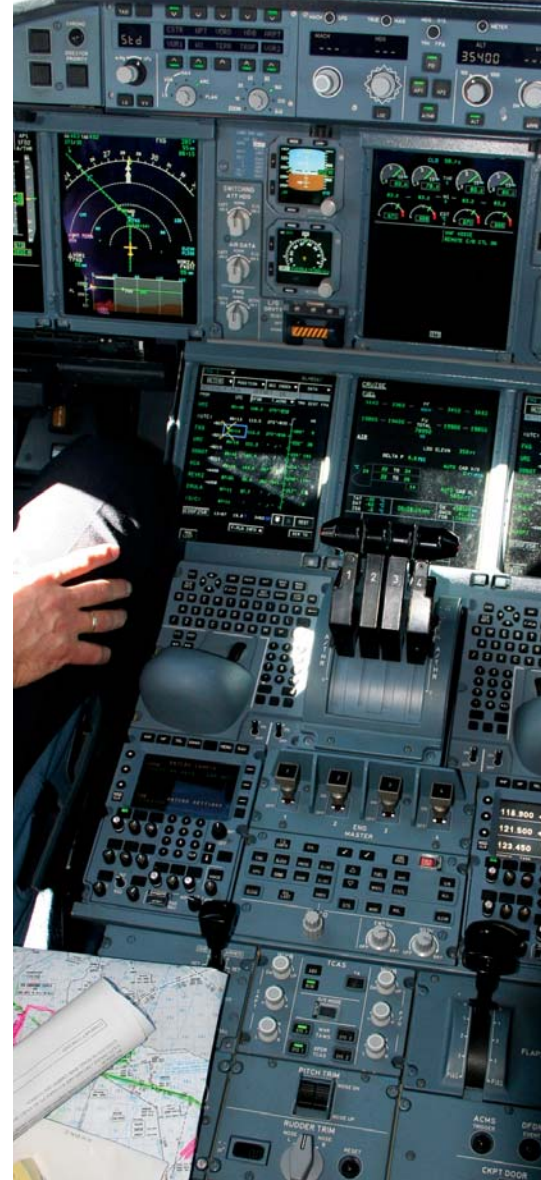
For one thing, Boeing has been far more aggressive than Airbus is making the case for its airplanes with appraisers and for the past several years the financial community. This effort has probably had a bearing (although not the only one) on the conclusions by both groups.

The results to some degree are reflected in the *Airfinance Journal* polls that consistently rate the 737 as a top investment, though not always higher than the A320 depending on the segment. Overall, though, the 737s ranked higher with all groups in recent surveys and has for several consecutive years.

Boeing has long held seminars for appraisers to talk about its airplanes. In recent years, the company has reached out to the financial community.

Joseph Ozimek, managing director of asset management for Boeing Capital, explained that the shift in Boeing's approach as a recognition that airline credits were no longer the criteria relied upon as the principal factor in financing airplanes. The asset value now rates as the most important factor, he says. This became even more evident following 9/11 and the string of airline bankruptcies in the US and elsewhere.

No effort probably was more fruitful than the one in advance of what is now called the 787. When the airplane was still a concept, Boeing began talking with appraisers and financiers. The virtues of the composite fuselage were explained to both. The financiers, in particular, promoted the idea of inter-changeable engines, making the remarketing of the airplanes easier for them. The result: when the plastic airplane concept became reality in the form of



>>> We will be giving appraisers more guidance and they will be doing NPV on lease rates, north of \$2 million a month. We have yet to properly brief appraisers on the value the airlines see in this aircraft. There has been a crisis of confidence in the A380.

Mark Pearman-Wright





the 7E7 and later the 787, market enthusiasm was overwhelming. Airbus, which after years of being No. 1, had become complacent and clearly didn't have its finger on the pulse of any segment of the industry: airlines, appraisers or financiers.

## >>Boeing had a brilliant strategy

"We recognized in the 1990s and became manifest in 2001 that you can't finance on credit," Ozimek told *Jetrader*. "You have to do it on the asset. We realized that if you're going to finance on the asset, you needed to tell them about it. You need to tell the banks and you need to tell the appraisers.

"It began in the 1990s but it really ramped up in 2001," Ozimek says. If the presentations are anything like *Jetrader* received

from Ozimek, these get into highly technical aspects like drag coefficients—things that on the surface seem to be a little beyond what might be expected when talking about values. But it's all part of the package Boeing has honed to get the message across to support its view that Boeing airplanes are better values, both near- and long-term, than Airbus airplanes.

These technical details are beyond the scope of this article, but what is not goes straight to the heart of what Aviation Specialists' Klein said, and that is pricing out the door.

"Escalations plus concessions ought to determine where the value of the airplane is for a given year," Ozimek says. "The market value of an airplane is set by the lowest deal and this depends on concessions."

Appraisers don't know what the real selling price of an airplane is and never will, Ozimek says, because concessions on other things associated with a sale aren't known to them. Aircraft trade-ins, training, support, spare parts and so on all affect the price.

"The only [outsider] who knows the selling price is the ExIm Bank because by law

they have to know," Ozimek says, including concessions.

While ExIm won't reveal pricing, it does announce the amount of financing that is guaranteed and this often gives a fairly accurate indication of the cost of an aircraft by multiplying up from the prevailing loan-to-value guarantee granted by the export agency.

"The manufacturer sells to an airline and the airline goes to the bank for financing," Ozimek explains. "The bank needs to get an appraisal and a bank in many instances shares a selling price. So appraisers form value opinions. It's the big mega-deals that set the prices but banks and appraisers don't know concessions tied to the 737 or 777 (for example.)"

Indeed, when FedEx bought 777 freighters in place of the canceled A380 order, market sources say FedEx paid list price for the 777s but got one heck of a deal on its commitment to convert 90 757s from P-to-F by Boeing and its joint venture partner and favorable pricing on used MD-11s from Boeing. But nobody outside of FedEx and Boeing know the details, assuming nobody on the inside talked. Both companies are notoriously tight-lipped about such things.

Appraisers have for years complained that aircraft pricing information on Form 41 of the US Department of Transportation has been withheld from the public versions. This data would be important in forming valuation opinions, the appraisers say. Ozimek is dismissive.

"You have to file Form 41; it doesn't have to be accurate," he says. (Which begs the question why the industry, including Boeing, fought so hard to redact the information when challenged, but that's a topic for another time.) "The standard [of reporting] for one airline is not the standard for another."

Supply discipline, to use Fred Klein's term, is another factor Ozimek points to. Boeing has the ability to reduce its workforce at will when market conditions warrant. Airbus, as we can now see in the Power8 restructuring, finds it more problematic to do so. Accordingly, Boeing cuts production while Airbus maintains production and—so the theory goes—has to cut prices to move the airplanes.

"If a customer can't take the airplane, concessions may be granted to induce the airline to take the plane," he says.

While Boeing lists all kinds of technical reasons, from drag coefficients to single-source engines to seat-mile costs, Ozimek is candid that valuation is less precise.

"I'm not sure there is an engineering answer to values, but there is a marketing reason," he says, "and the appraisers know it. They will never know the real number," but they know the trends.

## >>Appraising the A380

While the debate of the values of the A320 family vs. the 737 family seems a bit more clear now, given some of the technical differences as described by Avitas' Kelly—some points of which are even echoed by Boeing—values of Airbus wide-bodies, except perhaps for the A330, have consistently trailed Boeing twin-aisle airplanes.

"Right or wrong, the market perception is that Airbus wide-bodies don't hold values like Boeing wide-bodies," says Aviation Specialists' Klein. "What the market thinks is correct."

If current and past Airbus airplanes have presented challenges for appraisers, the coming A380 presents a super-jumbo problem.

"The appraisers have absolutely no idea how to value the A380," Airbus' Pearman-Wright says. "There have been no post-launch transactions. They have no idea. There has been a feeding frenzy of speculation over launch customer pricing and compensation."

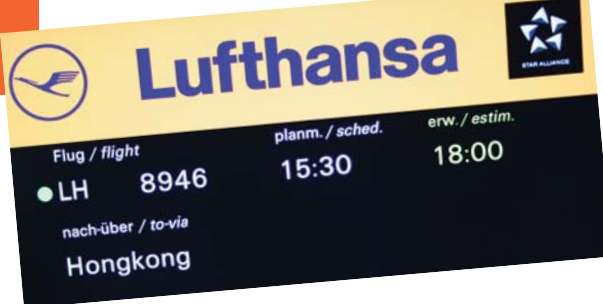
Pearman-Wright says reports of \$80 million in compensation for A380 delays were "stupid."

"We will be giving appraisers more guidance and they will be doing NPV on lease rates, north of \$2 million a month. We have yet to properly brief appraisers on the value the airlines see in this aircraft. There has been a crisis of confidence in the A380," which is now behind Airbus, Pearman-Wright says, pointing to reorders by Singapore and Qantas and solutions Airbus has in place for the industrial issues.

Pearman-Wright says Airbus is changing its approach to the marketplace.

"I don't think Airbus has courted the investors and financiers they way we have courted the airlines," the Airbus official says. "That's part of what my group is tasked to do."

*Scott Hamilton is president of Leeham Co. LLC. He may be reached via [www.leeham.net](http://www.leeham.net).*



First impression when entering the A380 didn't differ too much from entering the main-deck of a 747, although 007 featured a very pleasant interior in fashionable light colors. Contrary to the mock-ups in Toulouse, this aircraft did not feature any tax-free boutiques ("sorry darling, no Gucci handbag"), no waterfalls, no wine-tasting area and no showers. There were however a few stand-up bar areas, which would prove very popular once boozing altitude was reached.

At ten abreast in Economy (3-4-3) there was decent personal space for all of us "in the back of the bus" and the personally perceived comfort level seemed superior to most other economy flights experienced before. Rumor has it, an eleven abreast configuration (3-5-3 ?) is considered as well, but especially the middle "double-excuse-me" seat seems unlikely to score high on the "love-my-seat" website. Most window-seats on LH8946 were reserved for LH guests and employees, but all seats featured a personal video screen, offering video-on-demand, games and several info-channels about the A380, plus life pictures from the flight. To compensate the majority of passengers not so fortunate to sit next to any of the (standard sized) windows. Airbus had equipped 007 with something that turned out to be one of the most popular features during the flights, namely a tail-mounted video camera. Although also equipped with a downward looking as well as a forward looking belly-mounted camera, the pictures transmitted by the tail mounted unit offered the best show in town. From its high position, this life channel offered an almost video-game like picture of the A380's forward fuselage and wings as well as the surrounding landscape. Already during taxiing and take-off the pictures were impressive, but most spectacular were some air-to-air shots of a Lufthansa 747. For considerable time, 007 followed one of LH's "football nose" Jumbo's, its contrail clearly visible on the video screen. Whether the A380 went on afterburner or the 747 pilot deliberately slowed down to have a look at his future office-in-the-sky remains unclear, shortly before landing 007 overtook the 747 and this offered a very nice view – and a photo opportunity – of the 747 in mid air, for those seated in the right-hand side of the plane.

Guided tours offered during the flight were popular, albeit the stand-up bar areas were causing some delays as they had a strange attraction to many of the passengers. 007 had its first class section in the forward main-deck area and its business class section on the upper deck. Unless very well hidden, both premium sections did not feature any spectacular private cabins, jacuzzi's or private massage parlors as expected in some of the VVIP or up-market airline configurations. Whereas the impression of the A380's maindeck is not too dissimilar to the 747, the upper-deck is completely different. Personal impression of the A380's upper deck is more that of the main-deck of a "normal" modern wide-body. Especially carry-on storage space seems clearly more generous compared to the current 747's upper deck, although this is likely to be improved in the coming 747-8 as well.

Another difference with the 747 is the option to take the forward stairway up to the upper deck and go down via the rear stairwell (ideal for in-flight jogging). Airbus had equipped 007's main cabin with two different luggage-bin set-ups. Esthetically the most pleasing and creating the impression of a much roomier cabin were the contoured bins integrated in the cabin ceiling. In this prototype, Airbus had equipped the bins with servo's to assist passengers in lifting the bins (potentially containing several heavy roll-aboards) into their locked positions. These servo's were so effective, it actually required more physical strength to pull the heavy bins down than to push them up. Another section of the plane was equipped with more conventional hanging bins, also offering plenty of space but not really contributing to a "space-age" interior look.

Although continuously monitored by Airbus' cabin specialists, it seemed the cabin atmosphere was already perfectly under con-

trol. During both flights cabin lighting and temperature were excellent. The big differentiator here was the lack of air-frame and engine noise. It must be said, the inte-

rior noise in the A380 is at very, very

low levels. Even during take-off the engines were barely noticeable. Although some aviation nuts may enjoy the sound of two GE90's powering a 777 down the runway, most likely the vast majority of air travelers will prefer the silence of the A380's Alliance or RR engines. Oddly enough, because of this low noise level, sounds from retracting slats, flaps, landing gears etc. were more noticeable and later, some newspapers even had articles about passengers complaining about the snoring of their fellow passengers. Always hard to please everybody.

In-flight catering – courtesy of Lufthansa – was excellent and once more demonstrated that it is very well possible to create a tasteful in-flight meal, even servicing about 500 passengers, this in sharp contrast to what some –not to be mentioned- North American carriers seem to believe (and demonstrate).

After a night-long flight Hong Kong came in sight, and because of the late departure from Frankfurt, time in Hong Kong would be even more limited than originally planned. All passengers were eager to go to their hotels, freshen up and hit the street for some serious shopping or just some sight seeing. Again, contrary to expectation, disembarking the A380 was quick and easy and even in a "live" airport environment, immigration and customs could easily deal with the A380's passenger flow. Airbus had kindly arranged ground transportation to the hotel for its group of guests and after a short bus-ride a separate group check-in area was offered in another attempt to maximize usable time in Hong Kong.

Wake-up call the next morning was at 4.30 AM, and as such, a bit on the early side for a Sunday-morning with 5.30 AM departure to the airport. The group invited by Airbus was a nice mix of suppliers, financiers, lessors, regulatory and political authorities but it was maybe still a bit early for real lively conversation aboard the transfer bus. For some of our Scottish friends it can be doubted if they had seen the inside of their hotel room at all. Arriving at the airport at such an unholy hour had the benefit of a quick check-in and no delays at security, but the disadvantage that most – if not all – tax free shops were still closed. As in Frankfurt, the gate area was turned into a (breakfast)-party area offering a fantastic view of the A380 being prepared for its return flight and a good photo-opportunity (including for many of the ramp workers) posing with the A380 as background.

After a nice healthy airport breakfast, the party atmosphere returned and once more boarding was quick and effortless. The tail-cam still did its job and taxiing, take-off and return flight were smooth, comfortable and quiet with some extra entertainment offered by .... stress-testing the Panasonic in-flight entertainment systems. With no noticeable video malfunctions the flight went by quickly and welcomed by a crowd of German airplane spotters, LH8947 smoothly landed late Sunday afternoon in sunny Frankfurt. Taking a special "Lancel for Airbus A380" amenity kit as well as well as a "First A380 Lufthansa Passenger Certificate", it was time so say goodbye and thank the cabin staff for their excellent and enthusiastic service. With kind cooperation of the local Lufthansa ground staff, an early connection to Amsterdam was an unexpected bonus, preventing a long wait at Frankfurt airport. Another hour Amsterdam was in sight again bringing this truly unique weekend trip to an end. With thanks to Airbus for this unique opportunity, the conclusion for the route proving flight with 007 can only be "Mission Accomplished".

*The above represents a purely personal and independent impression of the A380 route proving flight from Frankfurt to Hong Kong and back and does not represent any official position of DVB Bank whatsoever. Neither Airbus, nor Lufthansa nor any other party were involved in the contents of this article. BVL*



## Boeing 777-200ER Appraisal . Steve Rehmann . Morten Beyer & Agnew.

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### 777-200ER Fleet Statistics

|                                |             |
|--------------------------------|-------------|
| Ordered                        | 497         |
| Cancelled                      | 67          |
| Delivered                      | 392         |
| Backlog                        | 38          |
| Destroyed/Retired              | 0           |
| Active Aircraft                | 392         |
| No. of Operators               | 35          |
| No. of Leased Aircraft         | 100         |
| No. of Owned Aircraft          | 292         |
| Daily Utilization (Hours)      | 11.2        |
| Average Fleet Age (Years)      | 6.2         |
| Maximum Taxi Weight (lbs)      | 658,000     |
| Maximum Takeoff Weight (lbs)   | 656,000     |
| Maximum Landing Weight (lbs)   | 470,000     |
| Maximum Zero Fuel Weight (lbs) | 440,000     |
| Fuel Capacity (U.S. gallons)   | 45,220      |
| Max Design Range (nm)          | 7,700       |
| Configuration: 3-class         | 301 pax     |
| Wing Span                      | 199ft 11 in |
| Length                         | 209ft 1 in  |
|                                |             |
| Engine Type                    | % of Fleet  |
| Trent 800                      | 41%         |
| GE90                           | 40%         |
| PW4000                         | 19%         |

**Background ::** The very large, twin-engine 777-200ER is the extended range version of the 777-200A. The 777-200ER entered service in 1997, with its first delivery going to British Airways in February of that year. It is powered by all three engine types: Rolls-Royce Trent 800 Series, General Electric GE90, and the Pratt & Whitney PW4000 Series. The new technology and operating economics of the 777 have made it one of the most popular widebody aircraft of all times.

**Current and Future Market Outlook ::** In the late 1990s the 777-200ER became the replacement for many of the older 747-200s, DC10s and in some cases the MD-11. With its enhanced range performance and easement of ETOPS restrictions, the 777-200ER not only currently dominates the Trans-Atlantic markets, but also is becoming increasingly more popular on the Trans-Pacific routes, over other twinengine widebody aircraft on frequency and available seat miles. As fuel costs continue to be a major factor, the twin-engine 777, is outpacing its four-engine rivals in the A340 family nearly 2:1 in orders.

The current order backlog for the Boeing 777-200ER currently stands at 38, and is shrinking. The market strength of the 777-200ER remains modest. However, operators looking to serve longer routes, or build-up capacity, might easily opt for the longer range 777-200LR as a suitable addition or replacement type, or possibly upgrade to a the larger 777-300ER. This was seen recently when Delta Air Lines paved the way for the –200LR becoming the first US airline to order this type building upon its already substantial –200ER fleet of aircraft.

In the not too distant future the Airbus A350XWB aims to compete directly with both the 777 and 787 families offering similar selection of passenger capacities and range capabilities. The expected entry into service of the A350XWB is currently 2012 and Boeing is unlikely to launch the 787-10 until there is a competitor. At that stage the oldest 777-200ER will be approaching 16 years of service and nearing replacement. In order to address the older 777s (15+ years of age) coming out of service from first tier carriers it is likely a conversion program will be announced within the next few years as the 777 as a freighter has garnered a significant amount of attention recently with the recent launch of the 777-200LRF variant. Programs such as these will only help stabilize residual values.



### Boeing 777-200ER :: Trent 800

|                      | 1997  | 1998  | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007    | 2008    | 2009    |
|----------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|
| current market price |       |       |        |        |        |        |        |        |        |        |         |         |         |
| 2007                 | 75.08 | 78.74 | 82.5 7 | 8 6.59 | 90.7 9 | 9 5.18 | 99.88  | 104.87 | 110.41 | 117.11 | 126.7 0 |         |         |
| base value           |       |       |        |        |        |        |        |        |        |        |         |         |         |
| 2007                 | 71.50 | 75.71 | 80.1 7 | 8 4.89 | 89.8 9 | 9 5.18 | 100.78 | 106.72 | 113.00 | 119.66 | 126.7 0 |         |         |
| 2008                 | 68.06 | 72.23 | 76.6 7 | 8 1.38 | 86.3 8 | 9 1.68 | 97.31  | 103.29 | 109.63 | 116.37 | 123.5 1 | 1 29.23 |         |
| 2009                 | 64.62 | 68.75 | 73.1 5 | 7 7.83 | 82.8 1 | 8 8.10 | 93.74  | 99.73  | 106.11 | 112.90 | 120.1 2 | 1 25.98 | 131.8 2 |
| 2010                 | 61.21 | 65.29 | 69.6 3 | 7 4.26 | 79.2 0 | 8 4.46 | 90.08  | 96.07  | 102.46 | 109.27 | 116.5 4 | 1 22.52 | 128.5 0 |
| 2011                 | 57.85 | 61.84 | 66.1 1 | 7 0.68 | 75.5 6 | 8 0.78 | 86.36  | 92.32  | 98.70  | 105.51 | 112.8 0 | 1 18.87 | 124.9 7 |
| 2012                 | 54.54 | 58.44 | 62.6 3 | 6 7.11 | 71.9 2 | 7 7.07 | 82.59  | 88.50  | 94.84  | 101.63 | 108.9 1 | 1 15.05 | 121.2 5 |
| 2013                 | 51.29 | 55.10 | 59.1 8 | 6 3.58 | 68.2 9 | 7 3.36 | 78.80  | 84.64  | 90.92  | 97.67  | 104.9 1 | 1 11.09 | 117.3 5 |
| 2014                 | 48.13 | 51.82 | 55.8 0 | 6 0.08 | 64.6 9 | 6 9.66 | 75.00  | 80.76  | 86.96  | 93.63  | 100.8 2 | 1 07.01 | 113.3 1 |
| 2015                 | 45.05 | 48.62 | 52.4 8 | 5 6.64 | 61.1 3 | 6 5.98 | 71.22  | 76.87  | 82.97  | 89.5 5 | 9 6.65  | 102.83  | 109.1 5 |
| 2016                 | 42.06 | 45.51 | 49.2 4 | 5 3.27 | 57.6 3 | 6 2.36 | 67.46  | 72.99  | 78.97  | 85.4 4 | 9 2.43  | 98.58   | 104.8 9 |
| 2017                 | 39.19 | 42.50 | 46.0 9 | 4 9.98 | 54.2 1 | 5 8.79 | 63.75  | 69.14  | 74.98  | 81.3 2 | 8 8.19  | 94.28   | 100.5 6 |

*The aircraft values stated herein are work product of independent third parties sources, and ISTAT neither approves or indorses the information contained herein or the use thereof for any purpose whatsoever.*

## Boeing 767-200ER Appraisal . Clive Medland, Senior Vice President, SH&E, Inc . tele +1 212 656 9231 – email cgmedland@sh-e.com

**Background ::** The Boeing 767-200 was launched in 1982 in response to the development of the ETOPS regulatory environment in the early 1980s that permitted long range, twin-engine operations over water and remote land areas. The 767-200ER, with a service entry in 1984, is an extended range version and with additional fuel capacity and increased maximum take-off weights up to 395,000 lbs with range capability up to 6,545 nautical miles with 224 passengers. The 767-200ER fleet is powered by four engine types manufactured by General Electric and Pratt & Whitney. Production of commercial variants ceased in 1993 but recommenced in 2000 with a single order from Continental. These aircraft are significantly improved as compared to the earlier production aircraft with advanced avionics, engines, brakes, interiors and other systems.

### Basic specs ::

Wing Span – 159 ft 1 in

Length – 159 ft 2 in

Maximum Takeoff Weight – 335,000 to 395,000 lbs

Maximum Landing Weight – 278,000 to 300,000 lbs.

Maximum Zero Fuel Weight – 253,000 to 260,000 lbs.

Operating Weight Empty – 181,130 to 181,610 lbs.

Fuel Capacity – 24,180 U.S. Gallons

Range with 224 Passengers – 6,545 nm

Passenger Configuration – 181 Seats – 3-class

224 Seats – 2-class

Up to 255 Seats – 1-class

Average Fleet Age – 16.3 years

### As of March 2007: Current Fleet + Backlog by Region

| Region        | Number of Operators | Total Fleet | %     | Orders | Stored |
|---------------|---------------------|-------------|-------|--------|--------|
| Africa        | 7                   | 10          | 9.8%  | -      | -      |
| Asia          | -                   | -           | -     | -      | -      |
| Europe        | 9                   | 22          | 21.6% | -      | 5      |
| Middle East   | 3                   | 4           | 3.9%  | -      | -      |
| North America | 8                   | 45          | 44.1% | -      | 7      |
| Pacific Rim   | 4                   | 13          | 12.8% | -      | 2      |
| South America | 2                   | 8           | 7.8%  | -      | 1      |
| Undisclosed   | -                   | -           | -     | 2      | -      |
| Total         | 33                  | 102         | 100%  | 2      | 15     |

### Current Fleet + Backlog by Engine

| Engine       | Total Fleet | %     | Orders | Stored |
|--------------|-------------|-------|--------|--------|
| GE CF6-80A   | 28          | 27.4% | -      | 7      |
| GE CF6-80C2  | 45          | 44.1% | -      | 5      |
| P&W JT9D-7R4 | 14          | 13.7% | -      | 3      |
| P&W PW4000   | 15          | 14.7% | -      | -      |
| Undecided    | -           | -     | 2      | -      |
| Total        | 102         | 100%  | 2      | 15     |

**Current and Future Market Outlook:** Current and Future Market Outlook: Although the 767-200ER, has no direct replacement, the type was steadily marginalized over the years. In recent times, however, demand for the type has improved significantly given a lack of availability of other longhaul aircraft coupled with strong demand for converted 767-200 freighters. The type has also found favor with all-business class long-haul carriers. Improved values and lease rates are likely to be sustained in the medium term, particularly for the very capable, late build, GE-powered aircraft. The potential new-build production of 767-200LRF freighter and the derivative KC-767 tanker aircraft offer a possibility that the production line may experience a new lease of life. Only two aircraft are reported as currently available for sale or lease.

### Boeing 767-200ER SH&E Half-life Values (US\$ millions):

| Year | BV    | CMV   | Residual Values |       |       |       |       |       |       |       |       |       |
|------|-------|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | 2007  | 2007  | 2008            | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  |
| 2003 | 36.70 | 36.70 | 34.30           | 32.02 | 29.84 | 27.77 | 25.80 | 23.92 | 22.13 | 20.42 | 18.79 | 17.23 |
| 2002 | 34.40 | 34.97 | 32.53           | 30.76 | 29.08 | 27.49 | 25.99 | 24.56 | 23.21 | 21.93 | 20.72 | 19.57 |
| 2001 | 32.38 | 33.45 | 30.61           | 28.95 | 27.36 | 25.87 | 24.45 | 23.10 | 21.83 | 20.62 | 19.48 | 18.40 |
| 2000 | 30.60 | 32.13 | 28.93           | 27.35 | 25.86 | 24.44 | 23.09 | 21.82 | 20.61 | 19.47 | 18.39 | 17.36 |
| 1993 | 17.00 | 17.00 | 16.06           | 15.16 | 14.32 | 13.51 | 12.75 | 12.03 | 11.35 | 10.70 | 10.08 | 9.50  |
| 1992 | 15.66 | 15.75 | 14.79           | 13.96 | 13.18 | 12.44 | 11.73 | 11.06 | 10.43 | 9.83  | 9.26  | 8.72  |
| 1991 | 14.39 | 14.55 | 13.58           | 12.82 | 12.10 | 11.42 | 10.77 | 10.15 | 9.57  | 9.01  | 8.49  | 7.99  |
| 1990 | 13.18 | 13.40 | 12.44           | 11.74 | 11.08 | 10.45 | 9.85  | 9.28  | 8.75  | 8.23  | 7.75  | 7.29  |
| 1989 | 12.04 | 12.31 | 11.36           | 10.72 | 10.11 | 9.53  | 8.98  | 8.46  | 7.97  | 7.50  | 7.05  | 6.63  |
| 1988 | 10.96 | 11.26 | 10.34           | 9.75  | 9.19  | 8.66  | 8.16  | 7.68  | 7.23  | 6.80  | 6.40  | 6.01  |
| 1987 | 9.93  | 10.26 | 9.36            | 8.83  | 8.32  | 7.84  | 7.38  | 6.95  | 6.53  | 6.14  | 5.77  | 5.42  |
| 1986 | 8.95  | 9.30  | 8.44            | 7.95  | 7.49  | 7.06  | 6.64  | 6.25  | 5.87  | 5.52  | 5.18  | 4.86  |
| 1985 | 8.03  | 8.38  | 7.57            | 7.13  | 6.71  | 6.32  | 5.94  | 5.59  | 5.25  | 4.93  | 4.62  | 4.33  |
| 1984 | 7.15  | 7.51  | 6.74            | 6.34  | 5.97  | 5.62  | 5.28  | 4.96  | 4.66  | 4.37  | 4.10  | 3.84  |

CMV = Current Market Value. BV = Base Value. Half Life future values assume a 2.5% annual rate of inflation.

'Half-life' – strictly refers to a component or assembly that has operated half of its prescribed life but is frequently used

synonymously with the term 'half-time' that itself refers to an aircraft, engine or component that is precisely halfway between its scheduled or expected overhauls.

*The aircraft values stated herein are work product of independent third parties sources, and ISTAT neither approves or indorses the information contained herein or the use thereof for any purpose whatsoever.*



Education model instills real-world readiness into graduates

# The quantitative benefits of the engagement education

By Denver Lopp and David Stanley, Purdue University Department of Aviation Technology

The popularity and success of this program has provided the foundation for establishing a solid research and engagement strategic plan for Purdue's Aviation Technology Department. With direct research being explored in actual working environments and networking relationships being formed and reinforced, a natural path has been established for increasing the department's research platform. The accessibility of the educational program in industry allowed "in-kind" allocations to be sponsored and encouraged by the partnership arrangements. This translated into several Purdue aviation initiatives gaining accessibility and receiving grants. Some of the aviation projects that have benefited from these grants include studies of human factors, safety measurement and productivity gains in aviation hub operations, airport noise abatement issues, and airport security.

This expansion into funded research has permitted true partnerships to be organized with industry, governmental agencies, and Purdue's Aviation Department that have brought academic theories into practical application in the workplace. Much of the strength of the program can be attributed to allowing students to openly discuss problems under the supervision of faculty, thereby helping to create a solid foundation of research and engagement within the department.

When examining the impact that industry partnerships have had on students as they graduate from the university to enter the workforce, the effects have been significant. Our graduates have extremely high placement rates, students find jobs quickly once they leave Purdue and the jobs that they have been offered generally pay \$5,000 to \$10,000 more a year than would be the case if they had no real-world industry experience. Participants also tend to secure positions that have a high rate of advancement.

One of the finest examples of this kind of success is Keri Wiznerowicz, who received a bachelor's degree from Purdue's Aviation Technology Department in 2004 and a master's degree from the department in 2006. While still a graduate student, Wiznerowicz was recruited for a position at Memphis, Tenn.-based Universal Asset Management. Steve Manley, the CEO and founder of the company, was visiting the Purdue campus in October 2005 to attend a donor luncheon. When he mentioned that they were searching for someone to fill a position, several Purdue faculty members recommended Wiznerowicz because of her leadership roles and industry experience while a student. She started her position as a project director with the company on Jan. 1, 2006, and at age 23, was promoted to vice

president on Oct. 1 of that year.

Wiznerowicz, who was recently placed in charge of the management of two Boeing 777s — the largest acquisition in the history of Universal Asset Management — said she is certain that the skills and experience gained while working within the industry were key factors in her achieving success. "It's amazing what has happened to my career in such a short time," she said. "My career was jet-propelled. It's been a dream come true."

Perhaps the only person who can attest more to the benefits of university-industry partnerships is Steve Manley. "What we're looking for in our industry is the cream of the crop, the stars," he said. "Keri certainly fits that description and has been a major asset to our company. Manley said he sees great benefit in hiring recent college graduates and developing partnerships with universities.

"Young adults at the university level who have both the textbook knowledge and the industry experience are a wonderful asset to a company," he said. "They already have the basic skills, and then we have the chance to mold them to become effective members of the industry. The industry is always looking for those who are driven, goal-oriented and who are not afraid to think out of the box to solve problems. A university is a great place to find them."

## A direction for the future

Purdue's model has resulted in greater success for both students and industry, and the university has increased its visibility with several major corporate leaders. Last year, FedEx donated a cargo airplane used by students as a training lab and as an outreach tool for area schools. Also in 2006, Pratt & Whitney donated a PW4098 engine — the engine used to power the Boeing 777 — to the university. Purdue's Department of Aviation Technology, which has a long and proud history of more than 50 years of quality aviation education and research, offers a wide variety of disciplines, including programs in professional flight, aviation management, and aeronautical technology, as well as a research-class airport, several research laboratories and full-flight simulators, and a variety of aircraft used for teaching purposes.

Utilizing university students can inject energy and new ideas into your business. Ask yourselves: What problems would you like to solve? Have you considered the idea of a business partnership with a university? As those companies who have worked with us can attest, whatever your goals and aspirations, the world-class students and resources of Purdue can help you achieve, or better yet exceed, them.



## What can Purdue do for you?

**Aviation Technology at Purdue University can:**

- Conduct research to enhance efficiency and safety
- Assess problems and suggest solutions
- Partner with industry to create practical education for future employees



Find out how Purdue University's Department of Aviation Technology can help you.  
(765) 494-5782  
atinfo@purdue.edu  
[www.purdue.edu/tech/at](http://www.purdue.edu/tech/at)

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## Siggi Kristinnsson joins Volito Aviation as President and CEO

Sigurdur "Siggi" Kristinnsson, will join Volito Aviation AB as President and CEO no later than July 20, 2007. Siggi worked for 17 years at PK AirFinance, an affiliate of GE Commercial Aviation Services, holding posi-

tions of increasing responsibility within PK AirFinance, most recently as Senior Vice President of Marketing. Siggi holds a B.S. Degree in Aviation Business Administration from Embry Riddle Aeronautical University.

Siggi will be leading Volito Aviation in its capacity as servicer for VGS Aircraft Holding (Ireland) Limited, a joint venture between Volito Aviation and an affiliate of The Goldman Sachs Group, Inc. (NYSE: GS).

Volito Aviation AB's owned and managed portfolio consists of F50, B737-3/4/700 and A319/320 aircraft and are on lease to carriers worldwide. Volito Aviation AB is wholly owned by Volito AB, a privately held investment company with a balance sheet of SEK 4 billion as of December 31, 2006 (approx. \$575 million). Volito Aviation AB is headquartered in Malmö, Sweden.

For further information about Volito Aviation AB, please visit our site [www.volito.aero](http://www.volito.aero) or contact Sven Holmgren, Group CEO, Tel: +46-40-660 30 00, [sven.holmgren@volito.se](mailto:sven.holmgren@volito.se).

**William Bath, Appraiser Fellow, Administrative Director, ISTAT Appraisers Program, is pleased to announce the results of the ISTAT Senior Certified Appraiser exam in Phoenix at ISTAT's Annual Conference in Phoenix, March 2007**

The following individuals advanced in grade from ISTAT Certified Appraiser to *Certified Senior Appraiser*  
**Robert F. Agnew** President & CEO, Morton Beyer & Agnew, Arlington, Virginia

**Oliver Stuart-Menteth** Technical Manager, Fintech Aviation Services, Ltd. Geneva, Switzerland  
*Certified Appraiser*

**Olga Ra zhivina** Senior Analyst, Ascend, a division of Airclaims Ltd., U.K.

**Robert Gallagher**

President, Aircraft Systems Group, Ltd., U.S.

*There are now 31 Certified appraisers*

**Kim Higgins**, ISTAT Certified Appraiser, has moved from AVITAS to Aviation & Portfolio Group, Republic Financial Corporation in Reston, VA 20190 . Phone 703-834-6983

## Brief CV Greg May

### Q Aviation President & CEO

You've seen him at ISTAT conferences where he has been a generous sponsor of many ISTAT events. You see his signature on the ISTAT and ISTAT Foundation Financial Statements as published in JETRADER. Greg May is an active ISTAT member, elected twice to the board and currently acting as Vice President and Treasurer for both ISTAT and the ISTAT Foundation.

Greg began his aviation career at United Airlines as an engineer and manager in United's maintenance division. His technical background served him well when he transitioned into finance and treasury at United. He moved to Fleet Capital Leasing as Vice President Aircraft Finance where he acquired, leased and sold commercial aircraft and originated secured debt transactions. At Northwest Airlines as Vice President of Purchasing, Greg acquired over 100 new aircraft from Boeing, Airbus and Bombardier. In 2003, Greg launched Q Aviation, a Fort Worth based commercial aircraft leasing company with a current portfolio of approximately 50 aircraft

An Arizona State University graduate with a bachelor of science in aerospace engineering, he received his master's degree in business administration from University of Chicago. Fort Worth, Texas is where he lives along with his wife Nancy and two children.



### Waviatech Announces 2 Appointments

Following an increase in demand for its services, Waviatech Limited, the UK based aviation consultancy, announces two key appointments to its technical staff. **Alan Godson**, Project Manager, joins us from Flyertech where he was employed as a Technical Engineer. A licensed aircraft maintenance engineer, Alan has extensive experience on a wide variety of aircraft types and was responsible for organising the base and line aircraft maintenance for customer airlines. His experience will strengthen Waviatech's global records scanning and aircraft/records technical appraisal services that are currently on offer to leasing companies and airlines. **Annamaria Szoke**, Project Manager, joins us from Lufthansa Technik Budapest where she was employed as a documentation co-ordinator. She has over 4 years of MRO experience and brings to Waviatech an excellent understanding of airframe documentation and quality control. Annamaria will be responsible for the project management of Waviatech technical records scanning services on behalf of our customers at airlines around the world.



# Jacques Schneider

+ the

# Spitfire

Supermarine S6B 1931

**O**n December 5th, 1912, at the Aero Club of France Gordon Bennett banquet, Jacques Schneider was one of the guests and an announcement was made that he would offer a trophy for an international competition by seaplanes; (The paparazzi and the supermarket checkout-counter papers would have had a field day recording the juicy scandals of James Gordon Bennett, jr., a New York socialite who founded the International Herald Tribune when he moved to Paris).

**So who was Jacques Schneider?** The son of a wealthy armaments manufacturer, he died in poverty in 1928 after the firm, Le Creusot went bankrupt. Reorganized, it was employed in making arms for the Germans after the fall of France in 1940 and heavily damaged by a number of raids in 1942 by RAF Lancaster bombers.

### So why seaplanes and what were some of the rules?

Given the lack of reliability of racing aero engines at that time, pilot's were more comfortable making a forced landing on water than trying to get into a cow pasture; also given the design for high speed and take-off weight loaded with fuel, there were few airfields with adequate space for extended take-off and landing distances.

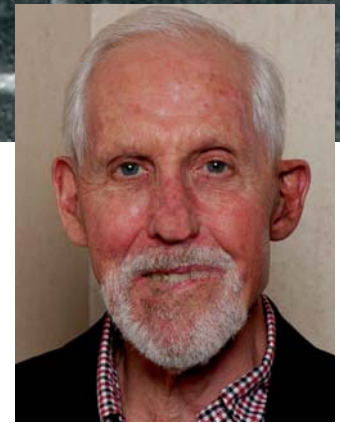
Here are some of the rules: The Contest was open to any club affiliated with the International Aeronautical Federation who could challenge the current holder of the Trophy and who was responsible for organizing the following Contest. The course had to be at least 150 nautical miles and the competitors had to be the same nationality as the club entering them. Any club winning the event three times in consecutive contests became the absolute owner of the Trophy.

To ensure the aircraft were truly sea-worthy they first had to taxi to the starting line; fly a short course of five to ten miles during which they had to land twice and taxi half a nautical mile at a speed of at least 12 knots, after which they had to taxi to a designated buoy and remain moored and unmanned for six hours. No repairs were allowed, so if the floats leaked the aircraft could sink.

The first Contest was held in 1913 at Monaco and after the sea-worthy trials only four started the actual Contest which was a time trial. The winner was a Frenchman (Prevost) in a Deperdussin monoplane powered by a 160 h.p. Gnome. He took 2 hr. 2 min. 29 sec. and averaged 45.75 m.p.h. (72.6 km.h.) as he missed the finish line and had to go out again, which added almost an hour to his time. The other three contestants either broke down or failed to start.

The second Contest was again held at Monaco and won by a Hawker test pilot, Howard Pixton, flying a special Sopwith "Tabloid" at an average speed of 86.78 m.p.h. (139.66 km.h.) He then continued at full throttle for two more laps to set a 300 km world record of 92 m.p.h.

WW1 put an end to the competition until 1919 at Bournemouth, U.K. where there were no official finishers due to fog and mishaps except for the Italian entry, a Savoia S.13 Flying-boat. Although the pilot (Janelli) missed a turning point in the fog, he did complete the required number of laps, so the Royal Aero Club awarded Italy the Trophy as a compliment to Janelli's effort; this meant Italy could choose the 1920 venue which was Venice where they won. With a second win at Venice in the 1921 Contest, Italy only needed to win again in 1922 at Naples. However, the British took the Trophy with a specially built Su-



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permarine "Sea Lion II" at an average speed of 145.7 m.p.h. (234.5 km.h). Look at its photograph; can you believe it could be looped, rolled, spun and stunted? It was designed as a Fighting-Scout to be catapulted off battleship gun turrets and landed in rough seas. For the 1923 Contest, the British chose Cowes, Isle of Wight.

Now it was the turn of the United States, and with it came a radical change in the nature of future Contests. The American government had decided to fund the development of the Curtiss Navy Racer CR-3 and its Curtiss 465 h.p. D.12 engine; in addition a high speed flight was formed with army and navy pilots training on a variety of fast aircraft. Although still a biplane the CR-3 was a remarkable design with small thin wings, streamlined fuselage and a high power to weight ratio. It was no contest; of the eight entries only three made it to the starting line; the two Curtiss CR-3s and a British Supermarine "Sea Lion III" powered by a 450 h.p. Napier "Lion" engine. U.S.A. Lieut. Rittenhouse won with an average speed of 177.3 m.p.h. (285.4 km.h) and Lieut. Irvine close behind at 173.46 m.p.h. Capt. Biard in the Supermarine came in 26 m.p.h. slower at 151.16 m.p.h. Now the Contest would move to Baltimore for the 1925 race. What happened to the 1924 race? Because of a lack of entries there were no challengers and the U.S. sportingly cancelled the event; if they had not done so, with the CR-3 as the only entry they would have retired the trophy as they won again in 1925.

Except for the U.K., the funding of the U.S. entries was a wake-up call to the European challengers, who with national prestige at stake, decided to follow suit for the 1925 Contest with their own government funded aircraft and air force pilots from special high-speed flights. Supermarine Aviation Works at Southampton built the S.4, designed by R. J. Mitchell and powered by a 700 h.p. Napier "Lion". A mid-wing monoplane with no external bracing, it was constructed entirely of wood, including the skin of the fuselage and wings. Besides the U.S. Curtiss R3C-2 biplane racers (600 h.p. Curtiss V-1400), and the U.K., Italy entered two Macchi M.33s with 500 h.p. Curtiss D.12s. The course was triangular, with seven laps of 27 n.m. for a total distance of 189.5 n.m. (350 km.).

In the eliminating trials, the S.4 crashed due to wing flutter, fortunately the pilot was not injured; one of the British two Gloster-Napier IIIs was badly damaged three days later by rough seas. In the main Contest, brilliant flying through the hairpin turns by Lieut. Doolittle, U.S. Army, gave the U.S. its second win at an average speed of 232.6 m.p.h. (374.2 km.h).

The 1926 Contest held in the Hampton Roads at Newport News was crucial to the U.S. if they were to gain permanent possession of the trophy. However, Britain did not enter and it was left to Italy as the sole challenger to keep the trophy in play. This they did in a convincing manner; Major di Bernardi averaged 246.44 m.p.h. (396.6 km.h), some 15 m.p.h. faster than Lieut. Schilt of the U.S., who was second.

Now the British government woke up and formed the R.A.F. high-speed flight and ordered special machines and engines for the 1927 Contest at Venice; these were two Supermarine S.5s and three Gloster IVs, all with 900 h.p. Napier racing engines. After final practice they were shipped to Venice on the aircraft carrier "Eagle". Italy was the only other entrant, the U.S. government having withdrawn its support from its own team due to budgetary difficulties. In the race itself, only the two S.5s finished the course, the winner averaging 281.65 m.p.h. (453.28 km.h).

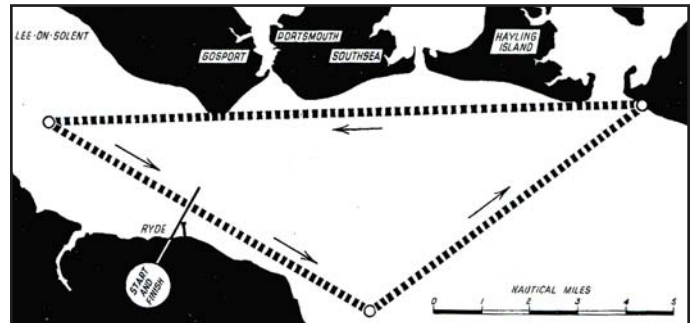
The die was cast, for in 1929 at Spithead, Isle of Wight, Flying Officer Waghorn in the Supermarine S.6 (1,900 h.p. Merlin R) had the Italian entry to contend with, but both the French and sole American challengers had withdrawn. New records were again set with the S.6 at an average speed of 328.63 m.p.h. (528.87 km.h.) and a straight away speed of some 370 m.p.h.

The final Contest in 1931 was again held at Spithead, when the trophy was retired to the Royal Aero Club in spite of the

## Supermarine Sea Lion 1923



British government withdrawing its support. At the eleventh hour Lady Houston advanced the sum of £100,000 to cover expenses, (\$2.6 million today). Flown by Flt. Lieut. Boothman, the S.6B (2,300 h.p. Merlin R) completed the course at an average speed of 340.08 m.p.h. (547.63 km.h.).



Besides being exceptional pilots, the contestants had to be physically fit to take the stress of 6Gs on each of 21 turns in 38 minutes.

The pilots had to be fitted to the cockpit, the cross section of which was almost equal to the cross section of the engine. The sides of the cockpit were blistering hot, as the engine oil was ducted along the sides to the top of the fin where it was circulated down via gutters and back to the engine. There was no direct forward view, only an oblique one out of minuscule side panels. The radiator for the engine coolant was the surfaces of the wing skins and the tops of the floats; the total heat loss from the cooling surfaces of the airframe was equal to almost 1,000 h.p. (40,000 BTUs per minute). The floats were also the fuel tanks; for take-off the starboard float had considerably more fuel to balance the 500 pounds of down pressure on the port float by engine torque at maximum power.

It has been said that six years of the Schneider Contests was equal to twenty years of normal development in aviation; certainly in Britain's case it was the difference between victory and defeat in 1940 when the Luftwaffe was given the task of gaining complete air superiority for the planned landing of Operation Sea Lion just eight miles from my home. The Legendary Spitfire and its Rolls-Royce Merlin engine were the results of the lessons learnt in the Contests. Of course there were many other factors that were crucial to surviving that summer when Britain stood alone and the world watched. As the Duke of Wellington said after the battle of Waterloo, "It was a damn close run thing".

Ellison Hawks; The Schneider Trophy Contests (1913-1931); Real Photographs Co. Ltd., 1945

Len Deighton; Fighter - The True Story of the Battle of Britain; Alfred A. Knopf; 1978



cause the two Pratt & Whitney Canada PW150A engines drive six-bladed propellers that turn at only 1,020 rpm at take-off, 900 rpm at maximum climb power and 850 rpm in cruise. Engine emissions are 40 per cent below the Part 34 requirement for smoke number, and 40 per cent below ICAO Annex 16 requirements for gaseous emissions.

While there is a heavy demand for Q400 aircraft, there aren't many available. Bombardier's Asset Management Group moved three in the last six months and only had one in the inventory in March 2007. The three that were moved were in the 5,000 -6,000-hour range. Lease rates for these aircraft run about \$160,000 a month on a five-year deal, while an outright sale would bring \$12,000,000 to \$12,500,000. A new Q400 lists for about \$25,000,000 in 2007 dollars.

Regional aircraft like the Q Series and the Bombardier CRJ regional jet are what have made regional airlines the power they have become today. In the U.S. in 1994, mainline carriers had 83 per cent of the traffic and regional airlines had 17 per cent; in 2005, the gap had narrowed to 63 per cent and 37 per cent respectively. Regional airlines carried 150.9 million passengers in 2005, up 100 per cent from 1995. The Regional Airline Association predicts that 241 million passengers will fly on regional airlines in 2017 and the regional aircraft fleet will grow from 2,757 aircraft in 2005 to 3,851 aircraft in the same time period.

Seating capacity of regional aircraft will continue to grow as airlines look for lower seat mile costs. The European Regions Airlines Association believes larger aircraft will result in a decrease of flights in the busy European airspace, while lightening the impact on the environment.

Bombardier recently launched its 100-seat CRJ1000 to meet this growing market, while a 90-seat derivative of the Q400 is under study.

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