

The Boeing 757 and 767 have been in airline service for nearly three decades and large numbers are still in service. The size and age profile of the respective fleets provides a major MRO market. *Aircraft Commerce* has surveyed the providers of airframe, engine and associated services

757/767 global technical support

Ease of maintenance was a key element in Boeing's design aims for the 757 and 767. When the launch of the aircraft was announced in the late 1970s, the manufacturer said the aircraft would incorporate the latest available technology to minimise maintenance costs. Reduced man-hour (MH) requirements and improved reliability were specifically targeted. The aircraft were designed to complement each other, and from the outset the manufacturer claimed a high degree of commonality. The two types had the same flightdeck, many systems were the same and both aircraft included first-generation electronic flight instrument systems (EFIS).

This commonality provided the potential to reduce spares investment for airlines that selected both types.

The 757 and 767 have both been developed extensively over their lifetime and a variety of models has been produced.

767 development

The original 767-200 was equipped with Pratt & Whitney JT9D, but the General Electric CF6-80A-powered version followed shortly. The 767-200ER, which was announced in January 1983, provides longer-range capability. Key

changes include higher gross weights and additional fuel capacity. A long production run of the 767-200ER has ensured that Pratt & Whitney and General Electric have introduced many engine developments for the model.

The 767-300 was first announced in 1983. It has the same basic airframe as the 767-200, but features two plugs in the fuselage fore and aft of the wings, substantially increasing its overall length and seating capacity.

The 767-400ER, the newest member of the family, includes some technology transfer from the 777. Developments on the 767-400ER include a further fuselage stretch and a strengthened wing. The flightdeck was also upgraded to include

liquid crystal displays (LCD) based on 777 technology.

767 freighters

In addition to its production freighter, the manufacturer offers the 767-300BCF (Boeing Converted Freighter). ST Aero subsidiary ST Aviation Services Co (SASCO) is contracted to carry out the actual conversion. IAI/Bedek offers a competing 767-300 conversion as well as a -200 programme.

757 development

The original 757-200 was equipped with RB211-535 engines, with PW2000



The global 757/767 fleet totals about 1,870 aircraft. Both types are likely to remain in operation in large numbers, with them proving to be popular candidates for conversion to freighter.

ENGINEERING MANAGEMENT & TECHNICAL SUPPORT

Maintenance Provider	Outsourced engineering service	Design organisation approval	Mtce records manage	Documents & manuals manage	Mtce programme manage	Reliability stats	ADs, SBs, & EOs manage	Check plan & job card manage
AAR Corp	757&767		757&767	757&767	757&767	757&767	757&767	757&767
Aeroplex (ACE)	767	767	767	767	767	767	767	767
Air Atlanta Aero Engineering					757&767			757&767
Air Berlin	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
Air France Industries (inc. KLM E&M)	767	767	767	767	767	767	767	767
Air New Zealand Engineering ANZES*	767	767	767	767	767	767	767	767
Aveos (inc Aeroman)	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
Ameco	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
ATC Lasham	-	-	757	757	757	757	757	757
Austrian Airlines/ Technik	767	767	767	767	767	767	767	767
Cascade Aerospace	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
Coopesa	757	757	757					757
Delta Tech Ops	757&767		757&767	757&767	757&767	757&767	757&767	757&767
Finnair		757	757	757	757	757	757	757
GE Engine Services	767 1)	767 1)	767 1)	767 1)	767 1)	767 1)	767 1)	767 1)
IAI Bedek Aviation	757&767	767	757&767	757&767	757&767	757&767	757&767	757&767
Iberia Maintenance	767	767	767	767	767	767	767	767
Icelandair	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
Lufthansa Technik	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
Mexicana MRO Services			757&767	757&767	757&767	757&767	757&767	757&767
MNG Technic	757				757		757	757
Monarch Aircraft Engineering	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
Pratt & Whitney	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)
Rolls Royce	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)	757&767 1)
Shannon Aerospace	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
SRTechnics		757&767						
ST Aero	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767
TAP M&E Brazil (ex VEM)	767	767	767	767	767	767	767	767
TIMCO Aviation Services	757&767	757,767 (planned)	757&767	757&767	757&767	757&767	757&767	757&767

Maintenance Provider	Aircraft config & IPC	Total tech support	Engine trend monitor	Flight data monitor	Aircraft accept & return	Continuing airworthiness approval	Approvals held
AAR Corp	757&767	757&767			757&767	757&767	FAA, EASA +others
Aeroplex (ACE)	767	767	767	767	767	767	EASA, FAA
Air Atlanta Aero Engineering							EASA, FAA +5
Air Berlin	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA +2
Air France Industries (inc. KLM E&M)	767	767	767	767	767	767	EASA, FAA +30 plus
Air New Zealand Engineering ANZES*	767	767	767	767	767	767	CAANZ,FAA,EASA +others
Aveos (inc Aeroman)	757&767	757&767	757&767	757&767	757&767	757&767	FAA, EASA +2
Ameco	757&767	757&767	757&767	757&767	757&767	757&767	CAAC, FAA, EASA +11
ATC Lasham	757	757	757	757	757	757	EASA, FAA +10
Austrian Airlines/ Technik	767	767	767	767	767	767	EASA
Cascade Aerospace	757&767	757&767			757&767	757&767	TC, FAA, EASA + 2
Coopesa	757				757		FAA , EASA
Delta Tech Ops	757&767	757&767			757&767	757&767	FAA, EASA +others
Finnair	757	757	757	757	757	757	FAA, EASA
GE Engine Services	767 1)	767 1)	767 1)			767 1)	FAA, EASA +others
IAI Bedek Aviation	757&767	757&767	757&767	757&767	757&767	767	CAAI, FAA, EASA +10+
Iberia Maintenance	767	767	767	767	767	767	FAA/EASA +16
Icelandair	757&767	757&767	757&767	757&767	757&767	757&767	EASA, FAA +others
Lufthansa Technik	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA + 39
Mexicana MRO Services	757&767	757&767	757&767	757&767	757&767	757&767	SCT, FAA, EASA + 4
MNG Technic					757		EASA, FAA + 3
Monarch Aircraft Engineering	757&767	757&767	757&767	757&767	757&767	757&767	EASA, FAA
Pratt & Whitney	757&767 1)	757&767 1)	757&767 1)			757&767 1)	FAA, EASA +others
Rolls Royce	757&767 1)	757&767 1)	757&767 1)			757&767 1)	EASA,FAA +others
Shannon Aerospace	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA + others
SRTechnics							FOCA, EASA
ST Aero	757&767	757&767			757&767	757&767	FAA, AEAs +1
TAP M&E Brazil (ex VEM)	767	767	767	767	767	767	ANAC, FAA, EASA +5
TIMCO Aviation Services	757&767	757&767					FAA, EASA +3

1) engines only

*Based on Aircraft Commerce Research

LINE AND LIGHT MAINTENANCE SUPPORT

Maintenance Provider	Maint ops ctrl	Off-site & off-line AOG	Line checks	A checks	Eng LRU & QEC change	Engine changes	Ldg gear changes	APU changes	Thrust rev changes	Despatch relia stats	Approvals held
AAR Corp	-	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA, EASA +others
Aeroplex (ACE)	767	767	767	767	767	767	767	767	767	767	EASA,FAA
Air Atlanta Aero Engineering	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA+5
Air Berlin		757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA+2
Air France Industries (inc. KLM E&M)	767	767	767	767	767	767	767	767	767	767	EASA,FAA &30+
Air New Zealand Engineering (ANZES*)	767	767	767	767	767	767	767	767	767	767	CAANZ,FAA,EASA + others
Aveos (inc Aeroman)	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA+7
Ameco	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	CAAC,FAA,EASA + 11 others
ATC Lasham				757	757	757	757	757	757	757	FAA,EASA+12
Austrian Airlines / Technik	757&767	757&767	757&767	767	757&767	757&767	757&767	757&767	757&767	767	EASA
British Airways Engineering*	757&767	757&767	757&767	767	757&767	757&767	757&767	757&767	757&767	767	EASA +others
Cascade Aerospace	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	TC,FAA,EASA+2
Coopesa			757&767	757	757	757	757	757	757	757	FAA,EASA
Delta Tech Ops	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA+others
Evergreen (EGAT)	767	767	767	767	767	767	767	767	767	767	FAA,EASA+6
Finnair	757	757	757	757	757	757	757	757	757	757	FAA,EASA
GE Engine Services					757&767	757&767					FAA/EASA +others
IAI Bedek Aviation	757&767	757&767		757&767	757&767	757&767	757&767	757&767	757&767	757&767	CAAI,FAA,EASA & 10 others
Icelandair	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA+others
Lufthansa Technik	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA+39
Mexicana MRO Services	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	SCT,FAA,EASA+4
MNG Technic		757	757	757	757	757	757	757	757	757	EASA,FAA+3
Monarch Aircraft Engineering	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA
Pratt & Whitney					757&767	757&767					FAA,EASA +others
Rolls-Royce					757&767	757&767					EASA,FAA +others
SRTechnics	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FOCA,EASA
ST Aero		757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA +others
TAP M&E Brazil (ex. VEM)	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	ANAC,FAA,EASA+5
TIMCO Aviation Services	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA
United Services	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA+14

*Based on Aircraft Commerce Research

1) engines only

2) based on Aircraft Commerce research not survey response

models following later. Many early low-weight 757s were subsequently modified to higher-weight extended-range twin-engined operations (ETOPS) aircraft (designated 757-200EM). These aircraft were usually equipped with the more powerful RB211-535E4 or PW2040 engines.

The 757-300 is a stretched version of the -200, with increased design weights but the same fuel capacity. The -300 was introduced relatively late in the life of the programme, and Boeing sold relatively few of them.

The 757 has attracted strong interest as a cargo aircraft. The manufacturer offered a production freighter: the 757-200PF. Other 757 variants include the -200M, which is a convertible version

where the seats can be removed in order to place cargo on the maindeck. In addition, many former passenger 757-200s have been converted into 757-200 SF (Special Freighters). There have been a number of entrants in the 757 freight conversion market, but the principal providers are currently ST Aero (SASCO) and Precision Conversions.

There is some evidence that facilities that convert aircraft are able to obtain the subsequent maintenance, repair and overhaul (MRO) work for the freighter aircraft. However, this is by no means always the case, unless check work was packaged with an initial conversion sale.

In addition to the freighter conversion programmes, there are some upgrade programmes for the 757, including

blended winglets that are offered by US company Aviation Partners.

Airworthiness issues

There were some incidents of corrosion and cracking on midspan fittings on the nacelle struts of several 757s, which resulted in an airworthiness directive (AD) that required modification of the nacelle strut and wing structure at a threshold of 37,500 flight cycles (FC) or 20 years. The MRO providers surveyed by *Aircraft Commerce*, however, confirmed that this work had largely been completed, and there were now no critical ADs driving or impacting MRO work volumes on either fleet. The view of the providers is that, with good planning,

BASE MAINTENANCE SUPPORT

Maintenance Provider	C checks	D& heavy checks	Interior refurb	Strip & paint	Types of back shop	No of base check bays	No of mechanics	No of shifts	Weekend shifts	Annual capacity base checks	Approvals held
AAR Corp	757&767	757&767	757&767	757&767	Extensive	757:16, 767:5		3	Yes	757:~64, 767:~20	FAA,EASA+others
Aeroplex (ACE)	767	767	767	767	Extensive including: avionics, NDT, sheetmetal	Budapest	n/a	n/a	n/a	n/a	EASA,FAA
Air Atlanta Aero Engineering	757&767	757&767	757&767		Includes: sheetmetal structures, machine shop, composites, interiors	Shannon:2		3	Yes	290,000 MH	EASA,FAA+5
Air Berlin	757&767	757&767	757&767		Sheetmetal, W&B, Composite	5 (Munich & Dusseldorf)	400	3	Yes	140	EASA,FAA +2
Air France Industries (inc. KLM E&M)	767	767	767	767	Extensive	Amsterdam:1	767	5 early, 5 late	2 early, 2 late	Flexible	EASA,FAA &30+
Air New Zealand Engineering (ANZES*)	767	767	767	767	Extensive	New Zealand				CAANZ,FAA,EASA +others	
Aveos (inc Aeroman)	757&767	757&767	757&767	Partial	Composite, sheet-metal process, machine shop, TNF, Cockpit and cabin seats overhaul	Montreal, Winnipeg & Vancouver (San Salvador)	750	24/7	Yes		FAA/EASA+2
Ameco	757&767	757&767	757&767	757&767	Extensive including: avionics, electrics, pneumatic	Beijing:4		3	Yes		CAAC,FAA,EASA+11
ATC Lasham	757	757	757	757	Interiors, machining, composites	Southend:2 Lasham:3	42	3	1	170,000 MH ~45 inputs	EASA,FAA+12
Austrian Airlines / Technik	767	767	767		Painting, upholstery, sheetmetal, composites, mechanical components repair, electrical component shops, emergency equipment overhaul	Vienna	105	2	As required		EASA, FAA
British Airways Engineering*	757&767	757&767	757&767	757&767	Extensive	Heathrow					EASA +others
Cascade Aerospace	757&767	757&767	757&767		Includes: structures, composites, interiors, instruments, pneumatics	757:8, 767:2	757:600, 767:200	757&767	757&767	757:1,4m MH, 767:400,000 MH	TC,FAA,EASA+2
Coopesa	757	757	757	757	Composite, batteries, machine shop	Costa Rica 1	450	2	2	120,000 MH	FAA,EASA
Delta Tech Ops	757&767	757&767	757&767	757&767	Comprehensive	Approx 20	3500	3	Yes	757:250,000 MH 767 increasing	FAA,EASA +others
Evergreen (EGAT)	767	767	767	767	Various	8	800	2	2	120	FAA,EASA+6
Finnair	757	757	757	757	Sheetmetal, painting, mechanical & metal structures, composite, brake & wheel, machining	5	290	2 or 3	As necessary	Approx 100	FAA,EASA
Iberia Maintenance	767	767	767	767	Extensive	Madrid	1050	3	3	800,000 MH	FAA/EASA+ 16
IAI Bedek Aviation	757&767	757&767	757&767	757&767	Extensive	Israel	-	11 per week	Yes		CAAI,FAA,EASA &10+
Icelandair	757&767	757&767	757&767	757&767	Various including; avionics, W&B	2					EASA,FAA +others
Lufthansa Technik	757&767	757&767	757&767	757&767	Full	Frankfurt:1	200+	Continuous	Yes	20+	EASA,FAA +39
Mexicana MRO Services	757&767	757&767	757&767	757&767	Extensive capability	10 (Mexico City and Guadalajara)	726	3	2	1,200,000 MH	SCT,FAA,EASA+4
MNG Technic	757	757	757	757	Extensive including; Hydrostatic, Structural, NDT, Avionics	Istanbul 3	400	2	1	74	EASA,FAA +3
Monarch Aircraft Engineering*	757&767	757&767	757&767		Extensive including; metallic & composite structures, avionic, electrical & instrument systems, emergency equipment installations	Luton & Manchester					EASA, FAA
Shannon Aerospace	757&767	757&767	757&767	757&767	Extensive including; interiors, composites, sheetmetal	Shannon: 1	~75	2	Yes	120,000 MH	FAA,EASA+others
ST Aerospace	-	757, 767	757, 767	757, 767	Extensive including; composite, machine-, shop, sheetmetal, wire fabrication, batteries	757:43 globally 767:25 globally	~2,000	Up to 2	Up to 2	757,767	FAA,EASA+others
TAP M&E Brazil (ex VEM)	757&767	757&767	757&767	757&767	Extensive including; structural repairs	Rio de Janeiro:4 Porto Alegre:1	200	As req.	As req.	60	ANAC,FAA,EASA+5
TIMCO Aviation Services	757&767	757&767	757&767	757&767	Full cap. to support MRO	Greensboro:10-16 Lake City:9-11 & Macon:3	1,250	2-3	Y	400+	FAA,EASA +3

*Based on Aircraft Commerce Research

ENGINE MAINTENANCE

Maintenance Provider	Engine maint mgt	Scheduled on-wing engine maint.	Unscheduled on-wing maint.	Engine shop visits	Parts repair schemes	Total Care Packages	Level of test cell capabilities	Aviation Authority Approvals
AAR Corp		757&767	757&767					FAA,EASA +others
Air Atlanta Aero Engineering		757&767	757&767					EASA,FAA +2
Air Berlin	757(PW,RR); 767(PW)	757(PW,RR); 767(PW)	757(PW,RR); 767(PW)					EASA,FAA +2
Air France Industries (inc. KLM E&M)	767 (GE)	767	767	767 (GE)	767 (GE)	767 (GE)	Full (767 GE)	EASA,FAA plus 30 others
Aveos (inc Aeroman)		757&767	757&767					FAA,EASA +7
Ameco	RR, PW	757&767	757&767	RR, PW	RR, PW	RR, PW	Full (RR, PW)	CAAC,FAA,EASA &11 others
ATC Lasham		757	757				None	FAA,EASA +12
Austrian Airlines / Technik		757&767	757&767					FAA, EASA
Cascade Aerospace		757&767	757&767					TC, FAA, EASA + 2
Coopesa		757 (RR,PW)	757 (RR,PW)					FAA, EASA
Delta Tech Ops	757 (PW); 767 (PW,GE)	757 (PW), 767	757 (PW), 767	757 (PW); 767 (PW,GE)	757 (PW); 767 (PW,GE)	757 (PW); 767 (PW,GE)	Full	FAA,EASA +others
Evergreen (EGAT)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	Full?	FAA,EASA +6
Finnair Technical Services	757 (PW)	757 (PW)	757 (PW)	757 (PW) limit to B1/B2 cap	757 (PW) limited cap	Not available	757 (PW) Full	FAA,EASA
GE Engine Services	767 (GE)	757&767	757&767	767 (GE)	767 (GE)	767 (GE)	Full	FAA,EASA +others
IAI Bedek Aviation	767 (PW)	767 (PW)	767 (PW)	767 (PW)	767 (PW)	767 (PW)	Full	CAAI,FAA,EASA &10+ others
Iberia Maintenance	767	767	767	767	767	767	767	FAA,EASA +16
Icelandair	757 (RR), 767 (PW)	757 (RR), 767 (PW)	757 (RR), 767 (PW)					SCT,FAA,EASA +4
Lufthansa Technik	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	Full	EASA, FAA+39
Mexicana MRO Services	757 (RR,PW)	757 (RR,PW)	757 (RR,PW)					FAA,EASA +4
MNG Technic		757 (RR,PW)	757 (RR,PW)					EASA,FAA +3
Pratt & Whitney	757 (PW), 767 (PW)	757&767	757&767	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	Full (PW)	FAA,EASA +others
Rolls-Royce	757 (RR), 767 (RR)	757&767	757&767	757 (RR), 767 (RR)	757 (RR), 767 (RR)	757 (RR), 767 (RR)	Full (RR)	EASA,FAA +others
ST Aerospace		757 (RR,PW)	757 (RR,PW)					FAA
TAP M&E Brazil (ex VEM)		757&767	757&767					ANAC,FAA,EASA +5
TIMCO Aviation Services		757&767	757&767					FAA,EASA
United Services	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	Full cap.	FAA,EASA +4
RR	Applicable Rolls-Royce engine models							
PW	Applicable Pratt & Whitney engine models							
GE	Applicable General Electric engine models							

turnaround times should not be affected by any of the outstanding service bulletins (SBs).

767 fleet & market trends

The delays to Boeing's 787 programme have led to an extension of 767 production beyond what most observers had expected. Deliveries of 767s have since slowed to a trickle, and the programme is now unlikely to see any more surges in deliveries. According to OAG/AeroStrategy's latest commercial aircraft MRO forecast, the 767 fleet is set to peak in 2011 at about 970. Numbers will show a steady decline thereafter. Over the coming decade, the consultancy suggests that the fleet size will decrease by about 4%.

The 767 fleet is heavily concentrated in North America, which accounts for nearly 45% of the total. Latin America is also a significant market, meaning that the American continent accounts for well over half of the fleet. The Asia Pacific region, which accounts for over 20% of the fleet, is a significantly larger market than Europe.

The North American concentration is partly driven by the major operators. Five of the largest passenger aircraft operators (Delta, American, United and Air Canada) are based in North America.

ANA, Japan Airlines and Qantas are also all in the top 10, contributing to the importance of the Asia Pacific market. There are no European companies in the top 10 and, with British Airways intending to reduce its fleet, the largest

European operators are likely to be charter and inclusive tour companies.

Although 767s, like other widebody aircraft, are sometimes ferried longer distances for maintenance than is typical of single-aisle aircraft, the availability of MRO facilities still tends to reflect the geographic distribution of the fleet.

The importance of the freighter market is highlighted by the position of ABX Air and UPS in the top 10 operators by fleet size. Freighters account for close to 10% of the total fleet and this is likely to grow as increasing numbers of 767s (-200s in particular) are converted. The current dire state of the freight industry might, however, put a brake on these conversions in the short term.

Although the fleet is operated by several large airlines, there are over 20

SPARE ENGINE SUPPORT

Maintenance Provider	AOG Services	Short-term leases	Medium /long-term leases	Engine pooling
AAR Corp	757(PW,RR); 767 (PW,GE)	757(PW,RR); 767(GE)	757(PW,RR); 767(GE)	757(PW,RR); 767(GE)
Air France Industries (inc. KLM E&M)	767 (GE)	767 (GE)	767 (GE)	767 (GE)
Ameco	757(PW,RR); 767 (PW,RR)	757(PW,RR); 767 (PW,RR)	757(PW,RR); 767 (PW,RR)	757(PW,RR); 767 (PW,RR)
Delta Tech Ops	757(PW); 767 (PW,GE)	757(PW); 767 (PW,GE)	757(PW); 767 (PW,GE)	757(PW); 767 (PW,GE)
Finnair Technical Services	757(PW)	757(PW)	757(PW)	757(PW)
GE Engine Services	757(RR,PW); 767 (GE,PW,RR)	767 (GE)	767 (GE)	767 (GE)
IAI Bedek Aviation	767 (PW)	767 (PW)	767 (PW)	767 (PW)
Iberia Maintenance	767	767	767	767
Lufthansa Technik	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)	757(PW,RR); 767(GE,PW)
Pratt & Whitney	757(PW); 767 (PW)	757 (PW); 767 (PW)	757 (PW); 767 (PW)	757 (PW); 767 (PW)
Roll-Royce	757 (RR), 767 (RR)	757 (RR), 767 (RR)	757 (RR), 767 (RR)	757 (RR), 767 (RR)
SRTechnics	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)
United Services	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)	757 (PW), 767 (PW)

RR Applicable Rolls-Royce engine models
PW Applicable Pratt & Whitney engine models
GE Applicable General Electric engine models

operators with one or two aircraft. This latter characteristic, which may well increase as the fleet ages, is significant for MRO providers as such airlines are likely to subcontract much of their maintenance requirement.

757 fleet & market trends

The 757 production run ended in 2005 and was not prolonged by delays in the 787 programme, not least because the larger 737NG models are more natural replacements for the 757. Despite the 757's production run ending sooner than the 767's, the 757 fleet is still larger. In 2009 the fleet saw a small decrease from 2008, and this trend is inevitably set to continue. Aerostrategy/OAG predicts that the fleet will be 970 aircraft in 2010, which would still be nearly 100 more aircraft than for the 767 in the equivalent period. The consultancy predicts the same rate of decrease in fleet size as for the 767, resulting in a fleet size of 660-670 by 2018.

The geographic distribution is even more strikingly biased towards North America than in the case of the 767, with close to 65% of all 757s based there. Europe is the other major region, accounting for over 20% of the total fleet.

Freighters are again a major part of the fleet, representing close to 15% of the aircraft in service.

757 & 767 MRO market

There is little doubt that the combined 757/767 MRO market is a significant contributor to the commercial-aircraft MRO industry. The Aerostrategy/OAG forecast predicts that in 2010 the total spend for the two types will be in excess of \$6.6 billion. The higher maintenance requirement of widebody aircraft is highlighted in the split of the work between the two types. Despite its smaller fleet, the 767 is predicted to account for well over half of the total spend. The forecast indicates that 2010 will be the peak year in terms of total MRO spend. By 2018 the forecast suggests that total combined spend will be down to \$4.1 billion.

The split between the various MRO functions is broadly similar for the two aircraft, but the predicted spend on modifications for the 767 is strikingly higher than for the 757. In 2010 OAG/Aerostrategy anticipates that \$337 million will be spent on 767 modifications, compared to \$149 million for the 757. Engine MRO spend is also significantly higher for the widebody aircraft.

Despite the predicted decline in market size, the 757/767 market is still regarded as a good sector to be in by many suppliers. Moreover, there are some established MRO facilities that are expanding into the 757 sector. For

example, Budapest-based Aeroplex indicated to *Aircraft Commerce* that it is planning to set up a 757 capability alongside its current 767 facilities.

Aviation Technical Services (ATS), based in Everett, Washington is one of the largest and longest established third-party, single-site MRO suppliers in North America and the two aircraft account for around 15% of its business. ATS President Matt Yerbic is positive that the 757/767 is an attractive, albeit very competitive, sector. His primary reason for this view is that ATS's core customers have indicated that they intend to keep the aircraft in their fleets.

This positive view of the market is also held by TIMCO Aviation Services. Work on 757s and 767s accounts for up to 40% of the light and heavy maintenance visits that the company handles. Leonard Kazmerski, vice president of marketing and business development, says the company sees the aircraft as a very attractive sector. He concedes that increasing retirements of the 757 and 767 could produce some excess capacity in some regions in coming years. He points out that as these fleets grow older, there are new opportunities to help operators identify cost-effective ways of keeping their aircraft operating efficiently and safely as they go through later-life light and heavy scheduled visits. Kazmerski adds that the respective fleets are still proving themselves to be workhorses and he believes that many will continue to find life with second- and even third-generation owners.

Martin O'Boyle, sales & marketing manager for Air Atlanta Aero Engineering (AAAE), confirms this view from a European perspective. He comments: "Talking to the operators we deal with, most would not see a decrease of these types in the next five to seven years."

In line with these views, there is a consensus among the MRO providers that the design of the 757 and 767 means that the respective fleets will remain active for longer than was the case for previous-generation aircraft.

Survey results

This global survey summarises the major aftermarket and technical support providers for the 775 and 767, and their associated engines. It lists the world's major providers of the various levels of technical support and is grouped into the following areas:

- 1) Engineering management & technical support (*see table, page 68*)
- 2) Line & light maintenance support (*see table, page 70*)
- 3) Base maintenance support (*see*

ROTABLES AND LOGISTICS

Maintenance Provider	Rotable inventory initial provisioning estimates	Rotable inventory leasing	Rotable inventory pooling	Consumables inventory	Repair & Document mgt	AOG Support	24 hour support	Fixed cost per FH full rotable support contracts	Aviation Authority Approvals
AAR Corp	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA+others
Air France Industries (inc. KLM E&M)	767	767	767	767	767	767	767	767	EASA,FAA &30+
Air New Zealand Engineering (ANZES)	767	767	767	767	767	767	767	767	CAANZ,FAA,EASA + others
Ameco	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	CAAC,FAA,EASA +11 others
Cascade Aerospace	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	TC, FAA,EASA +2
Coopesa				757					FAA,EASA
Dela Tech Ops	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA +3
Evergreen (EGAT)	767	767	767	767	767	767	767	767	FAA/EASA +6
Finnair Technical Services	757	757	757	757	757	757	757	757	FAA,EASA
GE Engine Services 1)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	767 (GE)	FAA,EASA +others
Iberia Maintenance	767	767	767	767	767	767	767	767	FAA,EASA +16
Icelandair	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA +others
Lufthansa Technik	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA +39
Mexicana MRO Services	757&767				757&767	757&767	757&767		SCT,FAA,EASA +4
MNG Technic				757	757	757	757		EASA,FAA +3
Pratt & Whitney 1)	757 (PW)	757 (PW)	757 (PW)	757 (PW)	757 (PW)	757 (PW)	757 (PW)	757 (PW)	FAA,EASA +others
	767 (PW)	767 (PW)	767 (PW)	767 (PW)	767 (PW)	767 (PW)	767 (PW)	767 (PW)	
Shannon Aerospace	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	EASA,FAA +others
SR Technics	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FOCA,EASA
ST Aerospace	767	767	767	757,767	757,767	767	767	767	FAA,EASA +15
TAP M&E Brazil (ex VEM)		757&767	757&767	757&767	757&767	757&767	757&767		ANAC,FAA,EASA +5
United Services	757&767	757&767	757&767	757&767	757&767	757&767	757&767	757&767	FAA,EASA +14

1) engines only

table, page 72)

- 4) Engine maintenance (see table, page 73)
- 5) Spare engine support provisioning (see table, page 74)
- 6) Rotables & logistics (see table, this page)
- 7) Heavy component maintenance (see table, page 76)

The data are based primarily on survey responses, but some additional research has been undertaken. As was the case in *Aircraft Commerce's* previous MRO surveys, many of the technical support providers are listed in most, if not all, of the seven sections. This means that they provide most of the services that an airline customer would require. The tables show the range of services these facilities are capable of offering. The tables reveal for each provider how comprehensive is the level of support they provide. A large majority of respondents indicated a capability for both aircraft, reflecting perhaps the commonality of the types.

Engineering management

The trend to outsourcing of maintenance functions by airlines,

identified in our survey for the 737 Classics and A320 family, is also evident in the 757/767 market. However, a number of respondents indicated that all-inclusive packages were less prevalent than for the aircraft featured in our previous surveys. This was particularly true for the 767, and probably reflects the general situation for widebody aircraft. Nonetheless, many of the providers offer engineering management services.

Line & light maintenance

As for most aircraft types, line and light maintenance is among the least likely functions to be completely outsourced, with many airlines choosing to look after all, or at least most of, their own requirements. Many such airlines try to leverage this requirement by offering third-party services on their networks. The size and operator base of the 757/767 fleets means that there is a large number of light maintenance providers, and this survey does not attempt to cover all such providers unless they offer other services for the aircraft.

Base maintenance

The 767/757 is well served by

providers of heavy maintenance across the various regions. The range of the 757, and particularly the 767, means that ferrying for heavy maintenance is feasible. With downtimes of up to 45 days for a heavy check, the time lost in ferrying is less significant than for some smaller aircraft types. These factors increase the scope for competition between facilities in different geographic regions.

Opinion is divided, however, as to how global the market really is. But TIMCO's Kazmerski is in no doubt: "Competition for the 767 is most certainly global, with labour costs in some regions rising faster than in others. The MRO provider market for the 757 is somewhat constrained by range, but even there we find that competitive services in North America can be offered to operators in Europe."

There was a consensus among respondents who were questioned by *Aircraft Commerce*, that providers in the US have been relatively fortunate over the past year as labour costs in Asia and Europe have risen, and currency fluctuations have been favourable to the US. However, all the respondents questioned agreed that service, turn-around time and quality remain the critical factors for operators and figure

HEAVY COMPONENT MAINTENANCE

Maintenance Provider	Wheels, inspection & repair	Tyre remoulding	APU test & shop visit	Thrust reverser shop visit	Landing gear overhaul	Landing gear exchanges	Aviation Authority Approvals held
AAR Corp	757,767				757,767	757,767	FAA,EASA +others
Air France Industries (inc. KLM E&M)	767	767	767	767		767	EASA, FAA &30+
Air Berlin	757&767						EASA,FAA +2
Ameco	757,767	757,767	757,767	757,767	757,767	757,767	CAAC,FAA,EASA +11
Cascade Aerospace				757,767			TC,FAA,EASA +2
Delta Tech Ops	757,767		757,767	757,767	757,767	757,767	FAA,EASA +3
Evergreen (EGAT)	767			767			FAA,EASA +6
Finnair Technical Services	757						FAA,EASA
Iberia Maintenance	767	767	767	767	767	767	FAA,EASA +16
Icelandair	757,767	757,767				757,767	EASA,FAA +others
Lufthansa Technik	757,767	757,767	757	757,767	757,767	757,767	FAA,EASA +39
Mexicana MRO Services	757,767			757,767			SCT,FAA,EASA +4
MNG Technic	757,767						EASA,FAA +3
SRTechnics	757,767						FOCA,EASA
TAP M&E Brazil (ex VEM)					757,767	757,767	ANAC,FAA,EASA +5
United Services	757				757	757	FAA,EASA +4

a) engines only

highly in their choice of provider.

However, a number of respondents to our survey indicated that they felt the business remains largely regionalised. This view was more prevalent among the European providers. However, even among those who doubted the global nature of the business, there was an acknowledgement that if prices were sufficiently low, operators would consider ferrying aircraft for heavy maintenance. But, as one respondent pointed out, the current volatility in fuel prices tends to make such ferry flights expensive.

Engine market

As is typical of most large engines for commercial aircraft, the overhaul market is dominated by the original equipment manufacturers (OEMs). All three engine manufacturers involved in the 757/767 programmes have an international network of overhaul facilities.

General Electric (GE) has overhaul and repair facilities located in North America, South America, Europe, China as well as North and South Asia. In addition to supporting its own products, GE's 'On-Wing' support centres at London and Seoul offer RB211 and PW4000 support respectively.

Rolls-Royce's (RR) repair and overhaul capability has expanded to 16 sites on four continents, and also includes the capacity to overhaul competitor engines at some facilities.

Pratt & Whitney (PW) has seven 'Engine Centers' around the world, plus a large number of what it calls 'Global Service Partners'. For the 767 engines (PW4000-94) work is performed at the company's Eagle Services Asia facility in

Singapore, in the Cheshire Engine Center in Connecticut, and by various Global Service Partners. Some of the Global Service Partners also have capability for the GE CF6-80C2.

For the 757 engines (PW2303, the PW2040 and the PW2043) overhaul is carried out at the Cheshire Engine Center. A number of Global Service Partners have capability for these engines, but the options are more limited than for the 767 models. Pratt & Whitney does not offer any facilities for the competing Rolls-Royce engines on the 757.

There are relatively few independent facilities for engine overhaul. The most extensive third-party capability is offered by Lufthansa Technik (LHT), which is the only respondent to our survey that indicated a comprehensive capability for all three manufacturers. As well as LHT, independent providers in Europe included Air France Industries/KLM Engineering & Maintenance. North American providers included Delta Tech Ops and United Services.

Rotables & logistics

A number of providers in our survey offer services such as: rotatable component provisioning; inventory and logistics management; and repair and overhaul services. However, there are fewer specialist players in this sector than was indicated in our surveys for the 737 Classics and A320 family.

Heavy components

Heavy components include: wheels, tyres & brakes, landing gears, thrust reversers and auxiliary power units

(APUs). It is rare for airlines to have the capability to maintain such equipment in house. Landing gear, thrust reversers and APUs are generally handled by specialist companies, although some of the larger MRO Integrators also offer capabilities. The OEMs of the respective components tend to dominate the overhaul market for their respective products. Another characteristic of this market, particularly landing gear, is the requirement to provide an exchange service.

Summary

As described, the 757 and 767 fleets have peaked or will soon do so. While most 767-200s and some -200ERs are likely to be scrapped, the 757 and other 767 variants make attractive passenger-to-freighter conversions. The 757 and 767-300ER also have a lot of appeal on the used passenger market. The number of 757s and 767s should therefore not decline as rapidly as other older generation aircraft, such as the DC-10 or A300/A310.

Like the 737-300/-400/-500 series, the 757/767 fleet has begun migration from original operators to secondary and tertiary users. This will see a parallel shift in the technical support market. Providing support for these aircraft will become a specialist issue, as major first-tier operators retire their fleets. With about 1,870 aircraft still in operation, the 757/767 technical support market will remain substantial for the next 10-20 years. [AC](#)

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