Large numbers of widebodies have been dumped on the market in recent years. The arrival of several more competitive types has pushed the 747-200/-300 and DC-10-30 down the popularity list. The A300-600 and A310 make a stark contrast. They remain popular, their supply is tight and an active freighter conversion market awaits.

Widebody orphans in search of homes

Used aircraft supply was already ahead of market demand prior to 11th September 2001. With airlines parking or retiring older aircraft used aircraft supply increased. The A300-600, A310, DC-10-30, 747-200/-300 are the majority of used widebodies coming onto the market, and also have established passenger-to-freighter conversion programmes available. What options do their owners have for successful remarketing? There is little concern over 767s and MD-11s coming onto the market. There are a limited number of MD-11s in passenger configuration, and any that become available will be acquired for freight conversion. The supply of 767s is also tight, except for early build-aircraft with JT9D engines. Most passenger operators have no short-term plans to retire.

Market opportunities

Conversion to freighter is the first option usually explored for older aircraft. The low aircraft utilisation levels of freighters require aircraft to have low acquisition costs. Projected demand for medium widebody freighters is 700 units over the next 20 years, an increase of over 550 units. The large widebody freighter fleet is projected to be 900 in 20 years, a net increase of about 700 units. About 120 are scheduled to retire. There is a large supply of large widebody aircraft. Their values are severely depressed due to the parking of large numbers, and their return to passenger service is doubtful.

One important issue in the used widebody market is whether the number of available aircraft is greater than the secondary market's requirement. If so, what effect will the increased volumes have on an already depressed market?

While the A300-600, and A310 are popular passenger aircraft, and demand for these types will probably continue for some time, the same cannot be said for the others. Few passenger operators are looking to add ageing widebodies to their fleet.

The freighter conversion market has bypassed the DC-10 in favour of the MD-11 and 747-400F. This has also made the 747-200SF redundant. The volume of parts and rotables on the market, especially JT-9D engines, is so large that the labour costs of dismantling and parting-out the aircraft outweigh the return from sale of parts.

So what markets, if any, exist for these aircraft? Can they find new operators willing to utilise 20-year old airframes in exchange for very low lease/purchase rates? Will they be converted to freighters, or simply parted out or scrapped for the salvageable money?

Aircraft availability

The number of passenger-configured A300-600s, A310-300s, DC-10-30s and 747-200s/-300s is 795. This comprises 214 747-200s, 76 747-300s, 195 A300-600s, 162 A310s, and 148 DC-10-30s.

This is a combination of parked and passenger operating aircraft. While the future of those aircraft in operation is also in question, it is the current volume of parked aircraft that needs to locate a market swiftly, to avoid extreme losses to the lessors and owners.

Overall, 21% of these aircraft are parked or awaiting re-use. Parked aircraft number 167, and comprise 77 747-200s, 11 747-300s, 12 A300-600s, 17 A310s, and 50 DC-10-30s. Of these 167 23% have been parked by their original owner, 27% have been purchased secondhand and subsequently parked, 37% have been returned to the lessor, and 11% are parked but on active lease.

A300-600 & A310

There are numerous secondary operators who wish to use the A300-600 and A310. FedEx purchased as many A310-200s as possible to operate medium-density freight routes, which suggests the A310-300 will be equally popular. The limited number of A300-600s will ensure its use remains high with both passenger and cargo operators, and availability will be tight.

The fleet of A300-600s/-600Rs has an average age of 10.7 years, an average of 22,900 flights hours (FH) logged, and 11,900 flight cycles (FC). This compares favourably with the A310, which has accumulated an average of 12.3 years, 39,200FH and 10,300FC.

As the youngest aircraft in this analysis, the Airbus fleet will remain popular for some time, partially due to its low average age, suitability to multiple markets and lack of replacement candidates. The A300-600's popularity was demonstrated when Lufthansa acquired three previously operated by Emirates. This was a departure from Lufthansa's normal strategy of acquiring only new aircraft.

Supply of A310s has been diminished by FedEx acquiring the majority of A310-200s for conversion to freighter. EADS-EFW has a conversion programme for the A310-300, and already have aircraft being converted for Intrepid Aviation. There are currently 141 passenger-configured A310-300s available, 17 of which are parked and 124 are operating in the passenger role. This indicates that the market is not oversupplied with aircraft.

Continental is one carrier that has dumped a large number of DC-10-30s on the market. The anticipated demand for large numbers of freight conversions never materialised, and the DC-10-30 has been squeezed out of the freight market by the MD-11 and 747-400F.

747-200/-300

The same cannot be said for the 747-200/-300. The 747-200/-300 have suffered from the arrival of competitors, which have provided airlines with more optimal seat capacity and lower cash operating costs. Most 747-200-/-300 operators have also replaced their aircraft with 747-400s. At the same time, the MD-11 has arrived on the market for freight conversion, and has been the more favoured aircraft. The 747-400F's economics has also suited many freight operators. The MD-11 and 747-400F have therefore squeezed the 747-200/-300 out of the market. There is also a limited market for used passenger 747s.

The 747-200 passenger fleet has an average age of 23 years. Aircraft parked or available for immediate lease have an average age of 24.5 years.

Virgin Atlantic has recently purchased Air New Zealand's three remaining 747-200s, but has since parked them. Their eventual return to service depends on a rise in traffic volumes. Air Atlanta Icelandic has also taken a limited number of used 747-200s/-300s in recent years.

Another option for the 747-200 is freighter conversion, where its volume, range and payload ability make it attractive for long routes. The 747-400F has made inroads into this market, where it offers the benefit of lower operating costs for airlines that are able to generate high utilisation rates to offset its higher purchase price. EADS also believes a 747-400 passenger-freight conversion market will soon develop. The oldest 747-400s have depreciated to a level where the purchase and conversion price becomes competitive.

The market for 747-200 freight conversions has almost reduced to nil. With low demand for the aircraft, the only other alternative is parting-out of the airframe and engines. There is a large volume of JT9D engines available on the aftermarket, and their values are already depressed. The 747-200 market is therefore rather bleak. With few demands as a freighter, even less as a passenger aircraft, and an oversupply of salvageable spares in the market already, there is no ready market for this aircraft.

Due partly to the lower build volume of the 747-300, these aircraft have not suffered as much as the -200 series. Market values of 747-300s have depreciated since the launch of the -400 series, and with operators like South African seeking to replace their seven-strong -300 fleet, and additional aircraft from Ansett, more of these types are becoming available.

There are 65 active aircraft, with a further 11 parked. Of the active operators, Japan Airlines has the largest fleet with 13 aircraft, Saudia operates nine, while Qantas has six.

Freighter conversions have been accomplished for a small number of 747-300s, with hull values now at a low enough level. These aircraft are more attractive than the -200 series, because of the combination of their young age of 16 years and low value, and may be able to find secondary markets when the bulk are removed from first-tier service by the current operators.

DC-10-30

The DC-10-30 was replaced on the passenger scene by the MD-11, A340, 777-200, and later the A330-200. The DC-10-30 had no competitors, and so was in high demand. This changed with the arrival of a string of competitors, and now the aircraft has gone into oversupply.

As a passenger aircraft the DC10-30 has a range of 5,500nm. This is reduced when converted to a freighter, but it has payload of about 160,000lbs. This high weight and large volume makes the DC-10-30CF attractive as a freighter in some respects, and a large number have been converted. The majority, however, are operated by FedEx, and limited numbers are used by other carriers.

Conversions of DC-10-30s may have continued, but the arrival of the MD-11 on the freighter market sooner than expected reduced DC-10-30 conversions. With operators choosing the MD-11 over the DC-10-30 due to longer range, lower operating cost and longer airframe life, demand for DC-10-30 conversions declined. Reduction in range occurs with conversion to freighter, and the DC-10-30CF is a North-South aircraft, not an East-West aircraft. This has limited the DC-10-30CF to the US-Latin America and Europe-African markets, closing it off from the vital trans-Atlantic market. The number of DC-10-30CFs that are likely to be required is limited, and it also faces competition from other aircraft types.

As the number of MD-11s available for conversion decreases, the DC-10-30 may come back in vogue. This assumption would change if the 767-300 became available for freight conversion in large numbers, since it would satisfy operators seeking a mid-range aircraft capable of carrying a large payload, and possessing a greater cycle life.

Current market values of the DC-10-30 are negligible. George Bachelor in Florida recently acquired five ex-Iberia aircraft for a total of $5 million. Gemini Air Cargo operates 12 DC-10s to which it may hold add should the fleet increase. The problems facing the DC10-30 in the passenger and freight market are mirrored by the 747-200, where over-supply and retirements have created a large volume of available aircraft.

Passenger market

When large widebody aircraft are removed from first tier service, the decision about what to do with them can be difficult. Due to the current passenger

Most operators of A310-300s, and A300-600s, have not begun to retire their aircraft, keeping supply tight and values high. This makes total build cost for a converted freighter high. A small number of aircraft have already been converted, but larger numbers will become available in 3-5 years.

climate, secondary operators will be wary of purchasing these types of aircraft in large volumes. A notable exception is Paul Stoddart's European Aviation group (EAL), which purchased BA's fleet of 747-200s. EAL currently operates two aircraft, and another three are parked.

EAL is a charter operator, and may find work for its 747s on the dense summer holiday routes to Egypt, the Bahamas and Greece, or destinations in Asia.

Another operator in a similar position is Corsair, the French charter operator. It currently has five 747-300s parked from its fleet of six. Again, utilisation will increase over the summer when they operate to Reunion Island, Tahiti, and other destinations.

The benefit of these older aircraft types is that their value is so low, that it does not adversely affect the balance sheet to cease operations for a period. This is the reason why Virgin Atlantic parked its ex-Cathay 747-200s following the drop in traffic after 11th September 2001. While an airline would experience considerable cost if it were to park a new aircraft and wait for a market to develop, older aircraft can provide operators with this flexibility because of low finance charges. It is probable that EAL, Corsair and others will selectively operate their aircraft on high-demand summer routes, and accept low utilisations for them over the winter.

The attractiveness of purchasing 747-200s, or DC-10-30s, is still low for most carriers, despite the lease rates that could be negotiated. The low take-up in this area suggests that the market is saturated.

Except for a few notable exceptions, the airline market for the 747-200 and DC-10-30 does not exist.

While the 747-300 may remain with carriers like JAL and Qantas, it is probable that it could experience the same fate as the -200, with secondary airlines selecting a new or used 747-400s at low rates.

The A300-600 and A310-300 will probably avoid this problem, since the A300-600 seems assured of continued passenger demand, while the A310 is already in high freighter demand. If the passenger market is not available for these aircraft, what other alternative markets can owners look at to place their used aircraft?

Freight conversion

The primary option available to a lessor seeking to place older aircraft is to convert them to freighters, and utilise the payload and range benefits these aircraft possess.

Freight conversion costs up to $16 million for a 747-200, $8.5 million for a DC-10-30, and $7.5 million for the A310 and A300-600.

Few A300-600s have been converted from passenger to freighter, with EADS-EFW having launched the conversion with an order for a large number of aircraft from Intrepid. These included some ex-Korean Air aircraft.

Meanwhile, BAE Systems has been examining this market. It is now reviewing its plans to convert the A300-600, partly because a lack of available aircraft is hampering launch. BAE is seeking to sell this facility. Unlike EADS-EFW, BAE was unable to access a suitable volume of aircraft to start this conversion, because most A300-600s are being retained by their original operators, as Gary Fitzgerald of BAE Systems explains. "Our conversion facility requires five aircraft to launch the conversion programme, but the A300-600s are only available one or two at a time." This launch volume requirement may change now that BAE has put the facility up for sale. Once more aircraft are released by their current owners and operators, a conversion market will be readily available.

One operator that may soon reduce its A300-600 fleet is Qatar Airways, which is taking delivery of the A330-200 as a replacement. Slow reductions in the first-tier fleet are expected to occur over the next few years, but not in sufficient volumes to depress the market.

Current market values are still high, due to limited availability. Operators have no plans to replace their aircraft, because of a lack of a similar sized replacement.

There are only large numbers of A310-300s available for conversion. EADS-EFW is the only facility available for freight conversion. EADS-EFW thus has the monopoly on A300-600 and A310 freighter conversions.

There are 17 parked aircraft accounting for 11% of the fleet. The A310-300F provides a maximum structural payload of 87,935 lbs, and 10,044 cubic feet of containerised capacity, making it suitable for short-haul, medium-density routes that do not require high volume services.

Purchase price will vary on these aircraft. Those coming from a substantial operator, possessing a higher maximum take-off weight (MTOW) and better engines are preferred to lower weight variants. Market values vary between $13-28 million. A purchase price of $13-15 million for older aircraft, conversion cost of a further $7.5 million and maintenance would take total build cost to the region of $25 million. This would require the aircraft to generate a lease rate of about $315,000 to recover the cost of purchase and conversion. The market is unlikely to accept aircraft at lease rates higher than $225,000-250,000, indicating that most aircraft are still a little too expensive for general freight, but may be acceptable for express package carriers which can self-finance aircraft.

While the benefit of the A300-600 as a freighter has already been proven, the current shortage of supply preventing

The 747-200 freight conversion market has dried up with the arrival of the more desirable MD-11 and 747-400F. Operators with similar volumes to the 747-200 and that generate high aircraft utilisations have bought factory-built 747-400s. Airlines with lower volumes have opted for the MD-11. This has virtually eliminated the 747-200/-300's secondary market.

further modifications. With Lufthansa purchasing ex-Emirates aircraft to supplement its passenger fleet, it will be several years before aircraft become available in sufficient quantities to reduce the conversion costs incurred. Current values are $8.5-12.5 million for A300-600s and $20-57 million for -600Rs. This makes build cost low enough for the A300-600, since the total build cost will be $18-22 million, and the market will probably bear a lease rate of $250,000-275,000. Build costs of the oldest -600Rs will be about $30 million, and so may be slightly too high considering the market will probably bear a lease rate of $300,000.

The A300-600 has a maximum structural payload of 109,740lbs, and 13,712 cubic feet of containerised capacity, making it suitable for short-haul, medium-density routes.

DC-10-30 freighter

DC-10 market values have suffered due to the earlier than expected arrival of the MD-11 in the freight market. Once MD-11 supply has been exhausted, the DC-10 may experience a return to favour. The aircraft is cheap to purchase and has a low freighter build cost, compared to the freight volume an operator can realise from the aircraft.

Purchase cost estimates vary, with the engine value being the influencing factor since the airframe value is virtually nil. The purchase cost is estimated to be in the region of $2-3 million, however this may be high if the most recent transactions are representative. Most aircraft will require substantial airframe, component and engine maintenance. This could be substantial if one or more engines require a shop visit and a heavy airframe check is necessary.

Freight conversion and cargo handling system installation totals about $9 million. For a total build cost of $15-20 million, an operator has a significant freight volume and cost advantage.

A DC-10-30 which requires an investment of $15-20 million will require a lease rate of $200,000-250,000 to cover build costs. The DC-10 has similar build costs to the Airbus products, but the DC-10-30CF provides the operator with greater range and more capacity payload. A DC-10-30CF has a payload capacity of 155,000 lbs, and 56,000 cubic feet of containerised volume.

747-200SF/-300SF

The purchase price of a 747-200 is about $4 million. Like the DC-10, the main price driver is the engines. Conversion cost for the 747 is about $16 million, taking probable build cost to about $20-23 million. Lease rates have fallen to less than $350,000, but this is enough to justify conversion. The problem is that the 747-200SF is a high risk aircraft, since it is unlikely to be required by airlines for long enough, despite having the highest capacity, to recoup investment. The 747-200SF's main problem is that it is squeezed on both sides by the MD-11 and 747-400F.

The case may be different for the 747-300, which can be acquired and converted to freighter for a similarly low amount, but with the advantages of a longer remaining life and highest MTOW and performance. The 747-300 is still likely to be squeezed out by the soon-to-arrive 747-400 conversion.

Demand for large widebody freighters is not high, with Boeing estimating that up to half the increase will be factory-built aircraft. That still leaves about 350 units to be converted. The MD-11 fleet will account for about 80, since this is roughly the number in passenger service. Another 270 will need to be sourced from the DC-10-30, 747-200/-300 and 747-400. The majority are likely to be converted 747-400s.

Parts salvage

The parts market mostly encompasses the 747-200/-300 and DC-10. The values of older airframes are driven by the value of their engines. Aircraft with CF6 engines have the highest values. The realisable value of a 747-200 is now in the region of $1-2 million.

The JT-9D engine, and its derivatives, have depressed values in the region of $250,000-$500,000. Apart from engines, the only other valuable parts that can be secured from these aircraft is the APU, and potentially the avionics. The landing gear may have some value, but as most operators are involved in an exchange programme, this is a limited market.

The cost of removing other items may exceed the value realised from sale. Once the engines, APU, and perhaps avionics and landing gear are removed, the aircraft has scrap value.

Summary

The A310 and A300-600 will continue passenger service, but will retire in larger numbers over the next 3-5 years to generate higher conversion volumes.

The 747-300 will continue as a passenger aircraft for some time yet, but a few will be able to secure a freighter role.

The DC-10 has a very restricted market, but this is may change when the remaining 80 passenger configured MD-11s are converted to freighters. UPS has options on 20 aircraft, and FedEx may buy the ex-Swissair aircraft, reducing the available number to less than 50. This may rekindle some interest in DC-10-30 conversions. It is a durable aircraft and is price competitive. Most DC-10-30s will still remain unconverted.

There are few or no options for the 747-200, with the exception of aircraft that can be used for passenger operations. Dismantling is the only realistic option for most. AC