

The freighter fleet is expected to grow by 1,300 units over the next 20 years. Another 900–1,400 will retire. An assessment of where the aircraft will come from to meet the demand is made here. Secondary market prospects for different aircraft types are variable.

The 20-year scramble for freight conversions

The growth of the freighter fleet has been supported for the past 10 years by a plentiful supply of used first-generation widebodies and narrowbodies. Because this supply of aircraft is finite, the market will soon have to take stock of what is left as conversion candidates and what it will then be forced to do once this supply is exhausted.

Conversion of aircraft to freighters and leasing or selling them to new operators provides many with a strong supply of business. How soon will it be before the remaining 727-200s, A300B4s, DC-10s and 747-100s and -200s are bought up, and the industry has to start considering a younger generation of aircraft for freight conversion?

Demand for freighters

The demand and supply of freighters is constantly being assessed by elements of the industry, including lessors, brokers and traders, airlines and aftermarket suppliers. The demand for new aircraft is forecasted each year.

The total freighter fleet is expected to grow by about a net 1,300 units over the next 20 years. Many of the 1,400 current fleet are old, however, and will retire over this period. Although freight aircraft are kept in service for as long as possible, economics, modifications and environmental legislation will force retirement.

The current fleet is comprised of about 580 aircraft in the DC-9, 737-200

and 727 category; 410 DC-8s, 707s and 757s; 130 767s, A300s, L-1011s and DC-10s and about 260 DC-10-30s, MD-11s and 747s.

Out of these aircraft, most of the DC-9s, 737s, DC-8s, 707s, L-1011s and 747-100s and -200s are expected to retire. The majority of 727s in the current fleet will also retire and even some A300B4s and DC-10-30s will also be disposed of. Although the A300B4 has only recently entered the freight fleet, the oldest are now 20 years old. Many will retire when they come due for their second eight-year check; after 16 years. The most noticeable feature of projected fleet growth is that the 707/DC-8/757 category is expected to diminish and give way to widebodies.

The majority of DC-10-10s could be kept in service during this period, since they have recently been put through the MD-10 modification plan.

The number of retirements of the current 1,400 aircraft over the next 20 years is expected to be between 900 and 1,150. This, combined with growth, will provide an opportunity for up to 2,200–2,400 new aircraft to be added. Some of these will be factory-built freighters, but economics will stipulate that the majority will have to be converted passenger aircraft.

The first aircraft to be converted to supply part of this 2,200 units will be the oldest available with the lowest market values. To assess how many of these will be supplied by the older types, it is necessary to analyse the 727, A300B4,

DC-10 and 747-100/-200 fleets to see how many aircraft remain as potential conversion candidates, the age of the aircraft and when each fleet might be sold or disposed of by its current passenger operator.

727-200

A respectable number of the 2,200 new aircraft will come from the remaining 727-200 fleet. The last fleets of the major US operators are now being retired, as are the last few aircraft operated by carriers such as Iberia. The 727s that remain in passenger operation are a mixture of small fleets in secondary carriers and larger fleets in the major airlines.

The large fleets constitute about 25 non-hushkitted aircraft with Iberia. Delta has 120 aircraft which have recently been sold. About 20 will be scrapped but the other 100 have been bought by Republic Financial Corp and will be converted to freighters. This will be the next large group of high gross weight 727Fs to come on the market. These aircraft are hushkitted -15/-15A-powered models.

American has a remaining fleet of -9 powered aircraft, which are hushkitted with Feasi and Raisbeck hushkits. United has 75 high gross weight hushkitted aircraft, which it will keep until 2007. Northwest still has 37 727s, 34 of which are hushkitted. Northwest will replace these aircraft in the next few years.



Continental has 23 aircraft and these are due to be returned to lessors before the end of the year. These are not hushkitted and may be bought by Pegasus. TWA has a fleet of 26. Eleven will be scrapped and 15 high gross weight models have been bought by Pegasus for re-engining with the BF Goodrich system.

Out of these fleets there are about 300 aircraft left which potentially could be converted to freighters. The secondary market suppliers in the industry consume quite a large number of 727s by scrapping and cannibalising them for parts. The large major airline fleets will present more attractive propositions for freight conversion and so these are more likely to be preserved for freight conversion.

The majority of these 300 aircraft will come available in the next two years, while the United aircraft will not come onto the market for several years. Freight carriers continue to demand the 727, but the rate of passenger airline retirement will not necessarily coincide with freight carriers' fleet acquisitions.

Investing in 727s presents several obstacles which buyers need to be aware of. The all-up cost of buying -7/-9 and -15/-17-powered aircraft, converting them to freighters and performing the maintenance necessary to make them operational is similar. The lower gross weight aircraft are also older (*see Late 727 retirement calls for prudent acquisition decisions, page 19, Aircraft Commerce, May/June 1999*).

The lease rates for the two groups of freighters vary. The implications are that lessors and investors will find it hard to

make a business case of acquiring and converting older aircraft. This means that values of older 727s will either have to fall below their current level of about \$3.0 million, or investors will avoid them and just acquire younger aircraft.

A300B4

The number of passenger configured A300B4s is now limited. Already 72 aircraft have been committed to conversion and only 13 of these have yet to be marketed by C-S Aviation and Pinnacle Aircraft Leasing to lessees.

This leaves only 98 A300B4-100s and -200s not yet converted and still in passenger operation. The small fleet of -100s is aircraft operated by Thai, Onur Air and Air Alfa. The -200 fleet is aircraft operated by Air Afrique, Air Anatolia, Air India, China Airlines, Indian Airlines, Japan Air System (JAS), Pakistan International and South African Airways. There are also two fleets leased to Sempati and Philippine Airlines (PAL).

Many aircraft are operated in small fleets and are regarded as in a poor maintenance condition to make freight conversion economic.

The fleets of A300B that lessors would consider buying belong to JAS, Indian Airlines, Sempati and PAL. Japan Air System and Indian Airlines are short of capacity and need to keep their fleets. This leaves the Sempati and PAL aircraft as the first best A300B4 options.

Although other A300B4 fleets should not be discounted, they are small and so are less attractive to lessors. Overall this means that perhaps only 50-60 more

A large number of DC-10-30s are due to come onto the market, including Continental's large fleet. These will be enough to satisfy demand for freighters for some time to come.

A300B4s will become available for acquisition over an extended period.

DC-10

Virtually all DC-10-10s have been acquired. The American and United aircraft have all been earmarked for purchase and conversion by FedEx. The only other operator of DC-10-10Fs is Emery. There are still some small fleets which are operated by: Premierair (4), Hawaiian (10), Continental (3) and Sun Country (4). It is possible that these could get converted to freighters, but the most likely occurrence of this will be if FedEx wants to increase its fleet.

This leaves just the -30 and -40 fleets for acquiring aircraft. The DC-10 is so popular as a freighter that many good -30 passenger fleets have already been sold and acquired by freight carriers.

Like many other types, FedEx has managed to produce a large DC-10-30F fleet. Other similar operators include Gemini Air Cargo, United Airlines and DAS Air Cargo.

DC-10-30 fleets have already been dissolved by major airlines such as British Airways, Lufthansa, Air France, Alitalia and Swissair. Swissair's -30s were bought by Northwest Airlines and added to its large -40 fleet. Finnair and other carriers sold their aircraft to French operator AOM, which has built up a sizeable fleet.

The number of major airline -30 fleets left for possible acquisition for conversion are therefore diminished. The larger fleets left belong to American (5), AOM (12), Bangladesh Biman (4), Canadian (10), Continental (31), Garuda (7), Iberia (5), Northwest (20) and United (5).

AOM, Biman and Canadian will not sell their aircraft for the foreseeable future. Northwest operates its -30s together with another fleet of -40s. It had placed orders for A340s, which would have replaced its DC-10s, but then cancelled these. Northwest's aircraft are therefore unavailable for several years.

Iberia, United and Continental have placed orders for either A340s or 777s to replace their DC-10-30 fleets.

Continental's aircraft will be returned to their lessors and will start to become available, as will the Iberia and United aircraft. These three fleets are able to satisfy demand for DC-10 freighters for some time to come. These will join the aircraft already retired by British Airways, some of which have already

been converted and the remainder will eventually be converted.

Other smaller fleets of DC-10-30s are operated by Air Liberte (3), Avenza (2), Condor (2), Ghana Airways (2), Japan Air System (1), Laker Airways (2), Monarch (1) and World (2). Condor will soon dispose of its aircraft, but most others have no plans to replace them in the short term.

The -40 fleet is smaller. The only fleets left in operation are Japan Airlines (14), Japan Air Charter (3) and Northwest. JAL's aircraft have all been bought by Irish leasing company Omega Air. This just leaves Northwest's fleet, and the airline has no immediate plan to retire these.

Overall, the number of DC-10-30s and -40s that could become available for freight conversion will eventually be as high as 160. Some will undoubtedly be scrapped for parts. The number that will be available in the short-term will not be higher than about 40 -30s plus BA's converted fleet and the remainder of JAL's -40s, as they get bought by Omega and then leased. The supply of -40Fs may be high for some time now that UPS has bought Challenge Air Cargo. This has triggered rumours that the -40Fs may be returned to their lessor. A shortage of DC-10Fs is not likely to materialise in the short term.

Only when Canadian and Northwest make a decision about retiring their fleets will the last of the major DC-10 fleets start to break down. Considering the number that already have to be absorbed by the freight sector before these and the negative effect on values retiring early would have, it is likely to be several years before this happens.

The total number of DC-10-30/-40s that could become available for freight conversion over an extended period will be about 130.

747-100/-200

The age and high modification status of the 747-100 fleet is now such that no aircraft are likely to present themselves as strong conversion candidates. There are about 30 -100s left, but this includes nine BA aircraft which have been bought by AAR for parts salvage and 10 Saudia aircraft, the fate of which is uncertain.

There are 180 747-200s left in passenger configuration. Some of these are major passenger airline fleets, including aircraft operated by Air France (8), Air India (7), Air New Zealand (4), Alitalia (7), All Nippon Airways (5), BA

(14), El Al (6), Garuda (6), Iberia (6), JAL (16), Lufthansa (5), Northwest (20), United (7) and Virgin (7).

Some of these are already due to be retired or are for sale. This includes Garuda's -7Q-powered seven aircraft, and those of United, All Nippon, Air France, Air New Zealand and Korean Air. Most airlines have now placed orders to replace their 747-200s.

The 747 aftermarket is currently oversupplied. The recent retirement of BA's and United's large -100 fleets has put a lot of spare material and engines on the aftermarket. Other aircraft have been on the market for some time, including high gross weight models such as Garuda's fleet. The oversupply of 747s is not helped by the Asia Pacific crisis and global excess freight capacity. This has temporarily stifled demand for 747 freighters. It could be several years before demand recovers enough to stimulate conversion of a significant number of 747s. When this does happen, only the highest gross weight aircraft will be in demand. This will include aircraft powered by the CF6 and JT9D-7Q and -7R4G2. Rolls-Royce RB211-powered aircraft also have high gross weights, but are less desirable and have the stigma of an industry orphan.

The 747-200 will also have to compete with the MD-11 and 747-300, which will also start to come available at the same time demand for the 747 starts to re-strengthen.

Although all 180 747-200s are good freighter conversion candidates, many could be left by the wayside while demand is low – and they will be 25-30 years old when demand returns. The

MD-11 and 747-300 will be strong competitors. The 747-300s are all high gross weight. Their only aftermarket with significant potential is freight conversion. All these factors make investing in the 747-200 and converting it to a freighter a risky business for investors.

There are about 100 JT9D-7Q/-7R4G2 and CF6-powered aircraft, for which the prospects for freight conversion are good. About 150 aircraft the size of the 747 are expected to be converted over the next 10 years. Some of these, however will be MD-11s and 747-300s. This casts doubts on the prospects on some of even the best 747-200s.

Younger aircraft

The total number of 727s, A300B4s, DC-10s and 747-200s that could become available is 600-750. This number will come onto the market over a protracted period, but the final ones that get retired and then converted will be in about seven to eight years.

Only a minority of the requirement for 2,200-2,400 aircraft will be met by first-generation widebodies and narrowbodies. Another 200-300 might be supplied by new aircraft for airlines that can make a business case for operating them.

This leaves about 1,200-1,300 aircraft that will have to be supplied by converted second- and third-generation aircraft. The category of small freighters is expected to increase by a net 344 aircraft. Taking retirements into account, about 540 additions will be



The number of 747-200s available for freight conversion is excessive compared to demand over the next few years. Even high-quality 747-200s will be difficult to sell.



needed over 20 years. Only about 200 large narrowbodies will have to be added. The fleet of smaller widebodies will require about 550 additional aircraft, while about 750 large aircraft will be needed over 20 years. The prime candidates in second-generation aircraft are the 737-300/-400, 757-200, MD-80, A300-600, A310, MD-11 and 747-300.

The oldest of these is the MD-80. The first aircraft are now 20 years old and are due to be retired en masse by American, Delta and Continental. Although the freight sector will resist change for as long as possible, it will eventually be forced to consider the MD-80. The MD-80's values will fall to the point that the lease rate for a converted aircraft will make its overall costs of operation superior to the 727-200, which has rising maintenance costs. Moreover, traffic growth and replacement alone cannot be met by the last 727s due to come on to the market. The growth in the fleet of small aircraft is expected to be about 350 units. Retirements could add 300-500 units over this time, taking total requirement to about 840. Up to 540 aircraft will have to be factory-built or converted later-generation aircraft.

The number of MD-80s that could be taken up by the freight sector is several hundred, or even a 1,000, aircraft less than the number of aircraft in global the MD-80 fleet.

The 727-100s are now 30 years old and younger aircraft are becoming increasingly expensive to operate. The

advantage 727-100s have is that many are fully depreciated. The oldest 737-300/-400 are nevertheless approaching 15 years old. Their values could be low enough in the next five years to make their lease rate and overall operating cost competitive against the 727. This will allow the oldest 737-300s and -400s to create an opportunity for themselves to be taken by the freight sector. The 737 has the advantage of a cross-section identical to the 727 when considered against the MD-80. There are also large fleets of 737-300s and -400s, which their operators have already made plans to replace. A battle for acceptance by the freight community will ensue between the 737-300/-400 and MD-80 in the next five years.

There are about 757s now in operation. Speculation that DHL is about to launch a freight conversion programme with BA's aircraft indicates that values have fallen enough. The number of 707/DC-8/757s is actually expected to decrease in the next 20 years. This is explained by the 707 and DC-8 giving way to widebodies. Taking retirements into consideration, about only 200 757s will be needed to meet demand.

The A300-600 and A310 fleets present freight airlines with some attractive choices. Virtually all A300-600s and A310s are with their original operators. This provides lessors and freight airlines with sizeable fleets of aircraft with uniform specification and maintenance history.

There are 160 A300-600s. The largest fleets are operated by Emirates,

BA is rumoured to be selling its 757s, which could be the first to get converted to freighters. Because the 707 and DC-8 are expected to give way to widebodies, the demand for 757s will be small.

Lufthansa, American, Egyptair, China Airlines, China Eastern, Saudia, JAS, Thai and Korean Air.

There are about 150 A310-300s. A smaller number are operated by major carriers, including: Air India, Austrian Airlines, Emirates, Lufthansa, Singapore Airlines, Swissair and Air Portugal. The first A310-300 freight conversion is expected to be launched within the next two years. Many A310 operators are expected to start replacing their aircraft. Nearly all A310-300s are good conversion prospects, although it will take several years for their values to fall enough for conversion to be economical.

The A300-600 and A310-300 will face competition from the 767. Although the freight market always first converts the aircraft that are the least popular and have the lowest values, the first 767 conversion programme may soon be launched with 767-200s by a Boeing modification.

There are 211 767-200s and 482 -300s in operation. The fleet in the A300/310/767 category is expected to grow to about 650 aircraft in 20 years compared to today's fleet of 130. About 620 aircraft will have to be added. There are plenty of aircraft to satisfy demand in this sector.

The MD-11 and 747-300 are the next aircraft in line to follow the 747-100 and -200. There are about 100 passenger MD-11s and 50 747-300s available. The MD-11s will all be sold by their operators and are a formidable competitor to the 747-200. The fleet in the DC-10-30/MD-11/747 category is expected to grow by 550 units in 20 years. Taking retirements of early DC-10s and 747-100s into account, about 750 additional aircraft will be required. All 747-200s, MD-11s and 747-300s could be acquired for freight conversion. The mis-match of expected retirement age and time when demand for these aircraft is expected to increase, however, could mean many miss the opportunity for conversion.

Demand will be weak in the next five to 10 years, which will put a lot of downward pressure on these aircraft. The requirement for aircraft after about 10 years is more likely to be met by the oldest 747-400s when a conversion programme becomes available. 