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MRO News
from around the world

AVITRADER
MRO

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Opinion

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Cabin fever

The aviation interiors industry once again converged on the German city of Hamburg in April for another riveting installation of Aircraft Interiors Expo - the world's leading event for airlines and the supply chain to source the latest innovations, technologies, and products for the cabin interiors, in-flight entertainment, and passenger comfort industries.

Since its inaugural event in 2000 the aviation industry has evolved beyond expectations, with a new generation of aircraft, such as the Airbus A350 and Boeing 787 and 777X, enabling airlines to redefine the onboard experience. And as demand for air travel continues to grow, thanks to a boom in China, India, Russia and the US, spending on cabin interiors is projected

to exceed \$2bn for narrowbody and widebody aircraft by 2026 – double the amount spent at a peak in 2016.

The show had several new pieces of innovation on display, notably, the brand new half-size thermally insulated inflight service cart able to maintain food safely chilled for more than 20 hours without dry-ice or air chillers, it was presented to the public for the very first time.

In this edition, we home in on cabins and explore how cabin maintenance strategies can keep costs lower and boost cabin efficiency.

Keith Mwanalushi
Editor

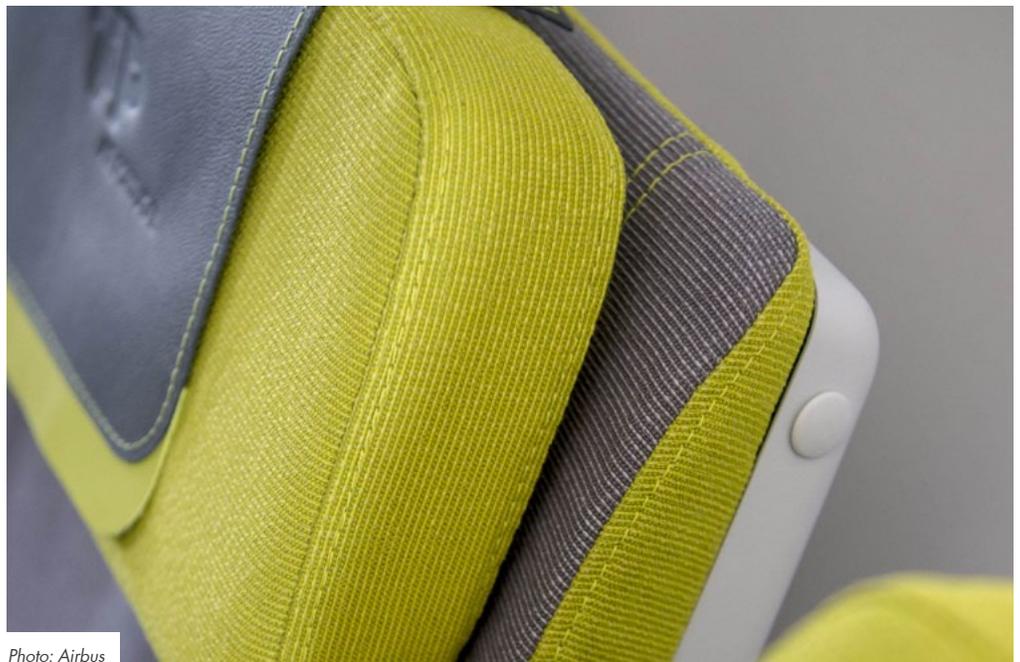


Photo: Airbus

Contents

MRO and Production News	4
Finance News	22
Information Technology	23
Other News	23
Managing expendables	25
Cover story: Cabin equipment maintenance	28
Industry Interview: Pam Corrie, Owner and CFO of Beach Aviation Group	32
Company profile: Farsound Aviation	34
Industry opinion: Unlocking the opportunities of digital twins in aviation	36
People on the Move	38



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Delta CEO Ed Bastian at MRO Americas 2019
Photo: Delta

Delta CEO highlights long-term TechOps growth

Delta CEO Ed Bastian outlined the importance of the airline's maintenance, repair and overhaul business to its long-term future at the annual MRO Americas conference in Atlanta. The business is expected to generate close to US\$1 billion in revenue this year, he said, and is on a path to double that figure over the next five years. Bastian highlighted the investments Delta has made in TechOps, particularly the new engine shop and test cell which recently opened. "These are investments in Delta's future," he said, noting that the new state-of-the-art test cell is the first built in the U.S. in more than 20 years. He also stressed the importance of Delta's workforce development to ensure a steady pipeline of new Delta people in coming years. "We're going to be hiring 500 AMTs just this year," he said.

CAVU Aerospace to open component repair station

During this year's MRO Americas trade show and conference, CAVU Aerospace announced its intent to develop a component repair station based in Phoenix, Arizona led by industry veteran Roy Hyde, former President & CEO of a tier-one FAA repair station. The announcement confirms CAVU's commitment to growth and this additional repair offering will further expand the capabilities available with CAVUSmartMRO™ service offerings. With over 30-plus years' experience in the aviation and aerospace industry focused on component repairs, Hyde is an experienced commercial aviation MRO professional. Prior to joining CAVU, Hyde spent thirteen years in the Air Force, three years managing the accessory shop at Dynair, then was later hired by Lee Benson to start the commercial over-

haul division of ABLE Engineering. He was also one of the founding members of ATC Components and most recently served as its President and CEO. Hyde will assume the role of Vice President of CAVU Component Repair. The new repair facility will be branded as CAVU Component Repair and will be headquartered in Phoenix, AZ. It will offer repair on flight controls, flap tracks, flap carriages, and landing gear for most Boeing, Airbus, Bombardier and Embraer aircraft types. It will look to expand its repair capabilities in the future. CAVU Aerospace will also enhance its repair process with the implementation of its patent pending CAVUSmartTags™ technology to provide additional efficiencies for material direct from the point of dismantling.

GAMECO becomes Boeing supplier for MRO support

Boeing and Guangzhou Aircraft Maintenance Engineering Company (GAMECO) have signed an MRO services agreement to work together to provide MRO support in the Asia-Pacific region. Through this agreement Boeing will provide MRO maintenance training and access to maintenance data and technical support, while GAMECO will commit to maintaining Boeing's rigorous quality standards for MRO services. "Working with GAMECO supports our commitment to meeting the needs of our customers in the Asia-Pacific region," said Ken Shaw, vice president of Supply Chain for Boeing Global Services. "By working with an MRO provider in the region, we can utilize their existing footprint and talent to best serve the needs of the local market." This agreement also bolsters GAMECO's capabilities and maintenance support of Boeing airplanes.

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Barfield and AerFin sign agreement on component maintenance
Photo: Barfield

Barfield signs major component repair agreement with AerFin

Barfield, an Air France KLM Engineering & Maintenance (AFI KLM E&M) subsidiary in the Americas, has entered into a long-term

maintenance agreement with AerFin to cover the repair of regional and single-aisle commercial aircraft components. Under this new agreement, Barfield facilities in Atlanta and Miami will provide support for approximately 170 component part numbers. Today, AerFin

already utilizes AFI KLM E&M's facilities in Europe. Working with Barfield in the Americas is a natural extension to that relationship. The agreement ensures that AerFin will receive services to meet their operational requirements.

Avianca chooses Safran services for A320neo Family jetliner nacelles

Safran Nacelles has been selected by Avianca Holdings S.A. to provide repair services and spares pool resources for engine nacelles that equip the airline's growing fleet of Airbus A320neo Family jetliners, which are powered by CFM International LEAP-1A turbofan engines. Safran Nacelles' repair services and spares resources are part of the company's NacelleLife™ support program, which ensures responsive, cost effective and high-quality services that keep airliners in operational condition while minimizing costs. Avianca Holdings S.A. currently operates nine A320neo Family aircraft, composed of seven A320neo and two A321neo versions, with 24 additional A320neo Family jetliners yet to be received.

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Global 7500 business jet
Photo: Bombardier

LBAS receives EASA Part-145 Line Maintenance approval for Bombardier Global 7500 Aircraft

Whilst Bombardier is delivering its newest and largest aircraft type to the first customers, Lufthansa Bombardier Aviation Services (LBAS) is now ready to offer services for the industry's largest and longest-range aircraft.

The European Aviation Safety Agency (EASA) granted Lufthansa Bombardier Aviation Services approval to perform Line Maintenance Services at its home base in Berlin Schoenefeld. Moreover, LBAS can offer AOG services at any location worldwide for the Global 7500 business jet. "With the EASA approval for Bombardier's new flagship aircraft, we meet the needs of our clients and we can

support them during the Entry into Service phase," said Clemens Schrettl, Head of Sales and Marketing at Lufthansa Bombardier Aviation Services.

Japan Airlines signs multi-year agreement with Satair for A350 material solution

Japan Airlines (JAL) has signed a multi-year IMS contract with Airbus subsidiary Satair for a long-term, fully integrated end-to-end supply chain package covering expendable material for the airline's new fleet of Airbus A350s. The service will commence in June 2019 in line with the delivery of the first of 31 A350XWBs (18 A350-900s and 13 A350-1000s, plus options for a further 25 aircraft) on order with the airline. First service planned for the new aircraft will be in September 2019 on the Tokyo Haneda-Fukuoka route. The service provided by Satair will cover all airframe expendables for the aircraft and will be provided through an on-site stock to JAL. The service includes planning, sourcing, purchasing, logistics and inventory management.

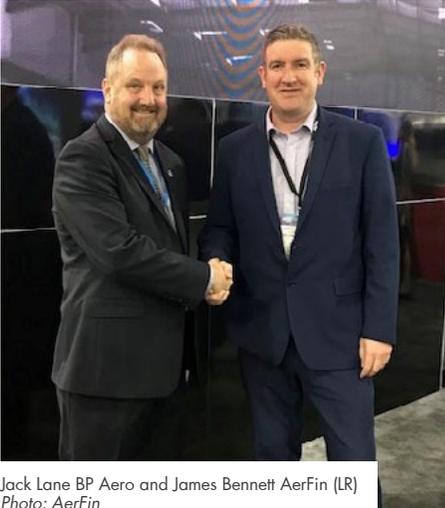
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Jack Lane BP Aero and James Bennett AerFin (LR)
Photo: AerFin

AerFin and BP Aero sign engine support agreement

AerFin, which specializes in aircraft end-of-life services, and BP Aero, the full-service aviation solutions provider, have agreed to a new long-term engine support contract.

The contract will support CFM56 and CF34 engine part overhaul at BP Aero's facilities in Irving, Texas. Attention will be paid to enhancing AerFin's extensive inventory of CF34 parts in order to meet ongoing industry demand. The deal enhances a growing relationship between the two companies which have collaborated for several years to deliver engine and component solutions to airlines and MROs.

CFM continues to expand LEAP aftermarket network

Since the LEAP engine program was launched more than a decade ago, CFM has committed to both developing internal capability through CFM Services, as well as working with its partners to expand third-party MRO capability to support the industry's fastest-growing fleet. The LEAP service model is based on the highly competitive CFM56 model, which has the most open MRO environment in the industry. More than 40 shops, including third-party providers, along with CFM parent companies GE Aviation and Safran Aircraft Engines, currently perform CFM56 engine overhauls, resulting in about two-thirds of worldwide shop visits being completed by non-CFM shops. By having a similar choice of MRO providers for the LEAP engine, aircraft operators and owners get the benefit of competition: lower maintenance cost over the engine life cycle; a broader range of services, and higher residual values. For the LEAP fleet, there are currently four CFM internal overhaul sites on line which will expand to a total of six

locations by the end of 2019, including Lafayette, Indiana; Queretaro, Mexico; Celma, Brazil; Saint Quentin-en-Yvelines, near Paris, France; Brussels Belgium; and Kuala Lumpur, Malaysia. In addition to CFM shops, in February 2018, Lufthansa Technik became the first CFM Branded Service Agreement (CBSA) licensee for the LEAP-1A engine. This agreement provides commercial and technical support to Lufthansa Technik so it can offer CFM solutions to maintain the LEAP-installed base to the highest standards. CFM offers other licenses that enable MRO providers to offer third-party LEAP engine overhaul. Air France-KLM and TAP have already announced LEAP services capability. CFM International's LEAP engine has surpassed four million flight hours in service with 100+ operators worldwide.

Embraer signs multiple new contracts at MRO Americas

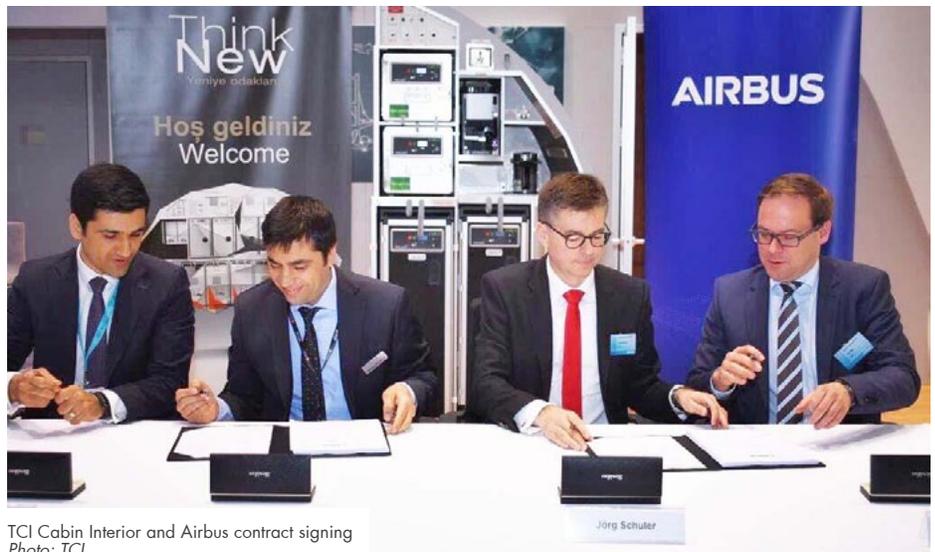
Embraer has signed multiple new contracts at MRO Americas this week. Including, among others, a Pool Program Agreement with Air Botswana to support a wide range of repairable components for its E170 aircraft. The multi-year Pool Program Agreement includes full repair coverage for components and parts as well as unlimited access to a large stock of components at Embraer's distribution center. Furthermore, Embraer and Spain's Binter have signed a multiyear Total Support Program (TSP) agreement to support the airline's new E195-E2 fleet, Embraer's second generation of E-Jets. Besides supporting the airline's component needs, the Total Support Program also covers a large scope of pool services, all heavy checks, routine and non-routine maintenance, landing and brakes overhaul, spare parts and materials, as well as onsite support

with an Embraer technical representative to ensure the highest aircraft scheduled reliability and smooth operation.

Mauritania Airlines has also chosen Embraer to support a wide range of repairable components for its two new E175s. Embraer delivered Mauritania's first E175 at the end of March and the second E175 is slated for the second quarter of 2019. Mauritania Airlines is the first E175 operator in Africa. The multi-year Pool Program Agreement includes full repair coverage for components and parts as well as unlimited access to a large stock of components at Embraer's distribution center. Additionally, Embraer is offering a door-to-door solution to minimize the logistical burden for the customer and the onsite stock, which is the inventory of NO-GO components Embraer provides at the customer's facility.

TCI Cabin Interior to become Bar Unit supplier for Airbus A350 XWB

TCI Cabin Interior has reached an agreement with Airbus to become a Bar Unit supplier of Airbus A350 XWB aircraft. TCI, will design, certify and manufacture A350 XWB Bar Units according to upscale requests of Airlines and requirements of Airbus. This agreement has been a critical milestone for TCI being a supplier for Airbus. TCI Cabin Interior, the joint venture of Turkish Airlines and TAI (Turkish Aerospace Industries), two major Turkish aviation companies, was established to carry the strength and quality of the two exceptional companies into the Aircraft Cabin Interiors industry. TCI is located in Sabiha Gokcen Airport, Istanbul. TCI produces aircraft galleys as a current line of the products and plans to extend the product range with other cabin interior items in the near future.



TCI Cabin Interior and Airbus contract signing
Photo: TCI



Ascent Aviation Services & Marana Aerospace Solutions have merged to create one of the leading aircraft MRO companies in North America. The newly merged company known as Ascent Aviation Services is a class IV 14 CFR Part 145 certified MRO specializing in every aspect of aircraft maintenance for the service life of your fleet.

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Transitions

FBO Fuel Services

On-Call Maintenance



At Aircraft Interiors in Hamburg, the Bucher Group and Satair sign agreement for the supply of galley spare parts
Photo: Satair

Bucher Group signs contract with Satair for galley spare parts

At Aircraft Interiors in Hamburg, Bucher Group and Satair have signed an agreement for the supply of galley spare parts, thereby sealing the first collaborative agreement between the two companies. The contract is effective as of April 2019. The Bucher Group is a Swiss-based company with over 60 years of experience in the aircraft interiors business and a leading manufacturer of galleys and medical systems. Products and solutions produced by the Bucher Group are used for Airbus, Boeing, Pilatus and many other aircraft. Likewise, Satair has more than 60 years of experience within the aerospace aftermarket industry, making the company a world leader within the commercial aftermarket within parts distribution and services.

Collins Aerospace signs new long-term agreements with Air Europa and ANA

Collins Aerospace has signed new contracts with Spanish carrier Air Europa and Japanese airline All Nippon Airlines (ANA). Air Europa has selected Collins Aerospace Systems, to provide a decade of exclusive nacelle MRO services support for the Boeing 787 including lease/exchange services. This long-term agreement extends an existing ten-year service agreement between the two companies where Collins Aerospace will carry on supporting the Airbus A330, Boeing 737, ATR 72 and Embraer E-195 aircraft operated by Air Europa and Air Europa Express. ANA has awarded Collins Aerospace a ten-year support agreement for its fleet of Boe-

ing 787-8, 787-9 and new 787-10 aircraft. The long-term maintenance agreement features Collins Aerospace's FlightSense™ program, which the airline has been a customer of for the past decade. Under the terms of the agreement, Collins Aerospace will guarantee availability of assets through access to a global distribution network, enabling minimized aircraft downtime.

Pratt & Whitney expands GTF™ engine MRO network to include Delta TechOps

Pratt & Whitney will expand its global network of providers that maintain the company's Geared Turbofan (GTF) engines to include Delta TechOps, the division of Delta Air Lines

providing maintenance, repair and overhaul (MRO) services in North America. Delta TechOps will provide engine maintenance for PW1100G-JM and PW1500G engines. Through the EngineWise™ platform of services, Pratt & Whitney provides operators with a variety of aftermarket services designed to provide long-term, sustainable value. Delta TechOps will join other industry leading MRO providers located around the world that deliver high-quality maintenance support to GTF engine operators.

BASF and AAR to jointly protect aircraft passengers and crew from ozone levels

BASF and AAR have signed an agreement to serve the aircraft ozone and Volatile Organic Compounds (VOC) converter market — providing improved airplane cabin air quality and healthier conditions for passengers and crew. BASF selected AAR as a distributor of BASF Deoxo™ aircraft cabin ozone/VOC converters and converter Maintenance Repair and Overhaul (MRO) services. The air at high altitude contains significant levels of ozone. If left unchecked, atmospheric ozone enters the aircraft through air conditioning ducts. Ozone exposure is known to cause adverse health effects, including headaches, fatigue, shortness of breath, chest pain, coughing, and irritation of the eyes, nose or throat. BASF offers technology to reduce both harmful ozone and VOC in aircraft cabin air. This technology improves air quality by removing ozone, as well as reducing certain hydrocarbon compounds responsible for unpleasant odors such as jet fuel smell, as well as those from lubricant leaks and on-ground maintenance activities.



BASF ozone converter
Photo: AAR



Photo: GAMECO's new Parts Manufacturing Center

New facilities of GAMECO PMC officially put into operation

On Apr 3, the new facilities of GAMECO Parts Manufacturing Center (PMC) were officially put into operation. The new site covers an area of nearly 6,000 m² with an appropriate layout and well-equipped facilities, guaranteeing that production is safe, effective and environmentally-friendly. At present, PMC has obtained parts manufacture qualification for more than 10,000 items, including cabin parts, cargo parts, airframe structure parts, as well as mod. parts, which covers CNC machining parts, sheet metal parts, injection molded parts, composite parts, leather fabric, placards, electronic parts and cables, etc. Compared to purchasing parts from OEMs, the use of PMC's self-produced parts makes maintenance more efficient and cost effective, reducing maintenance costs for GAMECO's customers including, China Southern.

GA Telesis MRO Services Group signs new long-term agreement with JetBlue

GA Telesis has reported the execution of a long-term agreement with JetBlue. The agreement, which began in December 2018, covers the repair and overhaul of a variety of components for JetBlue's fleet of Embraer 190 aircraft. "We started working with JetBlue in early 2018 and our performance on TAT and reliability led to the execution of a long-term agreement," said Pastor Lopez, President of MRO Services.

Lufthansa's Mobile Engine Services gaining momentum in North America

With the inauguration of a larger repair station in Montréal and the introduction of a new engine type to be serviced at the Tulsa, Oklahoma facility, Lufthansa Technik's Mobile Engine Services is gaining strong momentum in North America. The new Mobile Engine Services repair station in Montréal is currently moving from inside Air Canada's facilities to new and independent premises. With more than 2,500 m² (27,000 ft²) of floor space and 12 bays, the new building will triple the site's operational capacity for surgical repair

solutions on CFM56 engines. To support the capacity increase, Lufthansa Technik plans to expand its workforce in Montréal from today's 30, to 80 by the end of 2021. Since January, the Mobile Engine Services site in Tulsa has had its re-modelled hangar in operation, expanding the capacity for work on V2500 engines from four bays to six, plus a fully operational test cell. Along with the expansion, Lufthansa Technik will also add the CFM56 series to its Tulsa repair and test cell portfolio, with production starting in July. First in the series will be the CFM56-5B, with initially three bays. As of today, Mobile Engine Services employs 42 mechanics in Tulsa.

HAECO Cabin Solutions to debut Eclipse cabin

HAECO Cabin Solutions unveiled its Eclipse Cabin at the Aircraft Interiors Expo in Hamburg, Germany on April 2, 2019. During the event, HAECO Cabin Solutions also showcased its new Eclipse seat. The launch customer – an as-yet-unnamed Middle East-based airline – will begin flying with the seats in 2020. The Eclipse Cabin transforms travel in short-haul business class and long-haul premium economy by utilizing an innovative layout and design. This elevates the overall passenger experience by increasing privacy and comfort while maximizing passenger places (PAX) for airlines. The Eclipse Cabin further enhances flying by providing more stowage space for amenities and crew baggage, freeing overhead bin space. Customer deliveries will commence in the first quarter of 2020 after the Eclipse Cabin has achieved FAA Technical Standard Order (TSO) certification.



Eclipse cabin
Photo: HAECO

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The half-size ARCTICart launched at Aircraft Interiors Expo, Hamburg
Photo: Bucher

Bucher launches ATLAS half-size ARCTICart

Bucher Aerospace, the Seattle-based branch of the international Bucher Group, has launched a half-size version of its thermally insulated galley cart, ARCTICart. Launched on the first day of the Aircraft Interiors Expo in Hamburg, Germany, the ATLAS half-size ARCTICart enables cabin crew to serve chilled food and drinks to passengers without the need for chillers, dry ice and other cooling devices inflight, thereby reducing the weight of the aircraft and enabling airlines to make efficiency gains. The product can safely store its contents below 4 degrees for up to 20 hours. The innovative technology used in both the full-size and the half-size version of the product is unrivalled when it comes to ensuring food safety by reducing the risk of food contamination during ground handling and protecting food in hot climates. The half-size ARCTICart is the company's latest innovation for airline catering. It was launched just eight months after the full-size version of the product received Technical Standard Orders (TSO) Authorization from the FAA.

THE LATEST NEWS FROM MTU MAINTENANCE

MTU Maintenance launches MTUPlus Intelligent Solutions

MTU Maintenance has launched its redefined services portfolio MTUPlus Intelligent Solutions at the MRO Americas in Atlanta, Georgia. The portfolio has been conceived to fulfil the exact and specific needs of operators, who increasingly require tailor-made solutions across the lifecycle in order to control and optimize cost, as well as those of asset owners and lessors, for whom residual value and cost of ownership is key. The portfolio has been divided into four highly tailored solutions, PERFORMPlus, SAVEPlus, VALUEPlus, MOVE-

Plus, and a services cluster SERVICEPlus for single and ad-hoc requests. "Customers rely on us for world-class engineering, intelligent creativity and dedicated support," says Martin Friis-Petersen, Senior Vice President MRO Programs, MTU Maintenance. "It is our job to spot market trends and ensure our portfolio is meeting the customer requirements of tomorrow. As an independent service provider, our focus is going that extra mile for customers, and never giving up until the optimal solution has been found for them." MTU Maintenance and its 5,000-strong workforce currently perform over 1,000 shop visits a year for more than 200 airline customers and close to 30 engine types. The company is certified by the FAA, EASA and CAAC and has over 50 country-specific certifications throughout its global network. With locations in the Americas, Europe and Asia, capabilities for on-site and near-wing services, as well as representative offices, MTU Maintenance is available wherever and whenever needed.

AAR PW2000 contract with MTU Maintenance extended for another five years

AAR will be extending its PW2000 engine support contract with MTU Maintenance for another five years. AAR will be supplying PW2000 parts to support MTU, which is one of the largest engine overhaul providers in the world. MTU has recently said it has won contracts valued at more than US\$700 million and remains committed to its PW2000 engine MRO program for at least another 10 years. AAR is an important source of used serviceable materials (USM) in support of these engine overhauls.

MTU Maintenance secures close to US\$4.4 billion in contract wins

MTU Maintenance, the MRO division of MTU Aero Engines AG secured around US\$4.4 billion in MRO contract wins in 2018, surpassing the 4 billion mark for the first time in its history. Over 300 contracts were signed in 2018, of which 46 were with new engine MRO customers. In 2018, MTU Maintenance's worldwide facilities were operating at full capacity and the company completed well over 1,000 shop visits as well as close to 1,500 events. The highest ever number of engines went through the MTU Maintenance Hannover facility with over 400 shop visits completed. Within the network, around a third of all visits were for the V2500 engine, which is served at its three facilities: MTU Maintenance Canada, MTU Maintenance Hannover and MTU Maintenance Zhuhai. Once again, records were broken for the CF34 program at MTU Maintenance Berlin-Brandenburg,

with over 130 shop visits taking place. Airfoil Services (ASSB), MTU's joint venture with Lufthansa Technik in Malaysia also increased its proportion of third-party repairs to 60%, with the remaining 40% of volume coming from the joint venture partners. Nearly US\$400 million was won by MTU Maintenance in third-party repair deals, including parts, accessory and teardown services in 2018. More than 200 third-party repair customers were served and 20,000 orders placed. "This success combined with forecast repair demand in coming years is one of the reasons behind MTU's plan to build a new European repair facility, in addition to the massive capacity expansion taking place at all facilities across our network," Michael Schreyögg, Chief Program Officer, MTU Aero Engines said. MTU Maintenance Lease Services B.V., an 80/20 joint venture with Sumitomo Corp. operating out of Amsterdam also significantly surpassed records in 2018, demonstrating a growth rate of about 37% compared to the previous year in terms of revenue. The company focuses on short-term lease support and asset management and expanded its portfolio in 2018 to include technical asset management services (TAMS). The range of services covers comprehensive technical consulting and fleet management, transitions management and housekeeping support for aircraft engines. Photo: MTU Maintenance Text: CFM56 maintenance

MTU Maintenance signs 12-year GE90 contract with United Airlines

MTU Maintenance has signed a twelve-year GE90-115B maintenance contract with United Airlines. The fly-by-hour contract covers the maintenance, repair and overhaul of 49 engines powering the airline's B777-300ER fleet and includes MTU proprietary repairs as well as engine trend monitoring. United Airlines is headquartered in Chicago, Illinois. The airline operates over 770 mainline aircraft.

Commuter Air Technology taps StandardAero for PT6A-60A engine support

StandardAero has been selected by Commuter Air Technology (CAT) to provide support services for Pratt & Whitney Canada PT6A-60A engines installed on King Air 350 aircraft operated by the company. Under the multi-year agreement, StandardAero will provide CAT with PT6A-60A maintenance, repair and overhaul (MRO) services from its Designated Overhaul Facility (DOF) with Distribution rights in Summerside, PEI, Canada, delivering improved turn times and reduced operating costs to CAT and its customers.



Bombardier CRJ550
Photo: GAL Aerospace

GAL Aerospace to become supplier for aftermarket Bombardier CRJ series cabin retrofits

GAL Aerospace has entered into a collaborative relationship with Bombardier for the development and aftermarket retrofit of interiors for the existing CRJ Series fleet. As part of this relationship, GAL will collaborate with Bombardier to enable go-to-market optimized solutions in support of the in-service CRJ Series fleet. More specifically, GAL Aerospace has received authorization from Bombardier to supply cabin interior aftermarket support for the new CRJ550 aircraft that was launched last month. "The great success of the Bombardier CRJ Series family of aircraft has created opportunities for the modification and upgrade of in-service cabin interiors and GAL is fully engaged in fulfilling this niche demand," says Jonathan Cornwell, vice president of business development and sales for GAL Aerospace. "The support from Bombardier will further enhance our ability to develop and deliver innovative solutions for the CRJ Series aircraft," adds Glen Lynch, president and CEO of GAL Aerospace.

Rolls-Royce awards Volo Aero MRO repair services contract

Volo Aero MRO, a privately held MRO provider for engine and accessory piece part repair, has been chosen by Rolls-Royce for repair services on the AE3007 product line. As part of the organization's focus on supporting OEM's repair needs, this is the first contract received for this product line. Over the last few years Volo Aero MRO has been growing its Rolls-Royce, capabilities primarily on the T56/D-22 product covering shafts, gears and wheels. Recently Volo Aero MRO has added 4th-axis CNC machining, large-

capacity vertical grinding and rubber repair capabilities to its portfolio. As the company improves its in-house capabilities to better fit the outsourcing needs in the civil and military aerospace markets, it forecasts a continuation of the growth already seen in 2018 and the first quarter of 2019.

StandardAero signs multi-year contract with Sky Regional Airlines

StandardAero has signed a new multi-year contract with Sky Regional Airlines Inc. to provide maintenance, repair and overhaul services for the airline's Pratt & Whitney Canada APS2300 auxiliary power units (APUs). Sky Regional, based in Mississauga, ON, operates flights to destinations across Canada and the U.S. under the Air Canada Express banner. Under the agreement, StandardAero will provide MRO services for the APS2300 APUs equipping the fleet of Embraer E175 regional aircraft operated by Sky Regional Airlines. StandardAero's Maryville, Tennessee

location, which is an OEM-approved Authorized Repair Facility (ARF) for the APS2300, will provide Sky Regional with customized MRO programs offering maximum support and flexibility to meet the airline's specific operational needs.

Jet Maintenance International launches Citation and Dassault-focused MRO

A new aircraft maintenance company, Jet Maintenance International (JMI), is to be established at London Oxford Airport from the start of May. Headed by principals Neil Plumb and Ed Griffith, the MRO (Maintenance, Repair and Overhaul) and aircraft management business will be primarily focused on Textron (Cessna) Citation and Dassault Falcon aircraft product support with line, base and AOG capabilities. Veterans in the business aviation sector with over 40 years' combined experience, the JMI team expects to tap into the ever-growing demand for high-quality and personalized customer service for some of the more popular models in the U.K. and wider European business aviation fleet where demand for quality technical support is beginning to exceed capacity. Ed Griffith's experience includes running hangar MRO operations at Gama Aviation Plc, Textron, Kinch Aviation and transforming the London Luton Airport Line Station for CSE Citation Centre (now Signature TECHNICAir). Neil Plumb was the General Manager of a large MRO at Cranfield before going on to set up his own business managing and flying numerous business aircraft, predominantly Citation and Falcon types. Moving into London Oxford Airport's most recently completed facility, Hangar 14, Bay 4, they start with a brand-new £2m (US\$2.6m) facility with around 16,000 sq.ft. (1,500m²) along with bespoke external offices and dedicated customer parking.



Photo: Jet Maintenance International hangar

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Trenchard Aviation Group renews contract with Virgin Atlantic

Trenchard Aviation Group has renewed its long-term contract to provide aircraft cabin

materials management services to Virgin Atlantic. This comprehensive, wide-ranging contract will be fulfilled by the Group’s nose-to-tail cabin maintenance and total care management company, Aero Technics. The company will be delivering design services, interior parts development and repair, on-wing cabin maintenance, galley insert repairs, dry cleaning services and soft furnishing repair and replacement. The EPA part development aspect of the contract will include efficient inventory management and distribution of parts to maintenance areas as well as warranty management on behalf of the airline with OEMs.

AJW Group signs Pool Access Agreement with TAG Aviation for Boeing 757 aircraft

AJW Group has signed a Pool Access Agreement with private and business jet aviation services provider, TAG Aviation. The contract covers TAG Aviation’s Boeing 757 aircraft, which is operated in a VIP configuration of-

fering high-end, round-the-world tours. The news marks the extension of an existing relationship between TAG Aviation and AJW Group, with the lease of a flyaway kit already in place.

SR Technics completes major galley overhaul on Boeing 777

SR Technics has successfully completed a galley conversion project for the leasing company AerCap. The SR Technics Engineering team’s innovative proposal to modify the galleys on five Boeing 777-300ERs convinced AerCap to upgrade to the popular ATLAS standard. After a design and certification process, the first installation was completed at the beginning of 2018 and led to the delivery of all five aircraft by the end of the same year. The service allowed a rapid transition of the leasing firm’s aircraft. Interior upgrades of this sort assure higher lease rates and shorter ground times, which is why AerCap has contracted SR Technics Engineering to complete additional overhauls on the B777-300ER models in 2019.



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The new MRO site in Perpignan-Rivesaltes (France)
Photo: Sabena Technics

Sabena technics unveils new maintenance site

The French group Sabena technics, an independent provider of aircraft maintenance and modifications (MRO), has acquired the assets of the company New EAS – now known as Sabena technics PGF – and thus reinforces its implantation and development on the European continent. Based in Perpignan-Rivesaltes (France), the Group's new site employs 165 people and has three hangars able to accommodate a wide-body aircraft and up to five narrow-body aircraft for civil and military base maintenance operations. "This acquisition is perfectly aligned with our external growth strategy and reflects our desire to strengthen our presence in a very dynamic MRO market. Thanks to the complementarity of our sites, our customers will benefit from extended services with ever more quality and competitiveness", said Philippe Rochet, Chief Operating Officer, Sabena technics.

AFI KLM E&M obtains FAA certification to install RAVE system on AerCap 777s

AFI KLM E&M has been awarded Supplemental Type Certificates (STC) certification authorizing AerCap's three 777s to resume operations. AFI KLM E&M had reconfigured and retrofitted the cabins with Zodiac Aerospace's RAVE IFE system – a world first on Boeing 777-300ERs. AerCap has ordered the cabin retrofit for the three aircraft in October 2017 prior to their transfer to another airline. The retrofit was designed to maximize the aircraft's seating capacity using proven AFI KLM E&M expertise on the 777 product. AFI KLM E&M has already carried out over 100 modification programs on this aircraft type, both for its parent airlines as part of the BEST pro-

gram, and for third-party customers. Today it holds the record for the configuration with the largest number of seats aboard a 777, at 531 instead of the usual 410-430.

AFI KLM E&M personnel adapted to the technical constraints involved in the retrofit, as it was necessary to adapt the RAVE system to the architecture of a 777-300 and develop technical solutions to guarantee IFE operation aboard.

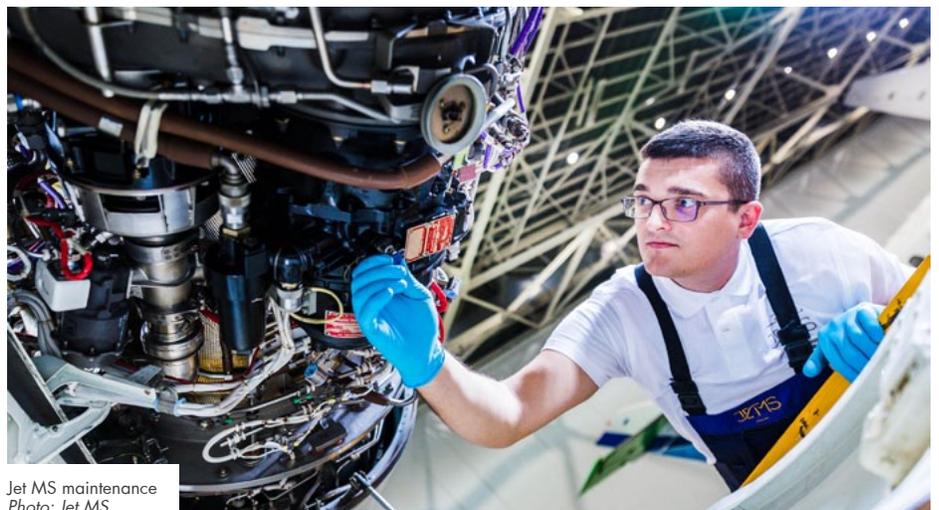
Triumph assigns E2 structural production contract to ASTK

Triumph Group's Aerospace Structures business unit has entered into a definitive agreement to assign the contract for the manufacture of structural components for the Embraer E2 program to AeroSpace Technologies of Korea (ASTK). The agreement follows Triumph's January 2018 strategic decision to partner with ASTK to outsource production of the E2 fuselage. ASTK now has responsibility for component fabrication, assembly, and

transport of fuselage shipsets to Embraer's E2 Brazilian final-assembly facility as ASTK supports the ramp-up in production following the E2 program's entry into service. Transition activities are underway with plans for ASTK to ramp-up to full rate production and build all required fuselages for delivery starting in January 2020. Triumph will continue to support ASTK by producing the rudder and elevator structures for the program out of its Milledgeville, Georgia facility. Triumph will also provide program engineering support. The assignment of the contract for the manufacture of the structure components to ASTK, which is subject to certain conditions, is expected to occur in the third quarter of the company's 2020 fiscal year.

Jet MS provides 7800 landings inspection for Bombardier CL604

Jet Maintenance Solutions (Jet MS), a part of Avia Solutions Group, became one of the first MRO companies to complete the 7800 landings inspection on a Bombardier Challenger 604 (CL604) type aircraft, as there are only five to ten CL604s globally that have reached such a milestone. To perform the 7800 landings inspection, Jet MS engineers had to remove the majority of the main aircraft parts and components: engines, inner and back-side fuel tanks, stabilizers, etc., which is not done during usual inspections after 48 and 96 months of aircraft operation. All construction parts were inspected and a complex of non-destructive tests (NDT) such as x-ray, ultrasonic, eddy current and magnetic were performed. 7800 landings inspection for this aircraft type is quite rare in the market as most CL604s have not yet reached this milestone. This particular aircraft has been used very intensively on short-haul flights.



Jet MS maintenance
Photo: Jet MS



Erickson Aero Tanker
Photo: Dan Watson / SCNG

AerSale to build another firefighting air tanker

AerSale has signed a contract with AeroAir/Erickson Aero Tanker to build another firefighting air tanker for the company's fleet at AerSale's MRO facility in Goodyear, Arizona. Conversion of the 6th MD-87 aircraft, formally begins on April 1 and will mark the sixth

such aircraft modification AerSale has completed at Goodyear. Once the modification is complete, the new Erickson Aero Tanker will cruise at 450 knots, carry 3,000 gallons of fire retardant in all environments up to 40 degrees Celsius, boast a 900-mile loaded strike range, require only a 5,200-foot runway loaded, and both take off and land fully

loaded. In addition to converting the air tankers' original MD-87 aircraft, AerSale also performs all heavy maintenance on the Erickson Aero Tanker fleet.

Acro Aircraft Seating launches new Series 6LC Economy Class seat

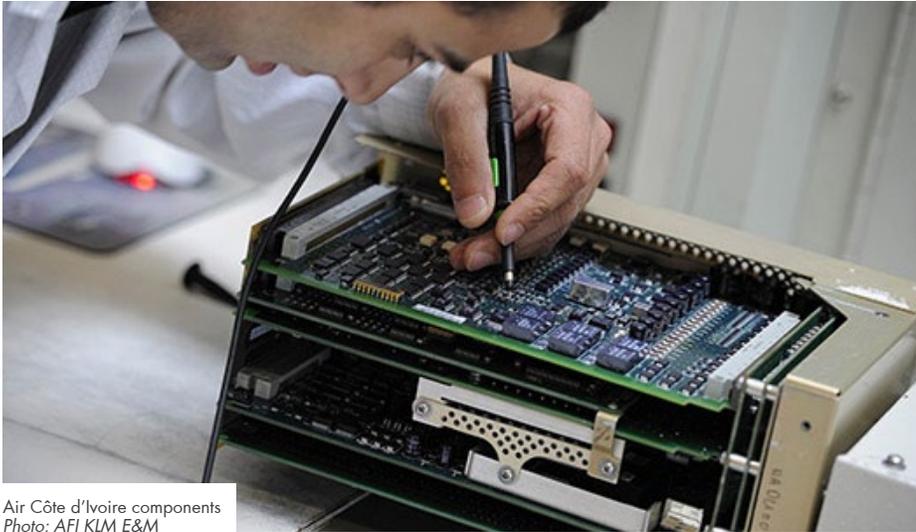
Acro Aircraft Seating (Acro) has launched Series 6LC Economy Class seat at the Hamburg Aircraft Interiors Expo. Aimed primarily at the hardworking low-cost carrier's narrow-body fleets, Series 6LC re-defines Acro's quest for simplicity with its minimalist design aesthetic and reduced part count, whilst also enhancing comfort with Acro's innovative curved seat back design which unlocks space at knee level. Series 6LC features include a pre-reclined fixed back, with an upper literature pocket, sliding table and lightweight armrests. Additional options include comfort seat covers, crew step, lower literature pocket and USB A & C provisioning. Acro has secured a major low-cost carrier as a launch customer for Series 6LC and will be announcing this collaboration in the forthcoming weeks.

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Air Côte d'Ivoire components
Photo: AFI KLM E&M

All Nippon Airways extends Integrated Material Services solution from Satair

All Nippon Airways (ANA), Japan's largest airline, has extended its existing multi-year Integrated Material Services (IMS) contract with Satair for its fleet of A320/321 CEO and NEO variants to include cover for its incoming fleet of three double-deck A380s, with the first entering service from May 2019. The service from Satair commenced in December 2017 and includes planning, sourcing, purchasing, logistics and inventory management covering an extensive amount of part numbers for the A320/321 fleet. The coverage includes all expendable material needs of ANA's Airbus A380. A collaborative on-site team consisting of both Airbus/Satair and ANA staff working in one office has created a truly integrated and seamless operation to deliver the service. The additional A380 IMS service is a full-scope expendable materials' solution covering all Line and 'A' checks, and pre-loading for 'C' Checks.

Air Côte d'Ivoire chooses AFI KLM E&M component support for A319-100 aircraft

AFI KLM E&M and Air Côte d'Ivoire have signed an agreement covering component support for the Ivorian carrier's four A319-

100s and two A320-200s. The contract covers future A319neo and A320neo aircraft scheduled to join Air Côte d'Ivoire fleet from 2020. The services delivered by AFI KLM E&M include repairs, spares pool access, the provision of a Main Base Kit, and logistics support.

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CRENO engineer adjusting the machine
Photo: CRENO

CRENO delivers 20th large CNC machine in China to AVIC

CRENO, one of the leaders in high-tech machining solutions, pursues its development in China as it prepares to deliver to AVIC, the Chinese OEM, a 2 in 1 computer numerical control capable of machining composite parts as well as cutting honeycomb, ultrasonically. Specialized in the aeronautics industry, a high consumer of composites, CRENO will deliver its 20th specialized large machine to China. The machine will be implanted in Jinan, at one of AVIC's locations, a Chinese equipment manufacturer and major actor of the COMAC program. Compared to traditional techniques, ultrasonic cutting processes are dust free and as a result significantly improve the workspace environment and cleanliness. It equally enables high-quality precision cutting with no deformation and is up to three-times faster. This tailor-made 5-axes CNC machine has been conceived according to detailed customer specifications in answer to AVIC's needs. Precise to a hundredth of a millimeter, the machine measures 6m long, weighs 30 tons and has a large vertical height axis (2.2 meters).

Joramco obtains A320neo FAA approval

Joramco, the Amman based MRO and the engineering arm of Dubai Aerospace En-

terprise (DAE), has announced the addition of the A320neo to its FAA approvals after adding this capability to the EASA approval last month. With more than 50 years of experience, Joramco has established a sound track record as a leading commercial aircraft maintenance, repair and overhaul (MRO) facility serving a wide range of customers in the Middle East, Europe, South Asia, Africa, Russia and CIS countries, offering services on several aircraft models from the Airbus, Boeing, and Embraer fleets. Strategically located at a free zone area in Queen Alia International Airport in Amman-Jordan, Joramco's facility includes five hangars that can accommodate up to 15 aircraft.

AAR awarded new additional Worldwide Aviation Support Services site

AAR has received notification from the Department of State awarding the company a new site under the Worldwide Aviation Support Services (WASS) program. Under the task order, the new site in Costa Rica will provide host nation aviation training. "The WASS program continues to perform very well, and we are excited to expand our support of the Department of State with this new site," said John Holmes, AAR President & Chief Executive Officer. "We remain focused on delivering world-class support to the WASS program and look forward to providing an exceptional service as the scope of this important program continues to grow." AAR was originally awarded the single award indefinite-delivery/indefinite-quantity (IDIQ) contract in September of 2016.

Allegiant Air selects SR Technics as CFM56-5B maintenance provider

SR Technics has been selected by United States-based low-cost airline Allegiant Air to service its fleet of CFM56-5B engines for a period of three years. Headquartered in Las Vegas, Allegiant Air is the ninth-largest commercial airline in the USA. It currently has a fleet of 80 Airbus A319/A320s but expects to be flying 93 aircraft by the end of 2019. The airline has already sent the first three engines to Zurich for the first of approximately 50 CFM56 shop visits over the term of the contract. The three-year deal includes an optional two-year extension.

S7 Technics and Air Astana agree on five-year maintenance contract

S7 Technics has commenced work under a five-year maintenance, repair and overhaul (MRO) contract signed with Kazakhstan flag carrier Air Astana. The Russian aircraft maintenance service provider won the open tender for the contract in the summer of 2018. Under the arrangement, S7 Technics will perform C-checks on the Airbus A320 family of narrow-body aircraft and Boeing 767 wide-bodies operated by Air Astana. The Kazakh carrier has become the first international airline to agree on such a long-term and large-scale contract with Russia's S7 Technics. The first aircraft Air Astana sent for a shop visit to S7 Technics was a Boeing 767. In February the Russian service provider's team completed a C-check on this aircraft at S7 Technics' Novosibirsk site at Tolmachevo airport.



Air Astana A320
Photo: S7 Technics



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Larger overhead bins for Bombardier Q400
Photo: GAL Aerospace

GAL Aerospace introduces larger overhead bins for Bombardier Q400

GAL Aerospace has launched its solution to increase overhead bin capacity for regional airlines operating the Dash 8 Q400 aircraft with classic interiors. The new overhead bin solution is part of an ongoing product development effort by GAL Aerospace to improve the customer experience and extend the service life of Q400 aircraft fitted with classic interiors by providing a plug and play replacement for the original, undersized bins. Insufficient overhead bin space poses a major challenge to on-time departures, frustrates passengers and cabin crew, and causes airlines to employ inconvenient and expensive gate check or plane side services to mitigate the problem. GAL's replacement overhead bin solution is specifically designed to accommodate standard roll-aboard bags, thereby eliminating the need for gate check service, and greatly improving the overall passenger travel experience. "Our overhead bin solution for the Q400 was developed in response to an identified

demand from regional airlines and aircraft leasing companies such as our launch customer, Nordic Aviation Capital. With our design now fully certified by the Canadian, American, and European authorities, we are very excited to move forward in support of regional aircraft customers," said Jonathan Cornwell, Vice President of Business Development and Sales for GAL.



Photo: Air Senegal ATR 72-600

StandardAero to provide engine support for Air Senegal's ATR 72-600 fleet

StandardAero has been selected by Air Senegal to provide a comprehensive range of engine services for its new fleet of ATR 72-600 regional turboprop aircraft. Under the multi-year contract with the Senegalese flag carrier, StandardAero will provide engine maintenance, repair and overhaul (MRO) services for Air Senegal's ATR 72-600s from its OEM-authorized Designated Overhaul Facilities (DOFs) in Gonesse, France and Summerside, PE, Canada. The contract will also see StandardAero provide Air Senegal with a range of rental engine, mobile repair team (MRT), engineering and engine condition trend monitoring (ECTM) support services. StandardAero is uniquely placed to offer ECTM analysis expertise as both an OEM-approved DOF and a CAMP Systems Designated Analysis Center (DAC).

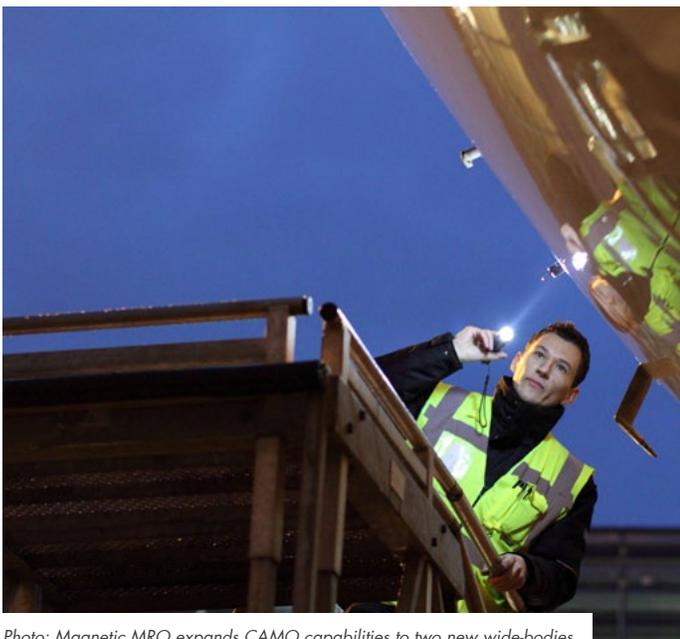


Photo: Magnetic MRO expands CAMO capabilities to two new wide-bodies

Magnetic MRO expands CAMO capabilities to two new wide-bodies

Magnetic MRO, a global provider of Total Technical Care for aircraft operators and lessors, has gained EASA approval to offer continuing airworthiness management (CAMO) services on wide-body Airbus 330 and Boeing 777 aircraft, as well as Embraer 145 aircraft type. News about the recently updated CAMO approval certificate that expands Magnetic MRO's capabilities to two new types of wide-body aircraft comes just weeks after the company finalized the acquisition of Direct Maintenance, a Dutch company that's specialized in Line Maintenance for wide-body aircraft.

Latecoere welcomes Searchlight Capital's 26% investment

Activist investor Searchlight Capital Partners (Searchlight) has confirmed its intention to acquire a 26% stake in Latecoere, the French aeronautics company, through the acquisition of existing stakes held by Apollo Capital Management, Monarch Alternative Capital and CVI Partners, at a price of US\$4.31 (€3.85) per share. The total investment is valued at US\$106.8 million. A number of French companies have been targeted by so-called Activist investors who feel they have been underperforming, including Elliott, which is piling pressure on drinks group Pernod, CIAM is tussling with reinsurer Scor, and Amber Capital has acquired a stake in Lagardere, according to Reuters. Latecoere cut its earnings outlook last December after start-up costs related to new contracts hit its margins and cash flow, although the company's latest set of results earlier this month showed signs of a recovery. Latecoere said it welcomed Searchlight's move and its presence on its board of directors. "The company welcomes this proposed transaction, Searchlight having shown on this occasion its support for the strategy proposed by management and approved by the board of directors," Latecoere said in a statement. It is understood that Searchlight will propose three candidates to join the board of directors.

Aernnova acquires Structural Integrity Engineering

Aernnova has completed the acquisition of Structural Integrity Engineering (SIE), an aircraft engineering company headquartered in Chatsworth (California) with regional offices in Seattle (Washington) and Madrid (Spain). With this acquisition, Aernnova reinforces its growth strategy in North America and adds engineering and certification expertise that complements its aeronautical engineering division and DOA services. Dr. Matt Creager, who will continue as SIE's President, said "We are hon-

ored to have secured the confidence of Aernnova's management based on SIE's strong reputation for engineering in structures' and systems' integration and our track record in delivering quality for our customers. We look forward to working as part of Aernnova's international engineering and manufacturing team to deliver high-quality solutions for our customers."

IAI posts US\$44 million net loss for 2018

Israel Aerospace Industries (IAI), Israel's largest national military and civilian security defense company, has issued its consolidated financial statements for the year ended December 31, 2018. IAI has recorded an annual increase of US\$2.3 billion in order backlog, reaching a record scope of approximately US\$13.5 billion at the end of 2018. The Company reported sales totaling USD\$ 3.7 billion, representing a 5% increase in sales compared to last year, and a net loss of US\$44 million. The Company has cash balances in the aggregate of approximately US\$1.5 billion and positive cash flows from operating activities totaling US\$313 million.

Willis Lease Finance Reports Record Pre-tax Profit of US\$56.3 Million

Willis Lease Finance has reported a record annual pre-tax profit of US\$56.3 million, up from US\$36.0 million in 2017, including total revenues of US\$348.3 million. The Company's 2018 pre-tax results were driven by continued revenue growth in the core leasing business and an increase in spare parts and equipment sales. Aggregate lease rent and maintenance reserve revenues of US\$262.6 million were driven by high utilization of a lease portfolio that grew 24.6% to US\$1.673 billion at year-end.

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AeroCentury reports fourth-quarter net loss of US\$3.8 million

Aircraft Leasing Company AeroCentury has reported a fourth-quarter net loss of US\$3.8 million compared to a net loss of US\$4.5 million for the third quarter of 2018 and net income of US\$6.0 million for the fourth quarter of 2017. Fourth-quarter 2018 results reflect the combined operations of AeroCentury and its newly acquired subsidiary, JetFleet Holding (JetFleet), which was acquired on October 1, 2018. Fourth-quarter 2017 results included a US\$5.4 million tax benefit from the revaluation of the Company's deferred tax liability caused by the passage of the Tax Cuts and Jobs Act of 2017. Net loss for the year ended December 31, 2018, was US\$8.1 million, as compared to net income of US\$7.4 million in 2017. The results for the fourth quarter and the year ended December 31, 2018, included a settlement loss of US\$2.5 million in connection with the ac-

quisition of JetFleet., the parent of the management company for the Company, which closed on October 1, 2018. The 2018 fourth-quarter and full-year results also included US\$1.0 million and US\$3.4 million, respectively, of net losses related to the sale of off-lease, older turboprop aircraft. The 2018 full-year results also included impairment provisions totaling US\$3.0 million on five off-lease turboprop aircraft that were identified for sale, two of which were sold during the year, as well as US\$1.6 million of maintenance reserves revenue resulting from payments received from a lessee that returned three leased aircraft to the Company in 2017 which payments the Company has recorded as they were received.

Information Technology

Startup ultra-low-cost carrier **Canada Jetlines** has selected the web-based **TRAX eMRO** software as its ERP maintenance solution. Jetlines is set to fly across Canada and offer a non-stop service from Canada to the United States, Mexico and the Caribbean. The carrier plans to fly some 27 routes, including to unserved or underserved markets by other airlines, such as Hamilton, Ontario to Halifax, Nova Scotia. Delivery of two Airbus A320s is expected by early second quarter of 2019, with long-term plans to expand to 24 aircraft. The sister aircraft have a high-density seating configuration of a single-class seating capacity of 180 seats. An Airbus A320 fleet was selected based on its fuel-efficient narrow-body framework, making it an ideal choice for Jetlines to start operations with. The TRAX eMRO software is a web-based, device-agnostic ERP product that will keep its users connected from where ever they work. It is a complete system with complete information flow. The numerous system modules cover technical, maintenance, materials, financial, and quality management to help reduce downtime, provide access to real-time data, and ensure full regulatory compliance.

FLYdocs, the aviation data and digital records management solution provider, officially launched its new Asset Management Platform at

MRO Americas 2019. In leading the digital innovation charge in aviation software, FLYdocs is taking a huge step forward in helping lessors and airlines realise the full benefits of embracing a paperless future. Within the cloud-based Asset Management Platform, lessors have instant access to the most business-critical information regarding the contractual obligations of their lessees to ensure ongoing compliance. Additionally, users can also tap into the data they need to manage and protect the value of their aircraft and engine portfolios throughout the term of the lease. Airlines not building up external maintenance reserves benefit from being able to more accurately predict maintenance event intervals/cost and budget for them through their own internal accruals. "One of the largest challenges for lessors and lessees has been the inability, using current software, to accurately forecast maintenance reserves and end-of-lease compensation, which can have a major impact on business health and asset value," comments Mark Hadfield, FLYdocs' Head of Asset Management. "That's until now! Using real-world expertise from within the FLYdocs team, we've built the most advanced algorithms for calculating precise and accurate maintenance reserve and EOL compensation cash flow forecasts to help reduce risks and allow users to make financial decisions with confidence."

Other News

Nuremberg, Germany-based MRO, **FAI Technik GmbH**, part of the **FAI Aviation Group**, has selected **Collins Aerospace's** latest Venue™ cabin management system and high-definition entertainment system for its latest Bombardier BD700 Global Express cabin refurbishment project, named "Project Pearl." Project Pearl represents one of the most extensive refurbishment projects for the type. The five-month project will include 60-, 120- and 240-month inspections and a full cabin refurbishment featuring the new Collins Aerospace Venue so passengers can enjoy watching HD movies and

listen to enhanced digital audio throughout the cabin. Venue can broadcast a range of other high-resolution content, while the project also includes the installation of Honeywell's Ka-Band broadband technology, delivering ultra-high-speed satellite connectivity. Project Pearl is FAI's sixth in-house Global Express cabin refurbishment and its third installation of Honeywell's Ka-band technology on a BD700. In January 2018, FAI Technik was appointed as an Authorized Dealer for Collins Aerospace avionics and cabin electronics equipment.

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Managing expendables



GKN Fokker Services has done extensive research on inventory forecasting.
Photo: Fokker Services

AviTrader MRO examines the management of expendable parts and their role in inventory holding strategies.

Despite the name, expendables are an important aspect to any operators' overall inventory strategy, for a low-cost fastener can ground an aircraft as surely as a \$750,000 flap assembly.

Mike Daly, AAR Director of Aviation Supply mentions that an individual piece part on the shelf generally is insignificant from both a financial and operational perspective. "The significance of expendables only emerges at a higher level, as the scale and complexity required to maintain adequate inventory levels and manage the transactional volume becomes one of the most challenging and important aspects of maintenance planning."

Daly says while expendables generally represent 10-20% of the inventory investment, they represent 80-90% of the SKUs and transactions, which means that the majority of an operator's procurement, planning, warehousing and logistics effort goes toward managing expendables.

The end-to-end supply chain must become smarter in fulfilling the airline demand signal by maximising the use of consignment stocking arrangements, suggests Guy van den Berg, Director of Contract Services, at AJW Group. "This is supported by pull inventory management systems and accurate demand forecasting especially for high-usage items. Segregating and prioritising inventory by their demand flow rates enables decisions on appropriate stock levels and overall stock investment."



Guy van den Berg, Director of Contract Services, AJW Group.

When looking at cost reduction opportunities for inventory, there are different approaches to take that can collectively help

to achieve the desired goal. Tom Covella, Group President of STS Component Solutions says the most important one is to have effective forecasting tools to help balance the right mix between proper inventory levels and providing effective levels of dispatch reliability (service levels). "In many cases historical demand is utilised to predict forecasted demand and that can become both costly and dangerous."

Covella states the ultimate challenge comes down to how to support intermittent demand without driving inventory costs higher. "The best way to approach this is to utilise various forecasting tools that allow you to analyse historical demand, forecasted demand and predicative analysis. The ability to collectively integrate all of these tools into your inventory models will provide you with efficient ways to accomplish this. STS Component Solutions has spent a great deal of time and resources in developing these analytic and forecasting tools so that we can provide the best value-added services to our customers and OEM business partners."

If the conversation is about reducing inventory holding alone, Simon Schalit, COO at Lokad reckons the most efficient way is surely to not hold any. "In all seriousness, inventory holding costs can only be considered as part of a more general optimisation framework. If we assume that the company has already taken measures to minimise those costs from a pure process perspective (easy access, sufficient tracking, limited handling...), then the optimisation consists in implementing a supply chain that would be as 'just-in-time' as possible," (while still considering possible EOQs or MOQs of course). He adds the key to such an optimisation lies in the correct understanding of



Tom Covella, Group President of STS Component Solutions.



Proper planning for parts is essential.
Photo: CSAT

uncertainties. "Demand is uncertain of course, and that should be represented by a probabilistic forecast, but the processes themselves hold a certain degree of uncertainty that is often underestimated."

He adds that lead times (of suppliers or even internal) are too often considered as fixed for simplicity's sake, although in reality they are everything but that. "Procurement lead times often vary widely. Understanding and mapping this variability is an essential step towards having a realistic and efficient stock policy and will be a key ingredient in the discussion with suppliers to try and reduce those lead times and their variability, thus reducing inventory levels and costs," says Schalit.

As we all know, the future usage of spare parts is difficult to predict and the high-usage items of last years are not necessarily the high usage items for the upcoming years. Therefore, it remains a logistical challenge to have all the parts available when they are needed and to control the risk of excessive capital stock investment and the corresponding risk of surplus. According to Fokker Services, the most efficient way for an operator, MRO outfit or Nation (in case of a military requirements) is to set a different approach for the non-platform specific parts (these are the standard parts or hardware like the bolts, nuts, fasteners which are normally required at random) and the platform specific parts with a high and (to a certain extend) predictable consumption.

Micheál Armstrong, CEO at Armac Systems comments that for an airline



Simon Schalit, COO, Lokad

one of the characteristics of inventory planning for aviation maintenance is that it is a pure overhead that, unlike production material, it will never result in consequential revenue. "It is a necessary cost of doing business," he suggests. "What is important is the opportunity cost that can arise associated with non-availability of the inventory. We must constantly balance the cost of holding the inventory against the opportunity cost of delaying aircraft during maintenance, or worse, delaying an aircraft on the ramp. He says

the opportunity cost is independent of the value of the part causing this opportunity cost. "It is therefore less acceptable to have an AOG for low cost consumable or expendable item. This does not allow us to throw caution to the wind and hold as much as we like. If we do not plan correctly, we will hold too much of the wrong parts and still not enough of the right parts."

Of course, it varies considerably depending on the operation, the type of maintenance and asset outsourcing policy, however, the investment in expendables is in the region of 5% to 15% compared to rotables. However, Armstrong suggests that unlike rotables which are typically capitalised, or perhaps even outsourced, expendables are expensed, so the P&L impact is disproportionately higher and an inefficiency in expendable planning can have a high impact on the operations EBIT.

Operators have many ways of managing such parts, believes Martin Houska, Head of Purchasing Department at Czech Airlines Technics. "You can use consignment stock, VMI or any other source. However, proper planning and data analyses are the key. These days, using big data shows you where you can really save money." Houska explains that high usage parts typically do not have a big impact on cost of inventory as they have high velocity and small risk of depreciation. "So, I would recommend purchasing a big packet of such parts a year. You will save a lot of money for transport; you can arrange a package deal and you will minimise the risk of such a piece becoming unavailable when needed. If you are out of cash, you can use the same model in a consignment way, but it has its cost."

AJW say expendables have a different life cycle to consumables; hence their management requires specific oversight to minimise wastage. Even within families of expendables such as oils, sealants and lubricants these have different usage rates and shelf-life, which necessitates bespoke understanding and management. Without it, cost quickly becomes the devil within the detail. Across the supply chain cost avoidance is the flip side to assured availability.



Micheál Armstrong, CEO, Armac Systems



Martin Houška, Head of Purchasing Department, Czech Airlines Technics.

approved alternative item, missing certification, etc.) the order is stopped and there is the risk of a resulting AOG situation. However, there is a difference between a missing low-cost fastener and a flap assembly grounding the aircraft since nobody will understand or accept this in the case it is being caused by the former."

Obsolescence is another issue faced very acutely in expendable management. If a fleet is retired or engineering/ regulatory action replaces the current expendable part with a new one, a mass of parts is suddenly outdated and useless.

"We recognise two main causes for a part to be classified as obsolete," says van Hilten. In the first, he states regulations may stipulate that a certain expendable must not be used anymore for a certain operation, and that the part is replaced by a new one. This results in any currently remaining stock of the replaced part number to become by definition obsolete for that purpose. "Within Fokker Services, we make sure to stay on top of the upcoming changes and updates to anticipate on the logistic effects. Within our company, we recognise our strength in this matter in the close cooperation between engineering and logistics, which enables us to stay on top of such events and eliminate the negative effects that might be linked to this type of obsolescence."

The second definition originates from the situation where a certain part number cannot be retrieved anymore from the original manufacturer, who may have ceased production of this specific part. "From our experience, we always aim at having an allocated interchangeable replacement for the part, which allows us to use the stock at hand until it is depleted. Furthermore, we communicate closely with OEMs to foresee the production of certain parts being phased out and have the possibility to perform a last time buy," van Hilten continues.



Marcel van Hilten, Business Development Manager at Fokker Services

Marcel van Hilten, Business Development Manager at Fokker Services reminds that after all, expendable parts are still spare parts and when they are required the ordering process has to follow the general spares ordering process to which, similarly as to the much more expensive components, all quality requirements and regulations apply. "This spares process consists of many different sequential steps, is rigid and if one of the steps is interrupted (because of an unknown price, part number not being listed on the Illustrated parts list, no

approved alternative item, missing certification, etc.) the order is stopped and there is the risk of a resulting AOG situation. However, there is a difference between a missing low-cost fastener and a flap assembly grounding the aircraft since nobody will understand or accept this in the case it is being caused by the former."

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Data from AAR shows inventory obsolescence rates of 1-2% of COGS per year can be expected due to engineering and fleet changes. Daly warns that over time, cumulative obsolete inventory can become a significant financial anchor to an otherwise efficient operation. He says effective management of this inventory absolutely requires the establishment of a sales channel to find alternate sources of demand in the market. "We have found success with both developing an in-

ternal sales capability and consigning inventory with partner companies who have established sales channels. Inventory that has become obsolete due to engineering changes with one operator could still commonly be requested by other operators."

Compared to other market areas, such as automotive or the computer industries, obsolescence is really slow in Aerospace, Houska feels, saying there is typically a lot of time for preparing for aircraft phase out. "I think that the main problem is that operators do not acknowledge the importance of this problem and they lack focus on the future. Then, suddenly, after a redelivery of an aircraft, they find Philippe Courtay, VP Business Development, Magellan Expendables.

When it comes to obsolescence, Philippe Courtay, VP Business Development, Magellan Expendables points that it is critical to stay aware of upcoming regulations and design changes. This can be accomplished with regular discussions with operators and manufacturers as well as constant intelligence gathering in the marketplace.

A complete fleet is rarely retired all at once so reduction of the inventory levels of the parts concerned can be done gradually. "This is valid for operators, MROs and their suppliers. Other operators may still use the concerned fleet for some time and will absorb some of the remaining supply. Some Expendables are specific to an aircraft model or an airline (due to colour codes, specific choices of galleys, stencils, etc.). This inventory reduction needs to be processed as soon as possible but that can lead to shortages near the retirement of an aircraft type," sates Courtay.

So, what is the best way to forecast expendable inventory? Courtay tells that forecasting expendable inventory is dependent on the activity. "Line maintenance requirements are different from those for checks or component maintenance in the type of parts and the volume needed."

The main source of forecasting usage for expendables is past data, he continues to say. Repairs required for a C-check for example can be predicted and the number of parts needed can be determined. However, when unexpected damage is found requirements for expendables surge with a risk of costly delays.

"Cycles of usage can be detected for some expendables without any rational or specific reasons for the variations. Some references will go without demand for several months before a surge occurs. Only an evaluation of the trends over long periods of time would help forecasters optimise the inventory."

The quantity of expendables required is often underestimated. This is especially frequent for items perceived as having lower costs or used in large quantities. Courtay continues: "Without proper checks in place, it is frequent for repair staff members to pick more parts from stock than they need. These excess parts are never returned to stock. Forecast of minimum inventory quantities should therefore include an additional buffer quantity to reduce the occurrence of unexpected (and untimely) stock depletion. Methods to control the flow of expendables to maintenance crews do exist but their cost and administrative burdens outweigh the cost of inventory losses. Only the most frequently used items should be provided using these automation methods."



Philippe Courtay, VP Business Development, Magellan Expendables



An inside job

Cabin maintenance market has benefited from a higher demand for cabin retrofits.
Photo: Lufthansa Technik

The cabin equipment maintenance sector has grown significantly over the last decade. Keith Mwanalushi looks at how the sector is shaping up.

Industry events such as the Aircraft Interiors Expo in Hamburg have demonstrated the sheer magnitude of the cabin interiors sector as passenger expectations rise and cabin developers respond with new innovations that simplify cabin operations and reduce maintenance costs.

In the more recent years, there has been a persistent trend of increasing attention to the interior of the aircraft and the airlines are ready to spend more effort, time and money in this direction, therefore the aircraft interior market is growing rapidly.



Darmilo Sosa, MD, Wingbox Aviation

"Innovation is the constant word in the market," states Darmilo Sosa, Managing Director at Wingbox Aviation. "Some of the aircraft manufacturers and suppliers now are providing all new line of products, like airplane Wi-Fi connectivity that is in the trend now on which also provides additional revenue to airlines."

In terms of using technology to revolutionise cabin equipment maintenance and prevent maintenance disruptions, Sosa highlights that 3D printing is now gaining popularity - "Specially, those OEM plastic parts that have a long lead-time that normally give a headache to MROs."

MAC Aero Interiors has also started to use 3D scanning in a move to distinguish itself as an industry leader in innovation. "The scanner was first used in January 2019 on a Boeing 767 aircraft as part of the latest partnership between MAC Aero Interiors and TUI, one of the biggest tourism companies in the world," comments Petras Akstinas, Managing Director of MAC Aero Interiors. "This new four-year contract between the two companies includes the production of 20 lavatory units for TUI's 767-300 fleet, and the scanner will play an integral role in achieving that."



Chris Reed, Managing Director at TRAX

Chris Reed, Managing Director at TRAX reminds that the condition of cabin equipment and



Late deliveries by seating and cabin parts OEMs can result in significant delays.
Photo: S7 Technics

configuration directly impacts airline passenger comfort, satisfaction and safety and also, high capacity use of a fleet causes increased wear and tear. "Airlines need to stock galley and lavatory equipment, seating, lighting, interior panels, and IFE parts for rapid repairs and to maintain high passenger satisfaction standards.

"An airline cannot afford to have a passenger dissatisfied when they pay for a first-class seat, only to find their monitor is not working. This is where the introduction of a mobile maintenance system, such as TRAX eMobility, allows the cabin crew to report an issue before the aircraft has landed so that a repair can often be scheduled and completed in the short interval before the next take-off," Reed states.

TRAX has incorporated mobile and RFID technology to transform the maintenance process and prevent maintenance repair delays for cabin equipment and all other aspects of an airline or MRO operation. Reed says the suite of TRAX iOS eMobility applications allows users to manage aircraft maintenance via their mobile devices from wherever they are working (offline), with the ability to automatically synchronise the data when in Wi-Fi or cellular signal range.

One of the 10 intuitive and task-specific eMobility apps is CabinLog.b – "This app is used by cabin crew to record defect information on an interactive seat chart (LOPA) while either online or offline. Equipment maintenance issues can be recorded during a flight for cabin objects. When data is synced, the defect report will be available for the ground crew to manage," Reed explains.

For example, he says a cabin crew member can report a broken tray by identifying the location on the CabinLog app's seat chart. The pre-configured information includes the aircraft tail number, flight information, part number for the selected seat, etc. The app defaults this information into the defect report, leaving the cabin crew member only with the need to describe the damage (including the option to take a photo). "The maintenance crew will have all necessary information to

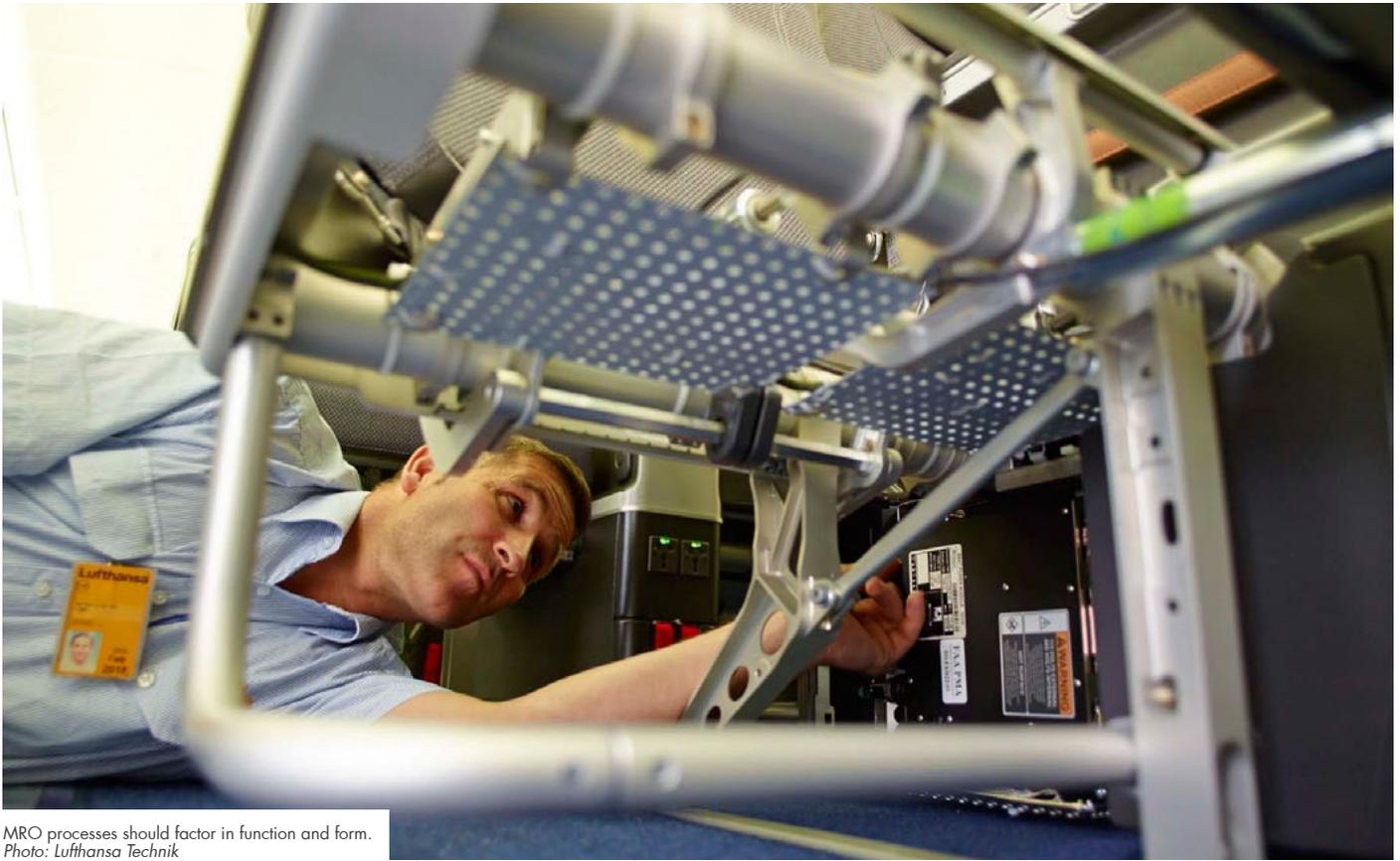
picklist a replacement part and be on hand to greet the aircraft upon arrival and rapidly fix the defect, thereby preventing flight and passenger disruption."

Robert Pearson, Head of Interiors at ACC Aviation Group observes there is now wider acceptance of PMA parts by both operators and lessors giving buyers greater choice as well as decreasing their lead times. "As a result, OEMs are starting to diversify to improve their aftermarket service offerings and keep pace with this change. This change also knocks on to the aftermarket sellers to ensure that they continue to add value through their customer service as well their product offering."

In the last few years, Pearson notes the cabin maintenance market has benefited from a higher demand for cabin retrofits from older generation aircraft. "The drop-in fuel prices have made these heavy fuel use aircraft more economically viable with airlines operating the aircraft longer and extending their leases. This has consequently created a demand for cabin updates and investment. As fuel prices level out, we may witness a drop-in demand and this work needing to be replaced."

He also cites that long lead times remain one of the key issues. "Late deliveries by seating and cabin parts OEMs has resulted in delays to aircraft line fit programmes and a loss of confidence in the industry. However, aircraft manufacturers are taking steps to improve this, which is already taking effect, Pearson adds.

At S7 Technics, due to the extensive experience in the aircraft maintenance, including the interior, the company is constantly improving the aircraft maintenance programme and adding items for additional checks of certain interior components – "we are introducing digital control systems such as RFID, AMOS, as well as using a reliability system," Maksim Akchurin – Project manager, S7 Technics tells this publication.



MRO processes should factor in function and form.
Photo: Lufthansa Technik

William F. Utset, President and CEO at MEKCO Group, Inc highlights several points saying as more technology is brought to the aviation industry, less personnel are used to monitor and maintain systems due to the higher reliability and predictable failures. Having overall visibility of each cabin system remotely, helps drive expedited solutions. With technology driven maintenance, it drives lower maintenance cost thus reducing the cost to the airlines - "A better method of our business is to be proactive having a good maintenance optimisation process means less passenger impact."

Cabin maintenance standards defined by OEMs and airlines may not be necessarily designed with passenger satisfaction in mind, some insiders believe. So, it's worth noting if MRO processes factor in procedures to better meet passenger and/or crew expectations for function and form.



Maksim Akchurin, Project manager, S7 Technics

"We definitely consider both passenger and crew expectations for function and form while performing cabin equipment inspections and maintenance activities," indicates Sam Habash, Training and Safety Manager at CAS Aircraft Maintenance. He says passenger and crew expectations are at the forefront of what they do and are an integral part to the success in maintaining cabin

equipment items. "Our team is trained to consistently place themselves in the shoes of both passenger and crew to determine whether an item is serviceable or not. Mediocre does not work for us and we excel in what we do through ensuring that every passenger and crew member has a most positive experience during their use of cabin equipment items."

Stringent regulatory necessities can compel airlines to pull an aircraft out of service or limit seating availability, mentions Reed from TRAX. "Maintaining maintenance and safety standards while balancing passenger satisfaction requires the capacity to rapidly repair or replace damaged or expired equipment," he notes.

Reed says the TRAX VisualCheck eMobility app for recording the current status of all emergency equipment is designed to work with an MRO or airline's processes and procedures. "The precise configuration of each aircraft in the fleet is uploaded, along with the listing of all emergency equipment installed on each aircraft. RFID technology is used to track any missing or expired equipment such as oxygen bottles, life vests, smoke masks, safety placards, etc. The easy to use interface has an interactive view of the cabin which allows the user to update



William Utset, President and CEO, MEKCO Group, Inc.



The cabin equipment MRO sector is growing.
Photo: S7 Technics

equipment status dynamically after each RFID scan.”

Sosa believes it is all about the cost and its projection to define what minima or maxima to follow. He feels airlines will be setting the standard that MRO’s follow. Sosa: “Operators can be super critical on the aesthetic value of the cabin on which giving peculiar guidelines to MRO, but this will definitely impact the budget or cost of maintenance.”

Utset says airlines, will need to shift from marketing to IT infrastructure to bring a better passenger experience. “Having IT ahead of a well structure marketing team will cause a negative impact. Too much technology on the planes without understanding your passenger needs will change the overall expectation of what the airline advertises over what they really mean to provide.”

Leasing interior equipment from seats to galleys and lavatories could be an avenue for airlines to upgrade their cabins but what implications might this have on MRO providers and do they see this as a growing trend?

“Perhaps for seats, leasing will be more in demand and the trend will go up if there is a wide range and affordable price, but for other interior components (galleys / lavatories / wardrobes) the need for reconfiguration is not very high,” Akchurin from S7 responds. He adds for MRO providers it is possible to increase the load associated with the cabin reconfiguration.

Pearson points out that leasing equipment does help with short term liquidity issues and cash flow. However, he notes that it is early days and we are still seeing the strategy of outright purchase being favoured as more beneficial in the long term, especially as there is limited choice on the market and the processes of personalisation is still endured – “It

will be interesting to see how this market develops over the next couple of years.”

Regarding leasing equipment, Utset argues that MROs will have a better impact and turnaround time because leased equipment will come pre-defined with the airline’s choices allowing for less ground time to refresh a cabin.

Habash from CAS believes that the leasing of aircraft interior equipment by airlines to upgrade their cabins is a source for a new revenue stream by MRO’s. “Due to the fact that the airline business is expected to grow significantly within the next decade, there will be major opportunities for MRO’s to network with cabin interior leasing companies to accomplish maintenance on their interiors.” Habash feels MRO’s can fully take advantage of this growing trend by obtaining contracts to accomplish the maintenance on cabin interior equipment that is under warranty, has been lease returned, and that requires maintenance. Leasing of aircraft equipment is a growing trend in general and he foresees that aircraft interior leasing will become a growing trend.

The fierce competition amongst airlines to deploy aircraft with the latest and greatest in cabin equipment and technology is in itself a driving factor which will sway airlines to lease interiors as opposed to purchasing, Habash indicates. “Leasing interiors will allow airlines much more flexibility in regard to upgrading their interiors once the lease is up as opposed to the upgrading of a purchased interior which has little value after it becomes outdated.”

Its expected that the cabin equipment maintenance market will grow at a very rapid rate which will allow for many more billions of dollars to be generated in the market within the next 10 years.

In the hot seat.....

Pam Corrie, Owner and CFO of Beach Aviation Group

AviTrader MRO: What are your key aviation solutions?

Pam: As an ISO9001:2015, AS9120B, ASA100 accredited superior aviation distributor, we reduce operational downtime by providing quick cost-effective solutions to airlines. Internally, we are developing a streamlined process to meet customer needs. We strive every day to be the most operationally efficient company in the aviation industry. The leadership here at Beach Aviation Group, brings a combined over 50 years of commercial aviation experience including airline engineering, major engine and airframe MRO experience, asset trading and leasing, new and used part distribution specialising in consigned material. Naturally, this has allowed us to expand at a very progressive rate and offer to our customers, right parts, at the right time.

AviTrader MRO: Your initial focus has been on sourcing of large commercial airframe and engine material. How is this progressing?

Pam: Beach Aviation has had tremendous success with this strategic initiative. Over the last year, the demand for the large commercial airframe and engine material has risen drastically. In addition, the grounding of the 737 MAX has had second and third order effects on other aviation platforms that has benefited us. We are continuing to refine our financial models to make smart purchasing decisions every day. We are looking to purchase more aircraft every day.

AviTrader MRO: Are you seeing any significant demand for regional aircraft parts and supply?

Pam: We are seeing a slight increase in regional aircraft parts and supply. This is primarily due to the ageing fleet around the world.

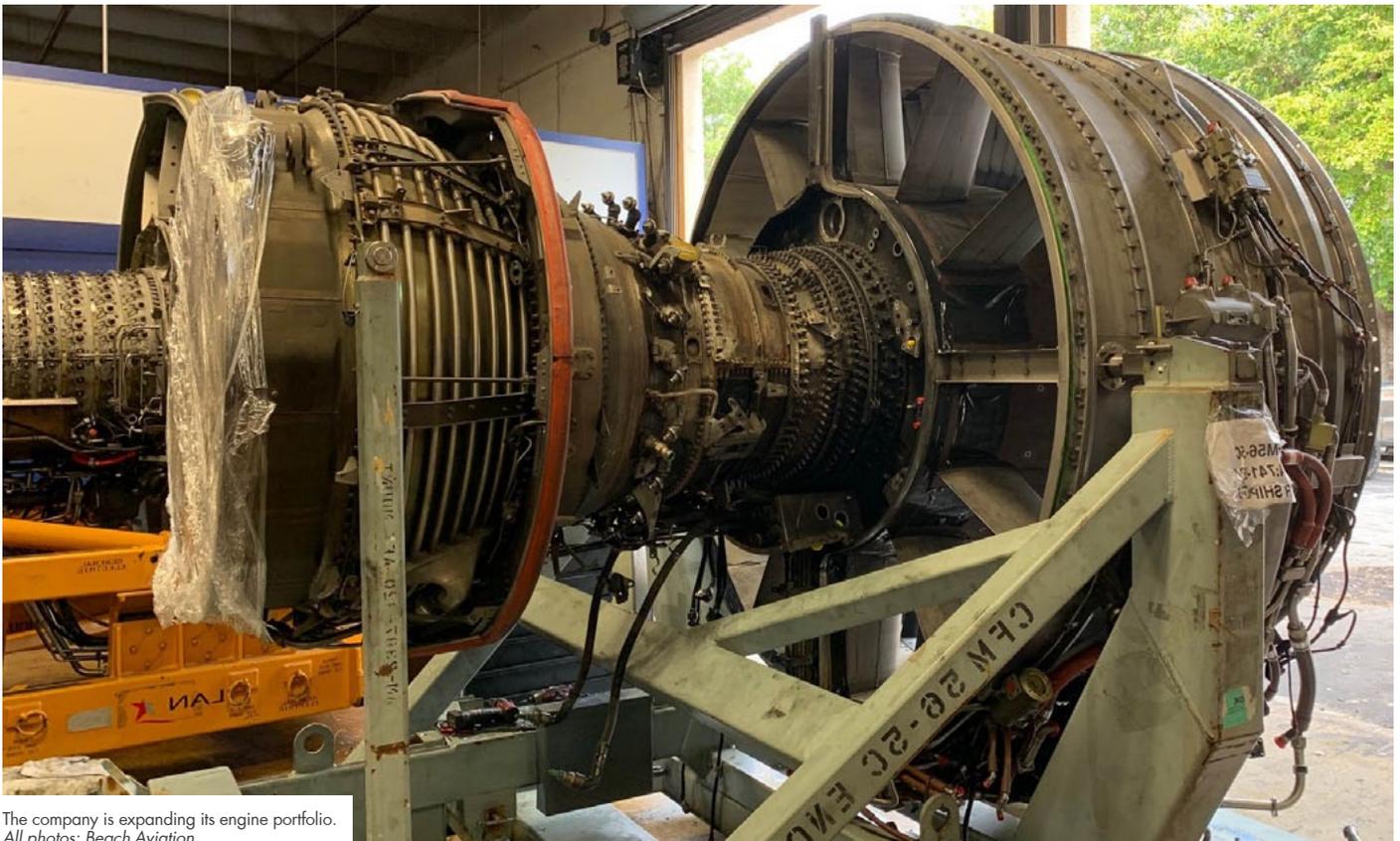
AviTrader MRO: What trends are you seeing in end-of-life solutions?

Pam: MRO's are becoming increasingly more expensive and we are seeing some un-



Pam Corrie, Owner and CFO of Beach Aviation Group

usual price activity in the aftermarket sector. Investors are becoming increasingly risky with their investments.



The company is expanding its engine portfolio.
All photos: Beach Aviation



Just-in-time inventory system is a management strategy.

End of life solutions are becoming more sophisticated, and more options are available than ever before. New technology has created a new frontier of possibilities for MRO's, suppliers, and operators alike. Beach Aviation Group actively engages in continuing education opportunities at conferences and seminars around the world to make sure our customers are receiving the full benefit of advancing intelligence within the industry.

AviTrader MRO: "Right Parts, at the Right Time." Tell us more about this?

Pam: The whole concept behind this just-in-time inventory system is a management strategy that aligns raw material orders from suppliers directly with production schedules. Companies increase efficiency and decrease waste by receiving parts only as they need to rebuild their engines. It requires producers to forecast demand accurately. Our commitment is to provide the highest level of quality, integrity, personal service and value while meeting the critical needs of our customers. To us, that commitment means having a reliable turn key solution readily available for

our clients when they need them. Turn key solutions are a core value that Beach Aviation Group provides. Our process involves technical modeling which allows us to foresee the upcoming requirements of our clients and prepare a solution before the requirement arrives. Hence, the right parts, at the right time.

Beach Aviation Group views ageing engines as a win-win. If airlines and leasing companies keep them flying then we are in the business to keep them in the air with safe, reliable overhauled parts. If they retire, we welcome the opportunity to support customers with their end-of-life needs, whether that be managing their material or consign the material to Beach Aviation Group for resale to recoup any residual earnings.

AviTrader MRO: What is next in the pipeline at Beach Aviation Group?

Pam: Vertical expansion. Beach Aviation Group is in the process of expanding the engine division to provide a full range of engine solutions for our clients. We are building an

engine portfolio comprised of GE, CFM, PW, and V2500 engines for sale, lease, and tear-down. We have also expanded our logistics division with the addition of a new Hino truck to assist with the shipping of parts, modules, and whole engines to and from Beach. The truck has already been scheduled to deliver 12 engines to Beach this year. The finance division of Beach Aviation Group has streamlined the process of analysis, utilization, forecasting, operating conditions, planning tools, maintenance procedures and most importantly predictive analytics versus historical data to mitigate any potential industry changes.

We are striving to be operationally efficient. We recently have dedicated more time to our internal processes to make information more digestible. This is allowing us to connect the dots better and synthesise better strategies in the future. We are expecting big things in the next couple of months, please stay tuned!

Keeping engines turning



The company supports a range of engine platforms.
All photos: Farsound Aviation

Founded in 1979, originally as a manufacturer of small machined and fabricated aerospace parts, Farsound Aviation has developed into a significant global presence as a major supply chain solution provider for the aero engine MRO sector. The business supports a range of engine platforms, including all Trent engines, RB211, V2500, GTF, GE90 and CFM56, to name a few.

With its head office in the UK and satellite branches in Abu Dhabi, Singapore, China, Hong Kong, Japan and a Spanish office opening in spring 2019, Farsound delivers a broad portfolio of value-added services, with a focus on logistics and supply chain management. Recognising that no two customers are the same, the company delivery solutions tailored exactly for every challenge that its customers face; including industry leading aero engine MRO facilities.

Farsound continues to grow strongly as its services are appreciated by more and more customers. In 2018 Farsound renewed or won contracts with HAESL, TEXTL, AMECO, Iberia and TS&S.

In July 2018, Farsound extended its operations with the acquisition of Sterling Aircraft Products Inc, based in Toronto, Canada. Sterling has a broad portfolio of customers across the aerospace and Industrial

Gas Turbine sectors and is an excellent complementary addition to the Farsound business. With excellent reputations in their respective markets and with an expanded product portfolio, Farsound and Sterling are now pursuing opportunities for further development, particularly in Asia and the Americas.

Specialising in the supply of C-Class, B-Class and other fast-moving consumable parts, and consistently achieving 99.5% on-time delivery solutions, Farsound Aviation offers:

Kitting Services

Delivered directly to the customers' assembly lines, Farsound's kitting solutions ensure that all the parts required at any single location are available whenever needed. Kits can also be delivered on consignment at customers' facilities, so they only pay for what they use, after they use it.

Line Feed Solutions

Parts can be provided in line feed bins directly on the assembly line, which are also available on a consigned basis, freeing up valuable resources for the customer to concentrate on their core business activities.

Carousels and Vending Machines

Where space is at a premium Farsound Aviation can provide carousels or vending machines, either on the production line or in the warehouse and ensure that consigned stock levels are always maintained at the correct level.

Warehouse Management

To complement its kitting, line feed and carousel/vending machine solutions, Farsound also has extensive experience of providing a complete warehouse management service.

At the heart of every supply solution lies a prudent procurement decision. Farsound's team of professionally qualified buyers manage thousands of parts across a multitude of suppliers ensuring that industry-leading delivery performance and best-value service is achieved for all customers. Moreover, Farsound has spent many years developing processes structured around the demanding quality requirements of the aerospace industry. The company's AS9120 and FAA AC00-56 certified quality management systems, combined with its experienced personnel, ensures that Farsound Aviation provides its customers with fully traceable and conforming products every time.



The HQ is located in the UK.



Quality, We Commit, We Deliver.

精心呵护，赢得全球信赖

GAMECO is the leading Part 145 MRO provider in the People's Republic of China jointly approved by CAAC, FAA, and EASA, providing an extensive range of MRO services for B737, B747, B757, B767, B777, B787, A300, A310, A320, A330, A350, A380 and EMB 145 & EMB 190 operators in the Asia-Pacific region and worldwide.

Based at the Baiyun International Airport in Guangzhou, the People's Republic of China, GAMECO today has a four bay wide-body hangar and an eight bay narrow-body hangar. GAMECO is a joint venture between China Southern Airlines Co. Ltd. (CSN)(50%) and Hutchison Whampoa (China) Ltd. (HWCL)(50%) from Hong Kong, specializing in aircraft and airborne component maintenance, repair and overhaul. To learn more about GAMECO.

Unlocking the opportunities of digital twins in aviation

With interest in digital twin technology at an all-time high across a wide variety of industries, one of the forerunners in its adoption right now is aerospace and defence. This is particularly true for the commercial aviation segment, explains **Nadine Etong**, Director, MRO Product Line at the Aerospace and Defence Business Unit, IFS. Here she zeroes in on the potential benefits for independent MROs, outlining how they can leverage the technology to better serve customers, differentiate their service offerings and increase understanding of the specialist assets they work with.

The global digital twin market size is expected to reach \$26.07 billion by 2025—registering a strong CAGR of 38.2% over the forecast years—and we are now starting to see the first successful use cases of digital twins in action in commercial aviation. GE has already built digital twin components for its GE60 engine family and also helped develop the world's first digital twin for an aircraft's landing gear. In this last scenario, sensors placed on typical landing gear failure points, such as hydraulic pressure and brake temperature, provide real-time data to help predict early malfunctions or diagnose the remaining lifecycle of the landing gear.

Four technology drivers:

These major advances in digital twin capabilities have been driven by four key technologies:

- **IoT & Big Data** – The proliferation of sensors on assets or components combined with connected systems allows organisations to gain detailed insights into live performance
- **Advanced analytics** – Through machine learning we can use this data to predict and simulate the future condition or deterioration of the asset in question
- **Computing power** – Cloud-based technology vastly improves the affordability and availability of the computing power required to run large-scale digital twin models
- **Accessibility** – Where previously a digital twin may have been locked into the control room of a factory or organisation, this data can now be accessed from anywhere via mobile devices

Digital twin in name only – dispelling the 'physical' myth

But how do you define a digital twin? An accepted definition would be a replica of anything which gives you real-time insight into

the status of a real-world asset to enable organisations to better manage equipment and inform business decisions. In fact, digital twins have been around – at least in part – for a while, but they've taken names such as 'mirrored systems' and 'connected factories.'

However, these deployments have been focused on physical assets, unlike digital twins which are not limited to a 3D model of a single piece of equipment. Running a digital twin for a single asset is only the first step and, thanks to those four enabling technologies, this can now be extrapolated to create a digital twin of a whole fleet of assets. Take this a step further and a digital twin of the whole fleet can become part of a digital twin of an entire business or organisation, with process flows visualised and bottlenecks flagged in real-time—much more valuable than one fancy 3D model.

No twins are identical

Digital twins work in different situations, applications and processes depending on the context of the organisation in the supply chain. Component manufacturers, for example, are primarily focused on individual components, while engine OEMs care mainly about the engine as an entire asset. Heavy/base maintenance inspectors and regulators are more focused on overall maintenance business processes and standards, and this continues right up to line maintenance providers who look primarily at MRO data and the airline/operator which wants to piece together a digital twin of the entire aircraft.

It's all about the data – business applications act as key enablers

These differing priorities have a consequence on what a business application needs to do to manage digital twin data. A lot of the data required for digital twin technology sits within supporting business applications: assets are mapped within enterprise software, including historical maintenance data, work orders and original engineering and design data.

From this we can see that enterprise applications are hugely beneficial in constructing different kinds of digital twins. In some cases, the supporting enterprise application acts as a digital twin of certain processes—whether that is the entire business or running a 3D model by taking in data from several third-party systems. In others, the enterprise software could be the source of the digital twin, becoming part of a larger data ecosystem which builds up a digital twin somewhere else. However, this requires flexible and agile enterprise



Nadine Etong says independent MROs should take a slice of the digital twin market.
Photo: IFS

software that has been designed to support digital twin initiatives and is suitable to fulfil a variety of roles—failure to track and deliver data in the right place at the right time could lead to weak link in the chain and undermine an entire digital twin operation.

Four business benefits for independent MROs

Independent MROs who are regularly capturing key data streams in their enterprise software can start to quickly take advantage of digital twinning to differentiate their service offerings against other independent MRO competitors, and also against large inflexible OEMs that have a number of disparate systems in place.

There are a number of ways independent MROs can leverage digital twins to benefit themselves and their customers:

1) Increase aircraft safety

Using serialised asset digital twins in conjunction with real-time/near real-time monitoring and predictive analytics can help detect a defect earlier, through prior insight into the component's condition. The net result is that part safety is increased, making aircraft and airlines safer. One strong example is Dutch carrier KLM— it reduced its minimum equipment list defects and delays and cancellations by 50% since introducing AI to manage predictive maintenance.

2) Evolve from repair shop to power-by-the-hour service provider

Digital twins can transform the maintenance models offered by independent MROs toward offering lifecycle support contracts that reduce maintenance visits and costs through

individual serialised inspection and service schedules. By taking the pressure of asset maintenance management, MROs allow airlines to focus on their core business of flying passengers, not spending cycles managing wrench turning. MROs can also redefine service contract terms for the specific assets being maintained, based on their digital twin history and projected future performance.

3) Extend asset life

Digital twins also enable MROs to build a broader understanding of supported assets while in service. They can use predictive maintenance techniques to maximise their availability and time on-wing or overlay health monitoring data with a digital asset twin to trend performance and reliability on a serial number basis. This gives them unparalleled insight into the assets they support over time. As more asset information is built into the digital twin, MROs can learn from this to cement their reputation as asset or component experts.

4) Improve the business supply chain

The benefits of a digital twin spread more

widely than just the single component in question. By knowing in advance which component will fail, supply chain managers can plan and have parts and material ready and available when needed—either to replace the failed component or for use as part of the repair process. The net result is that supply chain managers have better control of their stocks.

Case in point: TEST-FUCHS

One IFS customer that has designed a dedicated digital twin programme is TEST-FUCHS, a manufacturer of test systems and components for aerospace and defence organisations. TEST-FUCHS has a dedicated digital twin approach for ground support assets and test equipment.

As the manufacturer of the assets, TEST-FUCHS looks at the engineering and design and procurement data of the asset it is selling, and also has full control of the IoT-enabled test facility to provide maintenance data in real-time, then execute that maintenance in its repair shop. This gives the company a deep view of the data which builds up in an asset's

lifecycle and provides visibility across the entire digital twin landscape around every asset. IFS Applications plays a prominent role in this environment—enabling TEST-FUCHS to build up an enterprise-wide picture of their business processes to put the digital twin strategy into action.

Unlock MRO potential

MROs are ideally placed to harness the ROI and benefits of digital twin technology to improve and optimise their service offerings and business performance. But in all these examples I have shown, to effectively put a digital twin strategy in place requires the support of agile and flexible enterprise software geared towards data-driven decision-making. With a strategy that is both solid and visionary, and the right software support, independent MROs can take a slice of the \$26.07 billion opportunity the growing digital twin market represents, and better serve their increasingly demanding airline customers.

Source: IFS



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Kevin Geissler

GA Telesis has appointed **Kevin Geissler** as Vice President Aviation Lease Solutions. Geissler began his career at Curtiss Wright Accessories, the aftermarket repair business of the OEM, which was subsequently acquired by GA Telesis in 2008. Geissler spent several years post acquisition in the company's MRO services unit as a business unit controller and as Corporate Assistant Controller before being promoted to Vice President and Corporate Controller

in 2013. Geissler holds a bachelor's degree in Finance from the University of North Carolina at Wilmington. He will be responsible for oversight and development of the company's inventory leasing business as well as its thriving APU and landing gear leasing business. The company currently has a significant inventory lease portfolio consisting of Boeing 737, 747, 767, 777, 787 as well as Airbus A320, A330 and A350 rotatable components.



Donna Chase

TurbineAero, headquartered in Chandler, AZ., has appointed the new Vice President Sales & Marketing leading their global sales team. **Donna J. Chase** joined TurbineAero after spending 32 years in the aerospace/aviation industry in a variety of leadership roles. The last 26 years of those years were at Honeywell Aerospace which included running a US\$500 million global business aviation aftermarket business, consisting of avionics, mechanical and electromechanical components, software solutions and services.



Scott Butler

Ascent Aviation Services has announced that **Scott Butler** has joined the company as Chief Commercial Officer (CCO). In his new position Butler reports directly to **Dave Querio**, President, assuming responsibility for all Sales, Marketing and Customer Service functions. Butler and his team are also coordinating with the company's Operations group to ensure that all opportunities are thoroughly evaluated in order to effectively increase its volume of work. Butler and his team are in continued coordination with other Operational and Financial departments to ensure the continued efficient and productive growth of Ascent operations. Butler holds a degree in Aviation Human Factors and Aerospace Engineering from the University of Illinois at Urbana-Champaign. He is also a licensed multi-engine commercial pilot. His management experience includes more than ten years in the aerospace industry. Prior to joining Ascent Aviation Services, he was Director of Sales for Zodiac Aerospace. Throughout his broad tenure, Butler has held leadership positions in Program Management, Engineering and Operations Management at TE Connectivity, and Rockwell Collins.

Aircastle has named **Douglas Winter** as Chief Commercial Officer of its affiliate, Aircastle Advisor LLC. He will join the company at the end of April. Winter will succeed **Michael Kriedberg**, who will become a senior advisor through the remainder of 2019 in order

to ensure a smooth transition. Kriedberg previously announced his intention to retire as of January 1, 2020. Winter has over 30 years of operations and leadership experience in the aviation industry, managing large, diverse portfolios of aircraft for market-leading lessors. Most recently, he served as Chief Executive Officer of global aircraft leasing company Voyager Aviation (formerly Intrepid Aviation), as well as Vice Chairman of Amedeo, a leading asset management specialist. Previously, Winter served in leadership roles with AWAS, GECAS, and Octagon Aviation.



Christobal Henner

AD SOFTWARE, the France-based CAMO and MRO software editor, has reinforced its international sales team with the appointment of **Christobal Henner** as Sales Director in charge of sales and marketing strategy and customer relations. This appointment is in response to AD SOFTWARE's growing portfolio of customers and the recent partnership with ATR which led to increased visibility for AD SOFTWARE and additional solutions available

to aircraft operators around the world. AD SOFTWARE has been providing MRO, CAMO and Supply Chain IT solutions for aircraft operators, MRO shops and CAMO organizations for 20 years. It has 60 customers worldwide and enjoys a strong and positive reputation in the industry. The company needed additional resources to face the growth and facilitate interactions with prospects and customers.



Thierry Barré

TAG Aviation Maintenance Services has appointed **Thierry Barré** as Managing Director, to be based at TAG's primary Farnborough Airport U.K. location. Thierry Barré, who joins TAG's Maintenance Services Centre with immediate effect, was previously Technical Director of a Business Jet MRO (Maintenance, Repair and Overhaul) company based in Europe and brings extensive customer relations expertise and strong MRO experience to the position.

Cyrille Pillet, who was the previous MD of Farnborough Maintenance Services, will now focus his attention on the base maintenance service operations for TAG Aviation at group level. As part of TAG Aviation Maintenance Services' harmonization initiatives, Pillet will now be responsible for overseeing operations at the two main centers of Farnborough and Geneva.

Panasonic Avionics has named **Malcolm McKay** Vice President of Sales. McKay will be responsible for accelerating and driving top-line annual growth for Panasonic Avionics and will develop and plan the company's worldwide sales processes and methodologies. He will oversee sales leaders over each product line including Digital Solutions, Software as a Service (SaaS), Panasonic Technical Services and Connectivity, Sales Operations & Enablement. In addition, **Tom Eskola** has been named Regional Vice President and General Manager for the Middle East, Central and Southern Asia and Africa (MECSAA) region, and **Hernan Abbes** has been named to the Regional Vice President and General Manager for the Americas and Oceania region.



Priscilla Ang

GA Telesis has appointed **Priscilla Ang** as Director of Business Development for the Asia-Pacific Region. Priscilla brings over 20 years of experience in the aviation sector to the GA Telesis Asset Transaction Group. Ang was most recently a member of the Titan Singapore Aircraft Leasing team, where she served from 2014 through 2018 as Manager, Marketing & Lease Administration. Her responsibilities included marketing, lease placement, and managing customer relationships for Titan Aviation Leasing. Ang's prior experience includes positions with Airastle, Boullioun Aviation Services, and The Long-Term Credit Bank of Japan. Joining the GA Telesis Asset Transaction Group, Ang will be responsible for developing new relationships and maintaining existing relationships with airlines, financial institutions, and MRO's in the Asia-Pacific region from her base in Singapore.

East/West Industries, a provider of critical lifesaving equipment for the aerospace and defense industry, has promoted **Mike Vetter** to Senior Director of Product Development. In this newly developed role, Vetter leads the product development and engineering groups, working closely with the sales team to manage and expand East/West's continued growth.



Nigel Woodall

AJW Group has appointed **Nigel Woodall** as Group Sales Director. A trained and licensed aircraft engineer, Woodall has 40 years of management experience in the aviation industry. Most recently, he held the position of Senior Vice President Customer Support at Meggitt. In this role Woodall was responsible for leading the business' aftermarket support function. In his new role, which commenced on March 18, Woodall will be responsible for driving sales across AJW Group globally, reporting to Chief Sales Officer of AJW Group, **Tom De Geytere**. He will be based at AJW Group's Headquarters in Slinfold, West Sussex, with regular travel to the business' MRO in Montréal and other global offices. Prior to his time at Meggitt, Woodall also worked at Lufthansa Technik AG, Honeywell Aerospace and British Airways, among others.



Anca Mihalache

Innovative part-out specialist APOC Aviation has recruited **Anca Mihalache** to head up its new engine trading division. Her role will be to develop the leasing platform for APOC Aviation, foster relationships with airlines, investors and repair shops; manage engine sales; trade engines with leases attached or as naked assets, and evaluate engine stock for trading, leasing or teardown. The focus of the engine division at APOC will be on CFM56-3/5A/5B/7B and V2500-A5 engines. A

dynamic program of investment is underway and the Company is pursuing a fast-growth strategy to build trading relationships with like-minded counterparts that is underpinned by significant investment. Mihalache joins APOC from Vallair where she served as Head of Trading & Leasing responsible for managing sales operations and developing strategies and profit targets for all aircraft, engines, engine parts and airframe components.



Jarmila Kotkova

C&L Aerospace has hired **Jarmila Kotkova** a seasoned sales strategist, as its Regional Sales Manager for Europe. Kotkova has more than 20 years of experience in logistics, maintenance and parts support in the European regional airline market. Kotkova will develop relationships with European regional airlines, specializing in ATR, ERJ, Beech 1900, and Saab 340 aircraft, having previously held the Regional Sales Manager position with C&L from 2014 to 2017. During that time, she built strong relationships with European regional airlines by providing aircraft parts, programs and support to fit their needs.



Dave Paddock

Dave Paddock has been named the new President of the Jet Aviation Group, effective July 1, 2019. Paddock succeeds **Rob Smith**, who has served the company in this role since 2014. Smith is leaving Jet Aviation to join General Dynamics' Marine Systems business unit. A 20-year industry veteran, David Paddock joined Jet Aviation in January 2007 as vice-president of business development and strategic planning. He was appointed to his current position of SVP Regional Operations USA in January 2015, where he is responsible for acquisitions, facility expansions and the entire portfolio of Jet Aviation services. Prior to joining Jet Aviation, Paddock served as Vice President and Managing Officer for SH&E, specializing in business aviation strategy, market analysis and planning. He holds a Bachelor of Sciences degree in Environmental Engineering and is active with many industry organizations, including GAMA, MEBA and The Wings Club.