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MRO 360°

Rotables – Repair or Replace?

The constant challenge facing MROs

Cabin Trends
Talking to Andy Masson, VP, Panasonic Avionics

PMA Parts
The Aircraft Lessor's Role in the Use of PMA Parts

Safety
How Best to Manage Airworthiness Directives

© *Panasonic*

Dear Readers,

In this edition, we focus on the topic of rotables. Especially for older aircraft, the question of whether to repair a defective unit or to procure a replacement in the used-serviceable market is becoming increasingly important. As always, we spoke to industry experts to shed some light on the decision-making process when it comes to the question of when a defective rotable is beyond economical repair.

We think you will find our interview with Andrew Masson, VP Product Management and Strategy, Panasonic Avionics really interesting.

We also took a comprehensive look at the main factors for the safe and efficient management of airworthiness directives, which we hope will be enlightening.

Finally, we explore the role of aircraft leasing companies when it comes to the use of PMA Parts. PMA parts offer tremendous potential for saving costs when it comes to aircraft maintenance, but there are a number of factors which need to be taken into consideration as errors could prove very costly when an aircraft is returned.

I hope you enjoy reading this month's MRO 360°.

Peter Jorssen
Publisher


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MRO 360°

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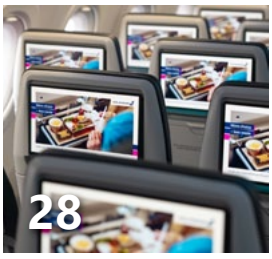
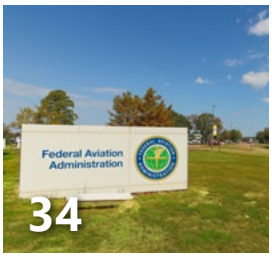
Rotables – Repair or Replace?





Leonardo secures new industrial partner for struggling aerostructures unit

Leonardo designs and produces 14% of the Boeing 787 Dreamliner, the world's first airliner to make large-scale use of composite materials © *Leonardo*

Italy's state-controlled aerospace and defence group, Leonardo, has identified a new industrial partner for its aerostructures division, which has been struggling due to ongoing challenges faced by U.S. planemaker Boeing, CEO Roberto Cingolani announced on Thursday, according to Reuters. Leonardo has been working for several years to return its aerostructures business to profitability. The division, which manufactures two sections for Boeing's 787 aircraft, has faced difficulties due to reduced demand and production adjustments from Boeing. In November, Cingolani stated the company was seeking new opportunities for the unit. During a post-results analyst call, Cingolani confirmed that Leonardo had found an investment partner from the defence and space sector to co-invest in a potential new industrial initiative in aerostructures. While he did not disclose further details, he stressed that negotiations were at a critical stage. Reuters quoted him as saying, "Tight negotiations are ongoing in these hours and in these days," adding that the company was committed to finding a resolution swiftly. A broader restructuring plan for the aerostructures business, which employs approximately 4,000 people across four plants in southern Italy, will be unveiled during Leonardo's strategic update on March 11. According to Reuters, Leonardo's latest results showed an increase in Boeing orders for 2024 compared to the previous year, and Cingolani noted that the company had successfully renegotiated component prices with the U.S. aerospace giant. However, delivery rates remain a challenge. In 2023, Leonardo delivered 49 fuselage sections to Boeing, up from 39 in the previous year, while stabiliser shipments fell from 32 to 28. "This is not enough, the problem is getting bigger," Cingolani admitted, underlining the urgency of addressing the division's financial struggles.

Pratt & Whitney adds Sanad to GTF MRO network

Representatives from Pratt & Whitney and Sanad Group at the signing ceremony © *Pratt & Whitney*

Pratt & Whitney, an RTX company, is set to expand its global network of GTF engine maintenance providers by adding Sanad Group (Sanad), the global aerospace engineering and leasing solutions company, wholly owned by Abu Dhabi's sovereign investor, Mubadala Investment Company PJSC (Mubadala). Sanad's new state-of-the-art facility, expected to be completed by 2028, will further strengthen the relationship between RTX and the UAE. The Al Ain-based facility will be the first Pratt & Whitney GTF™ MRO network member in the South Asia, Middle East and North Africa region. It will provide full maintenance, repair, and overhaul (MRO) services, including test capabilities, for PW1100G-JM and PW1500G engines, which power the Airbus A320neo and A220 aircraft families, as well as the PW1900G engine for the Embraer E-Jet E2 family. For nearly 40 years, RTX has maintained a strong relationship with the UAE, supporting local industry and providing critical capabilities to advance the Emirates' aviation sector. Raytheon Emirates was established in 2017 as a locally operated company to further contribute to the UAE's industrial ecosystem and economic diversification. The inclusion of Sanad in Pratt & Whitney's GTF MRO network, in collaboration with the Tawazun Council, reflects RTX's ongoing commitment to delivering sustainable economic benefits to the UAE. Pratt & Whitney's GTF MRO network currently comprises 20 facilities across four continents.

VietJet Air and Satair sign long-term material support agreement

Satair, an Airbus Services company, has signed a multi-year agreement with VietJet Air for its integrated material services (IMS), a comprehensive material support solution for the airline's entire Airbus A320 and A330 fleet. Under this exclusive agreement, Satair will provide consignment stock and pooling support for expendable materials specific to VietJet's Airbus fleet. The tailored service will ensure material availability at a defined performance level, delivering cost savings, improved cash flow, and reduced capital expenditure. Satair's IMS product offering provides an end-to-end supply chain solution, covering planning, sourcing, purchasing, logistics, and inventory management for expendables and consumables required throughout the aircraft maintenance lifecycle. The solution is developed in close collaboration with airline partners, catering to both full-service and low-cost carriers.

Signing ceremony of the new agreement between Satair and VietJet Air © *Satair*

GE Aerospace deploys AI-enabled tool to enhance aircraft engine inspections

GE Aerospace has begun rolling out a new AI-enabled inspection tool designed to improve accuracy and consistency in assessing key components of narrow-body aircraft engines. By streamlining the inspection process, this technology aims to return engines to service more quickly amid increasing air travel demand. The AI-enabled blade inspection tool assists trained technicians in capturing images of turbine blades, which generate much of an engine's thrust. The AI then helps technicians identify which images to review, ensuring greater consistency in spotting potential issues while reducing inspection times by 50%. The tool is being deployed across more than a dozen GE Aerospace MRO facilities, as well as to customers servicing the CFM LEAP engine. It has already been in use for three years on the GEnx wide-body aircraft engine, where it has demonstrated significant improvements in inspection speed and accuracy compared to traditional borescope methods. GE Aerospace is investing over US$1 billion in its MRO shops over the next five years as part of its commitment to supporting customers and enhancing aviation safety. The company has been integrating AI into its operations for over a decade and holds numerous AI patents within the aviation industry. Its AI applications range from engine monitoring and part inspections to predictive maintenance insights. To ensure responsible AI use, GE Aerospace adheres to strict guidelines emphasising human oversight, data integrity and transparency.

Avolon reports 2024 results with 79% increase in net income

Global aviation finance company Avolon has announced its full-year results for 2024, reporting a net income of US$608 million, marking a 79% increase year on year. Adjusted net income stood at US$458 million, up 35% compared to the previous year, excluding settlement proceeds of US$177 million (US$150 million net of tax) from insurance claims related to aircraft previously leased to certain Russian airlines. Avolon maintained a strong liquidity position, with total available liquidity of US$11.6 billion, comprising US$3.1 billion in unrestricted cash and US$7.2 billion in undrawn debt facilities. The company achieved record operating cashflow of US$2.0 billion, reflecting a 15% year-on-year increase. During the year, Avolon secured US$14 billion in funding across public and private markets, with 79% of this being unsecured. The company maintained a net debt-to-equity ratio of 2.1 times, an unsecured-to-total debt ratio of 67%, and held US$20 billion in unencumbered assets. Avolon also retained its investment-grade ratings with a positive outlook from both Moody's (Baa3) and Fitch (BBB-). Following the year-end, Avolon successfully closed and fully integrated its acquisition of Castlelake Aviation Limited (CA Ltd), adding 116 aircraft to its owned and committed fleet. Throughout the year, the company acquired 45 new aircraft and transitioned 23 aircraft to 25 customers. Avolon placed 30 aircraft from its orderbook, ensuring that its orderbook was fully placed for the next 24 months by year-end. It also entered into agreements for the sale and leaseback of 37 new aircraft. The company sold 55 aircraft in 2024 and ended the year with agreements in place for the sale of an additional 64 aircraft. At the close of the year, Avolon's owned, managed, and committed fleet, including the CA Ltd acquisition, stood at 1,129 aircraft.

Honda Aircraft Company begins production of HondaJet Echelon test unit

Honda Aircraft Company has officially commenced production of the first HondaJet Echelon test unit with the assembly of the aircraft's wing structure in Greensboro, North Carolina. Scheduled for its maiden flight in 2026, the HondaJet Echelon will feature a larger cabin, increased passenger capacity, and extended range compared to previous HondaJet models, introducing the award-winning design to a new segment of the aviation market. Honda Aircraft Company's production department began implementing specialised assembly lines in early 2024, completing tooling installation by the end of the year. With work now underway on the first major subassembly of the HondaJet Echelon, the programme has entered its next phase of development. The company is producing test articles to advance the design in preparation for aircraft certification. In January 2025, the Honda Aircraft Company advanced systems integration test facility (ASITF) marked a significant milestone by holding a ceremony to celebrate the completion of the HondaJet Echelon development simulator. This advanced simulator serves multiple functions, including system development testing. Using data from wind tunnel models and real aircraft hardware, the simulator predicts the aircraft's performance in operational conditions, allowing engineers to evaluate critical systems before the test aircraft takes flight. The HondaJet Echelon is set to become the first light jet with a range capable of non-stop transcontinental flights across the United States, offering 40% greater fuel efficiency than some midsize jets. The new aircraft will introduce innovative product features previously unseen in the HondaJet range while maintaining the high performance and operational efficiency that define the original HondaJet.

The Honda Aircraft Company has commenced assembly of the HondaJet Echelon's wing structure in Greensboro, North Carolina © Honda Aircraft Company

Coltala Holdings launches Coltala Aerospace

Coltala Holdings has launched Coltala Aerospace with the acquisition of Aeroparts Group © *APG*

Coltala Holdings has established Coltala Aerospace, a new platform dedicated to advancing the US aerospace and defence industries. The launch follows Coltala's acquisition of Aeroparts Group (APG), which achieved over 60% growth last year, reinforcing Coltala's commitment to strengthening national defence and aviation safety. Coltala Aerospace now includes Evans Composites, APM, and ACD Consulting, providing precision machining, Part 145 MRO repair services, and engineering expertise for both commercial and military aerospace sectors. The company is led by APG's Dale Gabel (CEO) and Ricky Armstrong (Founder & COO), whose leadership has driven APG's rapid expansion. Coltala collaborated closely with the APG team before finalising the acquisition, ensuring a seamless transition. With Dallas-Fort Worth as a key aerospace hub, Coltala aims to drive innovation and growth in the region. Inspired by platforms like Heico, Coltala Aerospace brings together top aerospace firms under a unified vision. Coltala partnered with Thornburg Bow River Advisors and Sunflower Bank to finance the transaction, securing essential resources for future growth. CEO Dale Gabel highlighted the alignment of Coltala's values with APG's, promising exceptional service to commercial and defence customers. COO Ricky Armstrong called the acquisition a "new chapter" for APG, emphasising the collaboration's potential. This acquisition marks a milestone in Coltala's mission to build lasting, transformative businesses, reinforcing America's leadership in aerospace and defence.

Bharat Forge and Liebherr partner for aerospace manufacturing

Guru Biswal, Aerospace CEO, Bharat Forge (2nd from left) and Alex Vlielander, Chief Customer Officer, Liebherr-Aerospace & Transportation SAS (middle), with representatives of Bharat Forge and Liebherr after the signature ceremony during Aero India 2025 © *Liebherr*

At Aero India 2025, Bharat Forge and Liebherr unveiled a strategic partnership to establish a manufacturing facility aimed at addressing the increasing global demand in the aerospace sector. Under this collaboration, Bharat Forge will develop a state-of-the-art facility at its headquarters in Pune, India, with operations set to commence in 2025. The facility will incorporate a ring mill equipped with advanced forging and machining technologies to manufacture high-precision components, including landing gear parts. This initiative, spearheaded by Bharat Forge Ltd., highlights the company's commitment to delivering high-quality aerospace solutions to Liebherr and its international customer base. Guru Biswal, Aerospace CEO of Bharat Forge Ltd., emphasised the significance of the partnership, stating that the collaboration reflects both companies' dedication to innovation and excellence in aerospace manufacturing. He highlighted that investments in the ring mill and landing gear machining capabilities will enhance precision engineering and create long-term value for the industry. Alex Vlielander, Chief Customer Officer at Liebherr-Aerospace & Transportation SAS, expressed enthusiasm for the partnership, noting that the integration of advanced technologies in the new facility will enable both companies to meet the stringent requirements of the aerospace sector. Additionally, he underscored how this collaboration will strengthen supply chain capabilities. This joint venture underscores Bharat Forge's continued expansion into the aerospace domain while reinforcing Liebherr's commitment to high-quality manufacturing solutions. The upcoming facility in Pune is expected to play a key role in supporting global aerospace demand, further solidifying both companies' presence in the industry.

Werner Aero acquires Airbus A319 to boost global aftermarket supply

Werner Aero has announced the acquisition of an Airbus A319-100, MSN2554, from FTAI Aviation, reinforcing its commitment to expanding its inventory and delivering top-tier aftermarket solutions to airlines and MROs worldwide. This strategic purchase strengthens the company's position as a leading supplier of aircraft components. The aircraft will be dismantled at Air Salvage International, based at Cotswold Airport in the UK, to recover high-quality spare parts. These components will be used to support Werner Aero's aviation partners, ensuring continued reliability and service excellence. Renowned for its high-quality service and customer-centric approach, Werner Aero is a key player in the aviation industry, offering asset management and logistical solutions to airlines across the globe. The company specialises in components for A320, B737NG, CRJ, and E-Jet aircraft, providing innovative and comprehensive transportation solutions. With a worldwide presence, Werner Aero is ISO 9001-certified and an FAA AC0056B-approved supplier, ensuring the highest industry standards. This latest acquisition underlines Werner Aero's dedication to supporting the aviation sector with sustainable, high-quality aftermarket solutions while reinforcing its global reach and reputation.

The Airbus A319 will be dismantled to recover high-quality spare parts © *Werner Aero*

Safran and HAL propel India's aerospace growth with LEAP engine pact

LEAP-1A engine © *Safran*

At the Aero India trade show in Bengaluru, Safran Aircraft Engines, the French aircraft engine manufacturer, has signed a major contract with Hindustan Aeronautics Limited (HAL) to produce turbine forged parts for LEAP engines. This agreement builds upon an MoU signed in October 2023, strengthening industrial cooperation under India's "Make in India" initiative. The deal supports the rapid expansion of India's aerospace sector and ensures a steady production ramp-up of LEAP engines, which power single-aisle civil aircraft worldwide. The partnership between Safran and HAL has deep roots, with the two companies previously establishing the Safran HAL Aircraft Engines joint venture in Bengaluru in 2022. This facility manufactures key components for both the LEAP engine and the M88 engine, which powers the Rafale fighter jet. Safran is further reinforcing its footprint in India by expanding local facilities and developing a broader aerospace ecosystem with strategic Indian partners. Dr D K Sunil, Chairman and Managing Director of HAL, highlighted the long-standing collaboration between the two firms, pointing to their joint development of the Shakti helicopter engine and their co-design work on the IMRH engine. He expressed enthusiasm for deepening the relationship, particularly in supplying critical nickel ring forgings for LEAP engines. This latest agreement cements Safran's commitment to India's aviation ambitions while elevating HAL's role in global aerospace manufacturing, positioning India as a key player in high-precision engine component production.

STS Aviation Services and Diehl Aviation launch new aviation hub in Dubai

STS Aviation Services, in collaboration with Diehl Aviation, has expanded its footprint in Dubai with the opening of a state-of-the-art facility in the Dubai Airport Freezone. This 1,100 m^2 site, strategically positioned in the airport's logistics hub, enhances both companies' regional presence and operational capabilities. The facility will function as a shared workspace, with Diehl Aviation overseeing the final assembly and certification of cabin components under EASA Part 21G, while STS Aviation Services handles final assembly and kitting under Diehl's supervision. This partnership allows for a more efficient and integrated approach to aircraft maintenance and cabin component services in the Middle East. Equipped with dedicated production lines, rework stations, spare parts warehousing, and office space, the facility is designed to streamline operations and improve service delivery. Initially, the focus will be on assembling components for the A380 aircraft family, such as lavatories and sidewall panels, with the flexibility to expand to other aircraft models as needed. The expansion highlights both companies' dedication to delivering high-quality products and faster turnaround times. Furthermore, STS Aviation Services is progressing towards GCAA CAR 145 certification, which will allow on-site repair and certification of aircraft components in Dubai, complementing Diehl Aviation's existing EASA Part 21G certification. By combining their expertise, STS Aviation Services and Diehl Aviation are reinforcing their commitment to innovation and excellence, ensuring they continue to meet the evolving needs of the aviation industry in the region.

Official opening of the new state-of-the-art facility in the Dubai Airport Freezone *© STS Aviation Services*

WestJet and LHT sign landmark engine maintenance deal

WestJet has signed a 15-year agreement with LHT for the maintenance of its LEAP-1B engines *© WestJet*

WestJet has signed an exclusive 15-year, multi-billion-dollar agreement with Lufthansa Technik (LHT) for the maintenance of its CFM International LEAP-1B engines, which power the airline's Boeing 737 fleet. As part of the agreement, Lufthansa Technik will establish a new engine repair facility in Calgary, dedicated to servicing LEAP-1B engines for near-wing and quick-turn work. The facility, set to begin operations in 2027, will feature Canada's first modern test cell for next-generation engines, creating jobs and strengthening Calgary's aviation sector. WestJet will be the launch customer for the new repair station. WestJet CEO Alexis von Hoensbroech highlighted the significance of the deal, emphasising that bringing engine repair operations to Canada will improve efficiency, cost certainty and competitiveness while supporting the Alberta economy. He described the agreement as a pivotal moment for WestJet, its customers and the wider Western Canadian community. WestJet, Canada's largest 737 MAX operator, currently has a fleet of over 50 Boeing 737 MAX aircraft, expected to grow to more than 130 by the end of the decade. Lufthansa Technik, a licensed CFM Premier MRO partner, brings extensive expertise in servicing LEAP engines and was the first independent provider recognised for both LEAP-1A and LEAP-1B maintenance. The new Calgary facility is being developed with support from Canadian government agencies and local partners, reinforcing the region's status as an emerging aviation hub.

British Airways to acquire Boeing's MRO business at Gatwick

British Airways is to acquire Boeing's MRO business at Gatwick © *British Airways*

British Airways has announced the acquisition of Boeing's hangar facility and MRO business at Gatwick, securing jobs and strengthening its presence at the airport. The move will enhance BA's engineering capabilities, benefiting both customers and operations. The transaction includes the creation of a new wholly owned subsidiary, British Airways Engineering Gatwick (BAEG), which will join BA's existing engineering divisions in South Wales (BAEW) and Glasgow (BAMG). Boeing employees at the facility will transfer to BAEG following a consultation process in the second quarter of this year. This acquisition is a key part of BA's long-term strategy to expand its engineering operations. In addition to securing existing roles, BA plans to recruit more staff and grow the Gatwick facility, reinforcing its role as a vital engineering hub within the airline's network. The Gatwick facility will allow BA to increase minor maintenance on 777 aircraft and in-source some scheduled heavy maintenance for its A320/A321 fleet, reducing the need to transfer aircraft to other bases. This expansion will also improve BA's ability to handle unscheduled repairs and relieve capacity pressures across its network, contributing to its sustainability goals. BA Chief Technical Officer Andy Best emphasised the benefits of the acquisition, welcoming new employees and highlighting the added expertise and modern facilities. He stated: "This will support the reliability of our entire fleet, which is good news for our customers and colleagues. We're proud of our Gatwick operation, and this underlines our commitment to the airport." Subject to regulatory conditions, the transaction marks a significant investment in BA's engineering future, ensuring operational efficiency and strengthening the airline's presence at Gatwick.

Liebherr-Aerospace to establish new service centre at Dubai South

Shaking hands after the signature of the agreement: Mohammad Al Falasi, Deputy CEO of MBRAH (r) and Damon Seksaoui, General Manager Aerospace Division at Liebherr Middle East (l) *© Liebherr*

Liebherr-Aerospace has signed an agreement with Mohammed Bin Rashid Aerospace Hub (MBRAH) to establish a new service centre at Dubai South. The agreement was formalised during the MRO Middle East exhibition 2025 in Dubai, underscoring the commitment to advancing aviation services in the region. The new 2,400 m² facility is scheduled to begin operations in early 2026 and will significantly enhance Liebherr-Aerospace's aftermarket service capabilities. Designed to support the Middle East's increasing demand for aircraft component repairs, the centre will cater to a broad range of commercial aircraft, business jets, and helicopters. The facility will also be EASA Part 145 certified, ensuring high-quality maintenance, repair, and overhaul (MRO) services with a particular focus on air management system components. Alex Vlielander, Chief Customer Officer at Liebherr-Aerospace & Transportation SAS, highlighted the strategic importance of this expansion, noting that increasing MRO capacity in the region allows for in-house servicing of more components. This will reduce logistical complexities and improve turnaround times, benefiting customers across the Middle East. Tahnoon Saif, CEO of MBRAH, expressed enthusiasm about the collaboration, stating that the partnership reinforces Dubai South's appeal as a premier aerospace hub. He emphasised MBRAH's dedication to attracting leading aviation companies and facilitating their expansion within an integrated economic environment that connects them to global markets. This initiative aligns with Dubai's broader vision to strengthen its position as a key player in the international aviation industry.

Etihad Engineering to become L3Harris' licensed repair centre

Daniel Hoffmann (l), CEO of Etihad Engineering and Simone Totti (r), Head of Avionics Aftermarket Sales at L3Harris *© Etihad Engineering*

At MRO Middle East, Etihad Airways Engineering (Etihad Engineering) and L3Harris Technologies (L3Harris) have announced their intention to enter into an agreement. Under this partnership, Etihad Engineering would be appointed as L3Harris' licensed repair centre for cockpit voice recorders and flight data recorders in the Middle East. Daniel Hoffmann, CEO of Etihad Engineering, stated: "We are excited about the opportunity to support L3Harris as their licensed repair centre in the Middle East. This strategic partnership would strengthen our component portfolio and enable us to offer OEM-level service and faster lead times on L3Harris aircraft components to our customers from around the world." Simone Totti, Head of Avionics Aftermarket Sales at L3Harris Technologies, added: "L3Harris is excited to strengthen our collaboration with Etihad Engineering through this new Licensed Repair Centre agreement. This partnership not only expands our ability to deliver high-quality, efficient service to our customers in the Middle East but also enhances our regional support capabilities, ensuring faster turnaround times and continued excellence in component repair and maintenance." The agreement would further enhance Etihad Engineering's component repair and overhaul capabilities, adding to its comprehensive MRO services at its state-of-the-art facility in Abu Dhabi, UAE, while also opening greater market opportunities for L3Harris in the region.

Satys Group opens aircraft painting hangar at DWC Airport

Satys, a French industrial group, has announced the opening of a state-of-the-art aircraft painting hangar at Dubai World Central (DWC) Airport. This cutting-edge facility highlights Satys' continued commitment to innovation and excellence within the aerospace industry. Founded in 1986 in Blagnac, France, under the name STTS, Satys operates in 12 countries across Europe, North America, the Middle East, Asia, and Africa, with a network of 50 sites globally. The group is recognised for its expertise in aircraft painting, sealing, and the manufacture of interiors for both the aerospace and rail sectors. With a workforce of over 2,500 employees worldwide, Satys remains a leader in the industry, holding numerous certifications and maintaining a strong emphasis on quality, safety, and operational excellence. "We are excited to open our new hangar at DWC Airport, a major milestone in our global expansion. This state-of-the-art facility will allow us to deliver faster, high-quality services for both VIP and commercial aircraft. Dubai's strategic location is crucial to our growth in the Middle East and Asia, and we are proud to be at the forefront of introducing innovative aircraft painting solutions to the region," said a spokesperson for Satys.

Satys Group has opened a state-of-the-art aircraft painting hangar at DWC Airport
© Satys Group

ATSG stockholders approve merger with Stonepeak

Air Transport Services Group (ATSG), a global powerhouse in medium wide-body freighter aircraft leasing, air transport operations, and support services, has announced that its stockholders have voted to approve the proposed merger with Stonepeak, an alternative investment firm specialising in infrastructure and real assets. The approval was confirmed at a special meeting of ATSG's stockholders. The final voting results from the special meeting are expected to be filed with the U.S. Securities and Exchange Commission (SEC) in a Form 8-K on 10 February 2025. Under the terms of the definitive merger agreement, ATSG's common shareholders will receive US$22.50 per share in cash upon the closing of the transaction. The merger is anticipated to be finalised in the first half of 2025, subject to the satisfaction or waiver of customary closing conditions, including necessary regulatory approvals. Once the transaction is completed, ATSG will transition to a privately held company and its shares will no longer be publicly traded or listed on NASDAQ. Stonepeak, the acquiring firm, manages approximately US$72 billion in assets and focuses on investments in defensive, hard-asset businesses worldwide. Its investment strategy aims to deliver strong risk-adjusted returns while prioritising downside protection. The firm specialises in sectors such as digital infrastructure, energy and energy transition, transport and logistics and real estate. As a sponsor of private equity and credit investment vehicles, Stonepeak provides capital, operational support and strategic partnerships to enhance the growth of its portfolio companies. The merger represents a significant shift for ATSG, positioning the company for long-term strategic growth under private ownership. The partnership with Stonepeak is expected to provide financial strength and operational expertise, supporting ATSG's continued expansion in the global air transport and logistics market.

TRIUMPH Group to be acquired in US$3 billion private equity deal

TRIUMPH Group has released that it has entered into a definitive agreement under which affiliates of growth-focused private equity firms Warburg Pincus and Berkshire Partners will acquire TRIUMPH through a newly formed entity for a total enterprise value of approximately US$3 billion. Upon completion of the transaction, TRIUMPH will become a privately held company, jointly controlled by Warburg Pincus and Berkshire Partners. Under the terms of the agreement, TRIUMPH shareholders will receive USA$26.00 per share in cash. The purchase price represents a premium of approximately 123% over the company's unaffected closing stock price of US$11.65 per share as of the close on October 9, 2024, and a premium of approximately 58% over the volume weighted average price (VWAP) of TRIUMPH common stock for the 90 days prior to January 31, 2025. The transaction is expected to close in the second half of calendar year 2025 and is subject to customary closing conditions, including approval by TRIUMPH shareholders and receipt of required regulatory approvals. TRIUMPH's Board of Directors unanimously approved the definitive agreement. The transaction is not contingent upon financing. Upon completion of the transaction, TRIUMPH will no longer be traded on the New York Stock Exchange.

AFI KLM E&M extends support for Air Côte d'Ivoire

Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) has announced the extension of its component support contract with Air Côte d'Ivoire, the flag carrier of Ivory Coast, for a further five years. This strategic partnership will support the airline's ambitious fleet expansion and international route development. Under the renewed agreement, Air Côte d'Ivoire will expand its Airbus fleet from five A320-family aircraft to eight A320-family aircraft (ceo and neo) and introduce two A330neo aircraft. AFI KLM E&M will provide ongoing component support for this significant fleet enhancement, with the launch of the A330neo planned for 2025. Air Côte d'Ivoire's expansion is a key part of its strategy to reinforce its position in the aviation market. The airline will increase its presence in West and Central Africa while introducing new international destinations in Europe, beginning with flights to Paris CDG and Beirut. This development is expected to boost tourism and business travel between Ivory Coast and Europe, strengthening economic ties between the regions. "This contract extension with AFI KLM E&M marks a crucial milestone for Air Côte d'Ivoire. Their expertise and support are vital as we expand our regional network in West & Central Africa and open new international routes, notably to Paris Charles de Gaulle (CDG) and Beyrouth. This collaboration will enable us to enhance our service quality and operational efficiency, ensuring a seamless travel experience for our passengers," said M. Y. Dakouri, Head of Fleet Management at Air Côte d'Ivoire.

Air Côte d'Ivoire Airbus A320 *© AirTeamImages*

TARMAC Aerosave and Safran Aircraft Engines sign contract extension

© TARMAC Aerosave

During the MRO Middle East exhibition in Dubai, TARMAC Aerosave signed a contract extension with its partner and shareholder, Safran Aircraft Engines. This renewal defines the conditions for the installation of the reverse bleed system (RBS) on the CFM LEAP-1A engine, carried out by TARMAC Aerosave to support Safran Aircraft Engines' operations. This marks the second extension of their contract, reinforcing a strong and ongoing partnership. The RBS system is an exclusive innovation by CFM International for the LEAP-1A and LEAP-1B engines. Designed to mitigate carbon build-up on fuel nozzles, the system reduces the need for on-wing fuel nozzle replacements, thereby lowering maintenance requirements. For customers, this translates into increased operational time and reduced operating costs. The first RBS-equipped engines were delivered in April 2024.
In September 2024, the TARMAC Aerosave "flying team" conducted its first on-wing installation of an engine reverse bleed system (RBS) off-site in Malta. Off-site RBS operations are ongoing. The TARMAC Aerosave team is fully trained and approved for RBS installation on-wing, near-wing, in-shop, and both on- and off-site. The company has already completed more than 360 CFM LEAP-1A and LEAP-1B events, including Radial Drive Shaft (RDS) changes, with more RBS installations planned in the coming weeks. Additionally, TARMAC Aerosave's "flying team" collaborates closely with customers to carry out engine and landing gear changes, both on and off site.

ATS Technic and STS Aviation Services form landmark partnership

ATS Technic and STS Aviation Services are poised to reshape the landscape of aviation maintenance in the Middle East
© ATS Technic

ATS Technic, the UAE's first independent EASA-certified provider of line- and base-maintenance services, has announced a new partnership with STS Aviation Services. This collaboration marks a significant step in reshaping the aviation maintenance landscape in the Middle East, as the two companies combine their expertise to offer an unmatched portfolio of services focused on safety, efficiency and innovation.

ATS Technic brings its deep-rooted knowledge of the Middle East market, along with cutting-edge facilities, while STS Aviation Services contributes its renowned global reputation for excellence. Through this strategic alliance, the two organisations will extend STS' line maintenance approvals to key locations across the region, including the UAE, Jordan, Oman and Saudi Arabia. The partnership aims to create a powerful synergy that will elevate operational capabilities and introduce groundbreaking services. Notably, the collaboration will introduce several initiatives. First, STS will extend its CAA approvals to all ATS Technic stations in the Middle East, expanding service offerings to a broader range of airlines. Additionally, a state-of-the-art module-level engine shop will be established in the region, eliminating the need for costly and time-consuming engine shipping, thereby streamlining processes for regional airlines. Furthermore, the partnership will enhance capabilities at ATS' new DWC MRO facility, which is positioned to provide exceptional services to the region's leading airlines. By leveraging innovative technologies, implementing best practices and fostering specialised expertise, this facility is set to meet the growing demands of the Middle East's rapidly expanding aviation sector. Finally, a shared approach to aircraft components and parts trading will boost sales and operational efficiency, enabling both companies to serve a wider customer base and enhance their competitive edge. Together, ATS Technic and STS Aviation Services are poised to lead the way in aviation maintenance across the Middle East.

Aircraft lessors settle insurance disputes over Russia-stranded jets

Aircraft lessors Avolon and BOC Aviation have settled lawsuits in the High Court against insurers over jets stranded in Russia after Western sanctions in 2022, the companies announced on Friday. The trial, which began last June, involved approximately US$2.7 billion in insurance claims. SMBC Aviation Capital, another major lessor, confirmed it had also reached settlements with Swiss Re and Scor Europe. These are two of the 18 insurers it is suing as part of a broader lawsuit brought by six lessors in the Irish High Court, which continued on Friday, February 7. Aircraft lessors are seeking compensation from multiple insurers worldwide over losses exceeding US$8.3 billion. More than 400 aircraft were left in Russia after sanctions against Moscow's invasion of Ukraine forced the cancellation of lease agreements. Avolon and BOC said they had dropped their Irish lawsuits after reaching commercial settlements with their insurers. Both companies, along with lessor SMBC—declined to disclose settlement terms due to confidentiality agreements. Representatives for CDB Aviation, Nordic Aviation Capital and Hermes Aircraft, the three other lessors involved in the Irish legal action, did not comment. BOC, headquartered in Singapore, said it would continue pursuing a separate claim against insurers in London's High Court, where another trial involving aircraft lessors began last year. Dublin-based lessor Avolon recorded a US$304 million impairment in 2022 to cover losses from ten of its aircraft stranded in Russia. BOC took a US$804 million write-down the same year for 17 aircraft. The Irish lawsuit targeted over a dozen insurers, including Lloyd's of London, Chubb and Fidelis. Since the legal action began—some cases are also set to be heard in the United States—lessors have secured more than US$2.5 billion in settlements with Russia for over 100 aircraft, transferring ownership to Russian airlines. With more than 60% of the world's leased aircraft owned or managed in Ireland, the ongoing Dublin trial is the largest in the country's history by the number of legal representatives involved.

Turkish Technic signs new agreements with IndiGo and Air India Express

Turkish Technic, a globally renowned MRO provider, has signed agreements with IndiGo, India's largest airline, and Air India Express, a subsidiary of the Air India Group, to provide extensive MRO services for their fleets. The agreements were announced during MRO Middle East 2025, reinforcing Turkish Technic's growing presence in the Indian aviation sector. As part of its agreement with IndiGo, Turkish Technic will carry out redelivery checks for over ten Airbus A320neo aircraft at its Istanbul Atatürk and Sabiha Gökçen Airport facilities. With decades of expertise, Turkish Technic will streamline these operations to ensure seamless and timely redelivery. Additionally, the two companies are in advanced discussions for a separate agreement covering landing gear overhaul operations for IndiGo's A320neo fleet. In a separate agreement with Air India Express, Turkish Technic will provide comprehensive component support and solutions for the airline's Boeings 737-8 and 737-10 fleet. Covering 190 aircraft, this partnership will enable Air India Express to benefit from component pooling, repair, overhaul, modification and logistics services. By leveraging its extensive global supply chain and technical expertise, Turkish Technic aims to enhance the operational efficiency and reliability of Air India Express's growing fleet. Commenting on the agreements, Mikail Akbulut, CEO and Board Member of Turkish Technic, said: "We are happy to further strengthen our partnership with Air India Express through a new agreement. The continuation of our cooperation is a testament to our reliability in component support, supply, and solution services. We are confident in our capabilities and global supply chain network to continue enhancing their operational efficiency. We thank Air India Express for choosing us as their trusted solution partner. We are excited to contribute to the elevation of Indian aviation." These agreements mark significant milestones for Turkish Technic as it continues to expand its footprint in the Indian aviation sector, delivering world-class MRO solutions to leading airlines in the region.

Turkish Technic hangar © *Turkish Technic*

Joramco expands global partnerships with new comprehensive agreements

Kostas Katsikias (l), CEO at FSTC EUROPE and Fraser Currie (r), CEO at Joramco © *Joramco*

Joramco, the Amman-based MRO facility and engineering arm of Dubai Aerospace Enterprise (DAE), has signed comprehensive agreements encompassing material support, maintenance services, and training partnerships. The agreements were formalised during MRO Middle East 2025, reinforcing Joramco's long-standing collaborations with global industry leaders. As part of the agreement, Joramco has renewed its partnership with PPG, the global supplier of paints, coatings, and specialty materials, ensuring a continuous supply of high-quality sealant and paint products. This guarantees optimal stock availability to meet Joramco's operational demands while securing competitive pricing throughout the year. Additionally, Joramco has expanded its maintenance agreement with global delivery company DHL. Under this agreement, which runs from January 2025 to May 2026, Joramco will perform C-checks and multi-heavy maintenance on 12 aircraft. Notably, for the first time, the Airbus A330 will be included alongside the Airbus A300, marking a significant expansion of Joramco's service portfolio. Further strengthening its commitment to aviation training, Joramco has partnered with FSTC EUROPE, an EASA-approved aviation training organisation, to introduce a new suite of training programmes at Joramco Academy. These programmes will include on-the-job Training (OJT) and type rating courses for the Boeing 737 and Airbus A320. Joramco and its academy maintain the highest industry standards, holding certifications under JCARC and EASA Part 145, alongside numerous other approvals. Similarly, FSTC EUROPE is certified under EASA, JCARC, and HCAA Part 147. Commenting on this partnership, Fraser Currie, Chief Executive Officer at Joramco, said, "We are excited to collaborate with FSTC EUROPE and leverage their extensive expertise in aviation training to enhance our training offerings. This partnership is testament to Joramco's commitment to advancing aviation excellence and supporting the development of the next generation of aviation professionals."

ST Engineering secures major Middle Eastern MRO contracts

ST Engineering has announced that its Commercial Aerospace business has secured maintenance, repair, and overhaul contracts for CFM56-7B and LEAP-1A engines from two major Middle Eastern operators. Under the multi-year agreements, ST Engineering will provide heavy maintenance services to the two operators from its engine MRO facilities in Asia. Tay Eng Guan, Head of Engine Services at ST Engineering, said, "As a trusted engine MRO partner, we are continuously investing in our capabilities and services to better support our customers globally. Our market presence in the Middle East has been growing in recent years, and our latest contracts with the two new Middle Eastern customers provide a strong foundation for collaboration with operators in this region. We look forward to building strong partnerships with them and delivering high-quality services that fully meet their operational needs." In addition to a strong track record in CFM56-5B and CFM56-7B engine services, ST Engineering is the first independent MRO provider in Asia to be designated a Premier MRO provider in CFM International's LEAP open MRO ecosystem. Its Commercial Aerospace business added testing capabilities for the new-generation CFM LEAP-1A and LEAP-1B engines at its Singapore facility in 2024 and is now expanding its capabilities to include LEAP Performance Restoration Shop Visit services.

ST Engineering has secured MRO contracts from two Middle Eastern operators *© ST Engineering*

Panasonic Avionics secures ten-year maintenance deal with Riyadh Air

Panasonic Avionics will provide in-flight entertainment maintenance support for Riyadh Air's fleet of 787 Dreamliners
© Panasonic Avionics

Panasonic Avionics Corporation has signed a landmark ten-year agreement with Riyadh Air, Saudi Arabia's premium global airline, to provide in-flight entertainment maintenance support for its fleet of 32 Boeing 787 Dreamliners. As part of the deal, Panasonic Technical Services (PTS) will establish a dedicated line maintenance station in Riyadh. Highly specialised technical teams with expertise in the Dreamliner's advanced systems will deliver top-tier maintenance, repair, and overhaul (MRO) services. Panasonic Avionics' investment in Saudi Arabia also includes hiring local staff and implementing education and training programmes to support the initiative. The agreement features PTS' total care package, ensuring seamless aircraft operations and an enhanced passenger experience. This strategic partnership underscores both companies' shared commitment to innovation and service excellence in the aviation sector. Riyadh Air, the world's first digitally native airline, aims to redefine air travel, and Panasonic Avionics will play a key role in shaping future passenger experiences while enabling the airline to distinguish itself in the market. With 25 years of expertise in dependable maintenance solutions, PTS will provide Riyadh Air with invaluable OEM support as it prepares to launch passenger operations in late 2025.

FL Technics strengthens Middle East presence with Fly Vaayu maintenance deal

FL Technics, a globally recognised provider of aviation MRO solutions, is strengthening its presence in the Middle East. This year, its subsidiary, FL Technics LLC, has begun providing fleet support for UAE-based airline Fly Vaayu, which operates across the Indian subcontinent, Southeast Asia, and beyond. Arif Alameri, Managing Director of FL Technics LLC, highlighted the significance of this expansion, stating: "The Middle East is a growing aviation hub, and our goal is to establish ourselves as a leading MRO provider in the region. Fly Vaayu is a key client for FL Technics LLC and we are committed to delivering faster and more efficient maintenance solutions." FL Technics LLC will provide maintenance for Fly Vaayu's Airbus A320P2F freighter, a rare aircraft model converted from passenger to cargo use. This aircraft features a containerised belly compartment for faster loading and unloading, along with advanced engine technology. Currently, it is the only aircraft of its kind operating in the Middle East, though the number is expected to increase to four by the end of the year. As Fly Vaayu's dedicated maintenance provider,

FL Technics LLC will provide maintenance for Fly Vaayu's Airbus A320P2F aircraft © *Airbus*

FL Technics LLC will offer full-time onboard engineering services at each destination, allowing the airline to respond more flexibly to customer demands. The team of specialists will provide a comprehensive range of maintenance solutions, including line maintenance. Additionally, engineers will assist in aircraft de-registration and re-registration procedures, ensuring a smooth certification process. Earlier this year, FL Technics expanded its operations in the United Arab Emirates (UAE) by opening a new line maintenance station at Dubai World Central (DWC)/Al Maktoum International Airport. This move reinforces FL Technics LLC's position as a trusted leader in aviation maintenance solutions across the Middle East.

LTCS expands Tulsa facility

Groundbreaking at LTCS' facility at Tulsa International Airport © *Lufthansa Technik*

Lufthansa Technik Component Services (LTCS), a U.S. subsidiary of Lufthansa Technik, has commenced construction on an expansion at its facility at Tulsa International Airport. The multi-million-dollar investment is aimed at reinforcing Lufthansa Technik's position as a leading provider of aircraft component services in the Americas. The expansion will increase the total facility size to over 140,000 ft² (more than 13,000 m²), with the addition of a 25,000 ft² (around 2,300 m²) building. The new building, expected to be completed by the end of 2025, will house administrative offices and an upgraded avionics workshop. The project also includes renovating the existing hangars, with the freed-up space being used to expand workshop areas and increase production capacity. The development will add 90 new workstations to accommodate the facility's growing operational requirements. As part of the expansion, LTCS will introduce new capabilities, including the repair of integrated drive generators (IDG), a crucial aircraft component that ensures a consistent generator speed to supply onboard electrical power. This enhancement builds on LTCS's recent addition of repair services for Air Data Inertial Reference Units (ADIRUs), which provide key flight information such as altitude, speed, and position. Thomas Illner, Managing Director and Head of Region Americas at LTCS, highlighted the significance of the expansion, stating that it enhances both capacity and capability to better support airlines across the Americas. Departing Co-Managing Director Michael Scheferhoff emphasised that the additional space would not only increase operational efficiency but also facilitate workforce growth, making Lufthansa Technik a more attractive employer in Tulsa. Oklahoma Lieutenant Governor Matt Pinnell, who attended the ground-breaking ceremony, praised Lufthansa Technik's investment, citing Oklahoma's long-standing legacy in aerospace innovation. He noted that the expansion strengthens the state's reputation as a global leader in maintenance, repair, and overhaul (MRO) services, with Lufthansa Technik playing a crucial role in driving future innovation and growth in the industry. With this expansion, LTCS is set to further solidify its role as a key player in aircraft component services while contributing to Tulsa's growing aviation sector.

Complex MRO vendor network?

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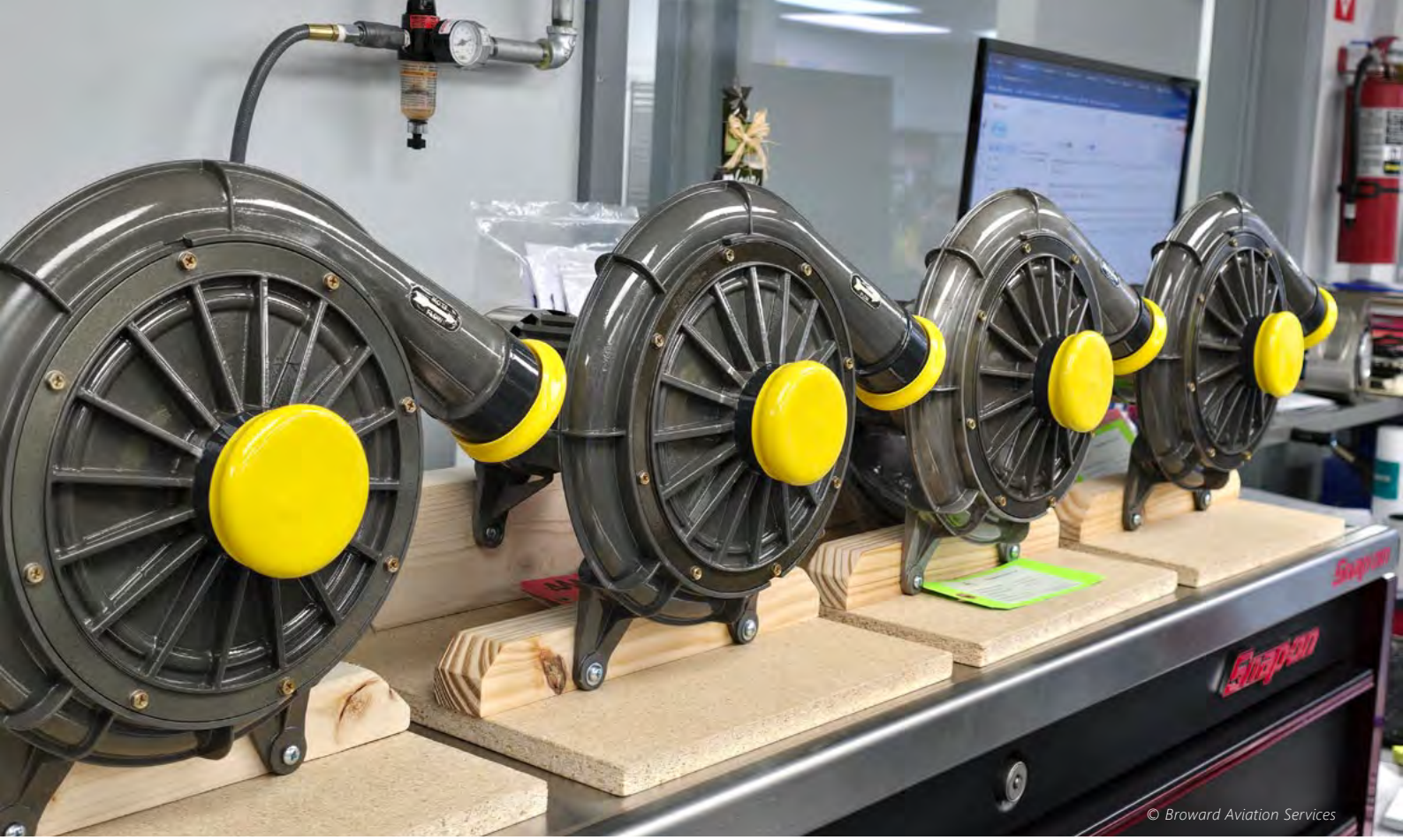

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Rotables – Repair or Replace?

The constant challenge facing MROs

By David Dundas

Is it fair to say that components which make up the structure of an aircraft fall into one of three main categories: Expendable, repairable and rotable. Expendable parts are those over which MROs can have little control. They get replaced when needed and there is never any question of repairing them. Repairable parts and rotables, on the other hand, share a lot of common ground, primarily the fact that they can all be repaired where appropriate in terms of safety and cost efficiency. However, rotables differ from repairable components in that they not only come with critical serial numbers, but they are subject to checks and maintenance at strictly pre-determined intervals. Also, like repairable parts, one of the biggest challenges involving rotables is knowing when a part can be repaired, and when it has to be replaced.

To find out what factors influence the rotable repair or replace dilemma, we decided to approach eight leading MRO operators for their input and knowledge to see what the overall industry perspective may look like.

What factors typically determine whether a rotable should be repaired or replaced?

When it comes to aircraft maintenance, one of the greatest challenges is reducing the overall running costs, with MRO activities forming a major element. As a consequence, in order to minimise such costs, there is a constant battle going on between repairing or replacing various components. Joe Greenwood, Vice President Sales, AAR Component Services clearly defines his company's approach to the problem in relation to rotables. "We assess the current market value, as well as overall availability of the rotable in the marketplace. If there is sufficient availability, the rotable is typically repaired up to a threshold of 60-70% of the current and fair market value (FMV). Another contributing factor is the amount of Used Serviceable Material (USM) and/

> ***"...if lead times are long, the component has recurring failures, or a newer version offers better performance, replacement may be the better option."***
>
> *Oliver James, VP Trading - Americas, AerFin*

Oliver James, VP Trading - Americas, AerFin

© Ascent Aviation Services

or availability of OEM piece parts to support a repair. When piece part supply is limited, the decision is often made to replace the rotable if there are overhauled units in the market." Oliver James, VP Trading - Americas, AerFin is of a similar opinion, as is Mike DeMicco, SVP Sales and Material Management, VAS Aero Services, and Tony Kondo, President and CEO, Werner Aero LLC. James adds that: "...if lead times are long, the component has recurring failures, or a newer version offers better performance, replacement may be the better option. Availability of spares, contractual obligations, and market conditions also play a role. Ultimately, the choice balances cost-effectiveness, aircraft downtime, and long-term operational efficiency." DeMicco also points out that:


Kyle D. Olson, VP Sales, Ascent Aviation Services

"In cases where the part is critical to flight operations, has significant damage and has expected risk of future failure, the part is best suited for replacement," while Kondo advises that that you also need to consider the BER rate of any rotable.

Ismaël Fadili, Vice President Sales Europe – AMETEK MRO has a slight variation on the theme, commenting that: "The main factors are economic and focus on price comparisons with the purchase price of a new unit. Most of the airlines consider that at a cost of up to 65% to 70% of the purchase price for a new unit, a rotable should be repaired. Some airlines are also questioning low value rotables, like ballast, with a repair or buy strategy." Kyle D. Olson, VP Sales, Ascent Aviation makes it clear that: "The age of the component plays a significant role, as older parts often provide diminishing returns on repairs, which may lead us to choose a replacement. Turnaround time is another key consideration—if repairs take longer than sourcing a replacement, we prioritise operational efficiency, and we explore exchange options. Lastly, regulatory compliance is paramount, ensuring that all components meet stringent safety and airworthiness standards after any repair. These factors guide us in making the best decisions to support our customers' needs," adding that "Each of these factors ensures that we make informed decisions that prioritize safety, cost-effectiveness, and operational efficiency."

Craig Padvaiskas, VP Asset Management, Broward Aviation Services adds to the growing list of factors to be taken into account when he points out that: "The service life of a unit is another factor noting that some units can only be repaired or overhauled so many times. Additionally, the impact (if any) on the operating efficiency and operational costs on the bigger picture. The overall revenue stream of that larger asset (the aircraft) needs to be taken into consideration." Meanwhile, Scott Loza, Snr. Component Trader, Setna iO also has a clear strategy "[when] determining if a rotable should be repaired or replaced, the decision depends on a mix of financial, safety, operational, and regulatory considerations, all tailored to the specific circumstances of the aircraft and the component." He then points out that if the cost of an OEM new unit is lower then the repair and repairs are complex,

> ***"Each of these factors ensures that we make informed decisions that prioritize safety, cost-effectiveness, and operational efficiency."***
>
> *Kyle D. Olson, VP Sales, Ascent Aviation Services*

Scott Loza, Snr. Component Trader, Setna iO

> ***"Maintenance teams rely on detailed inspections, historical data, manufacturer guidelines, and cost-effectiveness to make an informed decision on whether a rotable is repairable."***
>
> *Scott Loza, Snr. Component Trader, Setna iO*

replacement may be the more practical. He further comments that some manufacturers may recommend replacement after a certain number of hours or cycles to ensure safety and performance standards, while regulatory requirements such as Airworthiness Directives (ADs) may either mandate repairs or replacement of certain components. Compliance with these regulations is essential for continued operation.

How to decide if a rotable is still repairable?

Here we are not talking so much about the financial or time-sensitive constraints, but simply the physical condition of any rotable. Oliver James explains that "Maintenance teams determine if a rotable is repairable through inspection and testing in accordance with component or engine maintenance manuals. Inspections include physical inspections, use of NDT methods to check for internal defects, and functional testing." Ismaël Fadili goes further: "This is mainly based on the reason for the removal or what time has elapsed since the new installation or latest repair. Nevertheless, when a rotable has been identified as repairable, the airline first sends the unit for final investigation by a specialist repair provider like AMETEK MRO. A decision is then taken depending on the findings of that inspection, and the cost of the repair."

"At Ascent Aviation Services, our decision-making process for evaluating rotables is guided by several key factors. Our teams conduct thorough reviews of components, aircraft maintenance manuals, and manufacturer guidelines, alongside the associated task card," explains Kyle D. Olson. Additionally, Craig Padvaiskas advises that at Broward Aviation Services, "All Part 145 repair facilities are directed by the Component Maintenance Manuals to inspect, test, repair, or overhaul the units they receive. This determines how much of the unit needs to be repaired/overhauled," while Joe Greenwood points out that "The rotable undergoes an incoming inspection and evaluation against the corresponding Component Maintenance Manual (CMM) to determine the material requiring repair or replacement."

Scott Loza goes into greater detail with his assessment of the challenge. "Maintenance teams rely on detailed inspections, historical data, manufacturer guidelines, and cost-effectiveness to make an informed decision on whether a rotable is repairable. If the repair would compromise safety, reliability, or cost-effectiveness, replacement is generally the better choice. Preliminary inspection checks for visual damage and any signs of physical damage, such as cracks, corrosion, or wear, are documented. If the rotable had performance issues before removal, diagnostic tests are run to understand the root cause of failure. A review of the component's maintenance history helps assess whether the rotable has had frequent failures or repairs. If it has been repaired multiple times already, it may be approaching the end of its useful life." This is backed up by Mike DeMicco who states that, "Rotables are sent to a qualified MRO organization with the necessary inspection and repair capability to determine their condition and viability for repair service. The MRO will check for cracks, corrosion, excessive wear, and other defects which would compromise the part and render it not recoverable through repair."

When is a rotable cheaper to replace than repair?

The next deciding factor in relation to whether to repair or replace a rotable is the overall cost factor. This doesn't necessarily include just the cost of repairs or replacement, but also the availability of any replacement and therefore the length of time on ground for the aircraft, as noted by Tony Kondo. This is backed up by Craig Padvaiskas who says that: "I believe an industry guideline is if the cost of repair is more than 70-80% of the total cost of replacing the unit, then it is better to go with the replacement. Though once again,

> ***"I believe an industry guideline is if the cost of repair is more than 70-80% of the total cost of replacing the unit, then it is better to go with the replacement."***
>
> *Craig Padvaiskas, VP Asset Management, Broward Aviation Services*

Craig Padvaiskas, VP Asset Management, Broward Aviation Services

Technician working on brakes © Antavia AMETEK MRO

readiness or availability of such a rotable unit is major factors in the decision." Ismaël Fadili also provides an answer very succinctly: "I would say when the rotable is beyond economical repair (BER). This means that the cost of the repair is close to, or above, the fair market value or the purchase price of a new part from the OEM," with Oliver James following the same line of thought.

More comprehensively, Kyle D. Olson explains: "At Ascent, we carefully evaluate several factors when deciding whether to repair or replace a rotable. High repair costs are a key consideration—when repair costs approach or exceed the cost of replacement, replacing the component becomes the more economical solution. Obsolescence also plays a role, as older components that are difficult to repair or no longer supported may necessitate replacement. Frequent failures are another factor, as rotables with recurring issues often lead to increasing long-term costs, making replacement the more cost-effective choice. Additionally, operational urgency is a critical aspect; when repair lead times exceed operational deadlines, replacing the rotable ensures minimal downtime and helps maintain operational efficiency. These considerations guide our approach to ensuring the best outcomes for our customers." He adds: "In addition to these factors, we also consider regulatory standards, Service Bulletin requirements, and downtime/operational efficiency to ensure the most cost-effective solution. By evaluating all variables, we ensure our customers receive the most reliable and financially viable option for their needs."

Mike DeMicco concurs with Kyle D. Olsen with regard to when repair costs approach or exceed the cost of replacement, replacing the component becomes the more economical solution. However, he also points out that "That calculation should include the time required to repair the part and how long customer operations may be idled. Downtime is expensive, so it may be less costly, and faster time to service resumption, to replace the part. Additionally, some parts are tracked by TSN and replacement becomes a requirement. Another aspect that should be considered is whether the part is being replaced with a newly manufactured unit or a Used Serviceable Material (USM) part. As a leading supplier of USM, VAS engages with global airline operators to find cost-effective USM solutions."

> ***"When the condition of the rotable exceeds the established threshold against FMV, then the rotable is typically replaced. This cost analysis includes the original acquisition cost of the rotable as well."***
>
> *Joe Greenwood, Vice President Sales, AAR Component Services*

Joe Greenwood pays particularly close attention to full market value (FMV) for components, commenting that: "When the condition of the rotable exceeds the established threshold against FMV, then the rotable is typically replaced. This cost analysis includes the original acquisition cost of the rotable as well. However, when there is limited availability on the market, the threshold for repair goes up, and in some cases a decision is made to repair even when exceeding FMV due to no availability."

Are there challenges in sourcing replacement rotables, especially for older aircraft models?

As if there weren't sufficient factors to be taken into consideration for repairing or replacing rotables, the age of the aircraft adds a further raft of challenges, especially for older models, especially now that more and more carriers are extending the operational lifetime of many of their aircraft owing to the delays in delivery of new models. Kyle D. Olsen at Ascent Aviation Services is very much aware of the challenges, as he explains: "Yes, sourcing replacement rotables for older aircraft models can be challenging due to several factors. At Ascent Aviation Services, we understand that: sourcing replacement rotables for older aircraft models presents unique challenges. Limited availability of parts due to discontinued production or reduced stock of older components can make finding replacements more difficult. Additionally, the higher costs associated with the scarcity of parts often

Joe Greenwood, Vice President Sales, AAR Component Services

> ***"As aircraft models mature and production lines are discontinued, material supply chains become limited and must rely on aftermarket options to maintain the remaining fleet."***
>
> *Mike DeMicco, SVP Sales and Material Management, VAS Aero Services*

Mike DeMicco, SVP Sales and Material Management, VAS Aero Services

drive-up procurement expenses. Ensuring that replacements meet certification requirements is also critical, as components must adhere to strict aviation authority standards to guarantee safety and compliance. Moreover, we often rely on third-party suppliers or surplus inventories, which can introduce variability in lead times and quality. Despite these challenges, we leverage our expertise to navigate these complexities and provide reliable solutions for our customers."

At Broward Aviation Services, Craig Padvaiskas has noted that "older aircraft models" are now getting much older, and with that comes additional problems. "It definitely can be hard to find some older parts. OEMs sometimes stop supporting certain components and this can make products difficult to find. Supply chain disruption has slowed production too and driven up prices. Generally, OEMs support discontinued airframes for anywhere between 20 to 40 years dependent on the airframe's popularity, or how similar the parts are to those on newer airframes. Aftermarket suppliers like Broward Aviation Services play a very significant role in this supply chain through the acquisition of inventory through aircraft teardowns and other strategic acquisitions. There was a Forbes article in December 2024 that said the average age of the global fleet is 14.8 years old. Though this is trending up from the previous years due to supply chain issues, it also illustrates that 'older aircraft models' in operation on a global scale are no longer 28-30 years old, some are 35 years which makes sourcing some parts more difficult," he tells us.

Scott Loza at Setna iO has his sights set clearly on the fact that the harder it becomes to find replacement rotables for older aircraft, the higher the price becomes. "Yes, sourcing replacement rotables for older aircraft models can present several challenges. These challenges stem from various factors related to the availability, support, and regulatory requirements of components. For older aircraft models, parts can be in limited supply. OEMS may stop producing certain rotables, especially if the aircraft is no longer in production or has been retired. If the component is no longer in production, it might only be available through secondary markets or from other aircraft that are being dismantled for parts. These parts may be rare, and prices could rise as demand surpasses supply. Because of these challenges, airlines or operators with older aircraft often develop long-term relationships with parts suppliers, specialised repair shops, and salvage operations to ensure they can continue sourcing rotables when necessary."

Supply chain problems seem to pervade every aspect of the MRO industry and Mike Demicco at VAS Aero Services is keen to point out how the supply chain for OEM has influenced the operating procedures where rotables are concerned for older aircraft. "As aircraft models mature and production lines are discontinued, material supply chains become limited and must rely on aftermarket options to maintain the remaining fleet. The aftermarket industry has been working through supply chain constraints for some time now, which were only worsened by the pandemic. As a result, newly manufactured parts are oftentimes not available, making USM parts a suitable, cost-conscious replacement option. Today, it's critical for aircraft operators to have close partnerships with USM suppliers such as VAS, allowing them to access needed parts, not only for older models, but for other fleet and operational support," he says.

Ismaël Fadili at AMETEK MRO also has concerns relating to the supply chain disruption of rotables for older aircraft. "Yes, at AMETEK MRO we are managing challenges right now because of the supply chain disruption affecting older aircraft MRO programmes. This is primarily due to OEMs prioritising components for new aircraft production. It is also evident that extending the operational lives of legacy aircraft, due to deliveries issues for new

Ismaël Fadili - VP Sales EMEA, AMETEK MRO

> ***"...we are managing challenges right now because of the supply chain disruption affecting older aircraft MRO programmes. This is primarily due to OEMs prioritising components for new aircraft production."***
>
> *Ismaël Fadili - VP Sales EMEA, AMETEK MRO*


Escape slide

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aircraft, is leading to less teardown activity. So, there are far less used rotables on the market. At AMETEK MRO we have built robust solutions to forward plan and cope with these issues. As OEM-approved repair stations our business units like AEM, Antavia and Muirhead Avionics, need to sustain reliably good turn-around times for customers."

Werner Aero's Tony Kondo has major concerns in relation to a lack of product support for older aircraft, while AerFin's Oliver James is also concerned about limited OEM support. "There are a ton of issues with supporting older aircraft. One of the main ones is lack of product support as the aircraft ages. For component repairs, as the aircraft model gets older and fewer airlines operate them, fewer shops will keep this PN on their capes list as their customer base dwindles. OEMs sometimes stop supporting their parts on older aircraft and push operators to purchase new instead. Often, the older parts are still repairable, but OEMs will hold the piece parts to force operators to spend more on a new unit they might not necessarily need. With dwindling options, operators must get creative to continuing supporting their fleet," Kondo advises. "Yes, sourcing replacement rotables for older aircraft can be challenging due to limited OEM support on out of production parts this can lead to supply chain delays. Airlines and MROs can occasionally turn to PMA parts, DER repairs, and strategic inventory planning methods to mitigate these challenges," suggests James.

AAR Component Services' Joe Greenwood supports Kondo and James with regard to the problem concerning OEMs and components of older aircraft, though he acknowledges that continued teardowns of older planes helps to feed the supply chain for those still in service. "Due to the high number of retirements and aircraft teardowns for older generation aircraft, there are typically more opportunities to source replacement rotables. The challenges with sourcing are generally associated with newer generation aircraft, where there is less availability of USM due to limited teardowns. For older generation aircraft, as the market dries up, rotables are a challenge as most OEMs are typically not supporting the aircraft components from a manufacturing standpoint at the next higher assembly (NHA) level," he states.

How the repair-or-replace decision impacts overall maintenance costs for an airline

Finally, we come to the question of the bottom line. Costs, and how these are affected by the repair or replace decision where airlines are concerned. On an even playing field, it would be simple to say that when it becomes necessary to replace a component because it would be cheaper to do so, or the original component is simply too worn out or damaged to repair, then there is no problem. You simply replace the original component. However, do you replace it with an OEM (if available) or USM? When supply chain factors enter into the equation and time on ground becomes an additional factor, the repair-or-replace decision becomes more complex and can have a greater-than-anticipated effect on overall maintenance costs. This is implied by Craig Padvaiskas when he says that: "Everything is effectively driven by cost, availability and lead time - so there will be occasions when taking on higher costs in the immediate moment make more sense for long-term operational efficiency, and support of the operators' overall revenue stream. Irrespective of such events, a robust planned maintenance schedule is what will minimise the downtime, reduce overall costs, and ensure that aircraft are operating efficiently and safely."

Scott Loza, Oliver James and Ismaël Fadili suggest slightly different strategies, but each taking a longer-term view of the challenge to hand. As Loza further explains: "The decision to repair or replace is not purely about upfront costs, it's about balancing short-term savings with long-term operational efficiency, and it's something airlines must consider carefully when managing their fleet. Repairs might offer lower immediate costs, but they come with the risk of higher unplanned maintenance, frequent downtime, and reduced reliability. Replacements, while initially more expensive, can reduce long-term costs by improving reliability, reducing unplanned downtime, and potentially increasing resale value. Lastly, if the repair process is lengthy or involves multiple rounds of maintenance, the aircraft could be out of service for an extended period. This downtime can have a significant operational impact, especially if the aircraft is a critical part of the airline's

fleet." James points out that: "Repairs are cheaper upfront but may lead to higher recurring costs and longer lead times, increasing AOG risks. Replacing with a new unit reduces downtime and improves reliability but comes with a higher initial cost. A robust airline strategy will balance both fleet efficiency and cost predictability." Lastly, as Fadili puts it: "Depending on the value of the rotable and from a short-term perspective, repairing is more cost effective. But this must always be carefully compared with the costs of replacement with a new unit which brings additional benefits of an extended warranty term, and a longer lifetime."

Tony Kondo is very much of the opinion that 'time is money' and that the least disruptive option is so often the most cost effective. "Many factors are involved when deciding to repair or replace a component. Maintenance needs to understand how much ground time is available to perform the work. Also, if they have the experience mechanics, tooling and technical documents available to complete the repair. Often, maintenance will make a repair/replace decision that least disrupts the airline's operation as that usually has a bigger financial impact than the cost of most repairs," he says. Conversely, Mike DeMicco is very succinct in his approach to the financial challenges. "Most airlines have a capital expenditure budget that a replacement part would fall into as well as a component repair budget. Both budgets are affected depending on which decision is made," he states. At AAR Component Services and in response to the predicament, Joe Greenwood tells us that "As a component MRO, we work closely with our airline partners to manage the lifecycle costs associated with their maintenance. Rotable inventory to support AOG and critical components is paramount to keeping aircraft operational. When weighing the repair-or-replace decision related to rotables, we work jointly with our airline partners to assess the availability and costs associated with repairing vs replacing rotables. This constant analysis and awareness of market conditions is key to airlines budgeting properly for these components."

Tony Kondo, President & CEO, Werner Aero LLC.

Voice recorder © AMETEK MRO

And to round things off, Kyle D. Olson provides us with a comprehensive reply regarding such a critical decision-making process. "The repair-or-replace decision has a direct impact on maintenance costs for an airline by focusing on a strategic approach to managing maintenance costs. By optimizing budgets, we strike a balance between repair and replacement to effectively manage overall maintenance expenses. Reducing downtime is also a priority—faster turnaround times from replacements can minimize aircraft downtime, ultimately helping to maximize revenue. We also consider lifecycle management, where repairing components to extend their life allows airlines to defer costly major capital expenditures. Additionally, we recognize that inventory costs can rise with an over-reliance on replacements, which is why a strategic focus on repair helps minimize inventory carrying costs. This comprehensive approach ensures we deliver cost-effective and efficient solutions to our customers," adding that "At Ascent Aviation Services, we carefully evaluate these factors, ensuring that airlines achieve the right balance between safety, cost-efficiency, and operational reliability."

> ***"Often, maintenance will make a repair/replace decision that least disrupts the airline's operation as that usually has a bigger financial impact than the cost of most repairs."***
>
> *Tony Kondo, President & CEO, Werner Aero LLC.*

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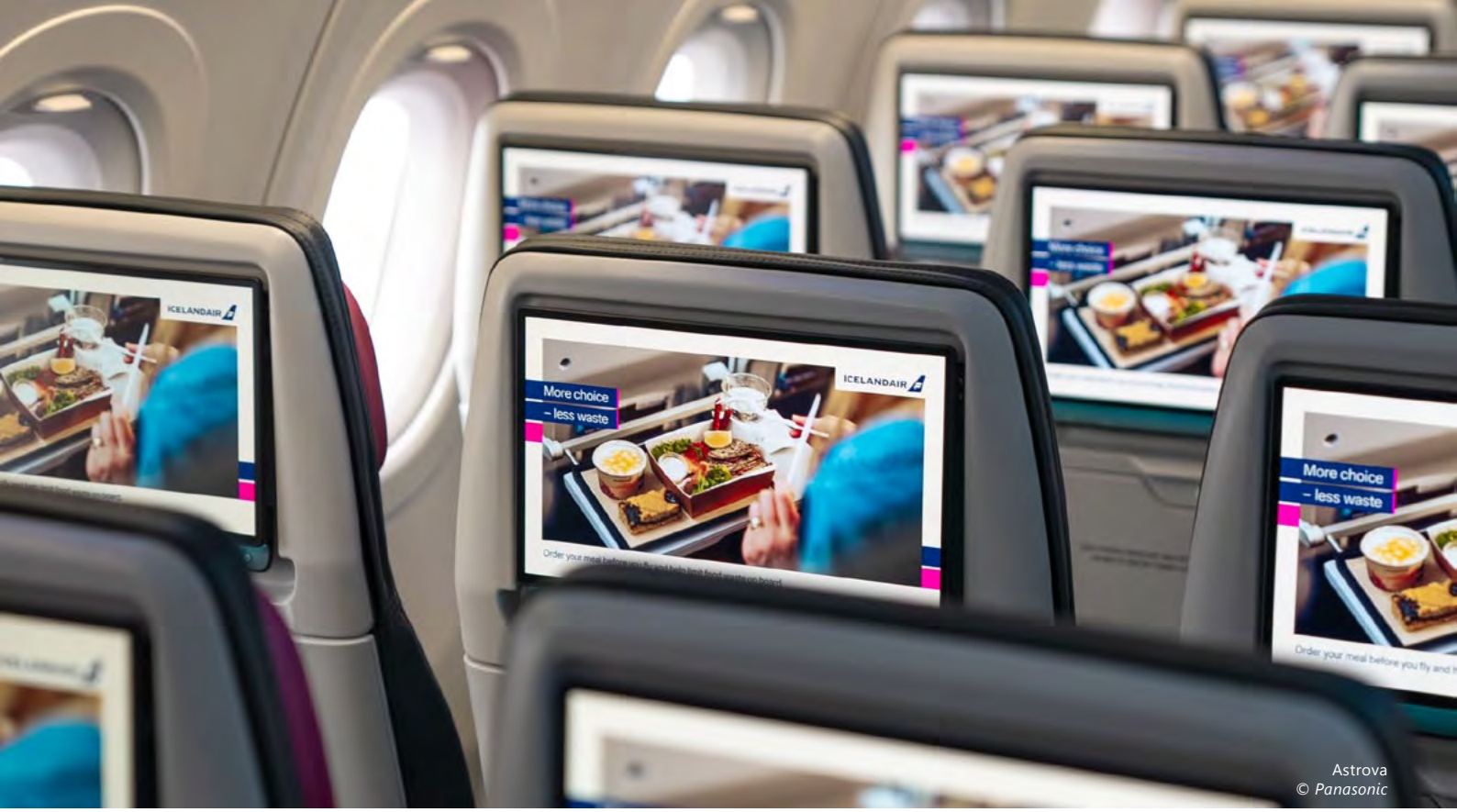

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New Trends in Aircraft Cabins

Talking to Andrew Masson, VP Product Management and Strategy, Panasonic Avionics

As carriers look to find better ways to attract passengers beyond the price of a seat on a plane, in-flight connectivity and in-flight entertainment have come very much in to focus, particularly with constantly evolving Wi-Fi capabilities and speed of connection. We were fortunate to catch up with Andrew Masson, the VP for Product Management and Strategy, at Panasonic Avionics. We were keen to get his take on current and future trends in in-flight entertainment as well as to learn more about the 'digital third channel and also Panasonic's much hailed and latest IFE solution, Astrova.

AviTrader MRO: What are some of the most exciting trends you're seeing in terms of in-flight entertainment and connectivity right now?

Andrew Masson: We're seeing a real convergence of trends right now. For the past 40 years, entertainment on flights has been all about watching movies in the sky. Passengers, eager to pass long hours on a flight, would hope to simply catch the latest blockbusters.

Now, passengers expect a seamless, personalized experience in the air, much like they do on the ground. This means high-speed connectivity, access to their own content, and entertainment that caters to individual tastes. There's also a growing focus on utilising technology to enhance overall comfort and well-being during flights.

We recognise this shift. At Panasonic Avionics, we're not just evolving existing technology and systems; we're reimagining it entirely, moving beyond traditional in-flight entertainment to deliver a truly engaging and immersive experience that extends far beyond movies, TV shows, and basic games.

Andrew Masson, VP Product Management and Strategy, Panasonic Avionics

We're hearing a lot about personalisation these days. How are you using this to shape the future of in-flight entertainment?

Personalisation is revolutionising in-flight entertainment to create a seamless transition from ground to sky. We envision a world where a passenger's seatback device becomes an extension of their relationship with the airline. Personal preferences, from dietary habits to travel choices, follow them from one flight to the next, creating a unique experience for everyone.

Panasonic Avionics empowers airlines to build stronger relationships with their passengers by creating personalised experiences and providing data-driven insights. For instance, we offer solutions like the Arc™ 3D map for real-time flight updates and Marketplace for pre-planned food and beverage service and duty-free shopping. Modular Interactive allows airlines to personalise the seatback experience with loyalty programmes and promotions, while our App Manager enables them to deploy their own or third-

party apps directly to the seatback.

Take for example our latest IFE solution, Astrova, which goes beyond traditional in-flight entertainment, fostering deeper passenger engagement through personalisation when paired with our Digital Solution portfolio.

Current expectations for in-flight entertainment and connectivity extend far beyond the traditional scope of movies and music. It's why our digital solutions are meticulously crafted to meet these expectations and transform passive flight time into an interactive and enjoyable part of the journey.

Solutions like our ArcTM 3D Moving Map and Modular Interactive ensure that every journey is not just a flight, but a dynamic and immersive passenger experience that deepens engagement and reinforces airline brand loyalty.

This personalised approach not only keeps passengers entertained but fosters a sense of comfort and familiarity, making the entire travel experience more enjoyable.

What does Panasonic Avionics mean by a digital third channel?

Our goal is to deliver engaging experiences that connect airlines with their passengers, revolutionizing the in-flight experience and redefining the value of in-flight entertainment and connectivity (IFEC) systems for a new era of air travel.

Together, with our airline partners, we are reimagining the world of connected air travel and creating unforgettable moments between passengers and airlines during every step of their journey.

Our vision is to seamlessly integrate our solutions into an airline's ecosystem with the connected seatback as a third digital channel. Working side by side with the other two airline digital channels (web and mobile), we're helping provide a seamless digital passenger experience across the journey – from pre-flight, to flight, to landing and beyond.

Airlines will be able to use Panasonic Avionics' enterprise-grade self-service tools to publish to seatback the same way they do with their web and mobile channels. This lets IFEC operate at the same pace of web and mobile to deliver high value business outcomes for airlines including

Astrova Curve © *Panasonic*

loyalty, ancillary revenue and operational efficiencies.

As a result, seatback IFE now has the potential to increase digital engagement significantly. On a travel journey, passengers may use the web for ten minutes to book a flight. The day before the flight, they use the airline app for an average of three minutes to check in and select a seat. At the airport, they use the app to check gates and flight status. Upon boarding, the passenger sits behind a seatback screen for 90 to 600 minutes, depending on the length of their flight. This length of time represents ten-times the digital passenger engagement opportunity, and why so many airlines are investing in fleet wide IFEC solutions.

To unlock the true potential of this digital engagement opportunity, Panasonic Avionics is creating this digital third channel using its four principle building blocks: in-flight systems, in-flight connectivity, digital solutions, and technical services. We're unique in that we are the only global IFEC provider that has the knowledge, spirit of innovation, and expertise to do this today. We're really excited about the potential of this solution for our airline partners.

How is technology, exemplified by systems like Panasonic Avionics' Astrova, transforming the in-flight entertainment landscape?

Our award-winning seat-end solution, Astrova, is a step change in in-flight entertainment systems, dramatically enhancing the passenger experience, creating a more immersive, personalised and connected journey.

Astrova's 4K OLED HDR10+ display offers exceptional picture quality, contrast, and color accuracy, creating a cinema-grade viewing experience. This, combined with high-fidelity audio options via wired or Bluetooth® connections, makes in-flight entertainment more engaging and enjoyable.

It has a sleek screen too, featuring an ultra-thin 7mm modular design that eliminates bulky under-seat boxes, maximising passenger legroom. This design-conscious approach contributes to a more comfortable and less cramped environment.

With Astrova, we're facilitating seamless integration with personal devices, allowing passengers to create a multi-screen environment similar to what they have at home. Its industry first USB-C fast-charging capability of up to 100W ensures that passengers can keep their devices powered throughout the flight, reducing anxiety about battery life. Programmable LED lighting also enhances passenger comfort and enables airlines to optimise the cabin environment for a transformative travel experience.

Its modular design enables it to adapt to the fast-changing market, allowing airlines to easily upgrade hardware and software to meet evolving passenger expectations. The system demonstrates Panasonic Avionics' approach to the market and its mindset in developing products and services that help

Astrova © *Panasonic*

airlines drive higher net promoter scores, enhance passenger engagement, increase revenue, and deliver operational efficiencies through IFE and connectivity.

Astrova represents a significant step forward in in-flight entertainment, focusing on providing a high-quality, personalised, and connected experience that meets the evolving needs of today's travellers.

And we're not done. We're already introducing larger-sized, curved OLED displays, called Astrova Curve, that are perfectly suited to premium seats in first and business class.

Our vision is that Astrova Curve becomes the centrepiece of in-flight experience. The monitors will draw passengers into an ultra-high-definition, CinemaScope widescreen film format viewing experience that's more immersive than other large screens.

Because at the end of the day, we want business class passengers to experience unprecedented immersion, customisation, and feature-rich personalised viewing experiences. And we also want to give them some space to be creative during those times when they aren't using the full width of the screen for ultra-widescreen. Our Digital Solutions help make Astrova Curve a multitaskers dream, keeping entertainment front and centre while also monitoring aspects of the flight and controlling the seat.

Staying connected is crucial for many travellers, especially while flying. How will advancements in satellite networks transform real-time connectivity for passengers on international flights, and what kind of impact will this have?

Passengers want to be both productive and entertained while they fly, and Panasonic Avionics offers a global high speed in-flight connectivity that is currently the choice of more than 70 of the world's leading airlines. This provides their passengers with high-speed in-flight connectivity that delivers the same streaming, email, web, social media, and productivity experience that passengers use to on the ground.

Our expanding multi-orbit connectivity network offers a compelling blend of LEO and GEO satellites and 5G networks. This delivers seamless connectivity from boarding to disembarkation, using electronically steered antennas will unlock new, low-latency passenger experiences from LEO satellites such as video conferencing in the cabin.

We've seen Panasonic Avionics expand its technical services from IFEC maintenance and preventive maintenance into aircraft ground handling. What market needs or opportunities is the company addressing with this expansion?

Panasonic Technical Services' (PTS) expansion into aircraft ground handling addresses the growing demand for aircraft handling services driven by increased air traffic, airlines' desire for streamlined operations and vendor consolidation.

This strategic expansion of services allows Panasonic Avionics to offer a more comprehensive portfolio to airlines. With eight repair locations and 46 line maintenance stations globally, PTS operates the most extensive maintenance, repair, and overhaul (MRO) network in the world. This network allows PTS to continue to meet customer needs for integrated support, addressing the industry's skills shortage, and diversifying its revenue streams for continued growth and stability within the broader aviation sector.

What's the ultimate vision for the future of connected flight, and what role does Panasonic Avionics see itself playing in realising that vision?

Our vision for the future of connected flight centres on creating a seamless passenger experience, transforming air travel from a period of disconnected time into an extension of everyday life. Uninterrupted connectivity is paramount, enabling passengers to work remotely, stream high-definition content, and stay connected with friends and family as effortlessly as they would at home or in the office. This requires not just access, but robust bandwidth and reliable global coverage, facilitated by advancements in satellite technology and network infrastructure.

Personalization is now taking the main stage, with passengers now able to curate their entertainment, access preferred movies, music, games, and even live events through intuitive, user-friendly interfaces. Beyond entertainment, personalisation extends to in-flight services, allowing passengers to customise their meals, shopping, and other amenities based on their preferences.

As our digital third channel takes to the skies, airlines will be able to leverage the connected environment to engage passengers with targeted offers, relevant information, and personalised services, creating new revenue streams and fostering stronger customer relationships.

Panasonic Avionics recognises that this future requires a collaborative ecosystem. Our role is to provide innovative technology, integrated solutions, and the strategic vision to make connected and engaging journeys not just a possibility, but a reality for every passenger.


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The Aircraft Lessor's Role in the Use of PMA Parts for Aircraft Maintenance

By David Dundas

Leasing an aircraft, for many, allows for greater financial flexibility and essentially enables the focus of operations to be primarily on operations as opposed to asset ownership. However, with the aircraft lease comes the responsibility to maintain that aircraft in operational condition, and as a result, considerable attention has to be paid to the costs involved and ways and means of keeping those costs to a minimum, yet without compromising on safety.

For many lessees, the responsibility of carrying out maintenance is delegated to an MRO organisation, but this does not mean the lessee is devoid of having to make any strategic decisions with regard to MRO practices and operations. One particular area of MRO activities is the option to use Original Equipment Manufacturer (OEM) parts, or Parts Manufacturer Approval (PMA) parts, the latter being parts which are Federal Aviation Administration (FAA) approved but not manufactured by the same manufacturer as the original part and can be a cost-effective alternative.

Because aircraft lessors have a significant influence on maintenance strategies, they can frequently dictate component choices based on residual value considerations and contractual stipulations. As a consequence, through this article we wanted to further explore the implications of PMA parts in aircraft maintenance and the role of aircraft lessors in determining their usage.

PMA parts – an overview

PMA parts are components produced by manufacturers other than the OEM, but which are still subject to the rigorous certification procedures as set out by the FAA or other relevant aviation authorities. These parts undergo thorough testing and quality assurance processes to ensure they meet or exceed OEM specifications, and this is not simply an 'offshoot' of the aviation industry. Currently there are over 300,000 PMA parts approved by the FAA and approximately 35,000 new PMA parts are added to that list, annually.

There are many benefits to PMA parts which include cost savings, improved competition in the supply chain as well as helping to solve many supply chain problems. It is also important to note that PMA parts should not be seen as 'inferior alternatives' to OEM parts as, on many occasions, PMA parts offer enhanced performance over OEM equivalents, primarily because some manufacturers specialise in producing PMA components that improve upon OEM designs, offering longer life cycles and increased efficiency. However, their adoption is not universal due to regulatory compliance concerns, together with levels of resistance from OEMs and lessors. That said, PMA parts are available for a wide range of aircraft components, including airframe structures, avionics, and engine parts, though airlines and MRO providers have to carefully evaluate the compatibility of PMA parts with existing systems to ensure continued airworthiness, safety and operational reliability.


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Regulatory bodies and parts' certification

It can come as no surprise to learn that no PMA part can be used on an aircraft unless it has full certification by an aviation authority, such as the US FAA or the European Union Aviation Safety Agency (EASA). While such authorities are responsible for ensuring that PMA parts meet stringent airworthiness requirements before they can be used on an aircraft, carriers must also ensure that any PMA part is in full compliance with airworthiness directives (ADs) and maintenance programmes that specify what are allowable component replacements. As the FAA website states: "No person may produce a modification or replacement article for sale for installation on a type-certificated product (an aircraft, engine, or propeller) unless this article is produced in accordance with a PMA issued by the FAA under 14 CFR part 21, Subpart K (sections 21.301 through 21.320)."

It should also be noted that PMA certification applies to those parts which will be used on an aircraft that have been manufactured by someone other than the OEM. However, that does not mean the part itself does not need to be certified by the FAA or similar body. To explain: the FAA grants PMA certification through one of three methods: test and computation, licensing agreements with OEMs, or identicality with an existing type-certified part. The test and computation method is the most rigorous, requiring independent verification of a part's performance and reliability. EASA, on the other hand, has a different regulatory pathway, often necessitating additional approvals for parts to be used in European-registered aircraft.

Challenges faced when using PMA parts

Despite their obvious advantages, PMA parts still face several challenges, primarily due to OEM resistance, contractual restrictions, and concerns from aircraft lessors. As a result, numerous OEMs discourage the use of PMA parts through warranty limitations and proprietary repair schemes. Additionally, some aircraft leasing agreements include clauses that restrict the use of non-OEM parts, primarily to maintain asset value and marketability of the aircraft upon lease return. Carriers also have to take into account the operational implications of using PMA parts as while cost savings are an obvious and attractive benefit, the potential for increased maintenance scrutiny, particularly during lease returns or aircraft transitions, must be weighed against any short-term financial gains. Additionally, some insurance providers are known to impose specific conditions on aircraft using PMA components, which has to impact overall risk management strategies.

As an example, when it comes to aircraft interiors, and especially seats, there are multiple opportunities to use PMA parts. However, where seats are concerned, more and more lessors are reverting back to OEMs to provide solutions. This can rage from simple single-seat repairs to whole shipset refurbishments. As Thomas Bulirsch, CEO of Aviationscouts comments, "Another trend airlines follow is the smart repair of cosmetic parts, either per the component maintenance manual or repair procedure of the Part 145 repair station. In many cases this can be accomplished on-board. It is cost-saving and sustainable. But we can see a trend from the market to avoid parts manufacturer approval (PMA) parts and use repaired components or original spares instead. Most lessors have a policy not to accept PMAs for the lease return. Also, the HIC [head-injury criterion element of seat safety certification] requirements and other regulations make it more difficult to replace parts. Therefore, a lot of markets are going away from so-called zero-hour overhauls that were popular in the FAA environment where all cosmetic components and spare parts were replaced with PMAs."

The role of the aircraft lessor and PMA parts

Aircraft lessors have always played a key role in determining the maintenance practices of leased aircraft. Their primary concerns include maintaining asset value, ensuring airworthiness compliance, and preserving the ability to remarket the


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aircraft. As such, key areas where lessors influence the use of PMA parts include:

• Lease Agreement Restrictions: Many leases explicitly prohibit or limit the use of PMA parts to ensure that the aircraft remains in a standard OEM configuration. This restriction protects the aircraft's residual value and adds to its appeal to any subsequent lessee(s).

• Redelivery Conditions: At the end of a lease term, lessors often require the aircraft to be returned in a condition which is consistent with OEM maintenance guidelines. This creates a situation where carriers can be forced to replace PMA parts with OEM components before redelivery, thus increasing overall maintenance costs for the operator.

• Negotiations with Airlines: Using PMA parts is not always a disadvantage, especially if the lessor has a strong track record for aircraft maintenance and successful remarketing of aircraft they have leased. Fortunately, many lessors are open to negotiating PMA part usage under specific conditions, such as guaranteeing performance and ensuring proper documentation of maintenance history.

Strategies for airlines and lessors

As with many maintenance challenges, there is a 'quid pro quo' solution which involves PMA parts. In other words, to balance cost efficiency and compliance, airlines and lessors have the option of whether or not to adopt any of the following strategies:

• Negotiating Lease Terms: Airlines can negotiate lease agreements that allow for PMA part usage where possible, especially for what are classed as non-critical components.

• Hybrid Maintenance Approaches: Using PMA parts in non-restricted areas while maintaining OEM components in key systems can offer cost savings while complying with lessor requirements.

• Industry Collaboration: Airlines, PMA manufacturers, and lessors can work together to establish quality benchmarks and acceptance criteria for PMA parts to encourage broader adoption.

• Independent Technical Evaluations: Airlines can conduct independent reliability studies on PMA parts to present evidence of their performance and safety to lessors, potentially opening the door for wider acceptance.

Future trends and considerations

The acceptance of PMA parts in the aviation industry continues to evolve as new manufacturing technologies and testing methodologies improve their reliability. This is especially so where advances in additive manufacturing (3-D printing) and digital twin technology are enabling more precise engineering of PMA parts, potentially narrowing the gap between OEM and non-OEM components. In addition, industry-wide cost pressures may lead to a gradual shift in lessor attitudes toward PMA parts, particularly if major airlines successfully integrate them into their fleets without compromising safety or efficiency. The rise of next-generation aircraft and increased reliance on predictive maintenance solutions could further shape the adoption of PMA parts in the coming years.

Conclusion

PMA parts provide airlines with a viable cost-saving alternative to OEM components, but their use is often limited by aircraft lessor restrictions where lessors prioritise asset value preservation, often mandating the sole use of OEM parts in lease agreements. To navigate this landscape, airlines must carefully negotiate lease terms and explore hybrid maintenance solutions to the point where, ideally, evolving regulatory environment and industry dialogue may eventually lead to greater acceptance of PMA parts, benefiting both airlines and lessors.

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How Best to Manage Airworthiness Directives

By David Dundas

Within the industry, airworthiness directives (ADs) are a fundamental component of aviation safety, issued by regulatory authorities such as the US Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA). These directives mandate inspections, modifications, or repairs to address safety concerns identified in aircraft, engines, propellers, or other critical components. Effective management of ADs is essential for maintaining the safety, reliability, and legality of an aircraft's operation.

According to the US Federal Aviation Administration (FAA) "Airworthiness directives (ADs) are legally enforceable rules issued by the FAA in accordance with 14 CFR part 39 to correct an unsafe condition in a product."

Owing to the importance of ADs where aircraft safety is concerned, it is imperative that they be effectively manages as soon as they have been issued. So, what is the best way to go about this?

Establish a compliance tracking system

It is critical that no AD ever gets overlooked and, as a consequence, a robust tracking system is vital. This tracking system should make a record of all issued ADs, their compliance deadlines, which aircraft they are applicable to, and what actions, if relevant/necessary have been completed. With advances in todays technology, there are a number of AD-specific software solutions available that can automate tracking and therefore ensure that no directive slips though the net.

Regular Monitoring and review

Not only are ADs being constantly issued by the appropriate regulatory authorities, but they are often frequently updated as well. Consequently, there is an ongoing need for operators, MROs, and aircraft owners to remain fully informed through the regular reviewing of official publications from aviation authorities. In addition, subscribing to AD notification services also helps to make sure you are kept instantly and fully up to date with all new directives.

The role of AD risk assessment

When ADs are issued, they usually come with a timeline for the necessary actions advised in the directive to be completed. This can range from a few days to several months, depending on the severity of the issue at hand and because of this, each AD should be evaluated for its potential impact on aircraft operations. Operators must assess the urgency and complexity of compliance, prioritising critical safety directives while planning for those that allow flexibility.

The Emergency Airworthiness Directive

The exception to the above is the issuance of an Emergency Airworthiness Directive, which in simple terms usually requires the immediate grounding of any


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aircraft deemed at risk, usually as a result of an accident or incident involving a particular model of aircraft. An example of this would be the EAD issued by the FAA following the incident where a door plug blew out of an Alaska Airlines Boeing 737-9 MAX jet in mid flight. As stated on the FAA website for January 6, 2024, the day after the incident:

> "The FAA ordered the temporary grounding of certain Boeing 737-9 MAX aircraft operated by U.S. airlines or in U.S. territory.
> The FAA is requiring immediate inspections of certain Boeing 737-9 MAX planes before they can return to flight," FAA Administrator Mike Whitaker said. "Safety will continue to drive our decision-making as we assist the NTSB's investigation into Alaska Airlines Flight 1282."
> The Emergency Airworthiness Directive (EAD) requires operators to inspect affected aircraft before further flight. The required inspections will take around four to eight hours per aircraft.
> The EAD will affect approximately 171 airplanes worldwide."

Two days later the FAA posted the following update to the EAD:

> "The FAA has approved a method to comply with the FAA's Boeing 737-9 MAX emergency airworthiness directive, and it has been provided to the affected operators."
> So, as far as ADs or EADs are concerned, the issuance is not where the relevant authority starts and stops its involvement, but they will also provide information on how best to deal with the requirements of any such directive.

Coordinating with maintenance teams

For any AD to be effectively dealt with, there has to be good coordination and communication between those who are made aware of any AD and those who will be responsible for its implementation, which invariably involves maintenance teams. This is primarily because the AD will require some form of physical checking, modifications or repairs. Because EADs are rare and ADs usually allow for a reasonable time period to comply with the directive, often the work required can be incorporated within existing scheduled maintenance. Therefore, it is essential that there is effective communication between aircraft operators and maintenance personnel to ensure that compliance efforts are streamlined, therefore reducing aircraft downtime and operational disruptions.

The importance of accurate documentation and record keeping

So much of the work carried out on an aircraft is not just from a safety or airworthiness aspect, but also from the point of maximising its residual value. Having a thorough and accurate history of all maintenance works carried out on an aircraft, including any work carried out as the result of an AD, is critical to maximising its value over time. Consequently, operators must maintain detailed records of AD-related maintenance actions, including log entries, work orders, and compliance certificates, to demonstrate adherence to all regulations. It should not be forgotten that detailed records of actions relating to ADs are also required in order to clearly demonstrate total adherence to all regulations. In addition, it is always good practice to carry out both internal and external audits to ensure total compliance with ADs and that there are no gaps in the AD management process.

To conclude

The efficient and effective management of airworthiness directives is key to maintaining operational safety, legal compliance, and financial stability within a company. A proactive approach that incorporates tracking, monitoring, risk assessment, and structured compliance processes ensures that aircraft remain airworthy and operate in line with regulatory requirements. By investing in systematic AD management, operators in the aviation sphere can safeguard their assets, minimise risks, and contribute to a safer flying environment.


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How Many of You Recognise the Name of Hans Joachim Pabst von Ohain and Not Just Frank Whittle as the Inventor of the Jet Engine?

By David Dundas

There is little question that the introduction of the jet engine has been the greatest technological 'game changer' in the aerospace industry and the history of powered flight. However, like so many scientific breakthroughs, the 'better known' history of the jet engine doesn't tell the whole story where credit is appropriately shared out. It is perhaps no different to the situation where Alexander Fleming is primarily associated with the discovery of penicillin, his colleagues Howard Florey, Ernst Chain and especially Norman Heatley getting little credit. Nor is it very different to the invention of the light bulb, accredited to Thomas Edison, with little mention for William Sawyer, Albon Man or Joseph Swan.

Credit where credit is due

In the case of the jet engine, while Britain's Sir Frank Whittle's name is eponymous with its invention, in reality no less credit should be given to the German designer, Hans Joachim Pabst von Ohain who, totally independently of Whittle, registered a patent for the turbojet engine in 1936, six years after Whittle's first patent. It was, however, von Ohain who was responsible for the first successful 'jet flight' in1939. One thing is for certain though, their work laid the foundation for modern jet propulsion, revolutionised air travel and military aviation, and collectively shaped the aviation industry as we know it today.

The early years

Frank Whittle was born on June 1, 1907, in Coventry, England. From an early age he showed a strong aptitude for engineering and mechanics, and his keen interest in aviation led him to join the Royal Air Force (RAF) where he became an accomplished pilot as well as a groundbreaking engineer. It was in 1926 that he earned a place at RAF College Cranwell in Lincolnshire, where he developed his first ideas about jet propulsion, while it was his thesis on turbojet engines which proposed a radical departure from conventional piston engines, envisioning a future where aircraft could fly appreciably faster and at greater altitude.

Hans Joachim Pabst von Ohain was born on December 14, 1911, in Dessau, Germany. He studied physics and aerodynamics at the University of Göttingen, a leading institution in aeronautical research. Under the mentorship of prominent physicists, von Ohain explored gas turbine propulsion and became convinced that jet propulsion could surpass traditional piston-driven aircraft. While pursuing doctorate work at the University, he formulated his theory of jet propulsion in 1933 and nine days after receiving his doctorate in physics in 1935, he patented his jet engine concept. He subsequently became a junior assistant to Robert Wichard Pohl, director of the University's Physical Institute. His early work on jet engines was theoretical and was focused heavily on the ram jet engine. This was a type of jet engine that relied on the forward motion of an aircraft to compress incoming air for combustion, essentially acting like a "flying stovepipe" with minimal moving parts. The major problem was that it operated at its greatest

efficiency at very high supersonic speeds (around Mach 3 and above) where it uses the air pressure generated by the aircraft's speed to create thrust.

Unique and highly skilled thinkers and innovators independently developing the jet engine

In 1930, Frank Whittle patented his first design for a turbojet engine. Unlike conventional engines which relied on propellers, his concept used a gas turbine to compress air and generate thrust. Because his design was so radical, it was initially met with a certain level of reluctance and scepticism from British authorities, but undeterred, he persisted and founded Power Jets Ltd. in 1936 to develop his designs. His total commitment and belief in the engine culminated in the first successful test run of his jet engine in 1937. However, due to limited funding and bureaucratic delays, progress was slow, and it was not until 1941 that the Gloster E.28/39, the first British jet-powered aircraft, took flight using Whittle's engine. However, despite the delays, this achievement still marked a significant milestone in aviation history, proving the viability of jet propulsion.

Meanwhile, on the other side of the North Sea, von Ohain was independently developing a similar concept in Germany. In 1935, he patented his own design for a turbojet engine, which caught the attention of aircraft manufacturer Ernst Heinkel, to the point where Heinkel decided to hire von Ohain to develop his ideas further, which led to creation of the HeS 3B engine. Then, on August 27, 1939, two years before Whittle's first successful flight, the Heinkel He 178 became the first aircraft to fly using a jet engine, powered by von Ohain's design. It is also important to note that this successful flight took place just before the outbreak of World War II, a critical period for Germany's advancements in aviation technology. However, and perhaps of even greater importance, unlike Whittle, von Ohain had direct support from the German aviation industry, which enabled him to progress his design and research work at a far greater pace than Whittle.

It is also worth noting at this stage that despite the critical importance of air superiority during the Second World War there were three major factors that hindered the development of jet aircraft that were seen as being strategically

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superior to turboprop ones. First was the complexity of the aircraft and engines and therefore the amount of time and resources required to build each one. Second, back then, jet engines were very inefficient and required far greater fuel loads compared to turboprop counterparts at a time when both sides were struggling with fuel shortages. Finally, jet aircraft only came into their own as potential fighters at higher altitudes and their capabilities were restricted at altitudes where turboprop aircraft excelled. However, despite such obstacles, Germany did manage to deploy the Messerschmitt Me 262, the world's first operational jet fighter, during World War II.

Their post-war legacy

Frank Whittle retired from the RAF and moved to the United States, where he worked as a consultant in aerospace research. He was subsequently knighted in 1948 for his contributions to aviation. Hans von Ohain was recruited by the United States under Operation Paperclip and worked for the U.S. Air Force Research Laboratory where he played a key role in advancing jet and space propulsion technologies. Remarkably, despite their similar roles in the history of aviation, it was not until 1991 that the two engineers finally met.

As far as their legacy is concerned, while Whittle's engine used a centrifugal compressor, which was simpler and more robust, von Ohain's design incorporated an axial-flow compressor, which was more efficient and later became the standard for modern jet engines. Von Ohain's engine may have powered the first jet aircraft to fly, but it was Whittle's work that laid the groundwork for mass production and further technological advancements.

Their contribution to aircraft propulsion is virtually immeasurable as through their achievements, the introduction of jet propulsion transformed military aviation, leading to faster, more agile fighter jets and post-war developments led to the introduction of jet airliners like the Boeing 707 and the de Havilland Comet, making air travel faster and more accessible. Beyond that, advances in jet propulsion also influenced the development of rocket engines and space exploration technologies.

It is hard to imagine a world where turboprop aircraft still rule the skies. However, while we talk about all the changes that Whittle and von Ohain brought to the world of aviation, there is one expression that is commonly used today which owes its very meaning to the work of these two remarkable engineers. That expression is: "The world has shrunk". This, of course, is not meant literally, but more that fact that today, the commercial jet engine, when combined with the very latest design in aircraft, means that you can now fly from one side of the world to the other in less than 24 hours. Better still, and quite remarkably, the new Quantas Dreamliner with its GEnx 1B74/75/P2 engines can now fly, non-stop, from Perth, Australia to London Heathrow in just over 16 hours!

PEOPLE

on the move

Ian Walsh

FDH Aero (FDH), a global provider of supply chain solutions for the aerospace and defence industry, has announced the appointment of **Ian Walsh** as Chief Executive Officer, effective immediately. Walsh succeeds **Scott Tucker**, who will continue to support FDH as non-executive chairman, focusing on strategy and M&A initiatives. Walsh brings over 35 years of executive leadership across the U.S. Marine Corps, commercial and general aviation, defence, and industrial sectors. Most recently, he served as Chairman, President, and CEO of Kaman Aerospace Corporation, where he led the company's transformation into customer-centric operating segments. Previously, he was COO at REV Group, Inc. and held senior leadership roles at Textron, Inc., driving new product development and operational efficiencies. Earlier in his career, Walsh served as a U.S. Marine Corps officer and naval aviator with combat tours in Somalia, Haiti, and Bosnia. He is also a certified Six Sigma Black Belt in operations and continuous improvement. “FDH has a reputation as a forward-thinking partner, able to solve complex supply chain challenges for global OEMs and MRO providers,” said Walsh. “I am honoured to join the exceptional team at FDH that Scott built, and I look forward to advancing our mission as a value-added supply chain solutions partner to our customers and stakeholders.”

Brad Vieux, Nick Phair, Kristina Snow

C&L Aerospace, a C&L Aviation Group company, has announced the promotion of three employees as part of its ongoing expansion in parts growth. **Brad Vieux** has been appointed Vice President of Business Development, where he will continue to focus on developing new distributorships and repair vendors, alongside advancing C&L's recently launched Citation Parts Programme. **Martin Cooper**, Senior Vice-President Sales at C&L Aerospace, commented, "Brad has demonstrated innovative and strong leadership in product development and parts management for both C&L's business jet and regional airline sectors." **Nick Phair** has been promoted to Director of Sales, Corporate Aircraft Parts. In this new role, Phair will be responsible for supporting large fleet operators, OEMs, and European operators. Cooper praised Phair's contribution, stating, "Nick has been instrumental in leading the sales growth of our Bizjet Sales Groups and the expansion of additional Sales Teams." **Kristina Snow** has been promoted to Director of Business Development. Snow will now work with all C&L sales teams on new customer development and market penetration of product lines. Cooper noted, "Kristina has achieved significant growth in C&L’s customer base in both corporate and regional markets through her leadership in C&L's trading parts sales businesses."

Bethany Little

Veryon, a provider of information services and software solutions for the aviation industry, has announced the appointment of **Bethany Little** as its new Chief Executive Officer (CEO). Her arrival marks a bold step forward as Veryon continues to lead innovation in aviation maintenance technology. Little succeeds **Norman Happ**, who has been appointed to Veryon’s board of directors. "I'm excited to welcome Bethany to the team as she is the right person to lead Veryon's next stage of growth," said Happ. In his new role on the board, he will continue to support the company’s mission and strategic vision while also serving on the General Aviation Manufacturers Association (GAMA) board. Little brings over 20 years of leadership experience in the Software as a Service (SaaS) technology sector. Most recently, she served as CEO of PatientNow, a prominent provider of medical EMR and practice management solutions, where she optimised growth during a period of rapid market expansion in the health and wellness sector. Recognised for her expertise in customer success, product innovation, and team development, she is well-positioned to lead Veryon into its next phase of evolution, driving innovation in aviation maintenance solutions.

Brian Postel

Brian Postel has been appointed as CAVU Aerospace's new president. With over 40 years of experience in aerospace management, Postel brings extensive expertise and a strategic vision to drive the company's growth and commitment to excellence. Throughout his distinguished career, Postel has achieved significant milestones in the aerospace sector. His leadership experience and in-depth industry knowledge position him to navigate the complexities of the market effectively. As President, he will focus on strengthening CAVU Aerospace's presence in the end-of-service/USM market, expanding MRO, parking and storage programmes, and fostering lasting client and partner relationships. Postel holds a degree in Aviation Maintenance Technology from Embry-Riddle Aeronautical University and an FAA A&P licence, alongside completing various executive leadership programmes. His passion for aerospace and dedication to excellence align perfectly with CAVU Aerospace's mission to deliver outstanding service to clients and partners worldwide. Established in 2010, CAVU Aerospace Inc. is a front runner in aircraft disassembly and recycling services. The company is renowned for its innovative CAVUSmartTags™ and operates three fixed disassembly facilities in Stuttgart, Arkansas; Roswell, New Mexico; and Victorville, California. CAVU Aerospace provides tailored consignment solutions for various airframe and engine models, including wide- and narrow-body aircraft from Boeing, Airbus, Bombardier and Embraer.