

A number of organisations offer comprehensive rotatable component support services, including homebase stock, pool access and repair management. Some of the main rotatable support providers for regional and narrowbody aircraft are identified here.

# Rotatable component suppliers: regional & narrowbody aircraft

**E**fficient rotatable inventory management strategies can reduce an airline's risk of spare component shortages, and any associated operational disruption.

Some operators perform rotatable inventory management in-house. Others outsource it to third-party providers.

*Aircraft Commerce* has identified some of the main providers in Europe, the Americas, and the Asia Pacific offering comprehensive rotatable inventory provisioning, technical support and logistics packages for regional and narrowbody aircraft. The services they offer, their operational bases, and the aircraft types they support are discussed.

## Rotatable components

Aircraft components can be split into different categories: rotatables, repairables, and expendables. Rotables and repairables can both be removed and repaired. Rotatable parts are serialised, but repairable items are not.

Expendables cannot be repaired. They are one-use items, such as washers or seals, that are replaced by new parts on removal.

Rotatable components are often part of major systems, which means they are usually critical to the continued operation of an aircraft. There may be multiple numbers of the same rotatable component

fitted to an aircraft. Examples of rotatables include pumps and avionics boxes.

Some rotatable components are maintained on a hard-time basis. This means they are removed for repair at given service intervals during base checks. Most rotatables are managed under on-condition maintenance, so they are only removed if they fail or start to develop faults.

A large number of rotatables can be accessed easily enough to allow replacement during line-maintenance checks. These components are referred to as line replaceable units (LRUs).

The failure of rotatable components, or a certain number of rotatables, can lead to an aircraft being grounded. This is known as an aircraft on ground (AOG) situation. The aircraft is only released to service when the faulty rotatable component has been replaced.

## Inventory management

AOG situations can be costly for airline, since they impact an aircraft's utilisation and can lead to operational disruption. The airline may also have to compensate its passengers and cover the expense of hotel accommodation or alternative travel arrangements.

To minimise the potential for AOG events, airlines should maintain suitable spare inventories of critical rotatables at



*Key aspects of rotatable management include the testing and repair of unserviceable components. Documentation management is also important. A serviceable part must have appropriate certification and trace paperwork.*



their main bases and outstations. These are often referred to as homebase or mainbase kits, and will consist of ‘no-go’ items and other components with high failure rates. No-go items are rotables that must be functional for an aircraft to operate. Where multiple numbers of the component are present on the aircraft, all, or at least a certain number of them, may have been operating normally for it to fly. If a suitable replacement is unavailable the failure of a no-go item will result in an AOG situation.

It will be necessary to evaluate the type and number of components required for homebase stocks for each aircraft type in an airline’s fleet. If this evaluation is performed in-house, it will be the responsibility of the airline’s maintenance and engineering (M&E) department.

No-go items will be identified using each aircraft type’s minimum equipment list (MEL). Items with high failure rates can be identified by analysing component reliability data.

Maintaining appropriate homebase stock levels is only one aspect of rotatable support.

The inventory management process also involves removing unserviceable components from an aircraft and sending them for test and repair, or overhaul. The repaired parts are then returned to the airline’s homebase spares inventory to await use.

This aspect of the process involves a number of associated support functions, including: repair management, physical component repair, documentation management, and logistics.

Repair management includes deciding which repair shop to send the unserviceable part to. When the repair shop has evaluated the component it will quote a price for the repair or overhaul work required. The quote must be reviewed and a decision taken about whether to proceed. If the price is too high the quote may be rejected and the component may be sent elsewhere for a second opinion. In some cases, high repair quotes may see a component deemed to be beyond economic repair (BER), in which case a decision must be made to scrap it.

Any required modifications related to service bulletins (SBs) or airworthiness directives (ADs) will need to be assessed.

The repair management process will also involve an assessment of a rotatable’s warranty validity. If a component fails while it is still under warranty it can be returned to the original equipment manufacturer (OEM) for a free-of-charge evaluation and repair.

Reliability data should be constantly assessed to identify any high failure rates among certain components. This allows airlines to begin trouble-shooting emerging trends and ensure they have the right stock levels of high failure items.

Some airlines may have the capability to physically repair components in-house. Others will outsource this function to OEMs or third-party repair vendors.

Throughout the repair cycle a component’s documentation will need to be tracked and amended, so that it states the component’s current condition.

A rotatable returned from maintenance

*Most rotatable component service providers provide access to pool stocks. They may have a main warehouse facility and additional store locations positioned around the world to ensure global coverage.*

will need an authorised release certificate confirming that it is serviceable and certified for use. If a component has been modified there may be a slight alteration to its part number. Any alterations should be reflected in the documentation.

Logistics support will be required to package and ship: unserviceable components to repair vendors, repaired items back to parts inventories, and serviceable items between main bases and outstations.

A large investment would be required for an airline to perform the entire rotatable inventory management process in-house. This would include costs for the inventory itself, as well as the equipment and staffing required for repair management, repair facilities, component repair, documentation, and logistics management.

Airlines can mitigate their inventory requirements and AOG situations by taking full advantage of the international airline technical pool (IATP) operated for IATA members. Through this, airlines can borrow rotables and repairables for zero or minimal cost when visiting homebases of other IATP members. These loans are for a short period, but alleviate an airline’s immediate problem of a technical fault for minimal cost when at an outstation.

## Rotable support providers

Airlines can outsource the entire management, repair and logistics of their rotable spare inventories. There are a number of organisations that provide comprehensive rotable inventory management services.

Some of these providers are specialist parts trading companies that have added additional services to complement their core business of parts provisioning.

Other rotable inventory support providers include airline affiliated, and independent maintenance, repair & overhaul (MRO) organisations. Some of these MRO organisations have added rotable provisioning to their service portfolio to support their core repair activities.

Rotable inventory management services are also provided by aircraft OEMs.

Most of the organisations that offer rotable support services have a global presence. They will have a headquarters or main facility in one country but other international facilities or pool stock locations providing support in other regions around the world.

## Services

Comprehensive rotable inventory management packages could provide a homebase stock kit that includes critical no-go LRUs. They will also normally include access to an exchange pool.

In addition to general aircraft and airframe LRUs, providers may offer access to engine, auxiliary power unit (APU) and landing gear LRUs. Some may also provide wheels and brakes.

Inventory support packages may also include repair management, which will cover the administrative process of the repair, such as deciding which repair shop to use and approving any repair costs. Any associated documentation management will also be included. Warranty and logistics services will be available in most comprehensive support packages.

If the support provider has its own repair shops, it may perform some component maintenance in-house instead of managing repairs at other third-party organisations.

Some inventory support packages may include reliability data management. The support provider will monitor component reliability and failure rates to help the airline troubleshoot technical problems and identify suitable spare stock levels.

The support provider may also use reliability data to provide an initial provisioning service. This involves establishing which components should be kept as part of a homebase kit, based on

identifying no-go items and those with high failure rates.

Most support providers will also offer a 24-hour AOG service. The airline can contact the provider at any time if it needs a component that it does not have in its homebase stock. These may be available from the parts pool.

## Pricing

A number of different pricing options are available for rotable support

packages. Some providers can tailor these to airline requirements.

It is common for a monthly lease rate to be charged for providing a consigned homebase inventory of rotatables.

Lease pools might involve a monthly access fee, while repair costs can be charged on a time and material basis.

Payment per flight hour (FH), or power-by-the-hour (PBH) agreements have become increasingly common in inventory support packages. In a PBH agreement a pre-arranged cost per FH is

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## REGIONAL/NARROWBODY AIRCRAFT ROTABLE SUPPORT PROVIDERS HEADQUARTERED IN EUROPE

Company	Product	Homebase Kits	Pool Access	Pool Locations	Types Supported	Engines Supported	Rotables Supported	Additional Services
AFI KLM M&E (AMG & Barfield)	PBH Support	Yes	Yes	Amsterdam Dubai Kuala Lumpur Miami Paris Singapore	737 Classic/NG/MAX A320 family ceo/neo 757 ATR-500/-600 E-Jet family CRJ family	CFM56-7 CFM56-5	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning
Airbus	FHS Components	Yes	Yes	Kuala Lumpur London Singapore	A320 family ceo/neo	All A320 family engines	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management Initial provisioning
AJ Walter		Yes	Yes	UK China Miami Singapore	737 Classic/NG/MAX A320 family ceo/neo MD-80 757 E-Jet family CRJ family C Series	Engines for all supported aircraft	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning
ATR		Yes	Yes	Kuala Lumpur Miami Paris	ATR42/72	PW100	General aircraft LRUs Engine LRUs Landing gear LRUs Propellers	Repair management Reliability management Initial provisioning
AVTRADE		Yes	Yes	UK Canada Dubai Russia Singapore South Africa USA	A320 family ceo/neo 737 Classic/NG/MAX 757 ATR E-Jet family	Engines for all supported aircraft	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management Initial provisioning
Fokker Services	ABACUS availability programme	Yes	Yes	Atlanta Amsterdam Kenya Singapore	F50/F70 Dash 8-100/200/300 CRJ700/900/1000 737 (ECS only)	PW125/127 CFM56-	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repair
Iberia Maintenance		Yes	Yes	Africa America Europe	A320 family ceo/neo 757	CFM56-5 V2500 RB211 JT8	General aircraft LRUs Engine LRUs APU LRUs Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning
Lufthansa Technik	TCS	Yes	Yes	FRA/HAM/MUC LAX/MIA/SFO China India Japan Moscow Singapore	A320 family ceo/neo 737 Classic/NG/MAX 757 Q400 CRJ family E-Jet family	Engines for all supported aircraft	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning
Sabena Technics		Yes	Yes	Paris CDG Singapore	ATR42/72 CRJ100/200 ERJ135/145 Fokker 70/100 E-Jet family	PW100	General aircraft LRUs Engine LRUs Landing gear LRUs Propellers Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning
SR Technics	ICS	Yes	Yes	Dubai London Melbourne Miami Singapore Zurich	A320 family ceo/neo 737NG/MAX 757 E-Jet family	CFM56-5/-7 V2500 CF34-8/-10	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning
Spairliners	Integrated Component Care	Yes	Yes	Munich Paris-CDG	E-Jet family	CF34-8E/-10E	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes (optional)	Repair management Reliability management Initial provisioning
TAP M&E		Yes	Yes	Lisbon, Oporto Porto Alegre Rio de Janeiro São Paulo	A320 family 737 Classic	CFM56-3/-5	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repair Initial provisioning

## Notes:

Documentation and logistics management are assumed to be part of the overall repair management service

agreed with an airline based on multiple factors including aircraft utilisation.

A PBH agreement might include all of the inventory management services, including parts provisioning and repairs.

Wheels and brakes may be charged for on a per landing basis.

Some support packages might involve a mix of pricing structures such as a PBH fee for pool access, and maintenance costs based on a time and material basis.

One of the most common requirements is for pool access and repair support based on a PBH arrangement.

### Service levels

Airlines will agree pre-arranged service levels with their rotatable support provider. These may stipulate the percentage of parts that should be available, and the timeframe in which they will be dispatched or delivered.

Service levels may depend on specific airline requirements and can be variable. The most stringent demands will be for no-go items. A provider may guarantee 95% availability and a dispatch time of within four hours for no-go LRUs. The service level for less critical items might involve a lower guaranteed availability and longer dispatch times.

### Benefits

There are a number of potential benefits to airlines from outsourcing the rotatable inventory management process.

A start-up airline may lack the finance to invest in a stock of rotatable spares, so an inventory support package may be the only way they can afford to begin operations.

Established airlines with owned rotatable inventories could raise capital by divesting their assets and outsourcing their spares support.

If the rotatable assets are owned by an inventory support provider an airline will avoid any associated residual value risks.

Outsourcing rotatable support services can also allow airlines to make savings in terms of the staff, equipment and training costs associated with: component repair; repair, warranty, and documentation management; reliability management; and logistics.

### Survey of providers

Many parts trading specialists offer rotatable components for outright sale or exchange. As it would not be possible to identify every one of these, the focus of this survey is on those organisations that offer comprehensive support including consignment stock, access to exchange pools, and repair services.

The survey is focused purely on support for regional and narrowbody

aircraft. Many of the providers included here also support widebody aircraft.

The following summary covers only providers that responded to the survey and does not claim to identify every company offering rotatable component support.

### Europe

European-based rotatable component support providers include parts trading

specialists, airline-affiliated and independent MROs, and OEMs (see table, page 12).

### Parts traders

A number of large independent parts providers headquartered in Europe offer rotatable component support for regional and narrowbody aircraft. These include AJW Aviation (AJW) and Avtrade.

Both companies are based in the UK

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REGIONAL/NARROWBODY AIRCRAFT ROTABLE SUPPORT PROVIDERS HEADQUARTERED IN THE AMERICAS

Company	Product	Homebase Kits	Pool Access	Pool Locations	Types Supported	Engines Supported	Rotables Supported	Additional Services
AAR	Rotable component support	Yes	Yes	Chicago Brussels Singapore	737Classic/NG/MAX A320 family ceo/neo 757 CRJ family E-Jet family	CFM56-3/5/7 V2500 CF34-	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repairs Initial provisioning
Boeing	Component services	Yes	Yes	Asia Europe North America	717 737 (with AFI/KLM)	CFM56-3/-7	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs	Repair management Reliability management Initial provisioning
Bombardier	Smart Parts	Yes	Yes	Chicago Frankfurt	Q400 C-Series		General aircraft LRUs APU LRUS Landing gear LRUs	Repair management Reliability management In-house repairs Initial provisioning
Delta TechOps		Yes	Yes	Atlanta New York JFK Seattle Tokyo London Heathrow Amsterdam	MD80/90 717 737 Classic/NG 757 A320 family	Engines for all supported aircraft	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repairs Initial provisioning
Embraer	Embraer pool programme	Yes	Yes	Fort Lauderdale Johannesburg Paris São José dos Campos Singapore Warsaw	ERJ family E-Jet family	CF34- AE3007	General aircraft LRUs Engine LRUs APUs LRUs Landing LRUs Wheels & brakes	Repair management Reliability management Initial provisioning

Notes: Documentation and logistics management are assumed to be part of the overall repair management service.

and can provide homebase kits and pool access, repair and reliability management, initial provisioning, documentation management and logistics services.

AJW Aviation began as a specialist parts trader. Since then the AJW Group has diversified and now includes component maintenance and engine leasing subsidiaries among its activities.

AJW's main stock and pool is located in Sussex, UK. It has other pool locations in China, Miami and Singapore.

AJW provides rotatable support for most narrowbody types, including the MD-80 family and 757, but with a focus on 737 Classic and NG, and A320 family aircraft. It can also provide inventory support for the CRJ and E-Jet families. In the future the 737 MAX, A320neo, and C-Series families will be supported.

In 2012 AJW acquired the former Aveos Fleet Performance component repair business in Montréal. It has since been renamed AJW Technique and provides in-house component repair capability.

There are currently 60 narrowbody operators under PBH contract for AJW's

rotatable support services.

From October 2015 AJW will provide component support for easyJet and its fleet of about 240 A320 family aircraft.

AVTRADE describes itself as an independent global component service provider. In addition to its UK headquarters there are regional offices in Dubai, Singapore and Moscow.

AVTRADE has pool stock located in the UK, Canada, Dubai, Russia, Singapore, South Africa and the USA.

It can support 737 Classic and NG family, A320 family, 757, ATR and Embraer aircraft. In the future it will also support 737 MAX and A320neo family aircraft.

There are currently more than 100 aircraft under contract for AVTRADE's rotatable component support services.

Another European-based spares provider is Spairliners, a component support specialist that was established as a joint venture by Air France Industries and KLM Engineering & Maintenance (AFI KLM E&M) and Lufthansa Technik. It initially focused on the A380, but in 2013 it began providing

component support for the E-Jet family.

Spairliners provides repair and reliability management, initial provisioning, documentation management and logistics services, as well as homebase kit and pool access. It can also outsource component repairs to AFI/KLM E&M or Lufthansa Technik.

Spairliners currently has 11 E-Jet operators and about 150 aircraft under contract for its rotatable component support services. These airlines are based in Europe or Africa and include Lufthansa CityLine, KLM Cityhopper, HOP!, Kenya Airways and Royal Air Maroc.

There are a number of parts trading companies in Europe with experience of lease and PBH support, which prefer to focus on the outright sale or exchange of rotatable components.

One example is Casco, which is based in the UK but also has stock in Florida and Singapore. Casco has rotatable stock for regional aircraft and narrowbodies including the Avro RJ family, 737 Classic and NG family A320 family and 757.

Casco fills its shelves with spares from

aircraft part-outs and consignment packages. It also offers brokered repair services.

### MROs

There are a number of European-based, airline-affiliated MRO organisations providing rotatable component support services, including: AFI KLM E&M, Iberia Maintenance, Lufthansa Technik and TAP Maintenance & Engineering (TAP M&E). There are also a number of independent European MROs with component support services, including: Fokker Services, Sabena Technics and SR Technics.

All these MROs provide homebase kits, pool access, repair management, reliability management, documentation management and logistics services. A key strength of their service offerings is that they each offer at least some level of in-house component repair capability.

With the exception of Fokker Services, they all offer initial provisioning services.

### Airline-affiliated MROs

AFI KLM E&M provides tailored component support solutions for A320 family, 737 Classic and NG family, E-Jet family and ATR-500 and -600 series

aircraft. It also provides some inventory for CRJ and 757 family aircraft and will support the A320neo and 737 MAX families when they enter service.

Its main pool locations are in Amsterdam, Paris, Kuala Lumpur, Miami, Singapore and Dubai.

“One of our main strengths is that we can repair close to 80% of the rotatable components in-house,” claims Henri de Belizal, vice president component asset management at AFI KLM E&M. “Due to our airline experience we have a good technical understanding of component reliability.”

AFI KLM E&M currently has about 1,000 narrowbody aircraft under some form of rotatable inventory support contract. Some of these are all-inclusive packages and others are more a la carte. They all involve pool access and repair support.

Iberia Maintenance provides rotatable inventory support for narrowbody aircraft with a focus on the A320 family. It has comprehensive in-house component repair capability for A320 family aircraft, and will also support the A320neo family in the future.

Iberia Maintenance has parts pools located in Europe, America and Africa.

Lufthansa Technik’s Total Component Services (TCS) solution is one element of a comprehensive MRO service offering.

The aircraft types covered by TCS include all Airbus and Boeing narrowbodies, the CRJ and E-Jet families and the Q400. The 737 MAX and A320neo will be supported in the future. Lufthansa Technik has pool stocks located in Germany, the USA, China, India, Japan, Moscow and Singapore.

Lufthansa Technik has about 180 customers and 2,500 aircraft under TCS contract, although it is not clear how many are regional and narrowbody aircraft.

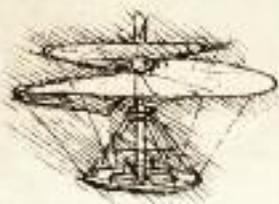
TAP M&E provides rotatable component support alongside its other MRO services. It supports narrowbody types, including the A320 and 737 classic families.

Its main pools are located in Lisbon, Oporto, Rio de Janeiro, Porto Alegre and São Paulo. It also has stock in Paris.

### Independent MROs

Fokker was an aircraft OEM. Since it ceased production Fokker Services can be considered an aircraft and component MRO service provider with OEM experience.

Fokker Services provides rotatable component support through its ABACUS services. These include full rotatable coverage for the Fokker 50, Fokker 70, Dash 8-100/-200/-300 and CRJ-700/-



A. Man aspires.



B. Man constructs.



C. Man soars.

FIG. 1 Building on where we came from to help you move forward.

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## REGIONAL/NARROWBODY AIRCRAFT ROTABLE SUPPORT PROVIDERS HEADQUARTERED IN ASIA PACIFIC

Company	Product	Homebase Kits	Pool Access	Pool Locations	Types Supported	Engines Supported	Rotables Supported	Additional Services
HAECO	ITM	Yes	Yes	Hong Kong	737NG/MAX A320 family ceo/neo	CFM56-5/-7 V2500	General aircraft LRUs Engine LRUs APUs LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability Management In-house repairs Initial provisioning
ST Aerospace	MBH	Yes	Yes	Asia Americas Europe	737 Classic/NG A320 family 757 MD80/90 Q400	CFM56 V2500	General aircraft LRUs Engine LRUs APU LRUs Landing gear LRUs Wheels & brakes	Repair management Reliability management In-house repairs Initial provisioning

Notes: Documentation and logistics management are assumed to be part of overall repair management service

900/-1000. There is also support for environmental control systems (ECS) for 737 Classic & NG aircraft.

Fokker Services has pool locations in Atlanta, Amsterdam, Kenya and Singapore.

ABACUS rotatable services are supporting 35 airlines, including KLM, Austrian Airlines, CommutAir, Air Niugini, Solomon Airlines, Air Panama, Air Iceland and Helvetic.

Sabena Technics provides rotatable inventory support for regional aircraft including ATR42s and 72s, CRJ-100/200s, E-Jets and ERJ-135s/145s. It also provides inventory support for Fokker 70s and Fokker 100s.

Its two main pools are located in Paris and Singapore.

Sabena Technics can repair up to 80% of rotatable ATR components in-house. It has about 135 ATR aircraft under PBH contracts.

SR Technics' Integrated Component Services (ICS) can support E-Jet family, 737NG family, A320 family and 757 aircraft. It will provide support for A320neo family and 737 MAX family aircraft when they enter service.

SR Technics has six pool and distribution centres located in London, Zurich, Dubai, Singapore, Miami and Melbourne.

SR Technics provides component support for about 850 narrowbody aircraft. Airline customers include Swiss and Finnair.

## OEMs

Airbus and ATR both offer rotatable component support services for their aircraft, including: homebase kits and pool access; reliability management; repair management; initial provisioning; documentation management; and

logistics services. Airbus and ATR do not provide in-house component repairs, but outsource these to approved vendors instead.

Airbus Flight Hour Services (FHS) Components is a rotatable inventory supply and repair programme that covers A319s, A320s and A321s. It will also support the A320neo family when this enters service.

There are three main pool locations, in Kuala Lumpur, London and Singapore.

About 40 A320 family aircraft are supported by FHS-Components.

ATR offers rotatable component support services for ATR42s and ATR72s as part of its Global Maintenance Agreement (GMA) package.

There are three pools located in Paris, Miami and Kuala Lumpur. A new pool will shortly open in São Paulo while another is being developed in Singapore.

Over 30% of the operational ATR fleet is currently covered by GMAs, including more than 60% of the latest -600 series.

## Americas

Rotatable component support providers based in the Americas include parts trading specialists, MRO organisations and OEMs (see table page 14).

AAR claims it is the largest independent MRO provider in North America, the world's largest parts trading company and the fourth-largest provider of rotatable component services.

AAR's Rotatable Component Support service covers A320 family, 737 Classic and NG family, 757, CRJ family and E-Jet family aircraft. It also anticipates providing support for 737 MAX and A320neo family aircraft.

AAR provides consigned homebase stock, pool access, logistics, component reliability and engineering support. Its

main pool locations are Chicago, Brussels and Singapore, and it has component repair shops in the USA and Europe.

Complementary services available from AAR through its Airinmar subsidiary include component repair and warranty management services.

AAR has more than 1,000 commercial regional and narrowbody aircraft under long-term component support agreements. Customers include Air Canada, Alaska Airlines and Mesa Airlines.

## MROs

Delta TechOps is the MRO arm of Delta Air Lines. It can provide rotatable component support for 717, MD-80/90 family, 737 Classic and NG family, 757 and A320 family aircraft.

It plans to expand its support to include CRJ and E-Jet family aircraft in the next 12-24 months.

Delta TechOps's rotatable support services include the provision of homebase stock and pool access. Its main pool locations are in Atlanta, New York, Seattle, Tokyo Amsterdam and London.

Delta TechOps has extensive in-house component repair capabilities. Its rotatable support package can include: repair management; reliability management; initial provisioning; documentation management; and logistics services.

Delta TechOps believes its affiliation to Delta Air Lines differentiates it from other component support providers, because it has to maintain an inventory of components to support its own airline. It claims that this can reduce prices for customers, since the stock is not being held specifically for third parties.

Delta Tech Ops has over 170 regional and narrowbody aircraft under rotatable component support contracts.

## OEMs

Boeing, Bombardier and Embraer offer rotatable component support services for their aircraft including: homebase kits and pool access; reliability management; repair management; initial provisioning; documentation management; and logistics services. Boeing and Embraer do not provide in-house component repairs but outsource these to approved vendors instead.

Boeing offers a variety of rotatable inventory packages for the 717 that can be tailored to each customer's requirements. Through its partnership with AFI KLM E&M, Boeing offers component support for the 737NG family. The 737 MAX will also be supported.

Boeing has major pools in North America, Europe and Asia, and other regional pools based on local demand.

Through its partnership arrangement Boeing has responsibility for close to 20 narrowbody customers.

Bombardier offers its Smart Parts rotatable support programme for its Q400 turboprops. Smart Parts will also provide component support for the CSeries family when those aircraft enter service.

Bombardier's main component pools are in Chicago and Frankfurt. Smart Parts inventory is complemented by a global network of eight additional

Bombardier parts depots.

Component repairs can be conducted at approved service centres, including in-house Bombardier repair shops.

Smart Parts was initially established in 2008. There are currently about 10 airlines and more than 100 aircraft serviced by Smart Parts contracts.

Embraer provides rotatable inventory support services for its ERJ and E-Jet family aircraft.

Embraer's pool stock includes more than 800 LRU part numbers. Its main pool locations are Fort Lauderdale, Paris, São José dos Campos, Singapore, Johannesburg and Warsaw.

Embraer currently has more than 50 customers and about 550 aircraft under contract for component support.

## Asia Pacific

Two Asia Pacific-based organisations responded to the survey. HAECO and ST Aerospace are both independent MROs offering comprehensive rotatable support services including the option of homebase kits and pool access (see table, page 16).

They also provide repair management, reliability management, initial provisioning, documentation management and logistics services, and in-house component repair capability.

HAECO provides rotatable component and asset management support for

regional and narrowbody aircraft through its Inventory Technical Management (ITM) Joint Venture with Cathay Pacific. This includes component support services for 737NG and A320 family aircraft. It will also provide future support to the 737 MAX and A320neo families.

HAECO is focused on supporting aircraft in the Asia Pacific region and its parts pool is located in Hong Kong.

HAECO currently has about 40 narrowbody aircraft under contract for some level of component support.

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ST Aerospace provides component support for more than 700 narrowbody and regional aircraft.

Other providers in the Asia Pacific include Ameco Beijing, GAMECO, Singapore Airlines Engineering, and Lufthansa Technik Philippines. [AC](#)

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