

Various passenger to freighter programmes have been waiting for aircraft values to fall to trigger a new wave of conversions. The continued economic difficulties experienced by airlines has pushed values of types into the region to stimulate conversions.

Used aircraft enter the zone of convertibility

The weak aircraft market continues to place pressure on market values. Low aircraft values increase the chances of freighter conversion, since they reduce the total cost of preparing a converted aircraft for freight operation. A lower total cost of preparing an aircraft for service as a freighter allows lessors to offer the aircraft at lease rates that are acceptable to themselves and operators.

The 737 Classics (-300/-400), 757, and 767 (-200/-300), A300-600 and A310 are all candidates for passenger-to-freighter conversions as a consequence of the fall in their values, which is sufficient to make conversion economic for many aircraft. The combined purchase, conversion and maintenance costs drive the minimum lease rates at which aircraft can be offered by lessors to make a return on their investment. If this lease rate is also economic to operators, conversion can go ahead.

Parked aircraft

The number of parked and available aircraft has increased over the past 18 months. The 737-300 and 757-200 are among the most commonly available aircraft, which influences their values.

The average age of parked aircraft (see table, page 14) will also influence appeal for conversion to freighter. Younger examples, or those with low flight cycles, will be preferred. Not all parked aircraft are suitable for conversion. Unsuitable aircraft include early variants, those with lower maximum take-off weight (MTOW), and

payload-range restrictions. Older aircraft are also less desirable, because they have a limited operating life.

MTOWs can often be increased or upgraded during freighter conversion by incorporating service bulletins (SBs). A higher MTOW enhances the operating economics of any freighter.

Express packages have lower packing densities of about 7lbs or less per cubic foot, meaning that volume limits are reached before weight restrictions. High volume is therefore more important than payload for express parcels. Types with high volume capacity will therefore be favoured by freight carriers that operate the largest fleets.

The number of parked aircraft, while currently high, may decrease again as conversions start to be performed. "We expect the market demand for 757 passenger-to-freighter conversions to be in the region of 160 units by 2010," says Brian McCarthy, vice president sales and marketing at Precision Conversions. "That may be a conservative number, but in the current environment, it is achievable. I expect 35 757 conversions will have been performed by the end of 2003, 34 Boeing conversions for DHL and one by us. The 757 is an ideal 727-200 replacement; representing lower direct operating costs, higher payload, increased cubic volume and a growing quantity of conversion candidates."

Aircraft values

Airlines have retired large numbers of older aircraft. Low aircraft values (see table, page 14) also mean lower lease

rates can be accepted for freighter aircraft. This will bring the aircraft into a larger zone of convertibility. Too high a value will limit remarketing prospects to passenger carriers, although there are some limited prospects. Values are mainly determined by supply versus demand.

Aircraft values have fallen, with the 737-300/-400, 757 and 767-200 experiencing some of the largest drops, while other types, notably the A310 and A300-600 have held more of their value.

The A300-600 was built in limited numbers, and there are few signs of any retiring. The same is true for the A310-300, although some small fleets are slowly becoming available.

Availability of 737s, 757s and 767s has increased in the past two to three years. These types also have clearly defined markets with primary carriers, which have problems of overcapacity. There are therefore few remarketing possibilities for them.

Airlines have downsized from the 757 to the 737-800, 737-700, A321 or A320 to reduce capacity while maintaining frequency. The 767 has been reduced for similar reasons. The 767 has also waned in popularity since the A330-200 entered service. Airlines are also less concerned about developing new routes, which was a previously dominant role for the 767.

"The market for the 757 and 737 is not that buoyant. However, that will not last. The market will bounce back as demand for freighters increases, and the 757 is an efficient type that serves many markets," says Bob Convey, sales and marketing manager of SIE. "Market value is elastic, as demonstrated with the

AIRCRAFT ACQUISITION, BRIDGING MAINTENANCE & CONVERSION COSTS COMPARED TO FREIGHTER MARKET LEASE RATES

Aircraft	737-300	737-400	757-200	767-200	767-300	A300-600	A310-300
Average age	14.2	12.3	11.7	19	9.5	12.7	15.4
Current market value-\$m	4	9	16	8	25	20	10
Freight conversion & freight handling-\$m	1.9	1.9	4.5	8.6	9	9	7.5
Maintenance-\$m	2	2	2	4	4	4.5	4.5
Total current cost-\$m	7.9	12.9	22.6	20.6	38	33.2	22
Required lease rate (1.2% per month) -\$	95,000	155,000	271,000	247,000	456,000	398,000	264,000
Market lease rate-\$	125,000	135,000	200,000	225,000	275,000	260,000	225,000
Acceptable total cost-\$m	12.3	13.3	19.8	22.2	27.2	25.7	22.2
Required market value-\$m	4	9.4	13	9.6	14.2	12.5	10

727. Prior to FedEx converting large volumes of 727s, their market value was virtually zero. The demand by FedEx pushed the value back up. A similar trend could occur with the 757 as interest develops. The question is, how far will the market rebound?"

Availability of acceptable aircraft is also a factor in the lease cost that freighter aircraft will be offered at. "Individual aircraft prices may vary significantly, dependent upon the age of individual aircraft and engine configuration (that is, Rolls Royce versus Pratt & Whitney)," explains McCarthy. "A significant catalyst for any successful conversion programme is the availability of meaningful blocks of standard aircraft, and not just low values. Commonality of an available fleet will be a major driver of aircraft prices and operator interest for the larger airlines. There are some great aircraft currently available, but they are in units of ones and twos. Lessors will probably assemble groups of these available aircraft to attract the interest in operators, giving them a presence in this growing market."

Economics of conversion

The economic viability of lessors converting passenger aircraft to freighters is dictated by the lease rates the market can bear. A minimum lease rate factor of 1.2% of aircraft cost is required for lessors to make a reasonable investment return. The required lease rate has to at least match the rate the aircraft can realise in the market.

With conversion cost for each type relatively fixed, excluding negotiated discounts, the minimum lease rate required will be influenced by purchase cost. Average market lease rates for each

aircraft type and the lease rate required to make conversion economic for a lessor are both shown (*see table, this page*). Using the market lease rate and conversion costs as fixed amounts, the acceptable market value a lessor can justify paying can be calculated as the remaining variable.

The market lease rate is the amount identified by freight operators and lessors as acceptable.

Higher value aircraft like the 767-300 and A300-600 would have a total cost of preparing them for service as a freighter that would require a lease rate that is too high for a majority of freight operators. Aircraft would need to be greatly depreciated to justify their conversion.

The values of 737-300s and some 757s are low enough to justify freighter conversion. Values of younger 757s are still high. For example, ex-National Airlines aircraft are only 2-3 years old. Older aircraft are candidates for conversion.

"There is a surplus of 757s due to the availability of United and National aircraft. We believe that the aircraft will have to be below \$10 million before they become conversion candidates, due to the high conversion cost offered by Boeing," says Brian Olds, president of aircraft sales and leasing at AAR. "If cheaper conversions can be offered the hull value at which conversion is economic can increase. The 757's values still have to fall to make it competitive against the 727. Aircraft values will definitely return to some degree, but not to pre-11th September status. All aircraft values have shifted downward. This is partly due to overcapacity and new aircraft being placed in the market cheaply. There has been a permanent reset of aircraft values to lower overall levels."

767-300/-200

The 767-300 and -200 are close competitors of the A300-600 and A310, based on mission requirements and cargo capacity. These types will therefore command similar lease rates in the market.

Conversion programmes are being developed by Bedek Aviation and Boeing, which may use Aeronavali as an exclusive license holder.

The 767-200 has market values of about \$8 million, with a conversion cost of about \$8.5 million. Additional airframe, engine and component maintenance would add about \$4 million. This produces a total cost of about \$20 million.

Lessors believe the 767-200SF would have a market lease rate of about \$225,000 per month. Minimum lease rates required for this investment, with a lease rate factor of 1.2%, will be \$240,000-250,000, dependent on actual purchase price. This makes conversion at this cost uneconomic.

A small reduction in hull cost, or discount in conversion cost, would reduce the required minimum lease rate, making the 767-200 economic to convert. Values of 767-200s will soon fall below \$8 million if they are not remarketed in the short term.

The current market value of a 767-300 is about \$25 million (*see table, this page*). Few aircraft are currently available. "The market has taken its toll on the 767. It is reaching the end of its production life, and it is difficult to get someone to pay a premium to operate," says Olds. "Lowering capacity affects widebodies first. The values of these aircraft will drop substantially when combined with market oversupply. Values

The large supply of 757s and weak passenger demand has put downward pressure of their values for the past two years. Values of some have dropped below the \$10-13 million level, pushing them into the economic zone of convertibility. The first aircraft are now to be modified to freighter with a non-OEM programme; by Precision Conversions.

are still relatively high, which makes its economic viability questionable. Values would have to fall to \$15-17 million to justify conversion. The 767-300 is a good conversion option, but the cargo economy has to be more advanced to justify this type of aircraft.”

Based on a purchase cost of \$25 million, conversion cost of around \$9 million and additional maintenance of \$4 million, the investment of \$38 million would need a monthly lease rate of about \$400,000 (see table, page 14).

Analysts believe a lease rate of about \$275,000 would be acceptable to freight operators, meaning that the 767-300's values are too high. Based on a static conversion cost of \$9 million and a lease factor of 1.2%, the hull value would have to fall to about \$14 million for conversion to be economic. Discounts for conversion would raise this value.

757-200

The value of the 757 is currently depressed, with some aircraft reportedly available for \$10 million. US Airways received a discounted lease to continue operating its fleet of 757s. Other airlines are paying up to \$260,000 per month if they have been unable to re-negotiate their leases.

The 757 is under review by many operators, while demand for its conversion to freighter has not yet developed. “Demand for the 757 is in its infancy, although interest in the type is high. We believe it will be another 12-18 months before operators require this type of aircraft,” says Convey. “The market for the 757 is there, but the current market conditions are suppressing potential demand.”

Market demand for 757s will increase as operators begin to seek additional aircraft. “The 757 is the likely candidate aircraft to replace the 727-200, since there is no direct replacement,” says Convey. “Operators will either decide to upgrade capacity to a 757, or reduce capacity to the smaller 737-300. This trend will continue until the A320 becomes available for conversion. The 757 is very versatile and will be the right fit for many markets.”

Conversion costs for the 757 vary.



The Boeing conversion is expensive at \$9 million for a 14 pallet conversion. Besides Boeing, four other companies are developing 757 conversions, including Precision Conversions and SIE. Both of these have list prices of about \$4.5 million and offer 15 container positions. Pemco may also develop a conversion.

Precision Conversions has just signed a deal with Boulliou to convert two 757-200s. Robert Genise, chief operating officer at Boulliou believes the 757 has a significant potential as a freighter, especially in replacing 707s, DC-8s and 727s.

Both Pemco and SIE estimate a conversion cost of about \$4.5m for a 15 pallet option. A 14 pallet plus smaller 15th pallet option will also be offered by SIE and Pemco, since it is a quicker and conversion can be offered for about \$1 million less.

Based on an average conversion cost of \$4.5 million and additional maintenance cost of \$2 million, the 757's value could not be higher than \$13 million for the total investment to be adequately covered by an expected market lease rate of \$200,000.

Aircraft with current values of \$16 million would require a monthly lease rate of about \$250,000. This means 757-200s with the lowest values are entering the economic zone of convertibility.

Hull values of most need to fall by an additional \$2-4 million, or a lower conversion cost would have to be negotiated, both of which are feasible.

The 757 is very close to economic convertibility, supporting the view that the market will develop in 18 months, and that it will prove a popular freighter.

737-300/-400

The popularity of the 737 for lower volume freighter conversion is growing, with new freight operators preferring the aircraft. Values of 737s are relatively low.

Pemco has three conversion lines, and is converting about 12 aircraft per year.

With a conversion cost of about \$1.9 million, the 737 is a cost-effective option. “The demand for the 737-300SF remains stable,” says Smith. “However, we expect demand to increase over the next 12-18 months as the industry begins to anticipate an economic recovery. The 737 is the best small aircraft available for conversion today. It is unlikely we will see parked 727s converted to freighters, and there are few other choices of aircraft in the 17-20 ton category.”

With a conversion cost of \$1.9-2.5 million, the 737 provides a favourable return to lessors. The 737-300SF can command a lease rate of \$120,000-140,000 per month, which is economic to both lessors and operators, considering value and conversion.

There are a large number of 737 Classics available with an average age of 12-14 years.

Purchase cost for a 737-300 is about \$4-5 million, additional maintenance would be about \$2 million and a conversion cost of \$1.9 million. This will take total investment to \$8 million. The minimum lease rate required, based on a lease rate factor of 1.2%, for this investment is \$95,000-100,000. This clearly indicates there is an economic case for converting the 737-300.

Values of 737-400s are in the region of \$9 million. Additional costs during



conversion would take total investment to \$13 million, meaning a lease rate of \$155,000 would be required. This compares to a probable market lease rate of \$135,000, illustrating values of 737-400s are still too high. Conversion programmes for the 737-400 have yet to be developed, but will be followed by Pemco when values have dropped to the right levels.

A310

Availability of A310-200s has been diminished by FedEx, with the remaining aircraft being either early variants or having limited market appeal. EADS-EFW has performed 44 A310-200 conversions, with five more orders, and has limited future demand. "The A310-200 has limited appeal when compared to the -300 version. The market value difference is now \$2-3 million between the variants, but you get a newer aircraft with greater range and payload capabilities with a -300," says Jurgen Haberman, vice president, sales and marketing, EADS-EFW. "We see market demand shifting towards the -300, and this will become more pronounced as values of the variants drop further to equal levels. EADS-EFW has converted four -300s for commercial operation, and we see this increasing over the next 18-24 months."

The A310-300 has a market value of about \$10 million, with a conversion cost of \$7.5 million. An additional \$4-5 million would be required for maintenance and would take total

investment to about \$21.5 million. This would require a lease rate of \$260,000-270,000 per month. The aircraft can probably command a lease rate of \$225,000-235,000 per month, putting the A310-300 in the economic zone of convertibility.

An increased number of -300s in the market will further reduce their market value, making them even more economic to convert.

A300-600

Few A300-600s have made it to freighter conversion. EADS-EFW is the only conversion facility that holds a STC for this type. Flight Structures recently purchased the A300-600 conversion facility from BAE Systems, and will develop a conversion STC.

The A300-600, like the 767-300, is a future conversion candidate that has limited current appeal. "There is a limited supply of -600s, keeping values high. Airlines are not removing the -600 from their fleets as quickly as expected, since it remains an effective passenger aircraft," says Haberman. "EADS-EFW has converted seven aircraft so far and we hold a further 18 orders. We expect availability to change in the next 12-18 months, but demand for the -600F is in its infancy. Its payload-range is superior to any competitor, and this alone is a positive."

The A300-600 should attract a market lease of about \$240,000 per month. The -600 has an average hull value of \$20 million, which is currently

The A310-300 provides a good value for conversion given its capacity and range capabilities compared to its young age and total cost of acquisition and conversion to freighter.

too high for conversion to be economic. Considering conversion and maintenance, the -600 would need to drop by \$7-7.5 million to about \$12.5 million.

Industry experts believe the -600's value may shortly fall due to the potential re-organisation of American Airlines, since it has too many fleet types. This will place a large amount of standardised equipment on the market, driving the value down. Some analysts believe the fall of A300-600 values could be more dramatic than those of the 767-300.

Summary

The increased volume of parked or available aircraft has significantly reduced total investment to make aircraft ready for service as freighters. Values are low enough to make conversion economic.

The competition between the A300-600 and 767-300 will be won by the aircraft whose value falls furthest and fastest.

The A310-300 is already economically viable to convert, while the 767-200 is now approaching the zone of convertibility. The 767-200 has a higher cargo volume and lower purchase cost, but the A310-300's younger age may be its advantage.

Both the 767-300 and A300-600 are too expensive to justify conversion. Both these conversion options are viewed as a medium-term investment that will develop in 12-18 months time. These aircraft are not yet in the economic zone of convertibility, and prices will have to fall substantially to make them economically viable.

The 757 is approaching values that make conversion economical, but large blocks are presently unavailable. If the passenger market rebounds 757 values will increase.

Lessors can now begin to purchase aircraft, convert them and offer them to the freight market at lease rates that are acceptable to themselves and operators.

The soft market conditions have not yet triggered a wave of conversions, but freight traffic is still down on 2000 levels. When the market rebounds, some aircraft will go back into passenger operation and aircraft values will rise again, taking some out of the economic zone of convertibility. The older examples will remain parked, and so be converted. [AC](#)