The development of the commercial widebody fleet in 2015 is examined. The active widebody fleet grew by 3.60% during the year. Deliveries to the main operators and lessors identified, and the fleet development for each main type examined.

The development of the widebody fleet in 2015

This is the second article of a two-part analysis covering the evolution of the commercial jet fleet during 2015 (see *The development of the short-haul fleet in 2011, Aircraft Commerce, April/May 2016, page 4)*. The focus is on widebody fleet. Most of this review concerns in-production aircraft, including the A330-200/300, A350, A380, 747-8I, 777-300ER and 787. Out-of-production types will also be reviewed where significant fleets remain in operation. This includes older 747 and 777 variants, 767s and A340s.

In-production aircraft

There were 2,278 active in-production widebody aircraft at the end of 2015, with an increase of 320 units over the year *(see table, page 8)*. New deliveries accounted for 357 aircraft, but 42 were parked during the period and 18 were re-activated.

A330

The active fleet of A330s experienced a net increase of 62 aircraft in 2015, comprising 12 A330-200s and 50 A330-300s. There were 26 new -200 deliveries and 70 -300s *(see table, page 8)*. Some 21 A330-200s and 14 A330-300s were parked during the year, however. Despite the pending arrival of the A330neo and the ramp up of new A350 production, the delivery stream and backlog for the existing A330-300 remains strong with 86 orders in the year. Only the 787-900 took more orders in 2015.

Air Asia X (8) was the largest customer for new A330s delivered in 2015. This included two aircraft for Thai Air Asia X. Turkish Airlines was the next largest customer with seven A330-300s. China Airlines took delivery of six A330-200s, and Hainan took six A330-300s.

Singapore Airlines (5) and Sri Lankan (5) were the next largest customers with a number of others including Delta, China Southern and Air China taking four A330-300s each, while Kuwait took four A330-200s. Korean Air took three and Lion Air became a new operator of the type with three units, its first foray into widebody aircraft.

Among the new A330 deliveries, a significant portion of aircraft were leased. The biggest lessors in the space during 2015, were Intrepid and Hong Kong Aviation Capital (HKAC) with six each.

HKAC leased four to Sri Lankan and two to Garuda. Intrepid's lessees include EVA Air, Cebu Pacific and Evelop Air.

CIT (5) was also a significant player with lessees including Air Europa, Fiji Air, Sichuan and Sri Lankan. BOC Aviation leased four new aircraft to Air Asia X, and Jackson Square leased four to Lion Air and Hawaiian. Other lessors included BBAM (2) to Singapore Airlines, MCAP (2) to Lion Air, Bohai (2) to Hainan and Macquarie (2) to Air Asia X. As Air Asia X also took a single aircraft from Aircastle, all of its eight deliveries except one came from lessors.

The active A330-300 fleet has a diversified operator base with a number of major carriers operating significant fleets. There is relatively little concentration, with no carrier among the fleet of 593 aircraft operating more than 30 units, except Cathay Pacific.

Cathay Pacific (41) is the largest operator of A330-300s. Seven of these are leased, including five from Aercap. Its Dragonair subsidiary operates a further 18, of which three are leased from Aercap and a further three from Deucalion. The next largest operators are Singapore Airlines (30) and Delta (24). Air China has 22, Korean (20), Air Asia X (19), China Southern (18) and Asiana (14).

Singapore Airlines stands out as being the carrier that leases most of its fleet from a diversified spectrum of lessors. These include AWAS (6), HKAC (5), Aercap (3), ALC (3) and a variety of others that lease pairs or single units.

The biggest lessor in the A330-300 space is Aercap (49). Other large lessors include: CDB (19), HKAC (18), CIT (15), AWAS (14), BOC (14) and Intrepid (12).

The A330-200 fleet also has a diverse operator base, with the largest carrier China Eastern operating 29 out of a total fleet size of 502 aircraft. The next largest operators are Hawaiian (21), Turkish (20), Etihad (18) and Qantas (17). A group of European carriers including Air France, Alitalia, Air Berlin and TAP operate fleets of 14-15 aircraft each.

Lessors feature most prominently among European A330-200 operators, with Aercap being the lessor for most of Air Berlin's and Air France's aircraft. Alitalia also leases all of its aircraft from a variety of lessors. Qantas and Garuda also lease the majority of their fleets. Lessors also dominate the fleets that many of the smaller operators operate, such as South African Airways and Sri Lankan, Virgin Australia and Vietnam Airlines.

The A330-200 is popular among the leasing community. Aercap is the dominant player, with 72 aircraft on lease. Other prominent lessors include: CIT (27), Aircastle (16), ALC (15) and GECAS (15). These five lessors own 29% of the world's A330-200 fleet.

A350

The A350 is the newest Airbus family member, with the first A350-900 delivery being accepted by Qatar Airways in late 2014. A further 14 were delivered during 2015. Qatar has taken delivery of half the production run to the end of the year, and operated seven aircraft. Vietnam Airlines was the second customer with four units delivered, followed by Finnair with three. TAM had a single aircraft by the end of 2015.

In the aircraft finance sector, it is highly unusual for operating lessors to dominate the delivery stream for a new aircraft type. Lessors usually like to see a

COMMERCIAL PASSENGER WIDEBODY FLEET DEVELOPMENT FROM 01/01/2015 TO 01/01/2016

	2015			Additions			Reductions			2016			Orders
	Active	Parked	Backlog	Deliv.	Re-activated	Frtr conv	Parked	Retired	Destroyed	Active	Parked	Backlog	in 2015
Current production aircraft													
A330-200	490	20	56	26	10		21	2		502	33	45	16
A330-300	543	12	120	70	3		14	2	1	593	29	113	86
A330neo			120									172	52
A350-800			16									16	
A350-900	1		593	14						15		564	16
A350-1000			169									181	
A380	151	3	165	27	2					179	2	140	3
777-300ER	533	1	230	78	1		4			608	4	174	22
777-8/-9			286									306	20
787-8	211	2	234	68	2		2			279	3	159	14
787-9	10		458	63						73		452	97
787-10			139									162	21
747-8	19		23	11			1			29	1	12	
In production total	1,958	38	2,609	357	18		42	4	1	2,278	72	2,496	347
Out-of-production aircraft													
A300-600	25	26			2	1	6	7		21	22		
A310-200		5						1			4		
A310-300	36	17			7		7	4		34	15		
A340-200		12			12			3		3	6		
A340-300	154	22			12		9	21		135	20		
A340-500	11	16					3	1		6	19		
A340-600	81	12			5		10	2		77	14		
767-200ER	29	36			4		15	13	1	17	34		
767-300	70	7			1		6	6		60	11		
767-300ER	459	59			15	7	44	4		426	82		
767-400ER	37									37			
777-200	81	2					3	4		76	3		
777-200ER	400	9			1		27	4		373	32		
777-200LR	54	2			2		1			55	1		
777-300	60						7	2		51	7		
747-300	7	6					4	6		3	4		
747-400	256	43					41	24		200	75		
MD-11		3						2			1		
Total	1,760	277			61	8	183	104	1	1,574	350		
Very old types													
A300B2/B4	3	9			3		1	3		4	5		
L1011		6									6		
DC-10-10/-15								1					
DC-10-30		5									3		
DC-10-40													
747-100													
747-200	4	6						2		4	4		
747SP	1	1								1	1		
Out-of-production total	8	27			3		1	6		9	19		
Fleet total	3,726	342		357	82	8	226	114	2	3,861	441	2,496	347

critical mass of aircraft operating in the market with a reasonably diversified operator base, so the fact that 13 of the 15 A350-900 deliveries went to lessors appears to turn conventional thinking on its head. Of the 15 units delivered, nine went to GECAS for onward lease to Qatar (7) and Finnair (2). A further four units were delivered to CIT (2) and Aercap (2) for onward lease to Vietnam Airlines.

It is likely that the leasing community has taken considerable comfort from the size and diversity of the A350 order book, where there is an impressive backlog of 761 aircraft. This backlog, however, only grew by a relatively small 16 units in 2015. This does not necessarily mean a lack of confidence among operators, but is more likely to reflect long lead times to delivery and well-publicised production delays.

A380

During 2015 there were 27 A380 deliveries *(see table, this page)*. Emirates (16) continues to take more aircraft than others, but its close neighbour Etihad took five, while Qatar took two. British Airways and Asiana each took two.

Of the 2015 delivered aircraft, only Emirates took some of its aircraft on lease. BBAM leased four and Amedeo provided two. Magi Partners structured a lease for a single unit and all others went directly to the respective airlines.

The overall A380 fleet is dominated by Emirates, with 71 of the 179 aircraft in service at the end of 2015. This represents 40% of the entire active fleet. Singapore Airlines (19) had the next largest fleet, followed by Lufthansa with 14. Qantas (12), British Airways (10), Air France (10) and Korean (10) had the next largest A380 fleets at the end of 2015. Thai and Malaysian each operated six, while Etihad and Qatar had five each.

Emirates also accounts for most of the A380 order book with more than 130 aircraft. The only new order in 2015 was placed by ANA for three units.

Despite a relatively narrow operator base and concentration of the type at a single operator, a significant portion of the A380 fleet is owned by lessors. The largest lessor is Amedeo, previously

Doric, with 26 aircraft. All but five of its portfolio are leased to Emirates. BBAM also leases five to Emirates. Novus owns five aircraft on lease to Emirates and British Airways. A further eight aircraft have been financed by German operating lease structures to Air France and Emirates.

747-8

The latest and largest derivative of the 747 is the -8 series, which was launched as Boeing's response to the A380. The type has failed to gain much market acceptance. At the end of 2015, the largest fleet was operated by Lufthansa (19). In addition, Air China operates six and Korean has four. The order backlog stands at only 12 aircraft.

During 2015, 11 787-8s were delivered: four for Korean, three for Air China and four to Lufthansa. Of the active fleet, only a single unit is leased to Lufthansa by BBAM.

777

The 777-300ER variant had an active fleet of 608 aircraft at the end of 2015, of which 78 units were delivered during the year.

Of the aircraft delivered in 2015, the largest customer was Emirates with 10. Other large recipients in 2015 included Turkish (7), Cathay (6), Korean (6), China Eastern (5) and Saudia (5). Several others took three or four aircraft, including Singapore Airlines, Eva, Air France, Aeroflot, Qatar, Thai and Garuda.

The 2015 delivery stream reflects a wide operator base for the 777-300ER. Emirates is the largest operator of the type, with 112 units and a fleet more than double that of the next largest carrier Cathay Pacific (53). The next largest operator is Air France (40) followed by Qatar (31) and Singapore Airlines (27). There is a substantial operator base with 20-30 aircraft including: Etihad (25), Turkish (23), ANA (22), EVA (22), Air China (20) and Korean (18).

The list of lessors active in the 777 space reads like a roll-call of the world's major lessors, with a large portion having at least some exposure. There are, however, five dominant players. Aercap is the largest with 35 aircraft. Of its portfolio, 20 are leased to Emirates, six to Air France and two each to Cathay Pacific and Air Canada. American and Air Austral lease a single unit each from Aercap.

The next largest lessor is GECAS (30), of which 14 are leased to Emirates. Six are leased to Egyptair and four each to EVA and China Air. A single unit is leased to each of British Airways (BA) and Philippine Airlines. BBAM also owns 25, of which seven are leased to Emirates and eight to Cathay Pacific. Qatar (4), BA (3), Air New Zealand (1), TAM (1) and Turkish (1) make up the balance.

787

During 2015, the 787 was the most popular aircraft with 68 787-8 deliveries and 63 for the larger 787-9 *(see table page 8)*. The 2015 deliveries went to a wide cross-section of operators around the world. US majors American and United took 13 and 11. In North America, Air Canada also took six.

In Latin America, LAN accepted a further seven and Aeromexico (3).

Asian operators ANA and Scoot took 10 each. In the same region Japan Airlines (JAL) (4); Vietnam Airlines (5) and Jetstar (4) took further aircraft.

In the Middle East, Qatar took seven, while Etihad added four and Oman Air two. In Europe, Virgin Atlantic added eight, British Airways a further five and Thomson three. KLM also took two.

Among the 787 lessors, Aercap was the most prominent in 2015, taking 14 aircraft. This includes three leased to Ethiopian, four to LAN, three to Virgin and two to KLM. Avolon leased two to Virgin and a single unit to Avianca.

The first A350 was delivered in 2015, with a total of 15 aircraft delivered during the year. The A350 had a firm order backlog of 761 units at the end of 2016.

BBAM leased to Thomson (2) and Etihad (1). BOC acquired two for lease to Kenya Airways and CIT leased two to Aeromexico. Given that Virgin also leased single units from others, it stands out as having leased all of its fleet delivered in 2015.

Despite only being launched recently, there are already 352 787s in revenue service with a diverse operator base. The majority are 787-8s, but most new orders are migrating towards the larger 787-9. The largest fleet is in Japan, with ANA (44) and JAL (24). United and Qatar are the next largest with 25 each. Other large operators include LAN (16), TUI (13), BA (12), Ethiopian (12) and Jetstar (11). To date, there is relatively little penetration in China with Hainan (10) and Xiamen (6) as the only operators.

Lessors are relatively under-represented in the production ramp up so far, possibly because the 787 is still new. Aercap (29) is the biggest lessor with its fleet dispersed across nine lessees. BBAM (15) is the next largest with six lessees and seven aircraft at BA.

Others such as Standard Chartered, GECAS, Showa and CIT have two to four aircraft. In the future order book, Aercap continues to feature strongly, but ALC and CIT also have large future positions.

Out-of-production aircraft

Out-of-production aircraft include current generation types with no deliveries or order backlogs over the past few years. These include types for which production has ended in recent years, or which have been superseded by newer variants. For Airbus, this comprises all variants of the A340, while for Boeing this comprises the 747-400, 767 and the 777-200, -200ER, -200LR and -300.

A340

At the end of 2015 there were only three active A340-200s in Egypt, but 135 A340-300s remain in service. All but 44 of these are now over 15 years old. The youngest aircraft are with Finnair (4) and the only other units less than 10 years old are with Air Mauritius (2). The largest operator is Lufthansa (18) and its subsidiary Swiss (15). Air France operates 11 and South African Airways and SAS have eight each. In recent years Aerolineas Argentinas has increased its fleet to seven, all of which are leased.

Most of the A340-300 fleet is owned but Aercap, Castlelake and Century Tokyo Leasing. Each owns six aircraft.

The younger A340-500/-600 models achieved limited market traction, and only six A340-500s and 77 A340-600s are in active service. The largest operators are Lufthansa (22) and Iberia (17), followed by Virgin (11), Etihad (10) and South African (9).

747

The 747-400 fleet is declining rapidly, having reduced from 256 to 200 aircraft during 2015. The type remains popular in Europe, however, particularly in the UK, where British Airways (40) and Virgin (10) now account for 25% of the global active fleet. Lufthansa operates a further 13 and Air France/KLM have 10.

Elsewhere United (22), Saudia (14), Qantas (11) and Thai (10) remain major operators of the type.

Guggenheim and GECAS are the main lessors of 747s, with five each leased to KLM and Virgin, while Aercap has two.

767

The vast majority of these are 767-300ERs with 426 remaining in active service. There are also 37 of the larger 767-400s in service with United (16) and Delta (21).

The 767-300ER was once the most ubiquitous widebody, but many carriers have replaced their fleets. An additional 50 767-300 and -300ER aircraft were parked in 2015 and 10 retired, although 16 were also re-activated. There remains, however, a core group of large operators. The US majors Delta (71), American (44) and United (34) account for 31% of the active fleet and Hawaiian also has eight.

In Japan, JAL (40) and ANA (39) account for 16%, so that almost half the active fleet is with five carriers. Air Canada (32) is also a large operator along with LAN (24).

Aercap is the largest 767 lessor, with 33 leased to 14 carriers followed by GECAS with 26 on lease to 10 airlines. The next tier is AWAS (12) and Castlelake (11). CIT and Guggenheim have smaller portfolios.

777

There are 504 777-200s, -200ERs and -200LRs in active service. The last two aircraft manufactured were -200LR variants delivered to Turkmenistan Airlines almost two years ago. There are no outstanding orders for the three -200 series variants. Eight aircraft were retired in 2015, and 36 were parked *(see table page 8)*.

US majors United and American are the largest operators of the three -200 series variants with 74 and 47, followed by British Airways with 45.

From a leasing perspective, Aercap has the largest exposure to the type with 38 aircraft on lease to 12 carriers. Its biggest lessees are Air France and KLM with seven and eight aircraft. Aercap also leases four each to Aeromexico and Air New Zealand, and three each to PIA and Nordwind.

GECAS owns 12, which are predominantly on lease to United and Alitalia. AC