

Long Range vs. Ultra High Capacity: “Ranging Capabilities...”

Aviation enthusiasts and analysts are familiar with the different views of more frequencies against more capacity. With aircraft manufacturers now offering aircraft with more range but also with more capacity, airlines are now determining whether the hub and spoke philosophy or the point-to-point philosophy is the best strategy to follow. More direct flights are becoming a new trend in the commercial aviation. ETOPS certification will also play a crucial part in the success of these new routes and the new generation of twin-engined aircraft. These new aircraft can fly longer while Airbus is leading the way in the very large capacity segment. Airbus claims there’s still life in the hub and spoke system especially between large city pairs between Asia, Europe and North America. This article compares the aircraft predictions analysed in the market forecasts published by Boeing and Airbus this year and the aircraft they offer. The influence of ETOPS on these new aircraft will also be briefly explained. The article will be closed with my conclusion based on the above mentioned findings. The information in this article is obtained from the Boeing and Airbus websites as well as the Great Circle Mapper website.

By Roger Cannegieter

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Different views?

Boeing and Airbus have different views on the global market forecasts. However, on some points both aircraft manufacturers share the same view. Worldwide travel depends on the economy, both nationally as well as internationally. People tend to buy more things before going on vacation. As the Gross Domestic Product (GDP) in countries is slowly increasing and liberalization of markets increases the accessibility, the air traffic growth is slowly getting on its feet a g a i n . Globalization and international trade can lead to more wealth which in turn has its effect on worldwide travel. While Boeing sees an annual passenger

traffic increase of 4.8% between 2005-2024, Airbus sees a slightly higher annual increase of 5.3% between 2004-2023. Boeing foresees a worldwide passenger fleet of 35,300 aircraft by 2024 while Airbus sees an increase to 21,759 aircraft by 2023. Boeing predicts about 22% will be in the midsize twin aisle category such as the 787 and A350 while the 747 and larger aircraft will only take up 4% of the total fleet according to Boeing. Airbus forecasts that by 2023 there will be 1,262 very large aircraft. Below you can see the worldwide summary of forecasts as calculated by Boeing and Airbus.



Global Forecast

Source: Boeing

World-wide demand will be more even between major regions

North America			Europe		
2004-2013	2014-2023	% of world deliveries	2004-2013	2014-2023	% of world deliveries
3,048	2,596	28%	3,290	3,113	32%

Latin America			Middle East			Asia-Pacific		
2004-2013	2014-2023	% of world deliveries	2004-2013	2014-2023	% of world deliveries	2004-2013	2014-2023	% of world deliveries
810	413	6%	396	299	4%	2,928	2,587	27%

Africa		
2004-2013	2014-2023	% of world deliveries
411	230	3%



A380/747-8

Hub & spoke

Besides the increase in number of aircraft, Airbus also sees an increase in the number of seats per aircraft of 20% (from 181 to 215 seats) until the year 2023. Cargo aircraft numbers will double to 3,530 fullfreighters in the coming 20 years according to Boeing, an average growth of 6.2%. In the same period Airbus sees the share of fullfreighters increase to 3,139 fullfreighters, an increase of 5.9%. The difference here is the future vision that Boeing and Airbus have, point-to-point versus hub & spoke. In the diagrams below the distances can be visualized with geographical maps. All geographical maps are provided by the Great Circle Mapper website.



CDG-HKG 9,607km 777-200LRF Cargo route Point-to-point



DXB-SYD 12,039km B777-200LR/A340-500 Point-to-point

ETOPS on 'top' of the game or bigger is better?

This depends on how you look at it. Boeing and Airbus are seeing the need for longer distances being flown by twin engine aircraft. Extend Twin-engine OperationS (ETOPS) is the rule that implies a twin-engine aircraft must be able to land within 90 minutes if one of the two engines fails. Obtaining this rating requires the certifica-

tion of the reliability of the airframe/engine combination as well as the airline's flight operations maintenance. For this extra equipment is required, such as additional back-up systems for electrical power. With the trend to operate more non-stop flights between more city pairs, Boeing and Airbus are hoping aviation authorities will approve even higher ETOPS ratings which would make these aircraft more potential. ETOPS is especially important for point-to-point traffic where Boeing offers the 787 and 777 and Airbus offering the A330 and A350. Currently Boeing holds the record for the highest ETOPS rating with 207 minutes ETOPS certification on their 777 model. Regarding ETOPS Airbus has its four-engined A340 which needs no ETOPS rating. This makes Airbus attractive for airlines that don't want ETOPS. Airbus is competing more directly with Boeing's 787 and the 777 with the A350, their latest twin-engined aircraft which will also feature next generation engines similar to those offered on the 787. With 529 aircraft ordered so far, Boeing has proven their 777 aircraft family has so far been a great success in the medium to long range point-to-point travel. The latest 777 model, the 777-200LR is capable of carrying 301 passengers up to 9,420 nm (17,445 kilometers). It's competitor, the four-engined A340-500 can carry 313 passengers on a distance of 9,000 nm (16,100 km). Airbus is also evaluating a higher gross weight (HGW) version of the A340-500 and -600 to increase its range even further. With more than 200 787s ordered so far the future of this all-new aircraft is looking very promising. The 787-800 will have a capacity of 223 passengers in a three class lay-out and has a range of 8,500 nm (15,700 km). The stretched 787-900 can 259 passengers over the same range.

Airbus's A350-800 will carry up to 253 passengers in a three-class lay-out with a range of 8,800 (16,300km). The stretched A350-900 can carry 300 passengers in a three-class layout with a range of 7,500nm (13,900km). Board approval has been given with the order for 60 A350s by a Middle Eastern airline still pending. According to Airbus's website there are firm orders for 28 A350s from three airlines with commitments signed by seven other airlines (incl. Leasing companies and a undisclosed customer) for a total of 115 A350s. While Airbus also offers its ultra long range A340-500, this four engine aircraft is getting increasing competition from Boeing's highly succesful 777 in the form of the

777-200LR which is chalking up more orders recently as interest from airlines for twin-engined operations is increasing. With the slightly higher range combined with lower operating costs (such as two engines instead of four), Boeing might have an edge for now. More airlines are seeing the benefits of operating twin-engined aircraft over longer distances.



Boeing 787 Final Exterior Concept

Besides twin-engined operations, Airbus is also working hard on getting its largest aircraft, the A380-800, into commercial service. Some see the size of the A380 as the disadvantage of the A380 while others see the larger number of passengers carried in the A380 as an advantage. Boeing launched its smaller but new generation 747 on november the 15th. These (very) large aircraft are more attractive for the bussier routes between congested airports. With the 747-8 Boeing is aiming at the gap between the 777/A340/A350 and the A380-800. With orders for 18 new generation 747 full freighters and negotiations still ongoing with several customers, Boeing is confident the new generation 747 will become a success. The Airbus doubledeck A380 will be able to carry 555 passenger in a three class lay-out over a distance of 8,000 nm (15,000 km). The 747-8 will carry 34 more seats in a three class lay-out and carry 14 percent more cargo compared to today's 747-400. The range of the 747-8 will be similar to that of the A380-800.

Conclusion

While both Boeing and Airbus see an increase in the number of aircraft according to their market forecasts, Airbus also sees a growth in the number of seats per aircraft which would explain their development of the larger A380. On the air cargo side, both Boeing and Airbus have a similar view with Boeing seeing an increase in the number of full freighters of 5.9 percent and Airbus seeing an increase of 6.2 percent for full freighters. These numbers wouldn't be so surprising as these market forecasts in my opinion are closely linked to the different views Boeing and Airbus have. It is clear the A380 is the right solution for congested airports in Europe, Asia and North America. Airlines will have no choice other than to offer more seats per aircraft to these congested airports. Even though this market segment isn't very big yet, the projected traffic growth over the coming years may make the A380 more attractive over the years. At the same time the similar dimensions of the Next Generation 747 compared to the current 747-400, may be more attractive to airlines. Combined with the 787-based technologies and design, the Next Generation 747 becomes attractive to airlines who don't necessarily need the capacity the size of the A380. In this respect, the new 747 will find its home between the 777/A340 and the A380. At the same time the developments regarding ETOPS and point-to-point and hub-and-spoke in the coming years are factors that have its influence on the success of the 787/777 and the A330/A350. Airlines can also chose to fly ETOPS free by opting for Airbus's A340. Even so, the aircraft manufacturer with the highest ETOPS rating will have a major advantage over its competitor. Both larger capacity and more frequencies are attractive solutions. The success of which one will be the better solution depends on the situation where the airlines and airports find themselves in over the years and the development of ETOPS ratings for twin-engined aircraft. Congested airports can use larger aircraft but at the same time the pressure these congested airports are experiencing can be partially removed by offering more flights from neighboring airports. The success of point-to-point and hub-and-spoke depends on market and economical developments throughout the world which will determine the success or failure of these new generation aircraft and their 'ranging capabilities'.

