

Older generation narrowbody freighters continue to provide reliable service, while younger aircraft offer lower operational maintenance costs and superior operating performance. Freight carriers describe how their narrowbody freighters serve them in operation.

Narrowbody freighters in service & operation: 727-100F/-200F, 737-200F, 737-300F & 757-200F

The old generation 727-100F/-200F, 707F and DC-8F have given way to younger freighters. While the DC-8 and 707 are being replaced by smaller widebody aircraft, there is a variety of aircraft with which to replace the 727. As there is not yet a direct replacement for the 727-200, airlines may choose from the smaller 737-300/-400 and larger 757-200. In addition to 727 replacement, there is a small number of small jet and large turboprop freighters to be replaced, including types like the 737-200. Freight airlines also have to consider aircraft for new routes and services. While the economics of older and younger aircraft must be taken into consideration, their operational performance and reliability must also be included in an overall fleet planning assessment. The operational performance and service experience of several freight carriers with the 727-100F/-200F, 737-200F, 737-300F and 757-200F are analysed here.

Blue Dart 737-200Fs

Few airlines have adopted the 737-200F, even though the aircraft has low acquisition costs. Many of the freight carriers that have utilised the 737-200F have been start-up small package operators, including the Mexican carrier, Estafeta Carga Aerea, and the Indian operator, Blue Dart.

Blue Dart Express started operations in 1984, and has become a leader in the express package and courier market in India. Blue Dart Aviation is a 100%

owned subsidiary of Blue Dart Express, and Blue Dart Aviation's role is to support Blue Dart Express by supplying air freight services via a wet lease contract. Blue Dart Express was recently bought by DHL Asia Pacific.

The 737-200F was Blue Dart's first aircraft, and the fleet currently operates five aircraft, having increased its fleet from two in recent years. These have moderate maximum take-off weight (MTOW) capability. The aircraft are operated on domestic Indian services of 600-700nm that have flight times in the region of 1.4 hours. The aircraft, however, can operate for up to 1,100nm with a full net structural payload of 34,720lbs.

Compared to many other express package operations, Blue Dart achieves high rates of utilisation with its 737-200s. These average in the region of 1,800FH and 1,200FC per year. Not only is the rate of utilisation impressive for the aircraft's vintage, but Vishok Mansingh, general manager materials and systems at Blue Dart Aviation, reports that the aircraft operate reliably with a technical dispatch reliability (TDR) rate of 99.7%, and do not suffer from any particular technical problems.

Blue Dart's route network includes some airports that have a combination of short runways and high elevations. Given India's high ambient temperatures, the aircraft do suffer payload limitations on some routes.

The aircraft were originally modified to freight using the Aeronautical Engineers Incorporated (AEI) freighter

conversion programme and cargo loading system. The aircraft can accommodate up to eight maindeck containers.

In operations, the aircraft take 30-35 minutes to load a full complement of freight, and another 20-25 minutes to offload a full payload of cargo. This means that the minimum time between flights is 50 minutes.

The age of the 737-200s is evidenced by their line maintenance requirements. As is normal for all types, the aircraft have a transit check prior to every flight and a daily check at a maximum of every 48 hours. The A check interval, however, is every 105FH of 25 days, which is low compared to the 400-600FH interval of current generation aircraft. The 737-200 also has a B check every 600FH and C check every 2,400FH.

Although the 737-200Fs provide Blue Dart with reliable lift, the airline has experienced high growth rates and is now in the process of replacing them with higher payload aircraft, such as the 757-200, which can carry 15 maindeck containers.

Capital Cargo 727-200Fs

Capital Cargo operates a fleet of 13 727-200s, which are high gross weight models with MTOWs of 195,000lbs and 190,500lbs. This compares to the highest MTOW for the type of 209,500lbs.

These aircraft have a net payload, not including weight of pallets or containers, of 61,000lbs. The airline operates mainly US domestic routes, and only suffers payload restrictions or limitations when



Bluebird is a European carrier operating 5 737-300Fs. The carrier utilises them for express package operations, achieving about 1,200FH per year.

operating from high altitude airports in certain high temperature situations. Examples are from Denver to Toledo and from Monterrey, Mexico to Toledo. Besides these routes with performance limitations, the aircraft can carry a full payload for up to four hours and 15 minutes.

Of the fleet of 13 aircraft, 11 were converted to freighters by AEI, while the remaining two were modified by Pemco. The freight handling and loading systems were also supplied by the respective freight modification facilities.

Capital Cargo achieves rates of aircraft utilisation typical of many other freight operators carrying small packages. The aircraft average 104 hours per month, equal to 1,250 hours per year. This monthly average fluctuates between a high of 205 hours and a low of 59 hours. Chris Chorley, president and chief executive officer at Capital Cargo explains that the airline does not experience any particular reliability or technical problems that cause delays with the aircraft, and that the fleet achieved a TDR rate of 98.9% over the four years from 2002 to 2005.

During operation, only 30 minutes are required to load a full complement of freight onto the aircraft, and a similar amount of time is required to offload a full load of cargo.

Chorley adds that not only does Capital Cargo have no plans to replace the 727s with younger freighters, but the airline also added two to its fleet in 2004.

Varig Log 727Fs

Varig Log is a general freight operator, and has five 727Fs, four -200Fs

and one -100F. The -200Fs have MTOWs of 195,000lbs, the third highest available on the 727-200 after 197,000lbs and 209,500lbs. The 727-200Fs have a net structural payload of 58,350lbs, and can accommodate 12 maindeck containers. The aircraft can carry this payload up to 850nm. The 727-100Fs have a smaller net structural payload of 43,000lbs.

Varig Log operates the aircraft on a mix of domestic Brazilian routes with sector lengths varying between 270nm and 1,300nm, and averaging 355nm. The aircraft do not suffer any payload limitations, except on the Sao Paulo-Manaus route, which is about 1,500nm, and on the edge of the aircraft's full payload capability. The aircraft therefore suffer a small payload limitation on this route.

Varig Log carries a range of manufactured goods, fish, fruits and express packages, and it takes about 30 minutes each to load and unload a full complement of freight. The aircraft therefore require a minimum turn time of one hour between flights.

Although many freight carriers are gradually phasing out their 727s, Varig Log increased its fleet by two in 2002. The airline plans, however, to retire the 727-100F and replace this with the 757-200. This naturally opens the possibility that the remaining 727-200Fs may be replaced with 757-200s.

Channel Express 737-300Fs

Channel Express operates a single 737-300QC, which is a 'Quick Change' variant that can be switched between passenger and freighter configurations for dual operations. The aircraft was

modified using Bedek Aviation's freighter conversion programme, and equipped with ANCRA's cargo loading system.

This aircraft has an MTOW of 135,000lbs, one of the lower gross weights available for the 737-300. The aircraft is operated in the United Kingdom on domestic routes that average just 210nm and a flight time of about 40 minutes. The aircraft can, however, carry a full net structural payload of 38,000lbs up to 1,500nm.

The aircraft is used to carry mail, and generates just 300FH and 520FC per year as a freighter. This is in addition to the utilisation that the aircraft generates during the day, when operating in passenger mode for Channel Express's parent company Jet2.com.

Not surprisingly the aircraft does not suffer any payload limitations on the carrier's route network, and can offload and load a full payload of freight in 40 minutes. Overall, Anthony Sainthill, director of aircraft management at Channel Express, explains that the aircraft and cargo loading systems have an excellent level of technical reliability.

Bluebird Cargo 737-300F

Bluebird Cargo is another European 737-300F operator, flying from Iceland with a fleet of five aircraft that have an MTOW of 139,500lbs, the highest for the -300 series. Two of these aircraft were modified by Pemco and the other three by Bedek Aviation.

Bluebird flies the aircraft on a European route network, which averages routes of 600nm and one hour flying time. The aircraft have a maximum net structural payload of 40,700lbs, which



Icelandair Cargo is one of the first carriers to operate 757-200s that were converted to freighter mode. It operates three aircraft modified by Precision Conversions, and the aircraft are operating at about 2,300FH per year and at a TDR of 98.2%

can be carried up to 2,000nm.

Bluebird carries mainly mail and express packages, and generates about 1,200FH and 1,000FC per year, which are typical of express package operations. Thor Kjartansson, chief executive officer at Bluebird Cargo, explains that so far the aircraft have demonstrated very good levels of technical reliability for the cargo door and cargo handling systems. A full payload of freight can be loaded in 10-15 minutes and offloaded in about 10 minutes, meaning that a turnaround between flights can be achieved in as little as 25 minutes.

Icelandair Cargo 757-200Fs

Icelandair Cargo is one of the first airlines to operate 757-200s that have been converted to freighter. The only 757s that were modified to freighter prior to this were 34 aircraft for European Air Transport (EAT). These were converted by Boeing, but no other operator has specified this modification.

Icelandair Cargo has a fleet of four 757SFs. Three of these aircraft were converted by Precision Conversions, and are referred to as 757-200PCFs. Precision Conversions is the first company independent of Boeing to have a passenger-to-freighter modification programme certified for the 757. The fourth aircraft is a Boeing factory production freighter, a 757-200PF. Icelandair Cargo will take delivery of a fourth 757-200PCF in November 2006.

All four aircraft have an MTOW of 250,000lbs, the highest available for the 757. Besides the -200PCF being modified by Precision Conversions, the aircraft

also have a cargo loading system supplied by ANCRA on the maindeck and a Telair sliding carpet system in the lower hold. So far neither of these systems has provided any particular reliability problems.

The 757-200PF has a net structural payload of 82,200lbs, and the 757-200PCF a smaller net structural payload of 64,630lbs. This is accommodated in 15 maindeck containers, three more than the 727-200. The range with this full payload is about 2,600nm.

Icelandair Cargo operates the aircraft for its own cargo network, while two aircraft also operate for TNT on its night network carrying express packages. The network originates from Reykjavik and includes a variety of destinations such as New York, Halifax, Brussels, Humberstone and Liege. The aircraft operate between Liege, Barcelona and Vitoria, as well as Liege, Gothenburg and Oslo for TNT. This puts the aircraft on route lengths that vary between 250nm and 2,253nm. The aircraft operating on the Icelandair Cargo route network have an average cycle length of about 200 minutes, equal to a distance of about 1,400nm. The aircraft operating for TNT fly shorter routes that average about 90 minutes, equal to about 600nm.

While most route lengths are well within the aircraft's full payload maximum range capability, Petur Eiriksson, managing director at Icelandair Cargo, comments that the aircraft do experience some small payload limitations on Reykjavik-New York, and in the opposite direction. This sector has a great circle distance of 2,250nm, but tracked distance will be increased up to

2,600nm when headwinds and flight routings are taken into consideration.

Overall, the aircraft accumulate 2,340 FH and 933FC across the operation. This is combined with a TDR of 98.2%. On its own freight network, Icelandair Cargo carries fresh seafood, produce, computers, general cargo and express packages.

The aircraft can have a full load of freight loaded in 30 minutes and offloaded in another 30. The turn time between flights has to be a minimum of 60 minutes, and a crew of seven or eight is required for unloading and loading the aircraft.

Compared to older types, the 757 has relatively light requirements for line maintenance. In Icelandair Cargo's operation, the aircraft have pre-flight and transit checks performed prior to each flight, and then daily checks that are allowed a maximum interval of 48 hours. The next highest check is an A check, which has an interval of 600FH.

Blue Dart 757-200SFs

In addition to the five 737-200Fs that Blue Dart Aviation operates, as described earlier, the airline has also recently started to operate two 757-200SFs. These are the first two aircraft that have been leased from European Air Transport on a seven-year contract. This was done because Blue Dart Aviation needed to increase its freight capacity, having experienced freight traffic growth sustained at annual levels of about 40% for several years. Mansingh explains that there was no passenger-to-freighter modification available at the time it decided it needed



India's Blue Dart Aviation has begun to operate 757-200Fs following high traffic growth rates. The airline is assessing which passenger-to-freighter modification to select for the one aircraft per year it plans to add to its fleet.

the 757, so Blue Dart has leased the aircraft from EAT on an interim basis.

The aircraft have an MTOW of 220,000lbs, which is a light version of the aircraft. The aircraft have a net structural payload of 59,700lbs, once the tare weight of pallets and containers has been deducted. Like the aircraft operated by Icelandair Cargo, Blue Dart's aircraft have a maximum range of about 2,600nm with a full payload.

These aircraft were converted by Boeing and have a Boeing cargo loading system. The aircraft are utilised on Blue Dart's domestic Indian route network and operate on an average sector length of 600-700nm, equal to an average time of 1.4FH. This is well within the aircraft's range with maximum payload.

The airline uses the aircraft to carry express packages, having expanded its capacity from its 737-200s due to traffic growth. The aircraft began operations in mid-2006 and are achieving pro-rate annual utilisations of 1,800FH and 1,200FC.

Mansingh reports that the aircraft require 34-40 minutes for a full complement of freight to be loaded, and a similar time for it to be offloaded. This is achieved with a crew of 10 to 15.

Compared to the airline's 737-200Fs, the 757-200SFs have relatively low line and ramp maintenance requirements. The aircraft have a pre-flight check prior to each flight, which can be performed by the flightcrew. Blue Dart then carries out a daily check, a service check every 100FH and an A check with an interval of 500FH.

In terms of future fleet requirements, Mansingh explains that Blue Dart Aviation requires aircraft that can provide it with a heavy load of 38 tons, the same

freight capacity as the Boeing factory freighter, for short route lengths of 600-700nm. The airline has not yet decided which passenger-to-freighter modification to use, and will wait until the modification being developed by ST Aero and Bedek Aviation has been certified before making a selection. The airline says it plans to add about one 757 freighter per year for the foreseeable future.

EAT 757-200SFs

European Air Transport (EAT) operates a fleet of 33 757-200SFs, which were converted to freighter under Boeing's modification programme. These are ex-British Airways aircraft equipped with RB211-535C engines, and their lower MTOW of 220,000lbs makes them suitable for short-haul operations.

Boeing's passenger-to-freighter modification for the 757-200 is unique in that it only accommodates 14 maindeck containers. This compares to 15 maindeck containers provided by Precision Conversions modifications. The aircraft have a net structural payload of 61,600lbs after tare weight of pallets and containers has been deducted.

EAT operates a trans-European air freight network from its Brussels hub for DHL, carrying mail and express packages, as well as a little general freight. The airline also operates A300B4Fs, and the network includes all major European cities. EAT's average route length for the 757s is 600nm, which compares to a range of 1,200nm with a full payload. Not surprisingly the aircraft do not suffer from any payload limitations on their route network.

Like many other express package

operations the aircraft have a low level of utilisation, clocking up only 800FC per year and 985FH. This is equal to about 16 flights per week, which is an average of just over two per day.

EAT has been operating the 757-200SF for about five years. The aircraft achieve a TDR of 99%, and the cargo door and loading system have a TDR of 99.8%. Nelson adds that the aircraft do not suffer from any particular technical problems that cause delays.

As with the other 757 operations described, EAT reports that it takes about 30 minutes to load a full complement of freight and another 30 minutes to offload the aircraft, using 10 to 12 people.

Summary

With freight carriers being ever more focused on minimising operating costs, the lower line maintenance requirements of younger freighters can make an impact on fleet planning decisions.

In addition to the obvious advantages of other elements of maintenance costs being lower than older aircraft, younger freighters also have the benefits of lower fuel burn and crew costs. The biggest advantage of younger aircraft, however, are their superior operating performance and greater revenue carrying capability, especially from short airfields in high temperatures.

Cargo operators will have to make decisions about replacing their ageing 737-200s, DC-9s and 727s, and have further modification programmes for the 737-300/-400 and 757 to consider. Other narrowbody freighters are also likely to enter the market over the next five years, with a conversion programme for the A320 and A321 expected. **AC**