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MRO 360°

Under Control
Trends in Avionic Repairs

Rejected Parts
Repair or Replace?

Flying High
Drones in Aircraft Maintenance

Data Analytics
Talking to Rob Suhs, ILS

© *Shutterstock*

Dear Industry Colleagues,

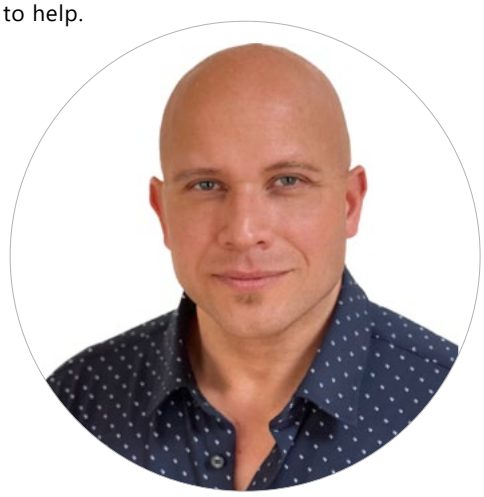
The year is slowly coming to an end. And the AviTrader team is already thinking about 2025. The last quarter of the year is always the time when everything happens at once. The Editorial Calendar has to be finalised, interesting discussion partners identified, and of course our advertisers' campaigns finalised. You can find our attractive advertising opportunities in our **2025 Media Kit**.

By the way, take a look at our **Editorial Calendar 2025**. I'm sure you'll find interesting topics there that you'd like to comment on. Or maybe you'd just like to present your company and its products and services. Just contact our friendly sales and customer support team. They'll be happy to help.

We are grateful to have found interesting discussion partners for this issue of MRO 360°. We talk about new trends in avionics repair and when to repair or replace engine parts. We also talk to Rob Suhs from ILS about data analytics.

Enjoy reading.

Peter Jorssen
Publisher



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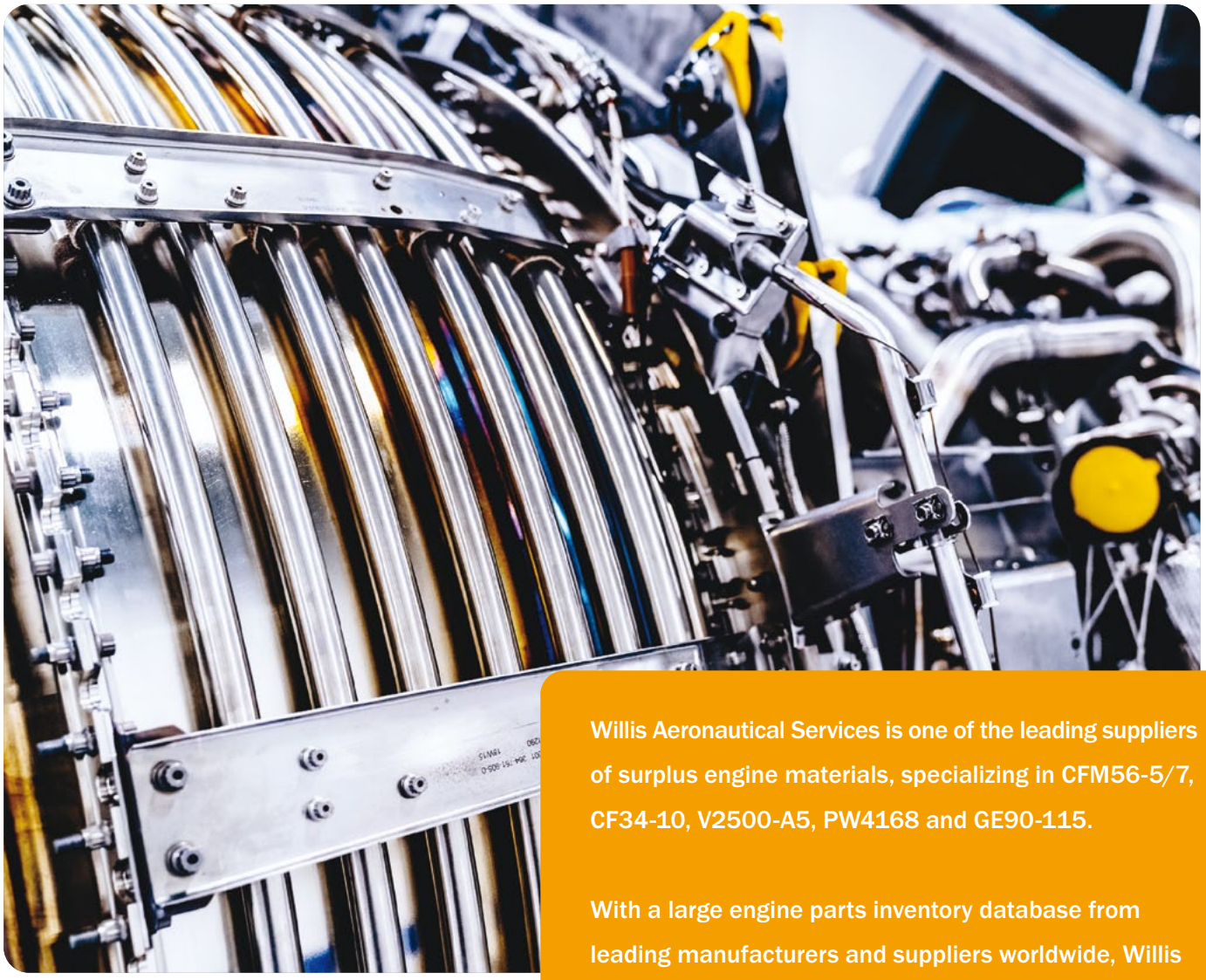

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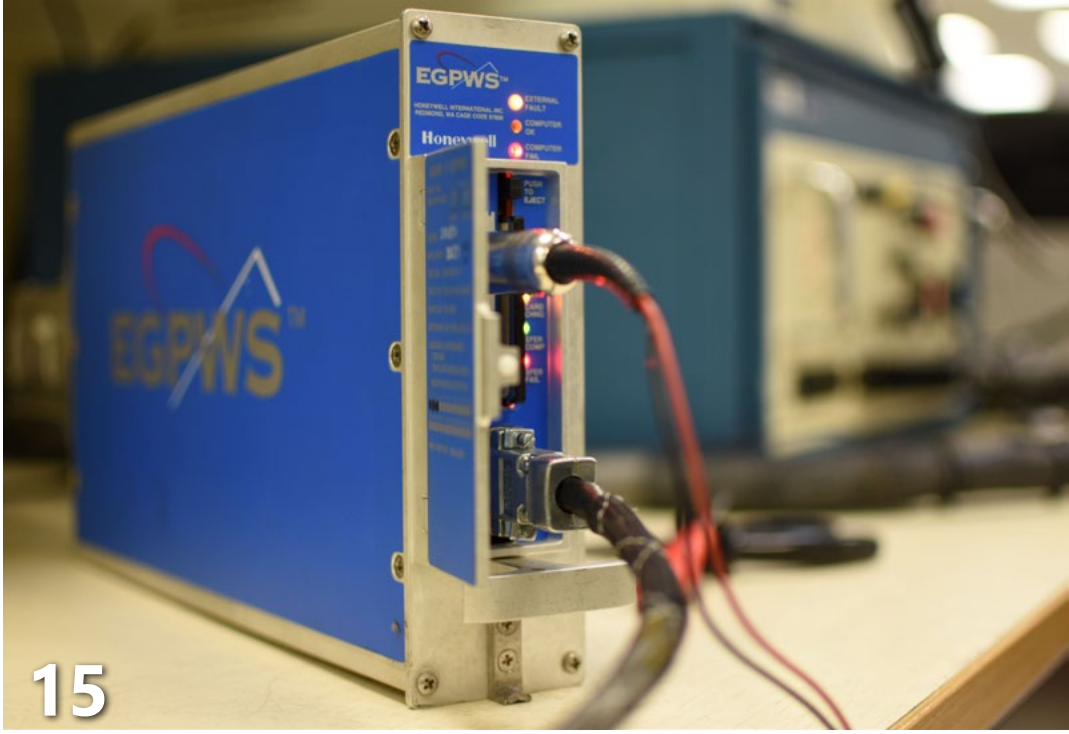

Understanding Avionics

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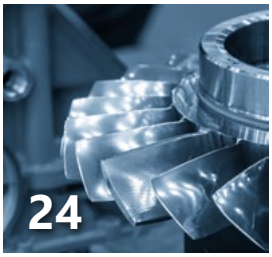


GKN Aerospace delivers key C-27J nacelles, revitalising supply chain

GKN Aerospace has delivered the first two C-27J nacelles to Leonardo Aircraft since 2018 *© GKN Aerospace*

GKN Aerospace has successfully delivered the first two C-27J nacelles to Leonardo Aircraft since 2018, marking a significant step forward in rebuilding its supply chain and production capabilities. The first nacelle was delivered in September, with the second following in October, aligning with Leonardo's schedule for test flights and certification by the year's end. This achievement underscores GKN Aerospace's commitment to the long-term in-service support of the C-27J platform. The project involved collaboration with over 40 suppliers, the re-establishment of advanced composite and assembly manufacturing processes and the assurance of business continuity for C-27J nacelles over the next five years. The programme included a close partnership with Leonardo Aircraft, highlighted by GKN Aerospace's participation in the inaugural joint supplier and end-user conference held in Turin. Shawn Black, President Defence Airframe, praised the milestone, saying, "This milestone illustrates GKN Defence's unwavering dedication to our customers and the expertise of our Cowes team. I am incredibly proud of what we've achieved in this journey, demonstrating our commitment to delivering excellence in defence aero structures." The nacelles incorporate composite components produced at GKN Aerospace's Cowes facility, combined with parts sourced from the EU, UK and US, including titanium machining and wiring systems. GKN Aerospace's Fokker division manufactures the harnesses critical to the nacelle's functionality, showcasing the company's comprehensive manufacturing capabilities.

Gulf Air and Joramco ink new MRO agreement

At the Bahrain Airshow 2024 - Gulf Air Group CEO Dr Jeffrey Goh (r) and Joramco CEO Fraser Currie (l) *© Joramco*

Gulf Air, Bahrain's national carrier, has signed a memorandum of understanding (MoU) with Jordan Aircraft Maintenance Limited (Joramco), the Amman-based maintenance, repair, and overhaul facility and a subsidiary of Dubai Aerospace Enterprise (DAE). This agreement aims to expand joint MRO services, building on a longstanding partnership that has seen over 250 heavy maintenance checks completed since 2009. The MoU was signed at the Bahrain Airshow 2024 by Gulf Air Group CEO Dr Jeffrey Goh and Joramco CEO Fraser Currie. It marks a significant step towards developing Gulf Air's MRO capabilities in Bahrain, including potential new hangar facilities. This collaboration seeks to leverage Joramco's extensive expertise, and the operational synergies cultivated over 15 years. Fraser Currie, CEO of Joramco, commented, "We are delighted to enter into this new MOU with our esteemed partner Gulf Air as they explore new and exciting strategic opportunities for MRO services. Joramco and Gulf Air have enjoyed a trusted partnership since 2009, and we now seek to grow that trust for the mutual benefit of both partners." This agreement reflects Gulf Air's commitment to strengthening its operational capabilities and supporting the development of Bahrain's aviation sector.

Champion Aerospace and Satair sign MoU to extend distribution agreement

Champion Aerospace and Satair are strengthening their 40-year partnership © *Champion Aerospace*

Champion Aerospace and Satair have signed a memorandum of understanding (MoU) to extend their long-standing distribution agreement, marking another milestone in their 40-year collaboration. The MoU sets the stage for a renewed partnership, focusing on the global distribution of Champion's turbine engine ignition products. Once finalised, the agreement will grant Satair exclusive rights to distribute Champion Aerospace's igniters, exciters, and ignition leads for the commercial aftermarket. This expanded partnership is expected to enhance Satair's product portfolio while ensuring continued delivery of high-quality solutions and technical support to aviation operators worldwide. Commenting on the MoU, Thomas Lagaillarde, Vice President of Product Management & Business Development at Satair, expressed enthusiasm for the ongoing collaboration. "This MoU reaffirms our mutual trust in the strong relationship between Satair and Champion Aerospace. It also demonstrates the value Satair is creating for OEMs, and we are excited to explore the next phase of this collaboration. We look forward to continuing to provide top-tier solutions for the aerospace industry." Andrew Wall, President of Champion Aerospace, pointed out the importance of the partnership in driving innovation. "Our longstanding relationship with Satair has been crucial in bringing innovative ignition solutions to market. This MoU signals our joint commitment to advancing aerospace ignition systems and aftermarket service with a focus on easy access for our global customer base." The agreement, expected to be finalised soon, is anticipated to further solidify the collaboration between Champion Aerospace and Satair, enabling them to build on their decades of success in the aerospace sector. Together, they aim to set new benchmarks for quality, innovation, and accessibility in turbine engine ignition systems, reinforcing their positions as leaders in the industry.

LATAM Airlines Brazil invests US$7 million in maintenance hub

LATAM Airlines Brazil has announced a substantial investment of US$7 million in the expansion of its maintenance base at LATAM MRO in São Carlos, São Paulo, marking the airline's largest commitment to its facilities in the past decade. This funding will support the construction of a new, specialised hangar dedicated to Boeing 787 Dreamliner aircraft, set to begin operations in September 2025. Construction will start on November 15, at the LATAM MRO centre, which is already the largest aeronautical maintenance facility in South America. The new structure will enable LATAM to bring more maintenance services in-house, reducing reliance on external suppliers, lowering operational costs, and enhancing the availability of aircraft for flights. Currently, major maintenance on LATAM's Boeing 787s is performed in Chile and through a network of international suppliers. However, this new facility will centralise these operations within Brazil, reinforcing LATAM's commitment to operational efficiency. Enrique Parada, Director of Engineering and Maintenance at LATAM, highlighted that this investment complements LATAM's existing maintenance offerings, further expanding their capacity. In addition to serving the Boeing 787 fleet, the new hangar in São Carlos will support painting and preventive maintenance for up to three Airbus A320-family aircraft simultaneously. A specialised

© LATAM

structure will be implemented to ensure painting activities remain isolated, thus preventing contamination and guaranteeing the highest quality standards. Advanced technology will be a core feature of the new hangar, with inspection drones and autonomous logistics carts integrated into daily operations, as already in use at LATAM's São Paulo facility. This expansion is expected to generate 300 new jobs within São Carlos, covering a wide range of roles, from warehouse workers and aircraft mechanics to planners and engineers, further boosting employment in the region. LATAM MRO employs 2,000 staff and is responsible for over 60% of scheduled maintenance across the LATAM Group's fleet, positioning São Carlos as a significant aviation hub. The LATAM MRO centre in São Carlos spans 95,000 m^2, with 22 workshops equipped with cutting-edge technology and certified by international authorities such as EASA, FAA, and DGAC Chile. Since 2019, LATAM has pioneered the use of drones for aircraft inspection, a first in Latin America, which has increased inspection efficiency twelvefold. This advanced method gathers up to 2,000 high-resolution images of the aircraft fuselage, using artificial intelligence to detect potential damage, while keeping records updated in real-time via cloud storage. With the internationalisation of São Carlos Airport, LATAM MRO has expanded its facilities and equipment, creating around 450 additional jobs and reinforcing São Carlos as a key player in LATAM's global operations.

Finnair selects RECARO seats for Embraer cabin retrofit

RECARO Aircraft Seating (RECARO) has been chosen by Finnair to retrofit 12 Embraer E190 aircraft with its R1 and R2 Economy Class seats. This marks the second Embraer programme to feature the lightweight R1 and R2 models, which align with Finnair's sustainability goals. The cabin will adopt a hybrid configuration, with the R2 seats in the first nine rows, typically used for business class, and R1 seats in the rest of the cabin. Both seat models are crafted from premium materials, reflecting Finnair's Nordic-inspired design, creating a fresh and cohesive passenger experience. Finnair, established in 1923, is based in Vantaa, Finland, and connects travellers across Europe, Asia, the US, and the Middle East through its Helsinki hub. As a member of the OneWorld Alliance, it has been recognised as the best airline in Northern Europe by Skytrax for 14 consecutive years.

AAR and Whippany Partner to enhance global actuation distribution

AAR CORP. has signed an exclusive multi-year distribution agreement with Whippany Actuation Systems, a TransDigm Group business, to globally distribute Whippany's actuation components and sub-assemblies. This partnership expands AAR's product offerings on platforms such as the Boeing 737 and 777 while improving lead times, stocking capabilities, and customer service for Whippany users. Whippany President Cedrick Fontes highlighted the collaboration's goal to optimise the supply chain and deliver high-quality products efficiently. AAR's Senior Vice President, Frank Landrio, emphasised the agreement's role in scaling Whippany's reach and enhancing AAR's value to the aviation industry.

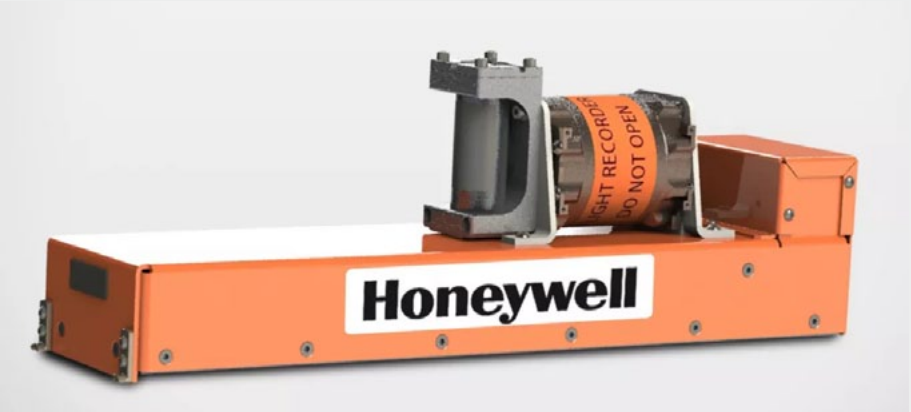
Chromalloy enters new engine parts supply agreement with AAR

Chromalloy and AAR have signed a global distribution agreement © *Chromalloy*

Chromalloy has announced the signing of a distribution and license agreement with AAR, under which AAR will exclusively distribute Chromalloy's PMA (parts manufacturer approval) parts for the CF6-80C2 engine high-pressure turbine (HPT) Stage 1 and Stage 2 blades across the global aftermarket. However, some account coverage exclusions apply due to Chromalloy's existing customer agreements. "This agreement builds on the long relationship between AAR and Chromalloy for connecting innovative solutions to our global aftermarket customers. The combination of Chromalloy's engineering and manufacturing capability with AAR's global aero-engine channel access ensures that our PMA solutions are accessible by operators and repair stations in every region," stated Chromalloy's Chief Executive Officer, Chris Celtruda. Sal Marino, AAR's Senior Vice President of Parts Supply, commented, "AAR is pleased to partner with Chromalloy and to expand our aftermarket solution offerings to include Chromalloy's CF6-80C2 parts. AAR provides a complete range of solutions for engine repair facilities, ensuring access to the best value combination for our customers." The agreement spans an initial term of three years, with AAR having made an initial provisioning order to ensure inventory readiness for the immediate global distribution of Chromalloy's CF6-80C2 HPT Stage 1 and Stage 2 turbine blades. Chromalloy remains dedicated to the ongoing design and development of PMA and designated engineering representative (DER) solutions, offering FAA-approved aftermarket alternatives that ensure best-value options for turbine engine service and restoration.

Honeywell and Curtiss-Wright develop 25-hour CVR

Honeywell and Curtiss-Wright have jointly developed the Honeywell Connected Recorder-25 (HCR-25), a combined cockpit voice recorder (CVR) and flight data recorder (FDR) now available for applicable Boeing and Airbus commercial and cargo aircraft. The HCR-25 was type-certified for use on Boeing 737, 767 and 777 aircraft last year and is set to be type-certified for Airbus A320-series platforms in the first half of 2025. This innovative technology aligns with Honeywell's commitment to automation and the future of aviation, supporting key megatrends within the industry. "The Honeywell HCR-25 addresses the FAA's mandate for cockpit voice and data recorders, helping to enhance flight safety," said Steve Hadden, Vice President of Services and Connectivity, Honeywell Aerospace Technologies. "Our collaboration with Curtiss-Wright combines our strengths to provide superior audio clarity and data streaming, enabling next-generation access to aircraft performance data." The HCR-25 meets the requirements of the 2024 FAA Reauthorization Act, which mandates that commercial passenger aircraft be equipped with a CVR capable of recording the last 25 hours of flight data. All newly manufactured aircraft must meet this 25-hour requirement, while existing aircraft must be compliant within six years. “We are proud to work closely with Honeywell to introduce the 25-hour cockpit voice recorder capability to both new OEM installations and retrofit applications," said Brian Perry, Senior Vice President and General Manager, Curtiss-Wright Defense Solutions Division. "Together, we are leveraging our expertise in flight recorders to deliver advanced technologies that provide airlines with direct access to their own data.” The 25-hour CVR significantly improves the ability to identify the root cause of incidents and accidents, enhancing passenger safety and improving training, policies and procedures. This joint development follows a letter from the U.S. National Transportation Safety Board (NTSB), which called for the installation of 25-hour CVRs in new aircraft and retrofitting existing planes. The NTSB highlighted 14 investigations since 2018 that were hampered by insufficient CVR data due to limited recording capacity. The HCR-25, based on Curtiss-Wright’s lightweight Fortress® CVR technology, complies with the latest FAA regulations and international standards in Europe, Canada, Mexico and Singapore. It features four channels of wideband audio recording, providing superior clarity compared to current-generation recorders. The HCR-25 FDR surpasses the requirements of each of the International Civil Aviation Organization (ICAO)-defined flight recorder types. The HCR-25 FDR, when coupled with Honeywell’s Aspire SATCOM system, adds real-time data streaming to support the ICAO Global Aeronautical Distress and Safety (GADSS) initiative and timely recovery of data requirements. It can record and store more than 3,500 hours of data in crash-protected memory before needing to overwrite the oldest data collected. The HCR-25 also provides a 25-hour CPDLC datalink recorder (DLR) function.



The Honeywell Connected Recorder-25 (HCR-25), a combined CVR and FDR © *Honeywell*

EASTEC, Thales renew avionics maintenance services agreement

EASTEC and Thales have renewed their partnership agreement in a signing ceremony at the 15th Airshow in Zhuhai, China. Under this contract extension, Thales will continue providing maintenance and repair services for its avionics equipment installed on China Eastern Airlines' A320, A330 and B737 fleets until 2029. This renewal builds upon a successful collaboration that began in 2018, marking a significant milestone in the decade-long relationship between the two companies. It further demonstrates the trust in Thales’ premium service quality and its commitment to supporting the expanding aviation market in China. Maintenance services will be delivered by both Thales Aerospace Beijing Co., Ltd., Thales’ local maintenance centre in China, and Thales Aviation Global Services (AGS) centre in Singapore, providing comprehensive support for China Eastern’s fleet. Since its first selection of Thales avionics equipment in 2014, China Eastern has equipped 270 A320 aircraft with Thale’s flight management systems (FMS), low-range radio altimeters (LRRA), and T3CAS integrated surveillance solutions. In 2018, China Eastern and Thales solidified their partnership with a strategic maintenance cooperation agreement. Thales remains at the forefront of innovation, ready to meet the aviation industry’s evolving demands. Thomas Got, Vice President of Aviation Global Services, Thales Avionics, stated, “We are proud to strengthen our collaboration with EASTEC, reinforcing our position as a trusted partner in the region. At Thales, we leverage our global expertise to deliver high-quality premium solutions to EASTEC and our local customers and partners.”

EFW and HNA Aviation Group to collaborate on A330 P2F conversion

Signing of the MoU at the China International Aviation and Aerospace Expo in Zhuhai, between EFW and HNA Aviation Group © *EFW*

Elbe Flugzeugwerke GmbH (EFW), renowned for its expertise in Airbus passenger-to-freighter (P2F) conversions, and HNA Aviation Group, a major Chinese aviation player owned by Fangda Group, have signed a strategic memorandum of understanding (MoU) to collaborate on converting Airbus A330 aircraft from passenger-to-freighter models. This agreement, signed at the China International Aviation and Aerospace Expo in Zhuhai, China, will help both companies address the rising demand for air cargo capacity, spurred by the growth of cross-border e-commerce and the global logistics market's recovery. Under the MOU, EFW will assist Grand China Aircraft Maintenance Services (GCAM), a subsidiary of HNA Aviation Group, in establishing A330P2F conversion capabilities at its facility at Meilan International Airport in Haikou, China. This partnership aims to build local capacity for converting A330 aircraft, creating an efficient and expanded freighter network within China's borders. EFW, a joint venture between ST Engineering and Airbus, currently has three P2F conversion sites in China and will use this collaboration to further expand its footprint within the Chinese market. The initial stage of this collaboration will see EFW converting the first A330 from HNA's fleet at its Shanghai facility in the first half of 2025, with the option for a second conversion later in the year. Following this, the remainder of HNA's A330 fleet slated for conversion will be modified at GCAM's newly set-up facility in Haikou. Jordi Boto, CEO of EFW comments: "We are happy to enter into an agreement on A330P2F conversion with HNA Aviation Group, one of the largest aviation groups in China. We look forward to working with our latest strategic partner to tap the growing Chinese market and beyond, and to better support the growing global demand for air cargo with our wide-body P2F solution." Ding Yongzheng, Chairman of HNA Aviation Group, highlighted the increasing demand for long-range, wide-body freighters due to e-commerce expansion and the revival of global logistics. He praised the partnership as a mutual opportunity, noting that HNA has extensive experience operating A330 aircraft, and the new venture with EFW will add strategic value and growth opportunities for both parties in the aviation market. This agreement positions both EFW and HNA Aviation Group to meet the surging need for freight capacity in Asia and beyond, establishing them as key players in the rapidly expanding market for passenger-to-freighter conversions.

ADE secures Vietnamese certification, expands MRO reach

Asia Digital Engineering (ADE), the MRO subsidiary of Capital A, has announced its latest achievement: receiving Approved Maintenance Organisation (AMO) certification from the Civil Aviation Authority of Vietnam. This milestone expands ADE's operational capabilities across ASEAN, enabling it to deliver its high-quality MRO solutions to even more airlines within the region. With Vietnam now on board, ADE has AMO certifications in nine countries, including Malaysia, Indonesia, Cambodia, the Philippines, Singapore, Nepal, Thailand and Myanmar. This comprehensive certification portfolio reinforces ADE's status as a reliable and leading MRO provider within the region. Furthermore, ADE's compliance with the European Union Aviation Safety Agency (EASA) Part 145 maintenance organisation standards, achieved last year, highlights its commitment to safety and operational excellence in aviation maintenance. Mahesh Kumar, Chief Executive Officer of ADE, stated: "We are thrilled to add Vietnam to our extensive list of maintenance certifications. This approval marks a crucial step in our journey to becoming the go-to MRO partner for airlines. With the recent launch of our state-of-the-art, 14-line hangar at KLIA and our innovative digital solutions like ELEVADE™ and AEROTRADE®, ADE is redefining MRO standards in the region. From maximising aircraft reliability to reducing turnaround times, our aim is to support airline partners in meeting their operational goals and enhancing fleet performance." ADE's growing network of certifications and recent investments in advanced infrastructure and digital solutions underscore its commitment to elevating MRO standards and providing reliable, efficient support to its airline partners across ASEAN.

easyJet extends partnership with Lufthansa Technik Milan

easyJet aircraft in Malpensa © *Lufthansa Technik Milan*

easyJet and Lufthansa Technik Milan have signed a three-year extension to their previous contract for ongoing light base maintenance on easyJet's extensive Airbus A320-family fleet. This extended agreement, now set to run until mid-2027, will see two of easyJet's 300+ aircraft pass through Milan every night for a range of high-quality maintenance services. The contract covers aircraft operated under easyJet UK, easyJet Switzerland, and easyJet Austria's Air Operator Certificates (AOCs). The scope of work for easyJet includes comprehensive phase checks, which allow larger, mandatory maintenance tasks for the A320 fleet to be divided into smaller, intensive inspections during each night stopover at Lufthansa Technik Milan. For instance, a major C1-check can be distributed across up to 64 smaller visits, referred to as P-checks, to optimise efficiency. Beyond these scheduled inspections, Lufthansa Technik Milan will support easyJet with additional tasks as needed, including structural repairs, modifications, component or engine replacements and interior repairs. Brendan McConnellogue, Director of Engineering and Maintenance at easyJet, commented on the partnership: "As a long-standing customer of Lufthansa Technik Milan, we value their highly skilled workforce, flexibility and customer-focused attitude and so we look forward to the next chapter in our joint success story with confidence that our fleet is in safe hands."

Spirit AeroSystems secures US$350 million in advance payments from Boeing

Spirit AeroSystems has announced a critical financial arrangement with Boeing, which will provide the company with up to US$350 million in advance payments. This cash infusion is designed to alleviate some of Spirit's ongoing financial challenges, including excessive inventory levels, strained operational cash flows and escalating production costs that have put pressure on its balance sheet. Spirit AeroSystems has been struggling to stabilise its financial position, recently voicing concerns over its ability to continue operating as a going concern. The cash from Boeing aims to support Spirit in its immediate financial needs, providing a temporary buffer against the turbulence in its operations. The advance comes with an agreed repayment plan, under which Spirit will repay 25% of the advance back to Boeing in four instalments spread throughout 2026. This structured repayment plan reflects the cautious optimism both companies hold regarding Spirit's potential recovery, but it also signals Boeing's need to ensure repayment over a manageable timeframe. In a separate but related development, Spirit AeroSystems also announced a new arrangement with Airbus through a second amended and restated memorandum of agreement. Under this agreement, Airbus has extended a non-interest-bearing line of credit worth US$107 million to Spirit. This line of credit will serve as working capital to support production activities across various Airbus programmes, enabling Spirit to maintain delivery schedules for key Airbus components. This financial support from Airbus also underscores the shared interests of the companies to ensure the continuity of production and delivery despite Spirit's current financial instability. Both agreements with Boeing and Airbus are temporary financial solutions to Spirit's ongoing challenges. They represent a vote of confidence from two major aerospace players in Spirit's future, but the road to recovery remains steep for the supplier.

Spirit AeroSystems will get an advance payment of US$350 m from Boeing *© Shutterstock*

Representatives from SkyFive and Lufthansa Technik showing where the compact antenna will be mounted *© LHT*

SkyFive, a provider of smart inflight connectivity solutions, has partnered with **Lufthansa Technik** (LHT) to scale the delivery of cost-effective Air-to-Ground (A2G) broadband services for commercial airlines worldwide. This collaboration, established through a new framework agreement, leverages Lufthansa Technik's expertise in design and production to create, certify and manufacture installation kits that simplify fleet upgrades with A2G technology. According to industry data from Valour Consultancy, 74% of narrow-body aircraft globally still lack broadband connectivity. A2G technology offers an efficient and cost-effective solution to address this gap. The system connects aircraft to dedicated mobile ground networks via a compact antenna, roughly the size of a human hand, mounted on the lower fuselage. Demand for A2G installations has surged, with the number of committed aircraft doubling over the past two years. To meet the growing demand, SkyFive has partnered with Lufthansa Technik for its robust design capabilities and global MRO (maintenance, repair, and overhaul) network. Lufthansa Technik, which already holds a supplemental type certificate (STC) for A2G systems, will oversee the production of installation kits, enabling rapid deployment across SkyFive's target airline markets. Additionally, Lufthansa Technik's prior experience with satellite-based connectivity installations positions it as a strong partner for scaling A2G technology adoption. This partnership not only aligns with the increasing demand for A2G solutions but also underlines the industry's commitment to enhancing passenger connectivity and operational efficiency in single-aisle aircraft fleets worldwide.

StandardAero's San Antonio facility begins LEAP-1A engine testing

StandardAero has completed correlation of its San Antonio test cell for LEAP-1A engines © *StandardAero*

StandardAero's engine overhaul centre in San Antonio, Texas, has completed correlation of its first test cell for the CFM International LEAP-1A turbofan engine, marking a significant milestone in its rollout of LEAP-1A and LEAP-1B maintenance, repair, and overhaul capabilities. The San Antonio facility is now equipped to conduct LEAP-1A functional and performance engine testing, serving Airbus A320neo-family customers. This new engine test capability for the LEAP-1A follows three months after StandardAero's 810,000 ft^2 facility in San Antonio correlated its initial test cell for the LEAP-1B engine used in the Boeing 737 MAX. This achievement opens the door to LEAP-1A and LEAP-1B performance restoration shop visit (PRSV) services, with PRSVs now available. As a 'Premier MRO' provider for the LEAP-1A and LEAP-1B engines, StandardAero signed the first North American non-airline CFM-branded service agreement (CBSA) for these engines in March 2023. The San Antonio facility began accepting LEAP Continued Time Engine Maintenance (CTEM) shop visits in March 2024. Alongside developing MRO capabilities for the LEAP-1A and LEAP-1B in San Antonio, StandardAero is also advancing new engine component repairs for the LEAP series through its Component Repair Services (CRS) division's network and its Repair Development Centre of Excellence. To date, StandardAero's CRS team has developed and implemented over 250 component repairs for the LEAP-1A and LEAP-1B engines.

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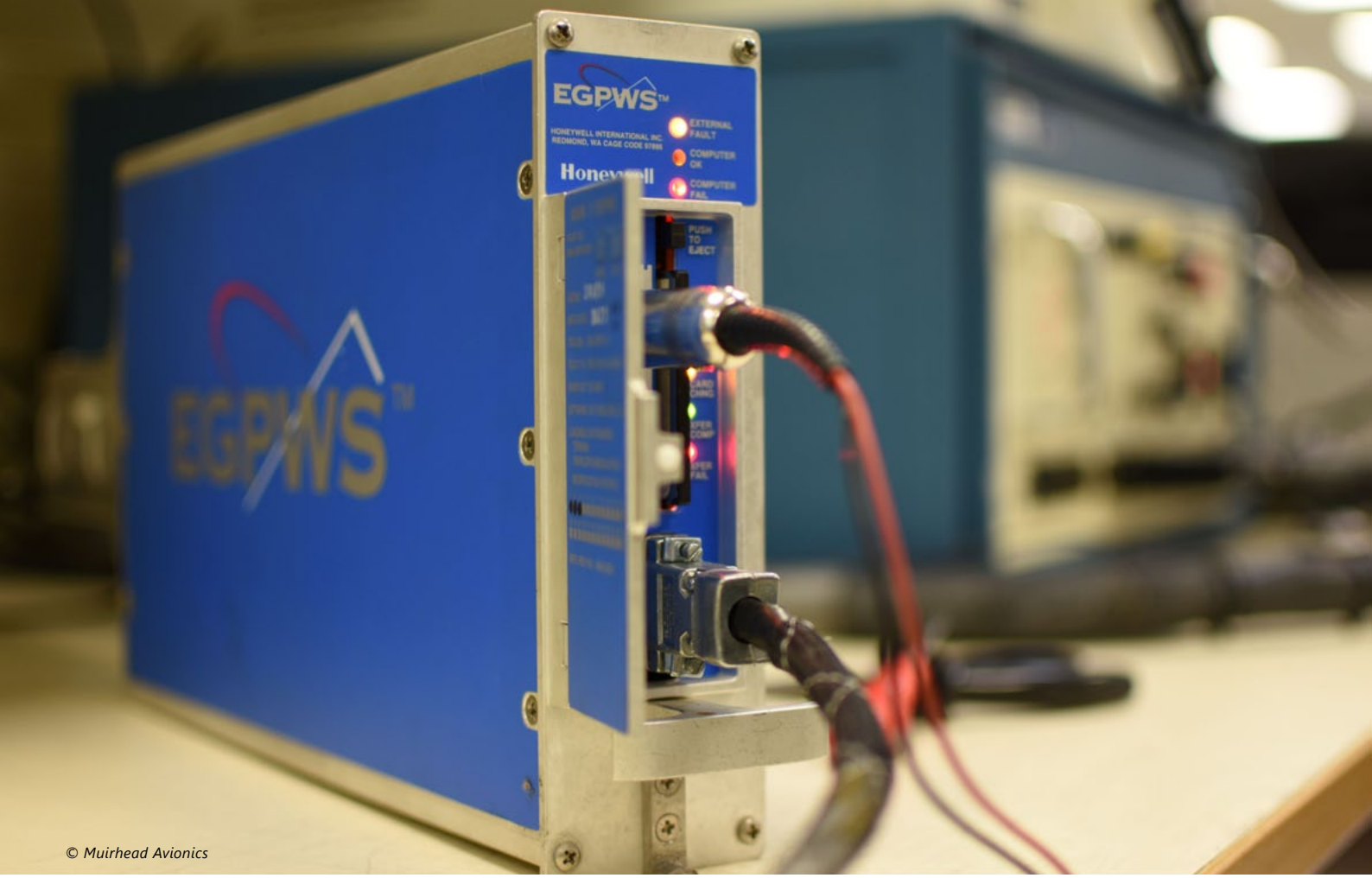


© *Muirhead Avionics*

Understanding Avionics

A look behind the curtain

By David Dundas

Avionics, in particular the electronic equipment fitted to an aircraft, is a highly specialised field. When it comes to MRO services, we wanted to learn more about how companies specialising in avionics deal with specific problems related to electrical systems and components in today's commercial aircraft. We are fortunate to have been supplied with a wealth of fascinating information from five highly respected operators in the field of avionics, and we hope the following will give you a valuable insight into the challenges they meet on a regular basis and how they deal with them.

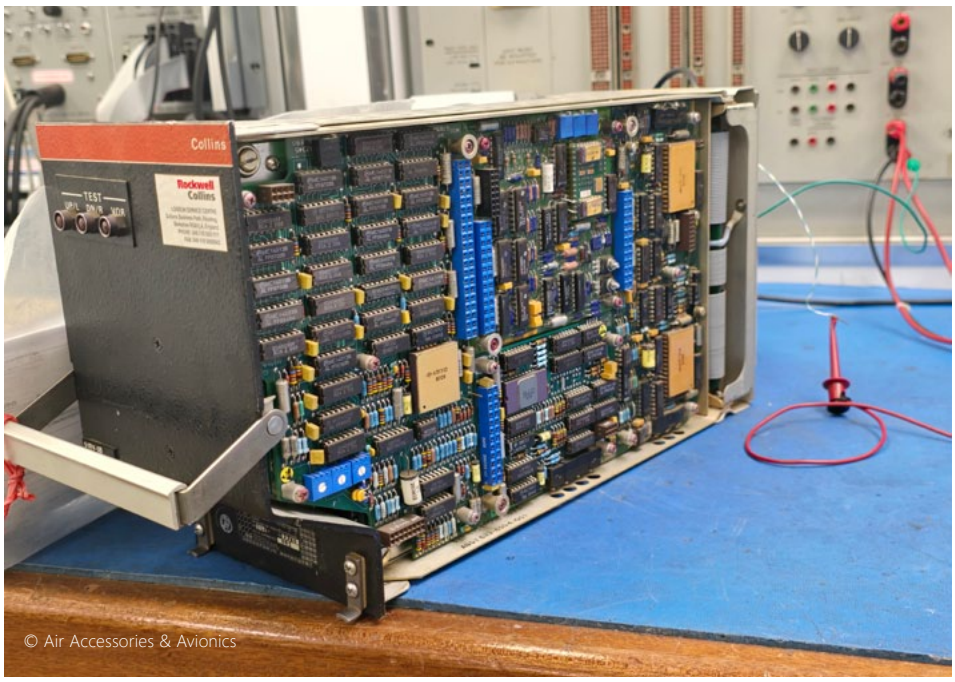
Emil Dickson, Business Development Manager, AAR CORP

Areas of focus and longevity

First off, we were curious to know how long our contributors had been operating in the field of avionics, and if there were any particular areas they specialised in. Emil Dickson, Business Development Manager at AAR CORP advised that their Component Services facility in Amsterdam has been in the avionics repair business for over 55 years. With regard to areas of expertise, Dickson informs us that AAR Corp: "maintains, repairs, and supports communication and navigation systems such as high-frequency systems (transceivers and receivers), auto pilot systems, flight systems, weather radar systems, warning and power supply systems. We also support instruments such as vertical and directional gyros, altimeters, audio systems, air data computers and several flight indicators."

AJW Group has been around for over 90 years and as Simon Merriott, SVP Customer Service, AJW Aviation puts it: "We specialise in a wide range of avionics

> ***"We maintain, repair, and support communication and navigation systems such as high-frequency systems (transceivers and receivers), auto pilot systems, flight systems, weather radar systems, warning and power supply systems."***
>
> *Emil Dickson, Business Development Manager, AAR CORP*



systems, including navigation equipment, communication systems, flight control computers, and displays. Our skilled technicians are adept at handling legacy systems as well as modern, complex integrated avionics platforms." He adds that: "AJW Group has built strong relationships with key component OEMs. This enables us to offer a diverse portfolio of repair and testing services across dominant aviation platforms."

It was in 1956 that Muirhead Avionics, part of AMETEK MRO began operations and David Bentley, DVP & Business Unit Manager at Muirhead Avionics, AMETEK MRO, tells us that the company's "...capabilities cover navigation, communication, radar, flight data recorders, cockpit voice recorders, instrumentation and main cockpit displays and test equipment. We are also close to receiving a newly accredited UKAS approval for avionics calibration." Our final contributor is Air Accessories & Avionics, a Broward Aviation Services Group Company, which has been serving and providing first-class repair quality and component reliability since 1992. The company is based in Miami, Florida and serves airline, OEM and parts broker customers worldwide. Marlon Bustos, the Accountable Manager at Air Accessories & Avionics expands on their field of expertise: "We specialise in WRT, HF Antenna Couplers, VHF, EDU, GCU, BCU, GAPCU, LCD Monitor, Antennal Pedestal, Radio Management Panels, Electromechanical and Pneumatics. In particular, we major in Rockwell Collins avionics equipment, especially radar components."

Key success factors of a quality avionic repair shop

You will note that all our contributors are long-standing and well-established companies, with an individual operating history ranging from just over 30 years to just over 90 years, so who better to ask what the key success factors of a quality avionic repair shop are?

Simon Merriott sees having expert technical staff as pivotal, followed by the implementation of strict quality control. He expands further: "Access to advanced testing equipment is also critical, as state-of-the-art diagnostic tools, such as those at our MRO repair facility in Montreal, AJW Technique, allow for accurate issue identification and comprehensive repairs. Efficient turnaround provides quick service without sacrificing quality and ensures high levels of customer satisfaction. AJW's strong supply chain management supports this by ensuring we have reliable access to spare parts, enabling seamless operations and prompt repair work. Lastly, comprehensive testing and troubleshooting procedures are essential and the ability to perform Level 3 repairs at a circuit card level, such as performing full functional tests with Automated Test Equipment (ATE), conducting manual circuit card analysis, and repairing these cards at a component level."

David Bentley sees things slightly differently, identifying the construction of the company's state-of-the-art facility near Heathrow Airport as a key move. He then highlights what has helped with his company's success, including: "Our skilled workforce with OEM-trained technicians, acquiring a number of OEM approvals supported by our proven track record of consistent, and high-quality service. Significant investment in engineering, spares, LRU inventory and next-generation automated test equipment. Regulatory compliance with a wide range of approvals, UK CAA, EASA, FAA. EN9110, EN9120. Plus, our ability to support legacy equipment is underpinned by a strong product and people safety culture."

Marlon Bustos has yet another reason for his company's success, and that is staff retention, especially of senior engineers. As he puts it: "Our senior technicians have been with the Company since its origins, 30 years ago, and that is truly why we are

Marlon Bustos, Accountable Manager, Air Accessories & Avionics, part of Broward Aviation Services Group

> ***"Our senior technicians have been with the Company since its origins, 30 years ago, and that is truly why we are able to back our overhauls with 24-month warranties and repairs with 12-month warranties."***
>
> *Marlon Bustos, Accountable Manager, Air Accessories & Avionics, part of Broward Aviation Services Group*

able to back our overhauls with 24-month warranties and repairs with 12-month warranties. We believe the experience of our technicians and our reliability is second to none. We are also focused on the transfer of this knowledge and take pride in our training schemes." Similar to the three others, Emil Dickson / Richard Heath put the company's success down, among other things, to the skilled workforce. "An experienced and knowledgeable staff, high-quality and accurate test systems, a clean room, and access to the latest revisions of manuals, software, and parts required to complete the repair. AAR works hard to maintain all these contributing factors and attributes our experienced staff and OEM support as prime reasons for our success."

AJW Technique Technician © *AJW*

Transitioning from mature to next-generation avionics

Advancements in modern technology are constant and the field of avionics has not escaped major changes. What we wanted to know was how companies specialising in avionics are able to transition from mature to next-generation avionics.

Simon Merriott highlights training as the key. "AJW leverages continuous training programs to keep our technicians proficient in emerging technologies. We also invest in the latest diagnostic and testing equipment compatible with newer systems, ensuring our MRO repair capabilities evolve in line with industry advancements. The Group's expertise spans from older analogue electronics to the latest digital technologies, and our technicians receive regular training to adapt to these advancements. Predictive maintenance techniques enabled by data analytics and machine learning are incorporated into our operations to anticipate potential failures, ensuring seamless transitions and proactive maintenance of components and parts coming to our facilities."

Simon Merriott, SVP Customer Service, AJW Aviation

As many avionics companies specialise in differing sectors, so their options for remaining up to date in their working practices can differ considerably. Understanding this helps with David Bentley's explanation for Muirhead Avionics' strategy. "Muirhead Avionics aims to strengthen our strategic partnerships with avionics OEMs and automated test equipment suppliers by investing in infrastructure upgrades, software, and test adaptors. Leveraging our in-house engineering expertise, we will secure the necessary repair licenses and inventory supply agreements from the OEMs and efficiently integrate new-technology products into the workshop."

Marlon Bustos explains the transition method adopted by Air Accessories & Avionics which "...works with the OEMs to secure approved repair contracts. This is underpinned by our investment in acquiring the latest ATE stations, training and tooling. Securing the trust from OEMs through the quality of the repair services we deliver places us in a good position to transition seamlessly to next-generation avionics and our team will be trained and ready." For AAR CORP the solution is seen as being one of adopting a multi-prong approach. "We are upgrading both our hardware and software to evolve alongside the next-generation and to meet the latest standards. OEM support and access to IP and parts are crucial, along with staff training and awareness of next-generation fleet requirements," comments Emil Dickson.

One of our contributors, Air Worthy, is an independent CAMO and does not carry out avionics repairs independently as it is not part of its approval and capabilities. Instead, Air Worthy is involved in selecting an organisation that is correctly qualified for certain avionics repairs, in the case where an aircraft the company is managing needs such a service. Lucia Soffientini, Continuing Airworthiness Manager – Avionics Engineer explains the situation for Air Worthy in relation to mature and

> ***"The Group's expertise spans from older analogue electronics to the latest digital technologies, and our technicians receive regular training to adapt to these advancements."***
>
> *Simon Merriott, SVP Customer Service, AJW Aviation*

> ***"Muirhead Avionics believes the long-term relationships we have established with OEMs are key to our business success and we work hard to sustain multiple repair licences and approvals with all the major avionic equipment OEMs."***
>
> *David Bentley, DVP & Business Unit Manager - Muirhead Avionics, part of AMETEK MRO*

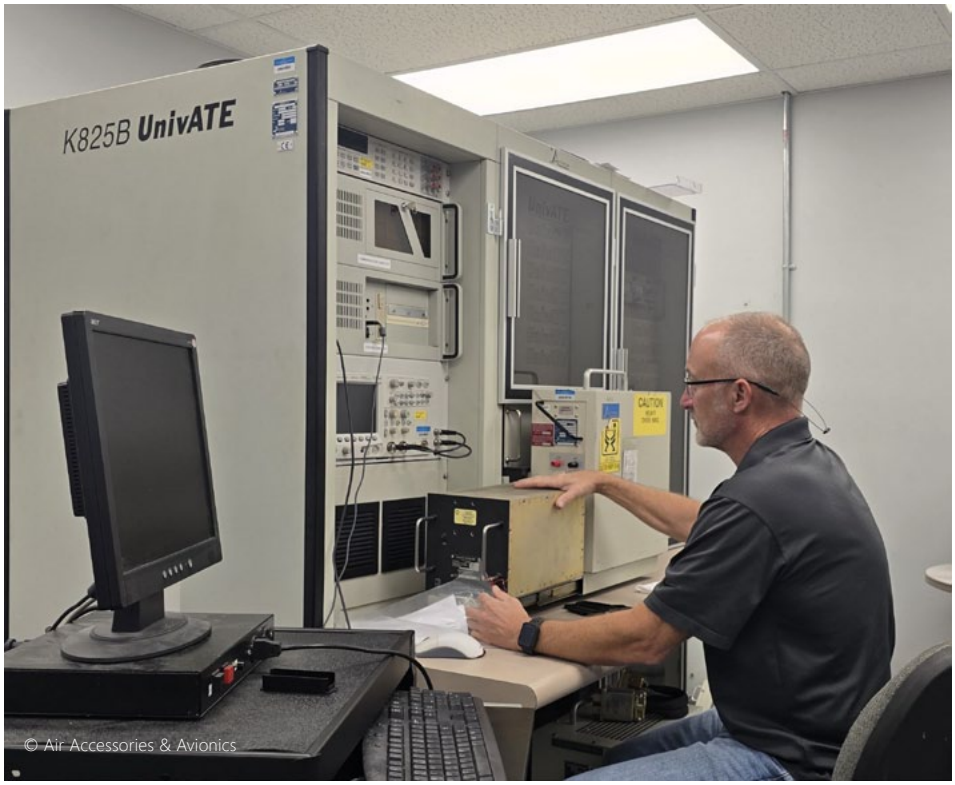
David Bentley, DVP & Business Unit Manager - Muirhead Avionics, part of AMETEK MRO

next-generation avionics. "Air Accessories & Avionics works with the OEMs to secure approved repair contracts. This is underpinned by our investment in acquiring the latest ATE stations, training and tooling. Securing the trust from OEMs through the quality of the repair services we deliver places us in a good position to transition seamlessly to next-generation avionics and our team will be trained and ready."

The importance of the relationship with an avionics OEM

According to Marlon Bustos, "Avionics OEMs have spent years researching and developing safe components for the aviation industry and it is essential to work closely with them as their training, tooling, data and component maintenance manuals (CMMs) are essential to underpin the high-quality repairs that Air Accessories & Avionics can then put under warranty." Meanwhile, Emil Dickson is very succinct in regard to his opinion of the importance of this relationship. "Without OEM support on most avionic components, it is not possible to perform the work. AAR is privileged to partner with several leading OEMs so we can support customers to the latest OEM standards." As for Lucia Soffientini, this relationship is critical: "It is very important and Air Worthy has good relationships with the major avionics OEMs, as it enables us to stay aware of any upgrade they may propose."

Simon Merriott at AJW Aviation feels that the strong ties with key OEMs ensures the company can offer a comprehensive service portfolio to keep up with industry growth to maintain its position as an industry leader. He further explains: "Maintaining a strong partnership with OEMs provides access to essential resources like updated technical documentation, training, and proprietary tools. These relationships enable our repair shop to perform certified repairs that meet OEM standards, enhancing reliability and safety for our customers. Furthermore, direct communication with OEMs can lead to faster resolution of technical issues and support in sourcing genuine parts, ensuring the highest quality repairs." Further, David Bentley is very concise yet very clear on the importance of such a relationship. "Muirhead Avionics believes the long-term relationships we have established with OEMs are key to our business success and we work hard to sustain multiple repair licences and approvals with all the major avionic equipment OEMs," he says.



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At what point should an avionic be declared "beyond economical repair"?

As with so many aspects of aircraft MRO, costs are a key factor, and avionics does not escape this problem. In particular, we have the case of deciding when an avionic has reached the point where it's repair is no longer a financially viable solution. We wanted to know at what point avionics companies felt that an avionic repair was not an option, financially speaking. Emil Dickson is very clear on the matter. "The avionic is declared BER when the cost of repair exceeds fair market (serviceable) value or factory new condition components. This can fluctuate depending on USM market conditions and customer acceptance of scrapping their own serial numbers." Lucia Soffientini is equally clear on the matter: "By definition, BER generally

> ***"BER generally refers to a situation where the cost of a necessary repair to an item is 75% or above the market value or original procurement cost. For an avionics component, we might consider that the electronics may soon become obsolete and no longer procurable."***
>
> *Lucia Soffientini, Continuing Airworthiness Manager – Avionics Engineer, Air Worthy*

refers to a situation where the cost of a necessary repair to an item is 75% or above the market value or original procurement cost of the item. For an avionics component, we might additionally consider that the electronics may soon become obsolete and no longer procurable."

Simon Merriott is of a similar opinion regarding the point where an avionic should be declared BER. However, he goes into further detail to explain how there is an alternative solution to the problem which can help to reduce costs: "The decision [to class an avionic as BER] is influenced by the extent of damage, availability of replacement parts, and total repair hours required. Comprehensive evaluations, including cost analysis and technical assessments, also guide the decision to determine if pursuing a repair is justified or if replacement is the more viable option." He adds that: "BER is more common on legacy components where market availability has reduced the fair market value of the components. AJW Technique has a robust process enabling the use of used-serviceable material at a SRU (Shop Replaceable Unit) level, which can avoid components being declared BER. The Group's extensive experience in this evaluation process ensures we make informed decisions that optimise cost-efficiency for our customers."

It is clear from all the replies everyone agrees that avionics are declared "beyond economical repair" when the cost of repairing the unit exceeds its replacement value or when repair is not feasible due to other factors. David Bentley goes on to explain further about deciding factors: "Typically, these factors include repair costs exceeding replacement value, obsolescence, irreparable issues beyond technical feasibility, recurring failures affecting reliability, and economic viability where investing in newer technology offers better long-term value, or upgrading to newer, more advanced systems is a more cost-effective solution." However, Marlon Bustos has an interesting point to make with regard to the fluctuating cost of components and how this can affect the BER decision-making process. He states that "...we have seen components deemed BER when the repairs can be undertaken at a fair market cost. This will impact the industry in the long run because the cost of the new component will go up due to the lack of serviceable components available in the market. Something could be declared BER today, but next year the market price will have gone up and then it will be worthwhile undertaking a shop repair."

Supply chain problems

Finally, we wanted to establish if those companies involved in avionics were suffering from many of the supply chain problems experienced by other aircraft MROs. In particular we wanted to find out if there are sufficient used avionics available to replace rather than repair a component when a repair is not economical?

For David Bentley at Muirhead Avionics, there is no clear-cut answer. He explains: "This situation is closely monitored by our team at Muirhead Avionics, and it depends on several factors including the type of aircraft and the market demand for the particular avionics units. For widely used aircraft types and avionics systems, the market normally has a good supply of used or refurbished units. For older or less common systems, finding suitable replacements can be challenging as production may have ceased, and used units might be scarce. In these cases, the knowledge to perform technical repairs on legacy equipment comes back into play." Marlon Bustos at Air Accessories & Avionics is similarly of the opinion that there is no simple 'yes' or 'no'

Lucia Soffientini, Continuing Airworthiness Manager – Avionics Engineer, Air Worthy

answer, advising that: "It all comes to the application, or the type of aircraft that the avionics component going to. Often it is best to purchase an SV unit and use it for parts, because purchasing new from the OEM can cost more than the actual unit. It's more economical for both the shop and the airline to use a serviceable unit such as a circuit board rather than commission a specialised repair that requires dedicated test equipment and intensive labour hours to find a failure."

Emil Dickson is optimistic with AAR CORP's response and supply chain problems do not seem to affect the company in this scenario. "Depending on the type of units or fleet type, there are surplus materials on the market to use instead of repairing. Factors to consider include modification standards between the units and age or serial number," he states. Dixon is not alone as AJW Aviation's Simon Merriott feels that there is "a robust market for used and refurbished avionics, especially on legacy platforms. These components can provide cost-effective alternatives when repairs are not economically viable. However, availability depends on the specific type of equipment, its demand, and overall condition." He goes on to explain that AJW is a leader in the management of aircraft teardown, increasing the availability of used components, and maintains strong relationships with certified suppliers and brokers to source high-quality used avionics that meet safety and performance standards. This network helps ensure that we can provide our customers with reliable options for replacement when necessary."

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Rob Suhs, ILS (right) and Peter Jorssen, AviTrader (left)

Importance of Data Analytics

Talking to Rob Suhs, Vice President of Global Sales at Inventory Locator Service (ILS)

By Peter Jorssen

> “Using data analytics helps the aviation industry improve operational efficiency by offering insights into supply chain management, demand forecasting, and strategic planning.”

AviTrader MRO: How can data analytics improve operational efficiency in the aviation industry?

Rob Suhs: Operational efficiency in the aviation industry can vary significantly depending on one's role within the sector. For instance, what constitutes operational efficiency for an airline might differ from that of a Maintenance, Repair, and Overhaul (MRO) organization or an aftermarket parts trader. Therefore, it's essential to examine operational efficiency through multiple lenses. While it's beneficial to analyse each aspect individually, a collective approach offers a more comprehensive and exciting discussion.

Data analytics plays a crucial role in achieving operational efficiency across various facets of the aviation industry. One of the most talked-about areas is the supply chain. Although the supply chain has been extensively discussed, there are other critical aspects where data can drive efficiency, such as planning and demand forecasting. Understanding where the demand for services or parts originates is a key component of the supply chain. By drilling down into more nuanced data sets, companies can pinpoint specific regions where demand issues arise. For example, is the demand signal occurring in North America, Greater Europe, the Middle East, or the Asia-Pacific region? Developing precise data models allows for greater operational efficiency by pinpointing these specific areas for signal strength.

For example, part suppliers and distributors can use data analytics to optimise the location of materials. Whether a distributor primarily stocks in the Americas or is a European distributor sending goods to the Americas, analysing demand metrics can inform decisions about optimising material supply levels in different regions based on demand metrics. This approach ensures that suppliers can service customers globally more effectively.

Using data analytics helps the aviation industry improve operational

efficiency by offering insights into supply chain management, demand forecasting, and strategic planning. This approach ensures smoother and more efficient operations across the industry.

What are the key challenges faced by aviation companies in implementing data-driven strategies?

The aviation industry faces several key challenges in implementing data-driven strategies. One of the primary challenges is companies striving to unlock operational efficiencies and understand current operations. This involves documenting and mapping out individual processes, such as placing an order or submitting a request for quotation (RFQ), so that everyone in the organisation can understand them, step-by-step. This operational clarity is essential for identifying ways to unlock the value that data can then bring to each process. When these processes are combined, they form an organisational component that can leverage data efficiencies on a larger scale.
Another significant challenge is maintaining data hygiene. Data hygiene is essential for any organisation, including those in aviation. Without clean and trustworthy data, it is impossible to make informed business decisions. Therefore, layering a data strategy on top of unclean data will not be successful. As a business partner to the aviation community, we at ILS emphasize the importance of data hygiene. We provide some of the cleanest and most trusted data in the aviation community, which is crucial for our customers. This trust in our data has been built over 45 years, and it is a key component of our recognition and success in the aviation community.

How can real-time data manage and mitigate disruptions such as weather or technical delays?

Although we at ILS may not directly handle data transmission from aircraft to operational centres, these centres within an airline can quickly process incoming data from aircraft to determine necessary actions upon arrival. For instance, if a valve is malfunctioning, the Aircraft on Ground (AOG) team can promptly place an order or prepare a replacement valve. If sourcing the valve is required, they can count on ILS to ensure its availability at the destination, benefiting from our capabilities in ensuring timely and efficient supply. This approach minimises operational downtime by making sure critical components are ready for immediate use, thus enhancing operational efficiency.

How is AI-powered data analysis transforming decision-making in the industry?

Today Artificial Intelligence (AI) is a hot topic and has become an integral part of everyday consumer life. It is utilized in various applications on mobile phones and personal computers. At ILS, AI has long been a central focus. We are not merely participants in the AI trend; we are leaders in its implementation. Since 2017, we have employed AI to enhance the value, statistics, and information we deliver to our customers. We employ numerous AI and machine learning programs behind the scenes to consistently analyse data. While customers may not realise that AI is being used, it plays a crucial role in analysing and synthesising the vast amount of data for our customers' use. These systems ensure the information is clean, as precise as possible, and easily accessible for our customers.

How do you validate through the human element that the data is correct? What types of checks and balances you have in place to do that?

Checks and balances are absolutely key. The public is becoming increasingly aware of this due to the ease with which false information can be easily propagated or generated by any number of different sources. We're seeing that today in many media outlets. Similarly, on the data side, it is likely to be present as well. We believe that our checks and balances, along with our long-running history of data, give us confidence in our data and our data sources, pre-empting us from a lot of the noise that comes from false AI outputs. That aside, rest assured we've got a number of checks and balances behind the scenes to make sure that does not happen.
Again, coming back to the data hygiene you talked about earlier, sometimes bad data does get in. But don't worry, we have systems in place to immediately flag it, put it off to the side, analyse it, and make sure its valid based on trends or other industry-related information.

"Checks and balances are absolutely key."

Do you work with the OEMs to change how they structure data so you can disseminate it better so AI can make better decisions?

At ILS, we collaborate with a number of OEMs, including engine, airframe, and component manufacturers for their data needs. If we look at OEMs individually, you will find that they are on similar, but very different, data journeys. Many times they have their own specific goals. Others are more open to collaboration. No judgment, no right or wrong, just different approaches. At ILS, we like to work with each OEM, meet them where they are at on their journey, remain neutral, and provide insight and assistance to help them reach their goals and objectives.
For example, some OEMs are very advanced and seek a collaborative approach, while others may prefer to operate in a more closed manner.

Regardless of their stance, our goal is to support them by integrating their data with ours to foster a comprehensive, global perspective. We maintain neutrality to ensure that our services are adaptable and beneficial to all our OEM partners, respecting their unique paths and contributing to their success. We believe this approach allows OEMs to make more informed decisions, ultimately benefiting the entire aerospace industry.

How important is data security in the aviation industry today, or what measures are you taking to enhance security for your platform users?

One of the things that's really important in our industry today is (data) security. It's at the forefront of many people's minds, both personally and professionally, and certainly at an organizational level. I'm very excited to share that ILS is the very first and only aviation marketplace to achieve SOC 2 compliance. So, what is SOC 2 compliance? It means that as a user of our platform, you have an added level of security and trust, knowing that the information you're inputting or getting from our platform is being handled with the highest standards of security. It also means that customers can have confidence in the reliability and integrity of the services provided, knowing that the company undergoes regular audits to maintain security standards

But we're not stopping there. Starting in 2025, we're implementing two-factor authentication. This extra layer of security ensures that the people on our platform are real and verified. What many people might not know is that ILS has been using a product called Visual Compliance for a long time now. We screen every company and every user in our system for compliance with international regulations. This means that when you come onto our platform and see a company or an individual, you can be confident that they have been screened every 24 hours through Visual Compliance. This service is provided by Descartes, a globally recognized security company, adding another layer of security and assurance.

> “We strongly believe that each company should be doing their own due diligence.”

And you want to make sure that they are doing their due diligence to make sure that they're at least adhering to corporate standards?

Absolutely. We strongly believe that each company should be doing their own due diligence. They should have the necessary relationships and conduct their own investigatory work. When companies get to ILS, they should know that there's an extra added level of security. It's not meant to replace an individual organisation's research, but to complement it and provide additional assurance.

When you're selling a part to a client, are you transferring the historical records with that component – it could be a used part? Do you have electronic documentation you pass on to it, or is it paper, or is it a combination of both - how does that work?

To clarify, ILS does not sell parts; but rather brings buyers and sellers together on ilsmart.com. Nevertheless, I find this topic very exciting because of the critical importance of the records verification process, especially given that the transaction cannot be completed without this critical step. And to your question, does [it] the records transfer process happen through a manual process whereby physical paperwork is being shipped by UPS or FedEx, or exchanged digitally through email or a file transfer service? The answer is that it depends; it depends on the capabilities and the preference of both the buyer and seller. We recently introduced a new feature [on ILS] called AeroChat, which everyone now has access to. AeroChat gives ILS users the ability to communicate directly with each other using a familiar chat window which also has the capability to send and receive documents directly on ILS.
For example, if you're a buyer looking for a specific part and want to ask the supplier for a quote and the paperwork, you can do all of that directly through AeroChat online. You don't have to leave the platform to go to email or phone; you can handle everything right there on ILS using AeroChat.
We are advancing our interest in this area. Last year, we launched our SalesEdgeTM Commerce, an e-commerce component of ILS. This platform enables sellers of parts and services to showcase their entire inventory on their own branded websites.
At ILS, our mission is to support the growth of your business, whether you are an airline, an MRO, an aftermarket parts trader, or an OEM. We aim to facilitate this growth by emphasising the importance of your brand, which we acknowledge as one of your most valuable assets.
Through SalesEdgeTM Commerce, our goal is to ensure that you can represent your brand as you intend, not by a third party. We aim to engage with your customers throughout their journey. Whether they contact you directly by phone or email, encounter your products and services on ILS, or visit your corporate website, we want you to be able to capture these opportunities effectively.


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Rejected Engine Parts Repair or replace?

By David Dundas

For MROs, there is the constant challenge of whether a part can be repaired, or if it needs to be replaced either with a brand-new part or USM. The dilemma becomes increasingly more challenging when it comes to the critical area of aircraft engines which are subject to forces that other parts of an aircraft are not subject to. We wanted to learn more about the 'tipping point', that point where it may not be economically viable to repair a damaged or worn engine part as opposed to replacing it. We are fortunate to have been in contact with four respected companies who have a wealth of knowledge when it comes to engine MRO and they have been kind enough to supply us with a great deal of interesting information on the frequent challenge of deciding whether a rejected engine part should be replaced or repaired.

Identifying primary criteria to be considered when deciding if a rejected engine part should be repaired or replaced

While everyone takes into account the actual cost of repairs to a rejected part, it soon becomes apparent there is a lot more to be considered when deciding whether or not to repair or replace an engine part. For example, Oliver Boro, Technical Consultant for Engines at AMROS Global point makes a very valid point with regard to any replacement parts when he advises that: "... the replacement components necessary for repairing or overhauling the part should be available," while Chris Lund, Director Operations at StandardAero's Center of Excellence (COE) for Turboprop Engine MRO, points out that from his perspective: "This decision is generally based on a combination of engine original equipment manufacturer (OEM) criteria, OEM commercial support program availability, and assessment of market value versus repair cost."

Valentins Iljins - Power Plant Lead Engineer at Vallair looks far beyond the basic cost of repairs versus value scenario and introduces the relevance of time factors. He comments that: "At Vallair we consider a variety of criteria when determining whether a rejected engine part should be repaired or replaced such as market availability, catalogue price for the new part (similar part or any modification of the part), used market cost for the part and repair capabilities, average cost, and lead time. Plus, time allowance is considered if there is a waiting time to get the part repaired and it would be better to replace the part so that the engine and/or aircraft can be released back to service." Going into even further detail, Desean Palmer, Senior Director Material Management at VAS Aero Services advises

> **"... time allowance is considered if there is a waiting time to get the part repaired and it would be better to replace the part so that the engine and/or aircraft can be released back to service."**
>
> *Valentins Iljins - Power Plant Lead Engineer, Vallair*

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that beyond looking at every situation on a case-by-case basis, four of the key factors to consider are current and future market demands of the specific part number and the average repair and recertification investment cost compared to the cost of replacing the part at current market rates. He also includes current MRO shop capacity and average lead-times, and work scope requirements to fully service a part and have it recertified.

Which engine part types are most commonly rejected?

It is fair to say that because of their very purpose, some engine parts will likely wear out or require repairs more often than others. Chris Lund is very precise and concise, identifying bearings, blades and hot section vanes/stators as the 'prime culprits'. Valentins Iljins is pretty much of the same opinion as Lund in mentioning high-pressure turbine (HPT) blades, and HPT nozzle guide vanes. However, he goes on to explain that these are parts related to the hot section of an engine and the causes of part rejection are as a consequence of: "fatigue and extreme thermal or mechanical stresses leading to cracks, pits, degradation, and other types of failure of the material."

Oliver Boro, Technical Consultant Engines, AMROS Global

Desean Palmer shares similar opinions as Lund and Iljins, identifying factors that can lead to part failure/rejection to include: "... total time on wing, operating environments, and level of work previously performed (if applicable)." However, he then goes on to explain that: "From our experience disassembling engines for USM re-sale and frequently investing in USM packages, parts with higher-than-average scrap rates include the hot sections (modules) within the engine (i.e., High-Pressure Turbine) and the High-Pressure Compressor (HPC) also is frequently subject to rejection due to increased stages of material and rotating parts throughout this section of the engine." Meanwhile, Oliver Boro is particularly focused on blades, and he points out that: "... the components most commonly rejected are the blades from both the compressor and the turbine section. The blades are exposed to high rotational speeds, vibrations, high temperatures (turbine section), and foreign object damage (compressor section). Approximately twelve percent of the blades in a typical, moderately aged commercial engine are classified as non-repairable during routine overhaul. The higher blade rejection rate is typical for Stage 1."

Does the availability of USM influence the decision to replace or repair a rejected part?

Let's face it, many 'replace or repair' MRO decisions can rest on whether or

> ***"Approximately twelve percent of the blades in a typical, moderately aged commercial engine are classified as non-repairable during routine overhaul. The higher blade rejection rate is typical for Stage 1."***
>
> *Oliver Boro, Technical Consultant Engines, AMROS Global*

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not replacement parts are available, irrespective of whether or no they are brand new or USM. Valentins Iljins is unequivocal where Vallair is concerned, stating that: "The availability of used serviceable material (USM) highly influences the decision whether to repair or replace a part. This is because if used material is available and the price is cheaper without reliability loss, the priority of a fast solution quickly becomes a determining factor." Desean Palmer agrees with Iljins, but goes into greater detail, particularly in relation to what has been happening more recently. "When parts are widely available in the USM market, replacement units may be the best, most cost-effective solution rather than making heavy investments in the repair and incurring long lead-time delays at the shop. However, during the last couple of years, supply chain backlogs have impacted the market for both newly manufactured and USM critical engine parts. New OEM parts have exceptionally long lead times and USM is in short supply or, depending on the part, simply unavailable. For this reason, repair investment may be the most economical path even when factoring in longer lead-times for the repair cycle," he comments.

Oliver Boro concurs with Iljins and Palmer, in particular when it comes to reducing time needed for maintenance and repair, stating that: "With readily available USM, we can avoid lengthy repair processes or waiting for new parts to be sourced. This helps minimize aircraft downtime and allows quicker turnaround times. USM parts undergo thorough inspections, repairs, and testing to meet the required airworthiness standards." Beyond the opinions given above, Chris Lund also makes a very valid point that: "... the cycles/hours remaining for USM parts will be considered when making a decision."

> ***"When parts are widely available in the USM market, replacement units may be the best, most cost-effective solution rather than making heavy investments in the repair and incurring long lead-time delays at the shop."***
>
> *Desean Palmer, Senior Director Material Management, VAS Aero Services*

Desean Palmer, Senior Director Material Management, VAS Aero Services

Chris Lund, Director Operations, StandardAero Center of Excellence (COE) Turboprop Engine MRO

> ***"The long-term reliability of a repaired part is initially predicted through design analysis/modelling undertaken during the development of the repair scheme..."***
>
> *Chris Lund, Director Operations, StandardAero Center of Excellence (COE) Turboprop Engine MRO*

The lifespan and long-term reliability of a repaired part compared to a new replacement

While there are many other factors that can heavily influence the decision of whether or not to repair or replace an engine part, the lifespan of the new part has to be a key factor. After all, a repaired part or USM might last only 30% as long as a brand-new replacement part, but if the repair costs are only 10% of the cost of that replacement, and the downtime is not excessive, repairing makes financial sense. Chris Lund, the Director of Operations, at StandardAero's Center of Excellence (COE) for Turboprop Engine MRO explains further: "The long-term reliability of a repaired part is initially predicted through design analysis/modelling undertaken during the development of the repair scheme, and subsequently validated as engines incorporating the repaired part are inducted for maintenance/overhaul and inspected."

Valentins Iljins at Vallair makes an extremely interesting observation with regard to repaired part reliability, stating that: "... we focus on maximising the life and value of aircraft, engines, and parts. Our experience shows that properly repaired used parts often last longer and are more reliable than new parts. Additionally, new parts can be significantly more expensive, and the lead time for delivery could be extensive." Meanwhile at VAS Aero Services, Desean Palmer is keen to point out that depending on the engine model type, for current-generation engines the repair work scope that was performed can be a sound measure of long-term reliability, with unique repairs extending the life of the part. He adds that "The advancement of parts inspection and test technologies also has allowed the market to conduct improved (and more reliable) high-level assessments on parts to better forecast their serviceable life."

As AMROS Global's Oliver Boro points out, USM parts can significantly reduce the time required for maintenance and repairs. He then further explains that: "With readily available USM, we can avoid lengthy repair processes or waiting for new parts to be sourced. This helps minimise aircraft downtime and allows quicker turnaround times. USM parts undergo thorough inspections, repairs, and testing to meet the required airworthiness standards."

When a repair can be financially beneficial in the short term, but not the long term

With continual supply chain issues, there are always going to be unforeseen situations where it will be cheaper to repair a part if it means keeping an aircraft operational because there is a shortage of new parts. The repair can be seen as financially astute as a stop-gap measure while a new part is on order, ensuring that when the repaired part is once again rejected, there is a replacement part immediately on hand. However, there are other more specific instances where a short-term repair still makes financial sense. This is highlighted by Valentins Iljins where he points out that: "There are scenarios where repairing a part is more cost-effective for the short term such as a fuel metering unit which is installed on a V2500 engine. There is a common problem with fuel leaks and the only way to fix this is to make a modification to the latest configuration. However, to embody that modification is extremely costly. So, sometimes it is better to repair FMU or replace it from the market with the pre-modification made and it will last a long time on-wing without fuel leaks. Thereby meeting your operational targets until the aircraft is returned back from lease for example."

Oliver Boro adopts a more pragmatic approach to the situation, commenting that: "Opting for a quick repair might seem like a cost-effective solution in the short term, but it could cost more in the long run if the asset continues to fail. As an example for short-term repair, we can consider the Boroblending repair technique which solves the problem through mechanical repair of compressor blades damaged by domestic or foreign objects. Boroblending could be performed in a few hours, cost much less and prolong the engine's safe usage." Alternatively, Desean Palmer feels that there are short-term cost savings, but that repair may very well impact the part's longer-term use and residual value. However, he goes on to reveal that: "Many companies are looking at more cost-effective repair methods such as Designated Engineering Representative (DER) repairs and the use of Parts Manufacturer Approval (PMA) materials. These methods realise short-term cost benefits but can affect the part's marketability over the long term." To round off, Chris Lund comes up with a very clear example where there is a short-term saving with a repair, but one which is not beneficial in the long term. He explains: "Hot section vanes and stators can be an example where money saved up front through a repair might end up being offset by the part having a shorter operational life, though there are often other factors that can affect this calculation, such as fuel nozzle condition and operating environment."


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The Rise of Drone Technology in Aircraft Inspections

By David Dundas

It is remarkable to think that drones have been with us since the days of the Vietnam war, yet it was only at the turn of the millennium that their potential for more than military use began to be explored further. By 2005 the commercial potential for drones had been recognised and when, in 2015, the DJI phantom drone with GOPS and an HD GoPro action camera was released, the commercial market for drones began to boom.

It was with the combination of drone technology, together with the advances in recording and storing digital imagery, that the use of drones for aircraft inspections became a possibility. Aircraft inspections, a critical component of aviation safety and efficiency, are now leveraging drones to enhance accuracy, reduce downtime, and cut costs and this article will delve into how drones are reshaping aircraft inspections, the benefits they bring, and the challenges the industry must address.

Why Aircraft Inspections Are So Important

Aircraft inspections are essential to ensure their structural integrity and operational safety. Traditional inspections previously required technicians to perform painstaking checks, often using scaffolding, lifts, or cranes to access hard-to-reach areas like the upper fuselage or tail. These methods, while effective, are time-consuming, labour-intensive, and subject to human error. With airlines and MROs constantly looking for more efficient ways to optimise maintenance while maintaining rigorous safety standards, drones have emerged as a complete game changer

How Drones Are Used For Aircraft Inspections

When equipped with both sensors and high-resolution cameras, drones are able to perform a comprehensive inspection of the exterior of an aircraft in a fraction of the time it used to take. There are four key areas where drone inspections have helped to improve the aircraft inspection process.

First, through visual inspections, drones are able to capture highly detailed images and videos of an aircraft's surface, identifying such issues as, but not limited to, corrosion, dents, or cracks. Then, through the use of infrared scanning, drones equipped with thermal cameras can detect anomalies, revealing hidden problems like electrical faults or fluid leaks while thanks to 3-D mapping, the more advanced drones can create precise 3-D models of an aircraft, enabling engineers to analyse damage or wear in greater detail. Finally, there is the 'rapid response' to a lightning strike, where drones can swiftly scan the aircraft for burn marks or structural damage, expediting its return-to-service process. This swift inspection process has been of huge benefit to commercial airlines whose planes, individually, can be struck by lightning on average once or twice in a year.

Benefits of Drone Technology Used in Aircraft Inspections

Perhaps one of the greatest benefits of drone technology is the amount of time a drone inspection can save. As an example, traditional inspections can take 6–8 hours or more, especially for large aircraft like the Boeing 777. Drones, however, can complete the same task in under two hours. This significant time saving reduces aircraft downtime and consequently improves operational efficiency. There then comes the

improvement in technicians' safety through the use of drones for aircraft inspections. Inspecting certain areas of an aircraft usually involves technicians working at heights which, regrettably, increases the risk of accidents. The use of drones eliminates the need for any technicians to work at height, instead enabling inspections to be conducted safely from the ground.

When you consider that manual inspections of an aircraft require the use of scaffolding, lifts and considerable manpower, plus they are time consuming, the use of drones for aircraft inspections can cut costs considerably, while enabling aircraft to return to service more efficiently. With drones lowering inspection costs, airlines can allocate resources more efficiently, investing in proactive maintenance rather than logistics-heavy inspections.

Once we introduce AI into the equation, the use of drones for aircraft inspections becomes even more effective. Drones equipped with AI-powered image analysis can detect minute defects that may be overlooked in manual inspections. This precision enhances the reliability of inspections and reduces the risk of undetected issues which, over time could develop into highly costly issues and more time on ground. It is also worth pointing out at a time when reducing carbon emissions is a challenge for all operators, the use of drones is an environmentally friendly option. To explain in greater detail, faster inspections mean aircraft spend less time on the ground with auxiliary power units running, reducing fuel consumption and carbon emissions.

Challenges and Considerations Facing the Use of Drones

While on the surface it would seem that the use of drones for aircraft inspections makes perfect sense on many levels, that doesn't stop the adoption of any new technology needing to obtain regulatory approval. Aviation authorities such as the FAA and EASA have stringent regulations on drone operations near airports. Ensuring compliance requires airlines to obtain special permissions and to follow strict protocols.

Of course, new technology brings with it the requirement to learn new skills. As an example, technicians must be trained to operate drones and interpret the data they gather. This requires investment in new skill sets, including drone piloting and AI-based analytics. Beyond this, one must also remember that drones cannot be operated in all weather conditions. Their use is severely limited when it comes to periods of high winds and heavy rainfall or snowfall.

Finally, there is the challenge of integrating a new way of operating into an existing aircraft management system. Because the use of drones is so very different to the alternative labour-intensive method of checking an aircraft, the whole inspection system needs to be amended, yet in such a way as not to disrupt other aspects of an existing aircraft management system.

The Future of Drones in Aircraft Maintenance

There is no question that the use of drones in the field of aircraft maintenance will not be limited solely to aiding with inspections. Continual advancements in AI mean that it is unlikely to be long before AI-powered autonomous drones are introduced. These drones will be able to identify and prioritise repairs based on their severity. Then there is the opportunity for hybrid inspections, which will combine drone-collected data with augmented reality (AR) tools to guide technicians during repairs. We then come to the situation we can call 'collaborative robotics' where drones will work in collaboration with robotic arms for minor repairs, massively reducing the need for human input and reducing repair times.

In other words, drones will not be responsible solely for identifying repairs necessary for an aircraft, but they will also play an active role in the repair and maintenance of aircraft as well. The increased use of drone technology in aircraft inspections can be seen as a pivotal shift in aviation maintenance. By enhancing efficiency, safety, and accuracy, drones are helping airlines and MROs to meet the demands of a fast-paced industry without compromising on safety. While challenges remain, the benefits far outweigh the drawbacks, meaning that drones are already an indispensable tool in the future of aviation maintenance.


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Maintaining Aircraft Dent and Buckle Charts: A Guide to Structural Integrity

By David Dundas

During their lifecycle, aircraft are subjected to numerous physical stresses, from weathering hailstorms and bird strikes to ground handling incidents. The consequences are that an aircraft fuselage can suffer from dents, buckles and minor structural damage. In general terms these minor structural defects do not affect the structural integrity of the aircraft, however precise documentation of such 'imperfections' is essential to guarantee its continued airworthiness and safety.

We will delve much deeper into not just the purpose of what is referred to as a 'dent and buckle chart', an essential tool for the effective maintenance of aircraft, but also best practices for managing dent and buckle charts, a cornerstone of effective structural monitoring.

What are Dent and Buckle Charts?

A dent and buckle chart is an ongoing and historic, comprehensive, detailed record of all structural imperfections identified on an aircraft. The details provided in these charts will include the location of the imperfection, usually by means of a grid reference system. The size and depth of any imperfection, including its diameter and depth, are also recorded as a means of helping to determine the extent of the damage.

The imperfection will also be assessed for its 'acceptability' based on manufacturer's guidelines for permissible limits and whether it will subsequently need to be repaired. Because a dent and buckle chart is a continuous record of events affecting a particular aircraft, over time you will end up with a 'living document' which will continue to evolve over an aircraft's lifetime, showing that all structural issues have been tracked, assessed and where appropriate, repaired.

What is the Importance of a Dent and Buckle Chart?

The principal role of a dent and buckle chart is to ensure an aircraft's airworthiness. Even minor structural imperfections can compromise an aircraft's integrity if left unchecked. By

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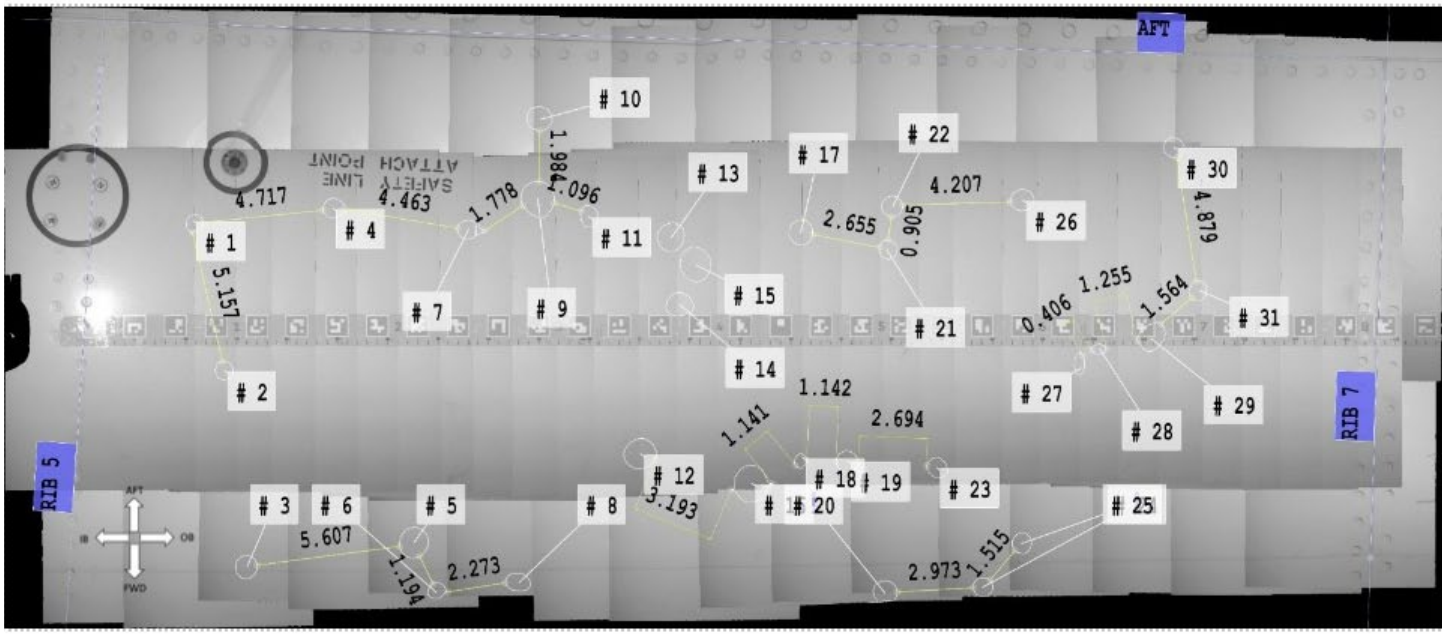

ID	Defect	Depth (Y)	Width (A)	Length (B)	Width/Depth (A/Y)	Length/Depth (B/Y)	AFT - A Dist.	AFT - B Dist.	RIB 5 - A Dist.	RIB 5 - B Dist.	RIB 7 - A Dist.	RIB 7 - B Dist.	Closest Dent ID	Distance
1	Dent	-0.0099	0.621	0.697	63	70	7.684	7.452	4.002	3.717	46.392	46.034	4	4.717
2	Dent	-0.0039	0.694	0.722	179	186	13.503	13.133	5.573	5.206	44.984	44.651	1	5.157
3	Dent	-0.0081	0.855	0.899	105	111	21.143	20.701	6.917	6.464	43.853	43.450	5	5.607
4	Dent	-0.0029	0.755	0.847	265	297	7.032	6.645	9.418	9.010	40.955	40.505	7	4.463

Large-area scan result from a hail-damaged stabilizer © *8tree*

maintaining accurate records, technicians can monitor changes over time, making sure they remain within safe limits. A dent and buckle chart is also a key element of the documentation required to be kept as proof of compliance required during inspections and audits as aviation authorities such as the FAA and EASA require airlines and maintenance organisations to document and manage any structural damage.

A dent and buckle chart also tends to help with cost management. This is principally because minor defects can be dealt with at the appropriate time, rather than being allowed to develop into something more serious, and costly, resulting in easily avoidable downtime. Last, but by no means least, a comprehensive and up-to-date dent and buckle chart will help an aircraft to maintain its maximum value. The chart is a means of providing transparency about its structural history, thus helping to increase buyer confidence.

What are the Best Practices for Maintaining a Dent and Buckle Chart?

To begin with it is vital that inspections are thorough and consistent. Consequently, technicians will need to be trained to both identify any damage to an aircraft using such equipment as a depth gauge and borescope, and also how to correctly document that damage. Where record keeping is concerned, it is vital to adopt a clear and standardised template for dent and buckle charts. This makes it easier for different teams and regulatory authorities to understand and interpret the data.

With constant advances in technology, thanks to modern maintenance management systems (MMSs), dent and buckle charts are now digitised. The main advantages of this are that digitised records are easier to keep up to date, information is more easily accessed across multiple hubs, and digital records are also integrated within predictive maintenance systems.

As previously mentioned, the dent and buckle chart is a historic record of every structural defect found on an aircraft over time. That record of defects also includes a note of each and every inspection made. This means that after every scheduled or unscheduled maintenance check, the chart must be reviewed and updated. New findings should be logged, and any existing damage re-evaluated for any changes.

In many instances, in their Aircraft Maintenance Manuals (AMMs) manufacturers like Boeing and Airbus provide detailed limits for acceptable dents and buckles. Technicians should always consult these guidelines before deciding on whether repairs to any damage are required, or if it can safely be deferred.

If the identified damage to an aircraft exceeds allowable limits, then it is vital that repairs are immediately instigated and coordinated to minimise downtime and ensure that no further damage is caused

to the aircraft. Once the repairs required have been documented, the work should be carried out and the repairs recorded on the dent and buckle chart, together with a post-repair status update.

Finally, it is important to ensure that all maintenance staff and technicians are regularly trained and updated with the latest techniques, tools and regulatory requirements and that dent and buckle charts are managed accordingly.

What Are the Most common Challenges Facing the Maintenance of Dent and Buckle Charts?

To begin with there is the problem of inconsistent documentation where, without standardised processes, records can become incomplete or difficult to interpret, potentially leading to oversights. Then there is human error, something that is very difficult to eradicate completely. Consequently, mismeasurements or failure to update charts after inspections can compromise accuracy. While lack of transparency and sharing of data can lead to discrepancies. Thus, dent and buckle charts should be maintained neither manually, nor locally as this will hinder information sharing between maintenance hubs.

Finally, there is the problem of hard-to-reach areas on an aircraft where it can be difficult to identify any damage without very close inspection. Fortunately, that problem has been alleviated to a degree with the introduction of new inspection techniques and tools, such as drones or robotic systems.

What Are the Recent Innovations in Dent and Buckle Management?

There have been a considerable number of advancements in modern technology which have had a tremendously positive impact on how dent and buckle charts are effectively maintained. A prime example of this is the introduction of drones with high-resolution cameras for inspections. Drones equipped with high-resolution cameras can more efficiently and accurately capture detailed images of dents and buckles, even in hard-to-reach areas. When combined with the power of AI this has become something of a game changer. AI tools can analyse images of structural damage to provide precise measurements and suggest classification based on regulatory standards.

Performing a leading-edge scan with the dentCHECK tool © *8tree*

We then have the use of 3-D modelling. Here, digital twins and 3-D mapping tools enable a detailed visual representation of an aircraft's structural condition, seamlessly integrating dent and buckle data. Finally, we have blockchain for records where blockchain technology ensures secure, tamper-proof documentation of maintenance history, adding trust and transparency.

To conclude, maintaining dent and buckle charts is an essential part of aircraft maintenance, safeguarding structural integrity and operational safety. By adopting best practices and leveraging modern technologies, airlines, owners and MROs can all ensure these records are accurate, accessible, and actionable. As the aviation industry continues to evolve, robust dent and buckle charts will remain a vital tool for the safe and effective maintenance of aircraft.

PEOPLE

on the move

Michael Sattler

Eirtech Aviation Services, a sister company of International Aerospace Coatings (IAC), has announced the appointment of **Michael Sattler** as President. Based at the company's headquarters in Shannon, Ireland, Sattler brings over 30 years of aviation experience to the role. Prior to joining Eirtech Aviation Services, he held senior leadership positions at prominent companies, including Jet Aviation, SR Technics, RUAG Aviation and Contact Air Technik. His extensive industry expertise spans the military, corporate and commercial aviation sectors, equipping him well to lead Eirtech Aviation Services as it continues to grow. **Martin O'Connell**, CEO of IAC Group, expressed his enthusiasm for Sattler's appointment, highlighting Sattler's deep understanding of the industry and the company's services. "We are delighted to welcome Michael to the team and look forward to future growth together. His aviation leadership is invaluable as we continue to expand IAC Group," O'Connell said. Sattler's appointment comes at a time when Eirtech Aviation Services is focused on further development and aims to strengthen its position within the aviation sector.

Hervé Grandjean

Sabena technics Group, a prominent European provider of civil and government aeronautical services, has appointed **Hervé Grandjean** as CEO of the Group, effective January 1, 2025. Grandjean will succeed **Philippe Rochet**, who has successfully led the Group since 2019.The leadership transition takes place during a period of significant growth for Sabena technics, largely driven by investment from funds such as Sagard, Towerbrook and BPI France. Over his 18 years with the Group, Rochet has played a pivotal role in expanding and strengthening Sabena technics, doubling its business volume and securing an international presence in both the civil and defence markets. Grandjean brings a wealth of operational and strategic expertise to further Sabena technics' development and reinforce its position as a leading aeronautical services provider. Grandjean began his career in 2007 in the French Navy as an armament engineer responsible for the maintenance of combat ships in Brest. He later held various senior positions within the French Defence Procurement Agency (DGA) before being appointed industrial advisor to the French Minister of Defence in 2017. In 2021, he became the Ministry's spokesperson. After joining EDF in 2022 as Director of Operations and Strategy for France's new nuclear programme, Grandjean came to Sabena technics in January 2024 as Chief Commercial Officer. His extensive experience in defence and strategy is expected to drive Sabena technics' ongoing growth and solidify its market leadership.

Stéphane Cueille (l) and Bruno Bellanger (r)

Safran Aircraft Engines has announced the appointment of **Stéphane Cueille** as CEO, effective January 1, 2025. He will succeed **Jean-Paul Alary**, who has chosen to pursue his career outside the group. Cueille will assume his new role following Alary's notice period. In a related transition, **Bruno Bellanger** has been named CEO of Safran Electrical & Power, effective January 1, 2025, and will also join the Group Executive Committee. Bellanger will step into the role currently held by Cueille. Cueille brings extensive experience to Safran Aircraft Engines. He began his career with Snecma in 1998, focusing on ceramic matrix composites (CMC). He later held multiple management roles at the French Defence Procurement Agency (DGA) in the aircraft propulsion and missile-space sectors. In 2008, he returned to Snecma, where he served as repair general manager within the Military Engine division and subsequently became the director of the Turbine Blade Centre of Excellence. In May 2013, Cueille was appointed Managing Director of Aircelle Ltd, the UK subsidiary of Aircelle (Safran Nacelles) based in Burnley. By January 2015, he was leading the Group's Research & Technology (R&T) centre, and in 2016, he became Senior Executive Vice President for R&T and Innovation, joining the Safran Executive Committee. In 2021, Cueille was appointed CEO of Safran Electrical & Power. Cueille is a graduate of the École Polytechnique (1991) and holds a postgraduate degree in solid-state physics along with a PhD in statistical physics (1998).