

OCTOBER 2014

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AIRCRAFT MAINTENANCE TECHNOLOGY

BUSINESS AVIATION

TEXTRON AVIATION COMMITS TO SERVICE

400XPR program provides new engines, aerodynamic winglets, avionics, interiors, and paint all available as an a la carte upgrade menu

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4 is the number of significant performance benefits Bell 407 and MD 600 customers will receive with the new Rolls-Royce Value Improvement Kit available through the M250 FIRST Network and Aviall. With this kit, you will **1)** increase your range, **2)** increase your service ceiling, **3)** improve your performance and **4)** consume less fuel. Contact your Aviall representative for details. **Aviall Delivers.**



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COVER STORY

MARTIN TRUEX Jr.'s Hawker 400 features his racing color scheme (with Sherwin-Williams coatings) and interior upgrades performed at a Textron Aviation Service Center in Wichita. **TEXTRON AVIATION**



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THE BUSINESS OF AIRCRAFT MAINTENANCE

AMT continues to keep you informed in our own new creative ways

This month thousands of aviation professionals from around the world will gather in Florida to attend the Business Aviation Convention & Exhibition (NBAA2014) at the Orange County Convention Center in Orlando, FL. To celebrate business aviation this month's issue of *AMT* takes a deep look into some of the strategies from leaders in the business aviation segment that can help you in your continued success.

In this month's cover story, leaders from Textron Aviation, now home to the iconic brands of Beechcraft, Cessna, and Hawker, speak about the ongoing support to their combined brands.

Jim Sparks, regular contributor to *AMT* and current chairman of the NBAA Maintenance Committee talks about the strategies used by the committee to address key initiatives supporting its members in his article titled, Business Aviation Supports the Maintenance Function.

In an exclusive interview with *AMT*, Peg Billson, president and CEO of after-market services for London-based BBA Aviation, describes the strategies she uses for her company as well as her personal climb to success in this industry.

Two industry-leading business aircraft MROs, Elliott Aviation and West Star Aviation, describe both the challenges and strategies used to meet demanding requirements by customers wanting new and at times exotic interiors in their aircraft.

Mecaer Aviation Group sees and describes many of the same challenges and strategies required with customized interiors in rotorcraft today. Mecaer feels that customizing new aircraft has become more encompassing with respect to aircraft systems, engineering, avionics integration, with an exponential increase in luxury.

Although this month's issue does focus on business aviation, *AMT* has and will continue to provide aircraft maintenance content directed at all segments of the aviation industry. This month you can also read about the strategy used by Air New Zealand Technical Operations and its move to the PinPoint Electronic Tool Control System from HABCO. We also provide a detailed look into the new MRO facility emerging to support the expansion of Turkish Airlines: Turkish Technik.

Keeping the dynamic industry we are part of informed also requires a strategy. *AMT* has been putting out a strong product for 25 years, and because keeping you our readers abreast of the changing aviation industry and strategies for success, we are working even harder to stay ahead of all the trends, best practices, and strategies by taking our editorial focus to the next level. In this issue of *AMT* you will see some of these strategies and dramatic changes with more compelling photographs and relevant content. Whether business practices, trends, best practices, or technical issues, *AMT* is, and will remain, the leading source for management, operations, and insight relating to aircraft maintenance.

Enjoy, Ron

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We want to thank Boise Cascade for being the initial customer to take that leap of faith to enroll on a JSSI program. It required foresight, an open mind and the willingness to take a chance on a new concept and a young company. We thank you, our loyal customers, who have entrusted us with your aircraft over the years. Thank you to the OEMs, who have worked hand-in-hand with us as we developed innovative programs like Tip-To-Tail®, the industry's only single-source maintenance plan. And thank you to all of the maintenance providers that have worked alongside our technical advisors to deliver outstanding service.

All of this begs the question, "Where do we go from here?" Stay with us throughout this, our 25th anniversary year, and we'll share some of our future plans. Because, thanks to you, even after 25 years, we're just getting started.

Neil W. Book,
President & CEO, JSSI

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MANAGEMENT STRATEGIES: FOCUS ON AFTERMARKET SERVICES

An interview with Peg Billson, president and CEO of BBA Aviation

By Charles Chandler

This year *Aircraft Maintenance Technology* is celebrating its 25th year of publication and contributors have been asked to focus on some of the industry changes that have occurred over those 25 years. Prior articles addressed changes in aircraft technology, the churn in company and aircraft ownerships, and globalization of customer services. Changes in the “people” side of our industry have been just as remarkable. Today our corporate executives and industry professionals are focusing on industrial engineering, human factors, worker safety, and ensuring that AMTs have the necessary technical, communication, and customer relationship skills.

For a top down perspective on some of the technological, business, and HR changes, *AMT* magazine interviewed Peg Billson, who in January 2013 was promoted to president and CEO of aftermarket services for London-based BBA Aviation, a global company that employs around 12,000 people at 220 locations on five continents. BBA’s Aftermarket Services are delivered by Dallas Airmotive, Premier Turbines, H+S Aviation, International Turbine Service, W.H.

Barrett Turbine Engine Company, International Governor Services, and Ontic. They repair and overhaul small thrust turbine engines, and manufacture and service aerospace components and systems from 20 locations worldwide.

Billson began her aviation career 30 years ago

“designing, developing, building, supporting, and/or selling aircraft and aircraft components.” She held leadership roles with Eclipse Aviation, Honeywell Aerospace, and McDonnell Douglas, earned a bach-

elor of science in aeronautical engineering from Embry-Riddle University and a master’s degree in aerospace engineering from California State University, and is an instrument rated private pilot.

We asked Billson to discuss her management strategies, how BBA Aftermarket Services differentiates their products and services, changes she has experienced over the past 30 years, and what it takes to go from an entry-level engineer to CEO and president with a seat on BBA’s Executive Management Committee.

AMT: After reviewing the profiles of the Aftermarket Services companies, it would appear challenging to manage businesses that have such diverse cultures, are dispersed around the globe, and deliver a variety of products and services?

Billson: On the surface our organization looks complicated but it is actually really simple. We market our products and services under seven different brands and provide three major services — engine repair and overhaul, aircraft systems & equipment MRO, and new OE and spare part manufacturing. Our major brands — Ontic, Dallas Airmotive and H+S Aviation — are responsible for producing and selling quality products to our customers. Our brands do not compete head-to-head and we have a culture of working together for the greater gain, looking for natural connections where we should be working together. For example, we have separate sales forces for our engine repair and overhaul and Ontic businesses, but they attend each other’s sales conferences to share information and contacts.

AMT: What differentiates BBA’s Aftermarket Services from other companies?

Billson: We are experts in small thrust business aircraft engines and maturing and legacy



PEG BILLSON,
president and CEO of
BBA Aviation.
BBA AVIATION



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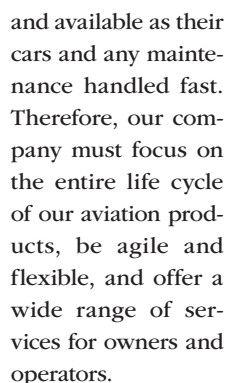
fleets. We collaborate closely with OEMs and the services we provide are either as a licensed OEM building parts or as an independent authorized repair and overhaul facility. All our PMAs are in collaboration with and under the authorization of the original OEM.

AMT: The press releases about the rate of change and churn in our competitive industry can be concerning. Tell us about some changes that you are seeing in the aftermarket segment.

Billson: Because of the uncertainty in our current market, interesting and fundamental shifts are tak-

ing place. For example, as new commercial airliners come into service, third parties are offering to buy and organize the initial provisioning of parts and spare components for a fee, saving each airline a large amount of money, but with an understanding that they get the repair and overhaul contracts for these same parts and components.

Another big change is consumers expect to buy quality products and are increasingly not very tolerant of breakdowns. When something does break we expect it to be fixed or replaced fast. Aircraft owners and operators are no exception. They expect their multimillion dollar aircraft to be as reliable



For new products less than 10 years old there is more on-demand, on-condition repairs and maintenance. Engines like the HTF 7000 and the GE Passport Engine don't require the traditional overhaul cycle; its maintenance is condition dependent. Concurrently, legacy aircraft still require support and we have a company like Ontic that focuses on traditional repairs and component manufacturing to support these maturing fleets.

These changes in new products and customer expectations will require the support network to become more diverse

and be provided locally and regionally. We will have less concentrated centers and more diverse facilities that can handle a breadth of products in more places.

AMT: Are you concerned about the graying of our aviation work force and being able to staff your organizations with enough qualified maintenance personnel to meet your business goals?

Billson: I have seen the demographics and heard the arguments that we are going to lose our talent and fall off the prover-

bial cliff. I don't think it is going to be a cliff, but we do have to pay more attention to career paths and offer interesting and meaningful work in order to recruit and retain qualified employees. We can't

have the same hiring practices and offer the same jobs that we did 25 to 30 years ago and expect to attract new workers to our industry. BBA's approach is to provide apprenticeship programs in our UK com-



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panies and internship programs in our domestic U.S. companies. We also need to support good technical and A&P schools and provide necessary in-house training.

AMT: From your experience can you tell us about some of the changes that you have seen in our work force?

Billson: The biggest difference in today's work force is the desire and expectation of being engaged in the decision-making process of daily work. Current workers believe that no matter what role they play in the organization, they bring a certain level of expertise and talent to the job so they expect to be engaged in the decision making. We also find that today's work force is very willing to collaborate and we see a mutual respect between the maintenance employees, engineers, customer services, and sales staff.

They understand it takes team work and the collective knowledge of the team to know what to do. We need employees that can not only manage aviation technology,



but interact and communicate effectively with the customer.

AMT: Tell us about your career path that led from an internship at McDonnell Douglas in California to the board room at BBA.

Billson: When I was 14 years old I became very passionate about aircraft and aviation. That is just as intense today as it was then. I did not deviate nor allow anyone else to diminish my passion. When people suggested that I could not or should not do something because I was female, I ignored the suggestion and

stayed on my path. Over my career there were many colleagues and managers that gave me the space to keep focused on my passion. I will always be grateful to the great mentors who let me succeed and fail at various tasks and jobs that provided those experiences which helped me get to this position. For everyone that said that I could not do something, there were 10 more that were supportive. I achieved my personal and career goals by staying focused on what I loved to do.

When interviewing industry standouts it has been the editor's experience that they are exceedingly humble and defer personal accomplishments to their mentors,

coworkers, and managers. Rising from an engineering intern at McDonnell Douglas; to managing and leading several major business units and programs at McDonnell Douglas, Honeywell, and Eclipse Aviation; to her current role as president and CEO of BBA Aftermarket Services, it appears that Billson had few failures along her career path. Focused indeed. **AMT**

AMT thanks Peg Billson for taking time from her busy schedule to provide insight into the aftermarket services business and to share her success story with us.



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THE AIRCRAFT HARVEST

HOW TO PROFIT

FROM AIRCRAFT RETIREMENT

A typical commercial narrow body aircraft on a nose to tail disassembly will produce around 2,000 parts; 20 percent of the parts typically carry 80 percent of the value

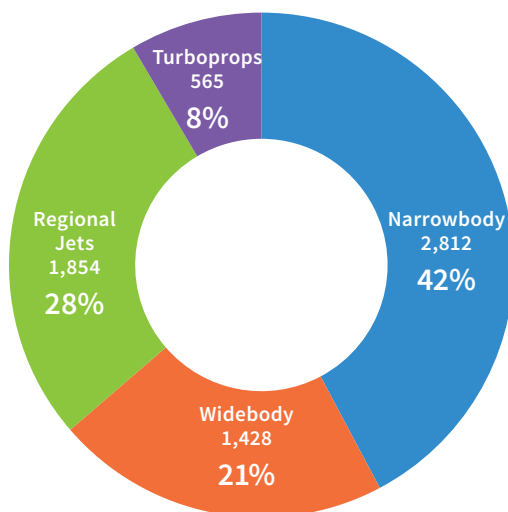
By Tim Knutson



THE COMPOSITION
of the retiring aircraft over the next 10 years is forecasted to be approximately 43% narrow bodies, 21% wide body aircraft.

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AIRCRAFT RETIREMENTS 2014 - 2024



AS OPERATORS SEEK MORE FUEL-efficient and environmentally friendly aircraft utilizing some of the lowest cost large equipment finance options in decades, the retirements of older models are accelerating. Aviation experts are forecasting that around 6,000 to 7,000 commercial aircraft will be replaced in the next 10 years globally. Historically low interest rates, higher fuel costs, and new technologies are all contributing to the increase in aircraft retirements.

Currently, the worldwide commercial air transport fleet stands at approximately 23,000 aircraft, both jet and turboprop powered. With annual air traffic growth at around 5 percent and over 3 billion passengers flying per year, aircraft deliveries will exceed 16,000 in the next 10 years. After aircraft retirements, the global fleet will be over 32,000 aircraft by 2024.

The composition of the retiring aircraft over the next 10 years is forecasted to be approximately 43 percent narrow bodies, 21 percent wide bodies, 28 percent regional jets, and 8 percent turboprops. With the historically high usage of leased aircraft by operators, the ease of replacing older models will certainly continue. So, what happens to all of these aging aircraft that will be pulled from service and parked?

A number of aircraft, approximately 2,000 to 3,000, have simply been abandoned in mostly developing countries. Many of these are scrapped due to the high rate of part cannibalizing and general disrepair of the aircraft. Others are parked in various storage facilities predominantly in the southwest U.S., the climate being optimal to keep corrosion to a minimum.

For most of these aircraft, the engines carry the majority of the

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A PARTS removal tag is required for each part that lists the exact part number, description, condition, as well as the aircraft serial number, date, and mechanic's name and license number.

PHOTO PROVIDED BY AIRTEAMIMAGES.



TIM KNUTSON

has over 28 years in commercial aviation holding positions of Material Requirements/Service Recovery, Director of Materials, Managing Director of Technical Operations, and VP – Operations. Currently Tim is the Director-Asset Management with Newcastle Aviation Partners, LLC in Burnsville MN. For more information visit www.newcastleaviation.com.

residual value and if they remain on-wing, will be pressed back into service at some point. Most of the legacy aircraft such as DC-8's, DC-9's, DC-10's; B707's, B727's, older B737's and B747's, will not fly again. These first generation aircraft offer very little in terms of a part-out exercise. However, the non-classic Boeing and Airbus models are attractive disassembly prospects and can provide value through component support to operators.

END-OF-LIFE SOLUTIONS

Newcastle Aviation specializes in end-of-life solutions across aircraft platforms by assessing certain types of airframes, engines, and components that we believe will provide maximum value to the marketplace as supply/demand dynamics continue to evolve and the world fleet changes. A number of factors come into play when considering and then processing a particular aircraft for part-out. Besides the geo-political, regulatory and governmental implications associated with the asset's location, performing the pre-delivery records review and physical inspection must be carefully planned and executed. But before any of this occurs, one critical step will come first. We undertake an in

depth demand profile analysis of the asset to obtain a clear picture of the teardown value and optimal exit strategy for the asset.

A typical commercial narrow body aircraft, for example, on a nose to tail disassembly will produce around 2,000 parts (airframe only) depending on how extensive the part-out is. By utilizing OEM illustrated parts catalogs (IPC) and Newcastle Aviation's proprietary aircraft parts valuation and demand forecast modeling, we are able to hone in on which components will provide the most value to the market at the best return on investment. The 80/20 rule generally applies to any part-out project: 20 percent of the parts typically carry 80 percent of the value and these are the components that garner most of the attention.

CATEGORIZING PARTS

Besides sophisticated valuation and demand modeling, another key consideration when looking to monetize an aircraft is the dispatch criticality of each component. Parts that are flight critical and have a no-go status are labeled as Category 1 items. Hydraulic components, wheels and brakes, flight deck instrumentation, and navigational equipment are some examples of these kinds of parts.

Even if the demand analysis is somewhat weak and market saturation is high, these parts are still good candidates to stock for customer support.

Category 2 parts are critical but are listed in the Master Minimum Equipment List (MMEL) so they have a level of dispatch relief. Category 3 parts cover a broad spectrum of ATA chapters including accessories and flight controls.

Lastly, Category 4 components would typically be interior parts and structural items. Categorizing components helps prioritize the workflow during a part-out and adds an additional level of intelligence when considering what to remove from the aircraft.

LOGISTICS AND QC

Logistics and quality control are essential elements to any disassembly project. Where the asset is physically located and its airworthy condition determine the first steps; does the aircraft have to be moved to a part-out facility or can mechanics be dispatched to where it currently is parked. Security of the asset is paramount.

Once ownership has transferred, it is essential that the aircraft is in a safe and secure location and that it is intact as described in the purchase agree-



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ment. If the aircraft must be parted-out in a remote location, environmental concerns must also be addressed. Along with this, final hull disposal must be arranged for.

Any components removed from the aircraft must be done so as per the maintenance manual and identified using the aircraft IPC. A parts removal tag is required for each part that lists the exact part number, description, condition, as well as the aircraft serial number, date, and mechanic's name and license number. A master removal spreadsheet is updated with all the removal activity on a daily basis.

INVENTORY AND REPAIR COSTS

Another significant aspect of any disassembly project is that once the parts are removed and now reside in a warehouse in as-removed condition, what level of repair dollars should be invested in the inventory on the front end? What parts should repairs be invested in? Which ones should not? What is the exit strategy for both?

Operators often cannot absorb any lead time for a part due to the criticality of the requirement. Thus, a certain amount of investment is made to have parts in stock on an immediate basis. Utilizing the aforementioned demand analysis again provides a solid tool that will pinpoint specific components that need to be inspected, tested, repaired, or overhauled. Also, Category 1 parts that can prevent a flight from dispatching are closely reviewed for repair opportunities. Even if the overall demand is low, these no-go units are prime candidates to invest in. Of course, even with this type of analysis, market demand trends and eventual supply saturation of any component still must be carefully evaluated and managed on an ongoing basis.

RETIREMENT STRATEGIES AND ASSET MANAGEMENT

Per Steve Hendrickson, CEO at Newcastle Aviation, "Our ability to offer cost-effective materials support and asset management solutions depends



THIS WAREHOUSE photo of B747 material shows harvested components are still good candidates to stock for customer support.

on our ability to develop and utilize the most cutting-edge market intelligence and asset valuation tools available today. This is critical to helping our end-user customers reduce and manage their operating and ownership costs throughout the life cycle of their fleets. This includes initial inventory provisioning, economies of scale repair management and spares pooling, asset leasing, inventory sale leasebacks and consignment, as well as working closely with them to design and implement fleet retirement strategies that maximize the return on their end-of-life aircraft, inventory, and related support equipment."

As the world's commercial fleet continues to be transformed both in size and composition, the number of aircraft retirements is increasing. The average aircraft age has fallen below 24 years and considering the average was almost 30 years as recently as 2008, this is a significant decrease. In addition, with the entry of new aircraft such as the A320NEO and B737MAX, further pressure will be placed on the disposition of the global fleet

of existing A320's and B737NG's.

Approximately one-third of the world's fleet resides in North America, Western Europe has 20 percent, Eastern Europe has 5 percent, and China, Asia Pacific, and India combine for about 25 percent. While North America will actually see a decline in its market share, emerging markets will see an increase. More mature aircraft will still find a home in these markets, driving demand for parts. The net result is that the wave of forecasted aircraft retirements presents numerous opportunities for aftermarket suppliers to harvest airframe and engine components and help reduce the cost of ownership and ongoing operating costs for airlines.

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OPENED EARLIER this year, the MRO facility at Istanbul's Sabiha Goken (SAW) Airport represents a \$500 million investment and provides 380,000 square meters of space.

TURKISH TECHNIC

A NEW MRO PLAYER EMERGES

Turkish Airlines' goal is to rank among the world's five largest MRO providers; a new facility and an investment of \$550 million shows its dedication

By Ronald Kuhlmann

Founded in 1933, Turkish Airlines (TK) spent the 20th century as a nondescript regional player with little notice outside its operating area — but in 2003 the game changed. Capitalizing on Istanbul's strategic location, the airline has since grown to be one of the world's most prominent carriers, with a route network larger than that of any other airline. In some ways, this growth arc and geographic advantage appears to be a variation on the model established by the Gulf carriers that have also, in the past decade, reached round the world and created new patterns of travel for millions of flyers.

But the comparison is tenuous at best. While the Gulf carriers are building flying hubs, Turkey, with a population of 75 million, is interested in becoming an *aviation* hub, replete with manufacturing and support facilities. Istanbul's geographic position puts 55 countries within a 3.5-hour flight radius; a huge demand pool for aviation services.

And with the opening of a striking new MRO facility at Istanbul's Sabiha Goken (SAW) Airport

earlier this year, the airline has vastly increased its capacity and resources. Begun as a greenfield project in 2010, it is one of the largest MRO facilities in the world and, unlike many of its counterparts, was built as a single complex designed to provide full MRO facilities as well as a certified training center. The complex, which represents an investment of \$550 million, is one of the largest infrastructure projects ever undertaken in Turkey and provides 380,000 square meters of space.

A MANUFACTURING SITE AS WELL

It also is the nucleus of a growing aviation industry in Turkey, with Turkish Seat Industries (TSI) and Turkish Cabin Interiors (TCI) already producing seats and galley sets for the Turkish Airlines fleet, with the intent to become a player in the global market.

The facility is operated by Turkish HABOM (an acronym for the Turkish full title), an MRO company established in 2013 within the Turkish

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Airlines group. It was created when labor and wage disputes at the existing MRO company, Turkish Technic, threatened the viability of future plans. However, those issues have been resolved and within the year, the full MRO program will again operate solely under the Turkish Technic logo.

THE FACILITY currently employs about 1,000; it is expected that 5,000 will eventually be employed. Turkish Technic will train many of its staff in an apprenticeship program with a six-month course followed by oversight and mentoring until the staff member is fully trained and licensed. And as the signage indicates, a full set of amenities is provided for employees.

PHOTOS PROVIDED BY
RONALD KUHLMANN

The new campus is in addition to an existing facility at Istanbul's main international gateway, Ataturk Airport, which has an MRO infrastructure large enough to handle the current Turkish Airlines fleet. Therefore, the size and scope of the SAW campus is a measure of the group's dedication to the expansion of the MRO sector, a means by which to achieve the group's goal of ranking amongst the world's five largest MRO providers. Like the airline it serves, Turkish Technic is determined to be a major player in the global aviation marketplace.

TWO YEARS TO FULL UTILIZATION

As the new facility becomes fully functional, a process estimated to take as long as two years, the focus will be on third-party work, with a major Gulf operator being the first major customer and work on six A330s and one A320 already scheduled. Eventually, the breakdown of work will be 75 percent third party/25 percent TK at SAW and 75 percent TK/25 percent third party at IST. Some functions will continue to be located at Ataturk but there is room at SAW should additional facilities be required.

The new campus has full certification from U.S. and EU authorities. While the focus remains on traditional metal aircraft, they have bought autoclaves that will be installed soon, allowing for the inclusion of carbon fiber aircraft maintenance.

There are two maintenance hangars at SAW, a narrowbody hangar with capacity for 11 aircraft and a widebody hangar capable of holding three aircraft simultaneously. The widebody section also includes a paint bay that can accommodate one widebody aircraft or be subdivided to handle two narrowbody aircraft. At present, four bays are operational with others being brought online as demand increases. Beginning in the fall, with the high summer flying season completed, the facility is fully booked.

Adjacent to the hangars is a composite shop that is divided into bays dealing with specific parts and components. As with the hangar bays, the shop space is only partially occupied at the present time and will grow with expansion.

MEETING THE PERSONNEL NEEDS

The facility currently employs about 1,000 staff, roughly 20 percent of the anticipated 5,000 that will eventually be employed. And staffing is a primary concern, as the need for licensed workers will grow rapidly in the next few years.

To meet that need, one of the buildings is a university level training and classroom facility that will be used by Turkish Technic, but is also available to third parties needing state-of-the-art training facilities. Like many of its European peers, Turkish Technic will train many of its staff in an apprenticeship program: beginning with a six-month course, followed by a period of oversight and mentoring until the staff member is fully trained and licensed.

Since Turkish Technic also does line and ramp maintenance, the rapid expansion of Turkish



Airlines has created a need for continual increases in staff numbers. In view of this heightened need, the airline group is also working with local technical universities to provide the necessary programs to meet its needs.

The entire campus is designed to be LEED Gold compliant and a great deal of effort has been put into environmental certification. The entire facility is self-sufficient in power generation, with gas turbines capable of providing 30MW — supplemented by solar and geothermal installations as well. The complex is temperature controlled by 150 kilometers of pipes linked to a geothermal generation unit, providing the heating and cooling essentially for free. There is also a full on-site recycling program as well as a building dedicated to chemical storage and waste.

CONNECTIONS FOR

each maintenance bay are integrated into the construction of the facility.



TK VERTICAL stabilizer being overhauled in one of the backshops.

PHOTOS PROVIDED BY
RONALD KUHLMANN

It is also designed to be a good place for people to work with fitness facilities, a full clinic, cafeteria, and even a mosque capable of holding up to 2,000 for Friday prayers.

AND YET TO COME?

The new installation is able to handle any current aircraft with the exception of the Airbus A-380. With Turkish Airlines

rumored to be in the market for a larger aircraft, and a decision to be made before the end of 2014, one is led to ponder whether this limitation will favor the Boeing 747-8 — an aircraft compatible with current facilities.

And there is the unanswered question regarding the MRO installations that will be a part of the New Istanbul Airport, now under construction and due to open phase 1 in 2017. Upon completion of the third and final phase, it is envisioned to be the world's largest airport with an annual passenger capacity of 150 million. When it becomes operational, Ataturk will cease

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AS THE facility becomes fully functional, a process that could take up to two years, the focus will be on third-party work, with a major Gulf operator being the first major customer.

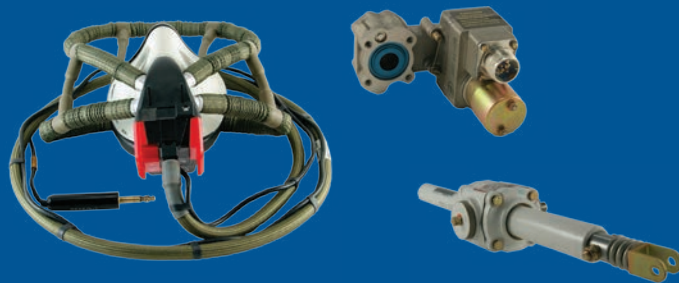
PHOTOS PROVIDED BY RONALD KUHLMANN

commercial operations and the new field will become Turkish Airlines' main hub. By that time the TK fleet could number up to 450 aircraft and the maintenance needs at the new airport will be substantial. At the present time, it is unknown as to whether yet another major MRO facility will be constructed at the new site or if TK aircraft will be ferried to existing installations for major overhaul.

Since the newly opened campus at SAW is designed primarily for third-party work, the real question concerns the future location of major workspace for Turkish Airlines' aircraft. What is clear is the determination by the Turkish Group to become a major player on the global MRO stage, and given the astonishing success of the airline at its core over the past decade, one would be ill advised to wager against its successful achievement of that goal. **AMT**

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TEXTRON AVIATION

400XPR program provides new engines, aerodynamic winglets, avionics, interior, and paint all available as an a'la carte upgrade menu

By Ronald Donner



Now home to the Beechcraft and Cessna businesses, one look at the new Textron Aviation logo clearly shows the iconic brands of Beechcraft, Cessna, and Hawker remain distinct, with a combined portfolio

of complementary general aviation products and services.

Brad Thress, senior vice president, Customer Service, says, "Textron Aviation stands fully committed to service capabilities

COMMITTS TO SERVICE



APPLICATION OF the Sherwin-Williams Acry Glo Black to the Hawker 400XPR (facing page). This page: Martin Truex Jr.'s Hawker 400XPR features his racing color scheme and interior upgrades performed at a Textron Aviation Service Center in Wichita.

TEXTRON AVIATION

supporting Beechcraft, Cessna, and Hawker owners. Our combined global service network continues to provide uninterrupted service and support for all Hawker aircraft. With 21 worldwide company-owned service facilities, the Textron Aviation global service network remains available for service, maintenance, and technical support for all Hawker and Beechcraft, as well as Citation, aircraft.”

Wichita Mid-Continent Airport now sports two Textron Aviation service facilities — one located on the airport’s east side and one located on the airport’s west side. Between the two Textron Aviation Service Centers customers spanning the Beechcraft, Cessna and Hawker brands can bring their aircraft to Wichita for maintenance, inspections, parts, repairs, avionics

upgrades, equipment installations, refurbishments, and other specialized services.

THE HAWKER 400XPR

This small cabin jet has a long history which began decades ago. In 1986 Beechcraft bought the rights to produce the aircraft and it was re-designated as the Beechjet 400. Brian Howell, vice president, Parts, Programs and Business

Development with Textron Aviation, explains in mid-2012 the Hawker 400XPR program was launched which incorporated several performance enhancements such as aerodynamic winglets and the Williams International FJ44-4A 32 engine, along with the latest in flight deck avionics, custom interiors and exteriors, and a cabin management system, all available as an a la carte menu for customers.



AFTER EACH application of paint the entire aircraft surface is thoroughly inspected for any minor imperfections that could affect the quality of the final product.

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Howell says, "These upgrades take the aircraft from a 1,333 nautical mile aircraft to a 1,950 nautical mile aircraft with four passengers and will climb direct to FL490 in only 19 minutes. This can be done by combining the new engine capability of the Williams FJ44-4A with the Genuine Hawker winglets. The upgrade will also decrease the overall operating costs of the aircraft as well as increase resale value. We have also included a significant amount of options the customer could choose as "add-ons" to the upgrade. Both Rockwell Collins Pro Line 21 and Garmin 5000 avionics will be offered, as well as customized interior, new paint, and warranty options that can all be added to the base XPR package."

Regarding maintenance Howell says, "The upgrade doesn't change the overall Chapter 5 maintenance schedule, but it will however increase the TBO from 3,600 hours on the current JT15-D to 5,000 hours on the FJ44. As the OEM of the aircraft, we have also designed a few STCs around some of the most frustrating maintenance aspects of the aircraft (bleed air and nose strut access) to also add in some reliability improvements that should complement the overall upgrade as well."

APPLICATION
OF the white
base coat.
TEXTRON
AVIATION

One new Hawker owner is NASCAR favorite Martin Truex Jr. The Truex Hawker recently underwent an XPR upgrade program at Textron Aviation in Wichita which, when completed, will include the winglet modification, installation of the Williams International engines, an interior refurbishment, other maintenance enhancements, and of course new exterior paint.

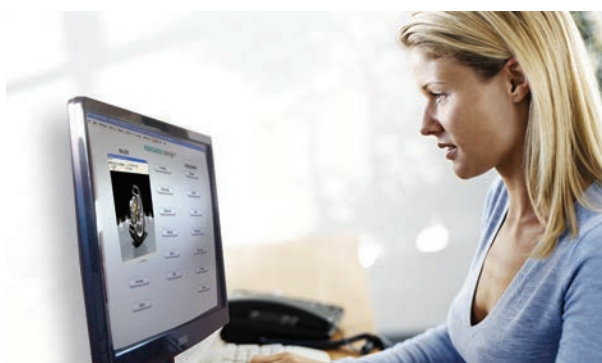
PAINTING THE TRUEX HAWKER

Many critical activities go into an aircraft upgrade, one of those being application of new exterior paint. Currently the Textron Aviation Service Centers in Wichita operate two paint booths with a new state-of-the-art paint booth scheduled to be operational soon. The new paint booth will have a modified cross-draft airflow with full strip and paint capabilities allowing for better control of the paint environment by accurately controlling temperature and air flow, and help eliminate more contaminants such as dust that older style paint booths could not.

Rob Tanner, paint manager, says, "The booth will be a new tool for our painters and will help make the quality of paint jobs better the first time limit-



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ing clean up and detail work. We will also start using state-of-the-art electrostatic paint guns which help with overspray allowing for better paint transfer, a more consistent coat on uneven surfaces, and eliminating waste.”

Tanner explains how understanding what truly *is* a great paint job is the first step in producing a great paint job. He says, “Quality does not happen by accident. Following and controlling the quality of each step of the process ensures a great paint job is done correctly. This means after each step whether it is the existing paint removal process or surface preparation for paint, the aircraft is inspected and areas of concern are identified and corrected before the next step. When the aircraft is delivered it has to not only meet regulatory requirements, but also the quality requirements of the customer. It’s key the customer will like the paint job for the life of the paint job. The only way to do that is to not only deliver a product that is appealing, but one that will also last with the proper care.”

Tanner explains the quality of a paint job is not determined by the booth, but by the detail of work done by the painters. He says of the painters, “We currently have two job types in the paint shop; those who prepare the aircraft and those who paint the aircraft. Both do prep and detail

SHERWIN-WILLIAMS PARTNERS WITH TEXTRON

CHIP MULLINS, GLOBAL SALES DIRECTOR, SHERWIN-Williams Aerospace Coatings, comments, “As the official transportation finisher of NASCAR, our brand’s motorsports people approached us with the opportunity



to partner with Textron Aviation to repaint NASCAR Sprint Cup series driver Martin Truex Jr.’s Beechcraft 400; and we jumped at the chance. Sherwin-Williams Aerospace Coatings enjoys a unique relationship with Textron Aviation because not only are they a top quality paint shop, but they also distribute our full range of aerospace primers and topcoats from their locations in Tampa, Wichita, Indianapolis, and Mexico providing us with unparalleled access to this key marketplace.”

Martin Truex Jr. says, “Having been a partner with and using Sherwin-Williams coatings on my NASCAR vehicles for more than 10 years, I know the importance of always having a winning finish. Just like the gleaming, durable finish on my Furniture Row #78 Sprint Cup Series Chevrolet, when it came to selecting a long-lasting finish for the repaint of my Hawker 400XPR, there was no doubt we were going with Sherwin-Williams’ Jet Glo Express polyester urethane and Acry Glo acrylic urethane products.”

work and the painters apply the base coats and stripes. The people we hire already have paint experience whether it is aircraft or automotive. After we choose a candidate for a job position they are trained on the job with close monitoring.”

Before the aircraft is even touched, the first step of the process is working with the customer to come up with a paint scheme. The paint scheme is first designed using a computer program, resulting with a digital rendering. The rendering shows the stripe design as well as the colors used, which correspond with Sherwin-William paint color charts and fan decks. Sometimes “spray outs” are sent to customers so they get a true visual representation of the colors that will be used.

The paint process begins with removing flight controls, masking areas of the aircraft that would be affected by chemical paint stripper, and a final inspection to ensure all masking has been done correctly. The clock begins ticking when the chemical stripper is applied. Depending on how the aircraft was previously painted, it can take a couple applications of chemical paint stripper, followed by a water rinse and more paint removal on areas not affected or missed by the stripper. Preparing the aircraft for alodine can take a couple days in order to again inspect the entire

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TEXTRON AVIATION



aircraft surface to ensure the smoothest of surfaces. After the alodine has been applied and removed the aircraft is ready for primer.

Sherwin-Williams Aerospace Coatings products were used on the Truex aircraft. The first step in paint application was the Corrosion Preventative Primer and when dry the aircraft is again inspected for any small imperfections of the primer application. Next was the Sanding Surfacer followed by a final sanding to ensure complete smoothness for good adhesion of the base paint. Jet Glo Express was used for the white basecoat requiring careful application to ensure uniform application. Once dry the basecoat was inspected for any imperfections and corrected as needed.

Now for the really creative part: the stripping! Textron Aviation commented using one of two ways to lay out stripes. The first method is to make a mask from a previous design. The second method requires the keen eye of a talented person who can look at a rendering and then lay out the design directly on the aircraft. This method requires the design be laid out on one side of the aircraft and then a pattern is made for use on the other side. Once the stripes are laid out the entire aircraft must be masked again and the areas that get color are sanded, cleaned, sprayed, and the process continues. Textron Aviation used a combination of both methods for this aircraft. The colors used on the stripes were High Solid Gloss Acry Glo Black, Toreador Red, and Charcoal Gray.

In preparation for customer delivery, flight controls are detailed, balanced, and reinstalled, placards are installed, sealant is applied as needed, and the aircraft completely inspected (again) to ensure the highest quality is achieved. During acceptance, the customer works with the paint team to review and inspect the entire aircraft to ensure the customer flies away happy with a new shiny aircraft.

Rob Tanner concludes by saying, "In the rare occasion a problem with the paint occurs, Textron Aviation stands by the product with a three-year warranty on metal aircraft and one year on composite." **AMT**



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THE TIME IS RIGHT: ELECTRONIC TOOL MONITORING AND CONTROL SYSTEMS

Buy-in from both management and the mechanics, and analyzing true tool costs are essential in implementing an electronic tool control system

By Bill Field

NEVER HAS A GREATER EMPHASIS BEEN PLACED on the investment in aviation safety technologies and the attention and focus directed at effective training of the use of that equipment. According to International Air Transport Association (IATA), aviation had its safest year ever in 2013. More than 3 billion people flew safely on 36.4 million flights (29.5 million by jet, 6.9 million by turboprop). While considerable dollars are being willingly invested on engine monitoring systems, angle of attack indicators, GPS, and synthetic vision systems, tool control systems are often an afterthought.

A significant aviation industry disconnect exists as many companies have extensive software solutions and answers throughout their enterprise's production environment. However, they don't extend this tech-

nological capability through to electronic tool monitoring programs or systems. They're relying upon older tool control methodologies that are costly and inefficient in today's metrics accountability world. What worked in the past for tool control systems doesn't cut it today. It's time to rethink these pervasive paradigms.

It is readily understood that maintenance-related accidents as a result of foreign object debris (FOD) are more likely to be fatal than accidents in general. The costs of engine FOD are staggering in both repair and out-of-service implications. Yet many of the same old tool control system methodologies live on. Why?

There are numerous dynamics at play when an operation begins investigating the development and implementation of an electronic tool control system. Capital expenditures are often the biggest hurdle.



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AIR NEW ZEALAND

Investments in the production environment carry a far greater level of importance than maintenance in budgeting requirements. The tool ownership issue, employee or company-owned, and the issue of shared toolboxes are obstacles that can't be avoided. A further impediment is the "that's the way it's always been done" pervasive perception that exists with management and mechanics alike. It doesn't have to be this way.

At HABCO, we're seeing how airlines and aftermarket operations are building the business case, aligning with mechanics and realizing metrics returns by implementing robust electronic tool control systems. There is a lot to learn from a best-practices standpoint by those that are thinking about going all in with a significant and far-reaching electronic tool control system strategy.

There are several key steps to ensure that an electronic tool control system meets expectations, has buy-in from both management and the mechanics, and also allows for a tangible financial return on the capital investment. In the past, electronic tool control product solutions didn't deliver on their broad marketing and sales claims. Product capabilities continue to evolve. A serious and well-thought-through approach to defining

needs requirements is a key element in the process. Mechanics' input and counsel needs to be factored in, together with a defined end state that management buys into. Here is what HABCO sees as mandatory in the planning and execution of a sound electronic tool control system program.

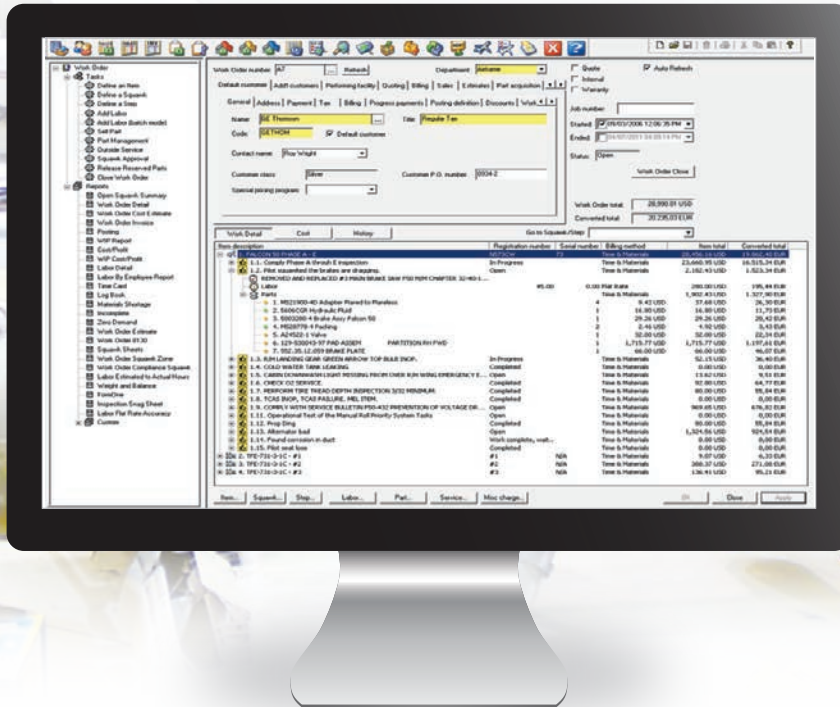
END STATE DETERMINATION

HABCO has worked with Air New Zealand Technical Operations, as well as with other major domestic and international airlines and airframe manufacturers, to thoroughly review and understand all key stakeholder requirements. It involves engaging with every stakeholder who is actively involved in tool control systems – from individual tool use to investment spending decision making. Having a definitive plan for business deliverables and financial return helps justify a substantial investment. It all starts with a strong and compelling business case with defined expectations.

"THE TOOL CONTROL SYSTEM IS GOOD ENOUGH" MISCONCEPTION

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version, a lot has changed and evolved. What was once right isn't the case today. Tool control needs to be viewed from a holistic approach that extends beyond what is currently in place. There is a general lack of awareness of the advances that have been made in today's electronic tool control systems.

ANALYZE TRUE TOOL CONTROL COSTS

Tool control is often viewed as being "soft" and not able to be fully tracked and implemented. Tool time and cost need to be carefully monitored for true financial implications on the operation. How many times are mechanics off the job in a sweep for a lost tool or searching for tools to complete a repair? Not to mention frequent trips to the tool crib or performing physical inventory of the tools themselves. It's all manifested in decreased efficiency and increased cost. Fully understanding the true cost of a tool control program is mandatory.

GAINING MECHANIC BUY-IN

It begins with the maintenance mechanics, whether they use company-owned tools or their own. Tools are personal and mechanics have a unique connection to them. Anything that disrupts this association is seen as a threat. Many mechanics view electronic tool control systems as a lack of trust in their performance. It is critically important to fully inform them to gain their buy-in to the new system to ensure acceptance and behavior change.

CHOOSING THE RIGHT ELECTRONIC TOOL CONTROL SYSTEM

There is a multitude of manufacturers offering various versions of tool control systems. The majority are major tool manufacturers offering a one-size-fits-all tool control system that is applicable for virtually every vertical industry segment. Few offer a true aviation-specific tool control system. The PinPoint Tool Control System from HABCO offers uncompromising tool control system capability all the way down to the individual tool pocket. Designed in close collaboration with Sikorsky Aircraft, the PinPoint Tool Control System is ideally suited for the aerospace industry because it was designed by aerospace experts for aerospace experts. The wants and needs of aviation maintenance mechanics and management influences were taken into account throughout the engineering and design implementation phase. It's a product that's been thoroughly vetted and endorsed by aviation maintenance users.

MARKET VALIDATION — A TRUE INDICATOR

Air New Zealand Technical Operations, the award-winning aircraft maintenance, repair and overhaul organization of Air New Zealand, selected the PinPoint Tool Control System from HABCO. It's using the system to facilitate a wholesale maintenance and operational changeover to RFID technology to manage aircraft tools, improve efficiency, and deliver greater safety across the operation.

Air New Zealand Technical Operations comprehensively defined its tool control program to fully understand what the payback would be for the significant investment in the maintenance requirements of the B-787 Dreamliner that enters into service later this year.

An increased level of safety within maintenance operations was the considerable driver for Air New Zealand. "Tool control has long been recognized as a vital element in aviation safety. The PinPoint Tool Control System from HABCO minimizes the potential for foreign object damage while allowing us to realize substantial operational benefits. This new technology provides the potential to make a step change in the way we operate, and to improve our efficiency and safety margins," states Tech Ops General Manager of Aircraft Maintenance, Viv de Beus.

Air New Zealand realized that although it had been using electronic tool tracking technologies throughout its maintenance facilities, there were newer and more aviation-centric electronic tool control solutions such as the PinPoint Tool Control System from HABCO. "Air New Zealand has used bar-coded electronic tool tracking technology for several years. This broad experience was used to develop real-world tests for the extensive testing and evaluation of new generation tool control technologies. The PinPoint Tool Control System was the clear choice," states Auckland Performance Improvement Manager Murray Courtier.

Electronic tool control systems have come a long way in a very short period of time. There is no question that more advances are coming in the foreseeable future. What won't change is the quest to always be safer and alleviate foreign object debris. It makes great business sense. Now is the time to implement a far-reaching electronic tool control methodology. **AMT**

HABCO Industries is based in Glastonbury, CT. For more information visit www.habco.biz or www.pinpointtoolcontrol.com.

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EXOTIC INTERIORS HELP BOOST REFURB MA





The airborne affinity for automobile interiors and the latest in-flight entertainment complement cutting-edge cabin furnishings; and while profitable, takes time and craftsmanship

By Jerome Greer Chandler

TODAY'S BIZJETS AREN'T YOUR FATHER'S FLYING machines, inside or out. The private jet interior refurbishment market is hot right now. Supplying the sizzle is an array of exotic cabin designs favored by flyers who want their airborne accommodations to mimic their ground-bound home or automobile.

Business or personal jet owners "are people that have demanding expectations," says Jarod Triplett, vice president of business development for Davis Junction, IL-based services supplier and certification testing firm Skandia. "They want to have some uniformity [among] the designs of their homes, exotic cars, and private jet."

Debi Cunningham couldn't concur more. Over the past six to eight months the vice president of marketing and interior design for East Alton, IL-based MRO West Star Aviation says customers have been craving seat stylings "just like they have in their cars — Ferraris, Maseratis. We've [even] had a couple of Bentley requests."

"In regards to aesthetics, you're seeing a direct link to the automotive industry," agrees Veta Traxler, paint and interior lead designer at Moline-headquartered Elliott Aviation. That automobile affinity plays out in seat perforations, piping, colors, forms, and shapes.

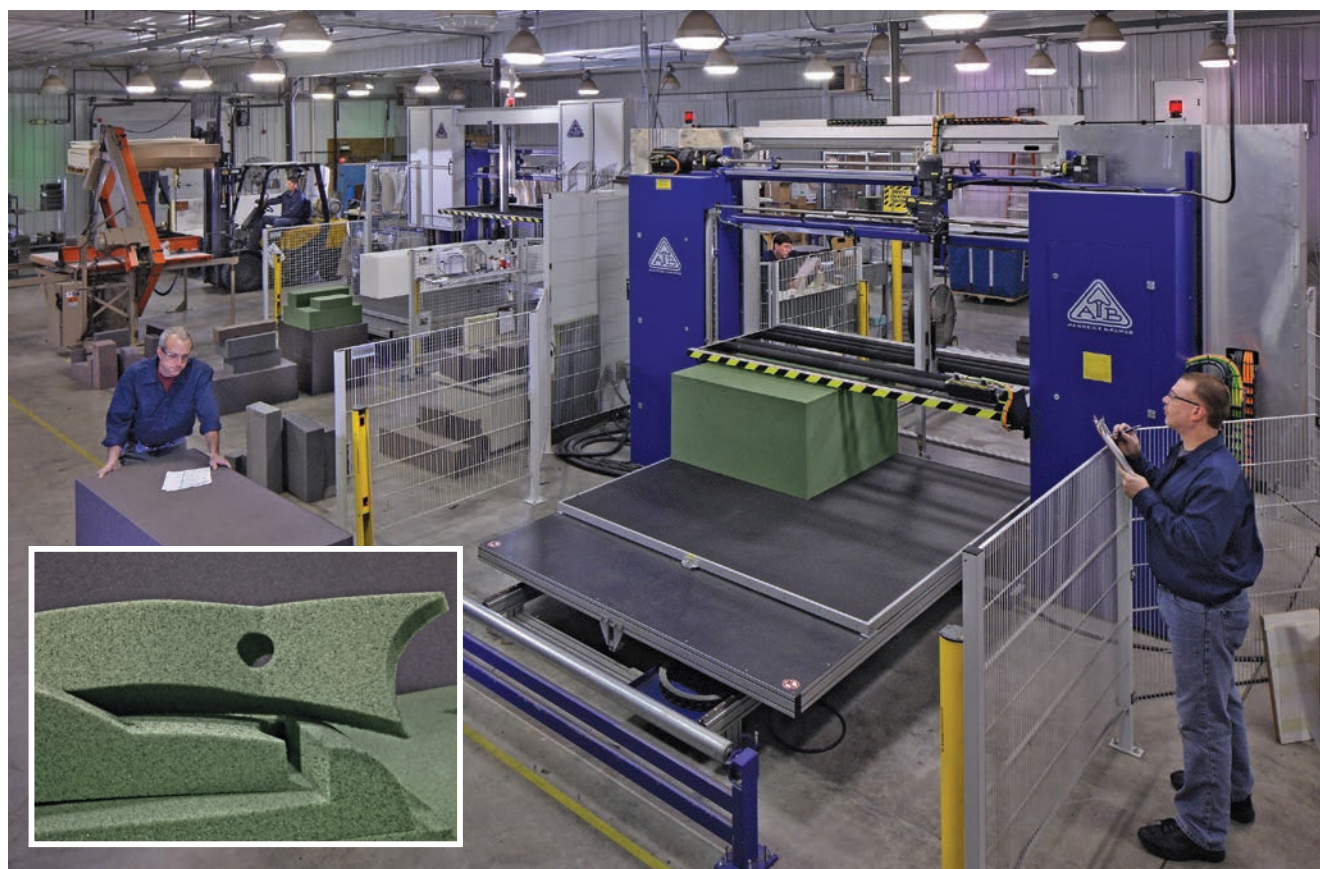
This airborne affinity for automobile interiors isn't the only reason for the surge in seat and interiors work MROs are handling, but it helps.

"It's crazy how busy we are," says West Star's Emilie Harbour, the company's paint and interior design lead. "How much we have going on at a time truly reflects how many people are wanting to have their cabin refurbished. Everyone wants something that is nice, trendy, and up-and-coming." Cunningham calculates West Star's interiors growth over the past half-dozen years at some 20 percent per annum.

Custom work dominates at both West Star and Elliott. "We have never really had a 'plug 'n play' [standardized] type of interior," says Cunningham. "Probably

MARKET, POSE CHALLENGES





85 percent of our interiors are custom.” Elliott’s work too is predominately custom. The price tag for interiors on aircraft such as a Falcon 2000 or Gulfstream can run “upwards of \$500,000 to a million dollars,” she says, when you figure in Wi-Fi, Sat-Com, and entertainment systems.

SKANDIA IS equipped with the latest and most advanced CNC equipment to hold tight tolerances and results in highly repeatable products. INSET: Skandia offers a wide variety of aviation-grade seating foams including DAX firehard foams, HR Poly, and Confor. SKANDIA

More and more private jet owners want the latest in-flight entertainment (IFE), the better to complement cutting-edge cabin furnishings. “They’re asking for very, very large [TV] monitors” too, says Harbour. One customer wanted a 32-inch affair for their aircraft, one that “will literally stow on the bulkhead then [deploy] to cover the bulkhead and part of the lavatory door.” Others are interested in sophisticated Alto audio systems.

Everyone demands airborne Wi-Fi and in-seat powerports so they can power up their PCs, iPods, iPads, or other devices.

CHALLENGES

For customers so acutely attuned to fashion, one challenge is getting the aesthetics right. A customer might love their Ferrari seat. But it’s not perfectly transferable — in material composition *or* look and feel — to a Challenger. “It’s going to be a lot more difficult to get that sleek car look out of their [airplane] seat,” says Harbour.

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The screenshot displays the AviationPros.com website interface. At the top, there's a navigation bar with categories: BUYER'S GUIDE, AIRCRAFT, AIRPORT PROJECTS, AOA, ENGINES & COMPONENTS, FBOS/TENANTS, GROUND HANDLING, GSE, RAMP OPS, and TOOLS & EQUIPMENT. Below this, the main content area is divided into several sections. On the left, there's a 'Latest News' section with articles like 'AMTSociety Supports the Aerospace Maintenance Association's Aerospace Maintenance Competition in 2014' and 'Heavy Duty Utility Gate'. In the center, there's a 'PRODUCT GUIDE' section with articles like 'AvFab Receives Canadian Approval For Installation Of Aft Jump Series Aircraft' and 'Russian Helicopters boosts Success on Kazakhstan Military Aviation Market'. On the right, there's a 'WELCOME' section with a 'Get Product info fast...' banner and a 'MEDIA CENTER' section with video thumbnails. The bottom of the page features a large 'AVIATIONPROS.com' logo and three smaller logos: 'airport business', 'AMT AIRCRAFT MAINTENANCE TECHNOLOGY', and 'GROUND SUPPORT WORLDWIDE'.

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That's because you've got to build up the foam, and fit the seat upholstery on the aircraft's certified seat frame.

Skandia's Triplett believes the advent of car-like seats and accoutrements focuses the whole interiors' process squarely on flammability testing and certification. Making the job easier is that "95 percent" of all private jet seat innards are formed from fire-retardant, graphite-impregnated DAX foam. To test the fire-blocking capabilities of a seat, Triplett says Skandia subjects a test specimen to an 18-inch flame at some 1,830 F for two minutes, all with the aim of ensuring it doesn't shed more than 10 percent of its mass. He says employing tried-and-true DAX foam "provides [designers] the opportunity to get a little bit more aggressive in the upholstery process."

THE IMPORTANCE OF PREPLANNING

Another challenge is timing. Don't just show up at the hangar door with your jet unannounced. Meticulous preplanning of the work package, on the part of customer and interior shop alike, is critical.

"The earlier we can start working with the customer before the aircraft [comes] into the door, [the better] it is for the

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featuring auto industry inspired two-toned seats.

CITATION 650

(Below) featuring a darker tan scheme with custom piping on the pillows.

ELLIOTT AVIATION



customer," says Cunningham. Lead-time is the latchkey. "If a customer gives us a month to preplan, we can cut probably two to four weeks off [the delivery date] of the final product. That allows the interior shop to work out the complex choreography of material, manpower, and space required to do the job."

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DESIGNERS CAN

ensure that the wood selection enhances the look of the aircraft interior. A technician putting the finishing touches on custom woodwork for an aircraft interior.

WEST STAR AVIATION

larger the tubular palate (the fuselage) the easier, some contend, the job is. It's when you start working the smaller airframes that things can get interesting.

"[Our] biggest challenge is that we're working in a smaller area," says Elliott's Traxler. She says customers must keep in mind that "you're designing for a tube, and not a room." Some patterns, some designs don't necessarily work well in tighter spaces.

To give customers a 3-D preview of what the cabin will look like Elliott is developing software allowing customers to change the seat color, re-work

Traxler too says lead-time is imperative. "The more you have pre-planned [the better]."

Even then, West Star says a large interior/IFE project can take 12 to 16 weeks to complete. Cunningham says 60 to 70 percent of the time large interior/IFE work packages are done during the same shop visit as heavy checks, inspections, or major engine work.

Size matters in any business, not the least aircraft interiors. Interestingly, the

the woodwork, and change sidewall fabrics. "You can [even] 'walk' up and down the airplane and change the stitch pattern," says Traxler.

ATTRACTING AND HANGING ON TO ARTISANS

All this work, of course, takes the proper people. If you think recruitment and retention is a problem for sheet metal and powerplant, squeeze into the shoes of the interior shop and see how tight things are.

In mid-2014 Cunningham had a chat with West Star's East Alton interiors manager. The shop employs some 75 to 80. He told her he could use 15 more people right then — *if* he could find them.

Cunningham says West Star finds its interiors people in the ranks of those already in the industry. That

task is "becoming very difficult." As for recruiting new trade school grads, the influence of the auto industry impacts here too. "A lot of time [workers] are being hired by ... BMW or Mercedes."

Make no mistake about woodworking, seat stitching, and sidewall installation: All are the province not of mere tradesmen, but of *craftsmen*.

Elliott Aviation faces the same problem. "It's very hard to find and retain good, qualified craftsmen," says Traxler, "especially when we're doing modifications to cabinets [and] sewing up different seat patterns" often from scratch.

There may be a labor gap just now, but there's precious little space between a customer's desires and what interior artisans can render. "They want to see everything customized to their liking," reiterates Cunningham. "When they come to visit [the shop] they want a show." **AMT**



JEROME GREER CHANDLER is a two-time winner in the Aerospace Journalist of the Year competition's Best Maintenance Submission category; he won in 2000 and 2008. His best-seller 'Fire and Rain' chronicles the wind shear crash of Delta Flight 191 at DFW. Chandler's passion for aviation safety is more than professional. It's personal. Two of his relatives have perished on commercial airliners, one of them in the infamous Braniff Electra crash of 1959.

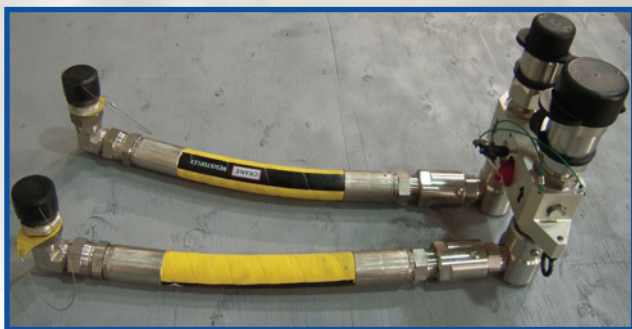
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BUSINESS AVIATION SUPPORTING THE MAINTENANCE FUNCTION

A dedicated NBAA Maintenance Committee made up of 137 of our industry peers provides information and guidance to members while taking an active role in working to give value to member companies.

By Jim Sparks

Virtually all aircraft require maintenance in some form or other. The military along with airlines generally operate maintenance depots along with field support groups in strategic locations capable of handling the rigors of our profession. Specialized shops and fixed base operators provide mechanical repair along with an array of services to fit the needs of smaller general aviation aircraft. Traditionally, aircraft and some engine manufacturers establish service networks for operators of their products while larger maintenance repair organizations (MRO) exist to provide services for a significant percentage of the business aircraft fleet. Some larger corporate flight departments do staff for varying degrees of aircraft support. Capabilities range from accomplishing daily and routine checkups to and including major inspections and overhaul.

NATIONAL BUSINESS AIRCRAFT ASSOCIATION (NBAA)

In the United States the National Business Aircraft Association (NBAA) has been around for 67 years and is a tremendous ally of today's aviation technician. Many initiatives are underway to enhance the profession while providing liaison with airworthiness authorities around the globe. Leaders of the business aviation community have recognized the special activities required to not only make the world's business aircraft safe for flight but fit for mission.

Many corporations use their aircraft in a role as mobile offices to ensure travel time is productive and hopefully profitable. In addition these portable meeting rooms can be utilized once the

aircraft arrives at smaller out of the way airports that just happen to be convenient to production or distribution centers and provide both comfortable and secure conference facilities.

A dedicated NBAA Maintenance Committee made up of 137 of our industry peers that are "actively engaged" in the aircraft maintenance profession provides information and guidance to members while taking an active role in working to give value to member companies.

INITIATIVES AND CHALLENGES

Some of the current initiatives include formation of a "Connectivity Group" addressing global airborne communications. Just how does the Airframe and Powerplant technician fit into all this? The question is presented frequently by executives experienc-

One of the greatest challenges faced by technicians today is dealing with **analog regulations** while working in a **digital world**.

ing "Failures to Communicate". Most corporate IT departments are very savvy with supporting their internal networks and firewalls. Consider accomplishing this with a mobile asset traveling at sometimes 85 percent the speed of sound in excess of 40,000 feet above the planet? Oh by the way, many of these network geeks think that the term A&P applies to a food store chain. They don't realize that correcting a data discrepancy on an aircraft could require an "approval for return to service."

The NBAA is not only addressing the repair capability but is also looking to provide guidance to flight crews or cabin attendants capable of guiding passengers through the intricacies of establishing a secure and stable connection in unfamiliar surroundings.

Another aspect is to provide some guidance regarding systems and overall capabilities so opera-

tional organizations. The concern — ours is a profession that has not stayed up with advancements in technology.

An initiative called “NEXTTECH for NEXTGEN” is underway and includes a multidirectional approach to the dilemma. Reports produced by both Boeing and Airbus predict technician shortages across the globe and with newer technology

NBAA 2014

tors can be informed when planning a connectivity installation in their business aircraft. Currently the schools providing education to those entering the maintenance profession don't touch on connectivity. Prospective technicians do not receive exposure to data networks which in itself poses a challenge as most new aircraft include varying degrees of digital data transfer. It has been realized technicians do need the knowledge to install, inspect, and diagnose data buses as airframe or engine computer anomalies can prevent aircraft dispatch. Unfortunately AC43.13 does not provide adequate guidance regarding this technology.

One of the greatest challenges faced by technicians today is dealing with analog regulations while working in a digital world. The NBAA Maintenance Committee Regulatory Group has undertaken this challenge and is currently pursuing concerns dealing with terminating actions for Airworthiness Directives, use of electronic documentation, and even approval of aircraft inspection programs. This can be accomplished by forming partnerships with the Federal Aviation Administration to provide industry guidance to ensure rule making is working as intended and will apply both to business aviation and in most cases, across the board to general aviation as well.

NEXTTECH FOR NEXTGEN

Currently the committee is keenly focused on the aircraft technician and has allied with a number of other pro-

finding its way into all corners of the aviation industry it is not only a question of enough technicians but enough qualified and competent people capable of ensuring airworthiness. Technicians involved in business aviation typically have a dif-



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ferent need to know than the specialists most often engaged by airlines, maintenance repair organizations, or manufacturing sides of the profession. They are more the general practitioners of the field and demonstrate

Leaders of the business aviation community have recognized the special activities required to not only make the world's business aircraft **safe for flight** but **fit for mission**.

proficiency in numerous areas in addition to mechanical aptitudes such as administration, inspection, diagnostics, and teamwork.

NEXTTECH does take into account the basic foundation knowledge of the aviation

technician and has aligned with the Aviation Technician Education Council (ATEC) to address the need to amend the curriculum developed 50 years ago to ensure the basic need to know is realized prior to bestowing "return to service" authority.

Considering the demographic that about 80 percent of those actively engaged in the business are over 40 years old, there lies an opportunity to provide for continuing education and to highlight the importance that those involved understand newer concepts such as set forth in Part 25-1701 known as Electrical Wiring Interconnect Systems (EWIS). EWIS does introduce methods and concepts not originally considered when installing, maintaining, or even testing aircraft wiring systems. In fact the Aircraft Electronics Technician (AET) certification is another initiative where NBAA has con-

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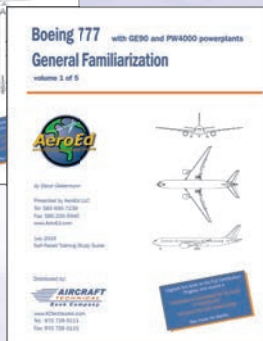
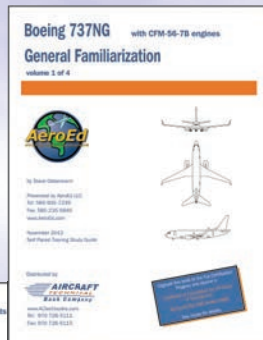
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nected with industry partners and engaged the American Society for Testing and Materials (ASTM) to create and champion a standard that hopefully will be adopted by global airworthiness authorities to ensure worldwide comprehension as technology continues to evolve.

PROMOTING THE PROFESSION

NBAA actively encourages members to promote our profession at school-sponsored career days as well as aviation events. This energy has been harnessed and the Maintenance Committee has created a program known as Technical Awards and Career Scholarship (TRACS). This program is funded by those with a vested interest in our livelihood and offers educational programs such as specific Maintenance Initial courses on an array of business aircraft along with more generic avionics and human factors programs.

In addition, cash contributions have been distributed to scholarship recipients to assist in travel costs while attending their awarded program. Unfortunately, there have been years where the number of scholarships outnumber the applicants. The program is open to all current and aspiring technicians

including active duty military personnel with a career interest in business aviation.

The National Business Aircraft Association does have international affiliation and provides a network where a global community can share ideas and create strategy to steer our collective future. In addition to conducting one of the largest annual aviation gatherings, it does promote local events including seminars acceptable toward Inspection Authorization renewal. For more information please visit NBAA.org.

Yes, the NBAA does champion the issues and concerns of member companies but can be a significant ally to all those tasked with preserving our profession and the guardians of airworthy. **AMT**



JIM SPARKS has been in aviation for 30 years and is a licensed A&P. His career began in general aviation as a mechanic, electrician, and avionics technician. Currently when not writing for *AMT*, he is the manager of aviation maintenance for a private company with a fleet including light single engine aircraft, helicopters, and several types of business jets. You can reach him at sparks-jim@sbcglobal.net.

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Corporate and VIP operators have migrated into bigger and faster aircraft which provide larger cabins, multi-

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engine platforms with longer ranges. As a result, customizing new aircraft has become more encompassing with respect to aircraft systems, engineering, avionics integration, and an exponential increase in luxury.

Helicopters are more sophisticated now which requires more planning and work to be performed up front. For example, the days of a light single

try, passenger seats, and inflight entertainment. All of these items now flow together and wrap in the design of the livery as well. Buyers at this level don't simply choose matching leather, carpet, and ultra-leathers for the panels. They host a designer, who has also designed their corporate jet, ground limousine, and mega-yacht!

In addition to larger aircraft, the

The **retrofit market** for updating of older aircraft to bring their cockpit technology up to the standard of current models **has grown** as a result of the popularity of this **“standard equipment.”**

landing at a completion center near you in the fourth quarter with minimal notice and no SOW are long gone. Some of these helicopters are being completed by the OEMs and the now larger twins are being negotiated eight to 12 months out and have components with similar lead times. The remainder of these aircraft are being completed by a small number of specialized completion centers.

STYLE OF THEIR OWN

Owners want a style of their own in the cabin. Luxury has taken on new dimensions with respect to the panels, cabine-

avionics in the cockpit has evolved dramatically. Aircraft are now being outfitted with “glass cockpits” straight from the OEM. This is a good thing and keeps our crews and passengers safe with the latest and greatest technology. However, completion facilities are slowly decreasing the amount of upgrades and modifications to the instrument panel. This has transferred to additional work in the cabin. The retrofit market for updating of older aircraft to bring their cockpit technology up to the standard of current models has grown as a result of the popularity of this equipment as “standard equipment” from most helicopter manufacturers.

Buyers of larger VIP helicopters typically utilize corporate fixed-wing aircraft as well and continually ask us to incorporate similar systems in their new helicopter. Inflight entertainment is ever evolving with modern systems and platforms. We no longer climb on board and put on a headset or perhaps utilize the sat-phone en route; we pair up our favorite smart device, listen to our favorite music, watch the moving map display, send emails, texts or catch up on social media. All done with Wi-Fi, blue-tooth, or a USB port connection!

IMPACT ON MAINTENANCE

The impact of these more complex interior completions can have a substantial impact on scheduled maintenance and inspection. If the ease of access to inspection areas and the complexity of the removal and reinstallation of interior components is not a major consideration during the initial design phases of the complete interior package this can significantly increase the downtime of an aircraft.

The advanced technology now being incorporated as part of the state-of-the-art inflight entertainment systems (IFE) can also pose a challenge from a maintenance and troubleshooting perspective. The design and documentation including accurate installation drawings are vital to the success of the proper repair of these systems. Keeping technicians trained on the latest technology is also an important factor in staying up to date on the fast changing IFE environment.

SO WHERE ARE WE GOING?

We don't have a crystal ball, however we believe the trend will continue toward more sophisticated systems and larger aircraft. Completion centers and customizing houses will continue to upgrade STC's, invest in engineering, and educate themselves on new products and technology. VIP passengers are looking to walk off their corporate jet and step into their helicopter and experience the same feel in style and technology.

The industry is currently experiencing an upward trend and is in a much better position than three to four years ago. Operators are upgrading to new aircraft or conducting major upgrades in their existing fleet and the global market for helicopters is ever expanding. We will be given the opportunity to certify new STC's and work with global civil aviation authorities. This will result in a broader target market and an opportunity to capitalize on the demand for luxury. We are excited for the next 25 years of corporate completions! **AMT**



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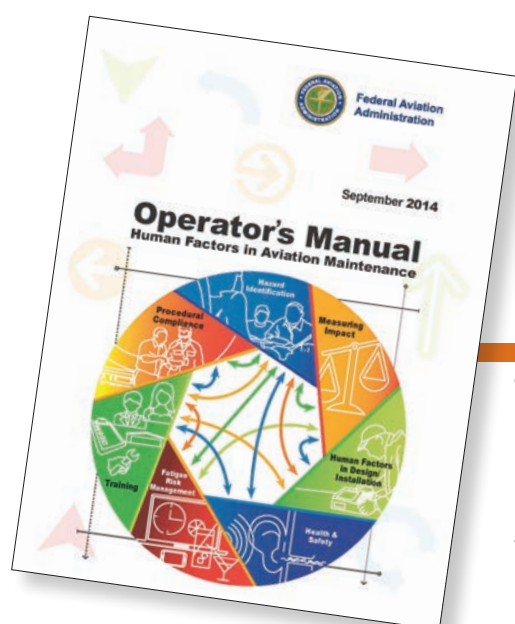
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THE 2014 OPERATOR'S MANUAL FOR HUMAN FACTORS IN AVIATION MAINTENANCE

HOW TO ENSURE MINIMAL RISK

Described below, the 2nd edition of the Op's Manual is a concise reference for when you want an overview and specific implementation advice

By Dr. Bill Johnson



THE NEW

Op's Manual is co-edited by Dr. Bill Johnson and Dr. Katrina Avers, from FAA

FORMAT

This manual recognizes that readers already know the importance of human factors — a science that pays attention to physical, psychological, and other human attributes to ensure that we complete work safely and efficiently with minimal risk to personnel and equipment. Content was based on portions of the original document. New topics were added based on relevancy, safety impact, and on industry or FAA request. The chapters discuss seven critical human factors topics.

The references, by design, are few and limited to the highest value. The Op's Manual is not designed to read cover to cover. Instead, the book is a reference when you want an overview and specific implementation advice on one of the topics included. Chapters have identical formats that include:

- Chapter topic introduction
- Why the topic is important
- How to implement the program component
- How to know the program component works
- Key references and links

IN 2005, THE FEDERAL AVIATION ADMINISTRATION (FAA) completed the *Operator's Manual for Human Factors in Aviation Maintenance (Op's Manual)*. That manual earned broad U.S. and international acceptance. A Spanish and Chinese translation influenced its international distribution and value. The Op's Manual won the FAA Administrator's *Award for Use of Plain Language*. Document design, simplicity, and concise delivery of technical information were the key features that made the Op's Manual useful for maintenance and engineering personnel.

This new 2nd edition of The Operator's Manual for Human Factors in Aviation Maintenance follows the same successful format as the 1st edition. As with the 1st edition, contributors remained disciplined to keep the information concise and limited to only relevant information. The new Op's Manual is co-edited by Dr. Bill Johnson and Dr. Katrina Avers, from FAA.

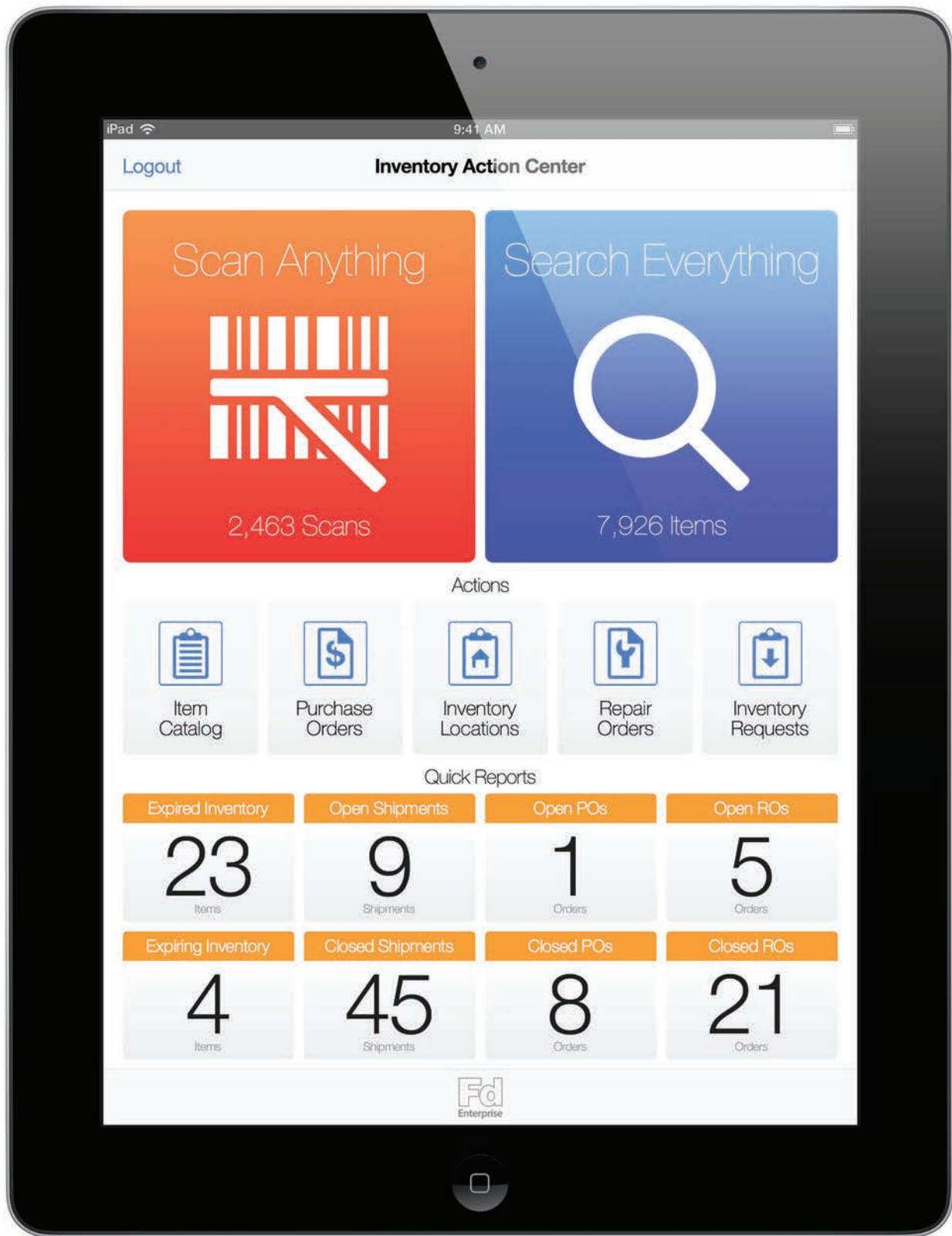
LET'S LOOK AT EACH CHAPTER:

Chapter 1: Event Investigation and Voluntary Reporting



This chapter topic is repeated for the 2nd edition. The chapter concentrates on the various methods of event reporting ranging from the classic Boeing Maintenance Error Decision Aide (MEDA) to FAA programs like Maintenance and Ramp Line Operations Safety Assessment (MRLOSA) and the Aviation Safety action program. The authors, Dr. Bill Rankin and Dr. Maggie Ma from Boeing, match investigations and reports to the requirements of a safety management system. They map data into the reactive, proactive, and predictive categories. They provide a step-by-step description on establishing an investigation and reporting system match to your organization.

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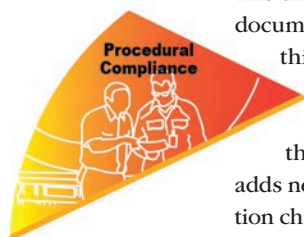
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Chapter 2: Procedural Compliance and Documentation

The challenge of "failure to properly use documentation" rears its familiar head in this chapter. Dr. Colin Drury, who has worked on this issue for a very long time, not only reviews the traditional solutions but also adds new ones. To affect the documentation challenge Dr. Drury sees four factors that must be addressed. They include: the maintenance system; the human user; the documentation and procedures; and the technical, physical, and cultural environment within which the maintenance is performed. The chapter contains detailed steps to establish an ideal procedural compliance program.



Chapter 3: Human Factors Training Evolution

With nearly 50 years of experience related to technical training, Dr. Bill Johnson authors this training chapter. He supports the importance of proper training system development that is matched to each organization. However, the chapter offers a complete listing of the traditional HF training topics as well as a list of new topics that are especially important today for both initial and recurrent training.



Chapter 4: Fatigue/Alertness Management

Fatigue remains a hot maintenance safety topic. Dr. Katrina Avers, from FAA's Civil Aerospace Medical Institute, describes the risk associated with fatigue, the way to establish a fatigue risk management program, and ways to measure if your program makes a difference in safety.



Chapter 5: Human Factors Health and Safety Programs

The average age of the maintenance technician is on the rise. With age comes challenges to vision, hearing, weight control, and more. Dr. James W. Allen, an aviation medical examiner and environmental health physician, converts medical



FIGURE 2

LATENT MEDICAL OR ENVIRONMENTAL CONDITIONS (LMEC)

Physiologic limitations experienced by the AMT that originates from abnormal medical conditions, normal aging, and occupational exposures.



concepts to plain language. He describes latent medical or environment conditions (LMEC) (see Figure 2) and its impact on all aviation maintenance workers. Dr. Allen offers many statistics to characterize the LMEC risk in maintenance. He also gives you a plan to address these issues in your working environment.

Chapter 6: Considering Human Factors in Equipment and Installation

This chapter is for the general aviation maintenance personnel who install a variety of modern avionics systems in an instrument panel about a third the size of a small kitchen table. Dr. Bill Johnson and Jason Bryes of the FAA Small Airplane Directorate offer advice on taking human factors into consideration. They offer a description of the challenges and ways to ensure that new installations give appropriate consideration to human factors.

Chapter 7: Measuring Impact and Return on Investment

This final chapter is a repeat from the 1st edition. Bill Johnson revisits the approach to assessing impact and doing a return-on-investment calculation for nearly any safety intervention. This approach has not reached its full potential so the author shows an FAA process that was created and used successfully since the 1st Op's Manual was published.



THE FINAL WORD

Bill Johnson, for obvious reasons, may not be the most impartial reviewer of the new Operator's Manual. However he has just given you a short description of the document. One caution, this announcement about the 2nd edition is a bit like Apple's announcement of the latest I-Phone. It is done, it works, but it is "not yet on the shelves." It will likely be on the web site (www.humanfactorsinfo.com) in late October or early November. If you must have an advance digital draft, please contact Dr. Bill at bill-dr.johnson@faa.gov. We look forward to your feedback. **AMT**

Celebrate with AMT!

The November/December issue will mark the official 25th anniversary of our publication

We've been the industry resource for 25 years, starting out as *Aircraft Technician* in 1989.



Aircraft Maintenance Technology has progressed along with the rest of the industry but we remain dedicated to presenting the information you need to know: the best practices and latest news and technology regarding aircraft maintenance to be safe and profitable.

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To be a part of the 25th anniversary issue of *Aircraft Maintenance Technology* issue, please contact one of our sales representatives:

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ATEC BOARD OF DIRECTORS MEET IN WASHINGTON WITH LAWMAKERS AND INDUSTRY ORGANIZATIONS

LAST MONTH THE Aviation Technician Education Council (ATEC) board of directors held its annual meeting in Washington, D.C. The ATEC mission is to advocate for aviation maintenance schools in the areas of curriculum improvement, technical and financial support, while promoting mutually beneficial relations with government and industry groups. For four days in September, the council made that mission front-and-center in the nation's capital.

On ATEC's behalf, representatives from many of this country's Part 147 aviation maintenance technician schools joined two industry members to wear a path around Washington. They

Together, the council will work with these representatives of the aviation world to build a robust supply of highly skilled, highly trained aviation maintenance workers who will ensure the safety of the global flying public.

"It was probably the best four days in ATEC's history in supporting and developing initiatives that affect our membership," said Ryan Goertzen, current ATEC president and president of Spartan College of Aeronautics and Technology. "There is a great deal of activity going on right now with the rewrite of Part 147, which has not seen significant change in over 40 years. We positioned ourselves not only to



ATEC BOARD members in attendance from left to right: Charles Horning, Embry-Riddle; Gary Hoyle, Pittsburg Institute of Aeronautics; Fred Dyen, Blue Ridge Community College; Donald "Jay" Gregson, Hallmark College of Aeronautics; Joseph McCourt, Tarrant County College; Dhyronn Goggins, Denbigh High School Aviation Academy; Shannon McGurk, Aviation Institute of Maintenance; Andrew Smith, Kansas State University Salina; Art Spengler, Premier Aircraft Sales, Inc.; Ryan Goertzen, Spartan College of Aeronautics and Technology; Amy Kienast, MIAT College of Technology; Paul Herrick, University of Alaska Anchorage; Donald Stark, Sinclair Community College; Ronald Donner, *Aircraft Maintenance Technology*; and Tim Guerrero, Redstone College. Board members missing are Kevin High, Western Michigan University; Kevin Gulliver, NIDA Corp.; Domenic Proscia, Vaughn College; and Mike Walker, The Boeing Company.

brought their message to the halls of Congress, opening the eyes of both members and their staffs to the particular challenges that aircraft maintenance schools face today. ATEC representatives also met with FAA officials to discuss regulatory activities affecting aviation maintenance schools.

INDUSTRY COALITION

Board members also strengthened their industry ties by engaging a broad coalition of trade groups, including the National Business Aviation Association, General Aviation Manufacturers Association, Helicopter Association International, Regional Airline Association and Aeronautical Repair Station Association.

continue leading on 147, but to advocate on behalf of our members and their students for years to come."

In August, ATEC transitioned its Business Office to Obadal, Filler, MacLeod and Klein, the Virginia-based law firm that also represents the Aeronautical Repair Station Association (ARSA). The council's officers and board members are working together with the firm to formulate key initiatives that will ensure the future of aviation maintenance providers, their customers and the men and woman who keep it all working.

To be part of this work, you can join ATEC at its annual conference next year in Orlando, FL. In the meantime, keep up by visiting: www.atec-amt.org.



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BEYOND STRONG

COMMUNICATIONS FOR MAINTENANCE MANAGERS

It's not just what you say that matters!

Communications courses for managers all too frequently focus on how managers should communicate with their employees. How to speak or write clearly and effectively so that management directions are understood and can be readily followed. These courses might also contain useful information on ways to ensure that managers correctly understand what employees are communicating to them — for example, by asking clarifying questions to make sure they understand what the employee is trying to say.

COMMUNICATE SAFETY CONCERNS

What I don't see taught very often in management courses for maintenance professionals or other aviation employees is perhaps of even greater importance from a safety perspective. And that is how to get employees to communicate maintenance issues or problems that they see. As we all know, front line workers have a unique perspective on issues that could have a bearing on safety that other workers just won't have — especially management workers who are usually physically at a distance from where the maintenance work is actually being done, even if their offices are nearby.

But all too often, concerns that mechanics have about an operation that could have an impact on safety or, worse if all the wrong stars line up, cause an accident are never brought up. Until an incident or an accident occurs and suddenly investigators find that mechanics on the shop floor were aware that, for example, certain maintenance procedures were incorrectly spelled out in the manual forcing employees to work around them. Or a certain airworthiness directive couldn't be complied with as written because the steps were out of order. Or a certain employee seemed to be coming to work unfit for duty. These examples are all taken from real situations that resulted

in accidents or incidents that management records did not document or address.

KNOW WHAT'S GOING ON

Yes, I know, all too often managers don't want to know what's going on out of a misguided belief that by ignoring problems they won't become even bigger problems. But for those managers who do want to know what's going on so that safety risks can be documented and prioritized for elimination or mitigation, getting employees to communicate these issues is a challenge. For whatever reason or reasons, employees are often reluctant to speak up about these problems but here are some suggestions.

1 This may seem obvious but make sure that employees know that you want them to tell you about issues — no matter how big or small — that could affect the operation. You may not be able to address all of them at once but at least you can document them and prioritize them based on their potential safety impact.

2 Provide a way for employees to communicate their concerns, including the option to do so anonymously. It doesn't have to be anything fancy — even an old-fashioned suggestion box can be used. Of course, if you work at an air carrier or repair station, encourage employees to use your ASAP — Aviation Safety Action Program — if you have one and, if not, encourage management to work with the FAA and employee organization to adopt one.

3 Reward employees who raise safety concerns, particularly if they provide solutions at the same time. Nothing gets the word out faster that you're serious about hearing from employees then publicly rewarding employees who do. **AMT**



JOHN GOGLIA has 40+ years experience in the aviation industry. He was the first NTSB member to hold an FAA aircraft mechanic's certificate. He can be reached at gogliaj@yahoo.com.



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Here are some of the key events and maintenance-related sessions during NBAA2014, Oct. 21-23.

Join NBAA for the Business Aviation Convention & Exhibition (NBAA2014) — the world's largest business aviation event. Ranked as the fourth largest tradeshow in the U.S., NBAA2014 at the Orange County Convention Center in Orlando will feature more than 1,000 exhibitors showcasing the latest products and services in the industry, nearly 100 business aircraft at the static display, opportunities to network with 25,000 business aviation professionals and dozens of education sessions to ensure you are operating as safely and efficiently as possible. Here are some of the key events and maintenance-related sessions.

TUESDAY, OCTOBER 21, 2014

NBAA2014 Opening General Session

8:30 a.m. - 10:00 a.m.

Location: Orange County Convention Center, Exhibit Hall, South B

Enterprise Holdings CEO Andy Taylor will discuss how business airplanes have helped his company succeed.

Get Ready for a New FBO Business Model

10:30 a.m. - Noon

Location: Orange County Convention Center, Room S320F

Moderated by: Amber Finchum, State Farm Presented by: Ron Jackson, Aviation Business Strategies Group and John Enticknap, Aviation Business Strategies Group

Because of a strong push toward alternate fuel purchasing strategies, FBOs are forced to change the way they deliver and charge for services. This session will detail why a new FBO business model is in the wind and how it will benefit aircraft operators and FBOs alike.

Leadership Challenge for Business Aviation Professionals

10:30 a.m. - Noon

Location: Orange County Convention Center, Room S320H

Presented by: Phil Roberts, PAR Travel Tech, Inc.

This session will begin with a short review of leadership principles and then engage participants through a facilitated session on a scenario generated by currently unresolved issues or problems facing the business aviation community. This session is eligible for CAM application and recertification credit.

Mission Ready and Fit for Purpose?

10:30 a.m. - Noon

Location: Orange County Convention Center, Room S320G

Session Coordinator: Jon Haag, Executive Jet Management

Moderated by: Jim Sparks, Richardson Aviation

Presented by: Adrian Paull, Honeywell; Mark Burns, Gulfstream; and Sanaa Saadani, Satcom Direct

An "airworthy aircraft" on the ramp may not be good enough for your passengers. Today's most

accurate operational term is best described as "fit for purpose." With the demand for constant communication in our personal and business lives, cabin communications is becoming as important as the aircraft's engine to the end user of the aircraft. Cabin communication technologies are consistently changing. The Next Tech for the Next Gen will need to be well-versed in more areas of concentration and IT education won't just be a nicety. Knowledge of network interfaces, fault isolation, and correction of sophisticated LAN systems within the environment will be required. This session is eligible for CAM application and recertification credit.

Bombardier Customer Service - Roundtable without Executives

(Bombardier owners/operators only)

Noon - 1:30 p.m.

Location: Orange County Convention Center, Room S330A/B

Honeywell Avionics Technical Discussion

12:30 p.m. - 1:15 p.m.

Location: Orange County Convention Center, Room S330F

Honeywell Propulsion Technical Session (TFE & CFE)

1:30 p.m. - 2:15 p.m.

Location: Orange County Convention Center, Room S330F

KPI's: Promoting Aviation Value & Building Credibility with the Top Floor

2:00 p.m. - 3:00 p.m.

Location: Orange County Convention Center, Room S320AB

Presented by: Stan Phipps, ConocoPhillips

This session will explore ideas on developing and communicating Key Performance Indicators that build credibility with executives through transparent reporting of the important metrics that measure the costs, performance, and value addition of the company's aviation department. Scope will include ideas on 1) strategy development (what are the objectives,

opportunities, and future state to be achieved), 2) goals definition to support the strategy, 3) process & tools for data gathering, benchmarking, and reporting, and 4) sustainability and continuous improvement. This session is eligible for CAM application and recertification credit.

Pilatus PC-12 M&O

2:00 p.m. - 3:00 p.m.

Location: Orange County Convention Center, Room S330H

Streamlining LOAs

2:00 p.m. - 3:00 p.m.

Location: Orange County Convention Center, Room S319

Presented by: David T. Norton, Shackelford, Melton, McKinley & Norton, LLP and Roger Sultan, FAA

This session will provide a brief history of the work between NBAA and the FAA to streamline the RVSM and ADS-B approval processes, details on guidance, an overview of how the process should work, and a report on how it has been working to date. This will be an opportunity to learn do's and don'ts for ADS-B and RVSM approvals and to provide feedback on other approvals that are being delayed.

Honeywell APU Technical Discussion

2:30 p.m. - 3:00 p.m.

Location: Orange County Convention Center, Room S330F

Unmanned Aircraft Systems: Regulatory and Legal Developments

3:00 p.m. - 4:00 p.m.

Location: Orange County Convention Center, Innovation Zone (Booth #288)

Join us for this session on the future of UAS in the National Airspace System. Panelists will share their thoughts on the FAA's 2015 mandated deadline to have UAS flying daily in the NAS and when a full integration might occur.

Honeywell Propulsion Technical Session (HTF)

3:15 p.m. - 3:45 p.m.

Location: Orange County Convention Center, Room S330F

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A Conversation with FAA's Top Safety Leaders

3:30 p.m. - 5:00 p.m.

Location: Orange County Convention Center, Room S320E
Moderated by: Doug Carr, NBAA and Mark Larsen, NBAA

Hear about the latest developments on issues affecting aircraft operations, maintenance, and training for business aviation.

Creating Business Aviation's Next Generation Work Force

3:30 p.m. - 5:00 p.m.

Location: Orange County Convention Center, Room S320AB
Moderated by: Sheryl Barden, Aviation Personnel Intl.

This interactive workshop, structured as a focus group/think tank, will identify key challenges to recruiting top (entry-level) talent and ways to overcome those challenges for all positions in business aviation. This session is eligible for CAM application and recertification credit.

Maintenance Check Flights - Mitigating Risk

3:30 p.m. - 5:00 p.m.

Location: Orange County Convention Center, Room S320C/D
Session Coordinator: Will Dirks
Moderated by: Don Henderson, VanAllen

Presented by: William Riley, KeyCorp Aviation Center; Michael Graham, Cessna Aircraft; Rod Hootor, Bombardier Aerospace; John O'Meara, Gulfstream Aerospace Corporation; Rich Iudice, Dassault; Dan Grace, FlightSafety International; and Brad McKeage, Embraer Executive Jets

This session will review the risks associated with flights after maintenance events or with abnormal aircraft conditions. The panel will discuss best practices to mitigate these risks. This will be a presentation of the issues and then a round table discussion. This session is eligible for CAM application and recertification credit.

Honeywell TPE Technical Discussion

4:00 p.m. - 4:30 p.m.

Location: Orange County Convention Center, Room S330F

Soar Networking Event

5:30 p.m. - 7:00 p.m.

Location: Orange County Convention Center, Innovation Zone (Booth #288)

Attendees will get the chance to meet and greet with rising business aviation professionals and current industry leaders. Take advantage of this valuable opportunity to expand your professional network, while gaining unmatched exposure to current and future leaders. To attend, you must be a registered attendee and/or exhibitor at NBAA2014.

WEDNESDAY, OCTOBER 22, 2014

Bombardier: Challenger 300 Technical Update

9:00 a.m. - 10:00 a.m.

Location: Orange County Convention Center, Room S330E/F

Time Management for Sales & Marketing Teams

9:00 a.m. - 10:00 a.m.

Location: Orange County Convention Center, Room S320H
Presented by: Paula Williams, Aand John Williams, ABCI LLC

Aviation professionals who are responsible for sales results often find themselves with more to do than time to do it! There are a myriad of tasks that you know would improve your company's sales and marketing performance. Unfortunately, small teams or even single individuals find themselves responsible for work that was performed by a team of six or eight people prior to 2009. When sales and marketing tasks are neglected, sales and revenues decline, leading to smaller budgets and potentially further reductions in staff. Turning this vicious cycle around and improving sales and marketing productivity is key to a company's success, or even survival. This session will offer proven solutions that have worked for us and for our clients.

Dassault Customer Service News Brief

10:00 a.m. - 10:30 a.m.

Location: Orange County Convention Center, Room S330B/C/D

Bombardier: Challenger 600 Series Technical Update

10:30 a.m. - 11:30 a.m.

Location: Orange County Convention Center, Room S330E/F

Dassault Falcon 7X M&O

10:30 a.m. - 11:30 a.m.

Location: Orange County Convention Center, Room S330B/C/D

NBAA2014 Second Day General Session

10:30 a.m. - Noon

Location: Orange County Convention Center, Exhibit Hall, South B

Political power couple James Carville and Mary Matalin, will share their well-informed, often humorous perspectives on November's mid-term elections.

Daher Socata M&O Session

11:30 a.m. - 1:00 p.m.

Location: Orange County Convention Center, Room S330A

Dassault Falcon Pilot Session

11:45 a.m. - 12:45 p.m.

Location: Orange County Convention Center, Room S330B/C/D

Gulfstream Operators Forum

Noon - 5:00 p.m.

Location: Hilton Orlando
Noon - Refreshments/light lunch, 1:00 p.m. - 5:00 p.m. - Forum

Bombardier: Global Technical Update

12:30 p.m. - 2:30 p.m.

Location: Orange County Convention Center, Room S330E/F

Dassault Falcon 900 Series M&O

1:00 p.m. - 2:00 p.m.

Location: Orange County Convention Center, Room S330B/C/D

NBAA Regional Leadership Networking Session

1:00 p.m. - 3:00 p.m.

Location: Orange County Convention Center, Room S310G
Moderated by: Don Hitch,

Paramount Citrus Aviation

This networking session is designed specifically to foster interaction and a sharing of best practices among peers.

Pratt & Whitney Canada Turboprop Engines (JT15D, PW300, PW500, PW600)

1:00 p.m. - 3:00 p.m.

Location: Orange County Convention Center, Room S330G

Educating, Implementing and Maintaining Aviation Internship Programs

1:30 p.m. - 2:30 p.m.

Location: Orange County Convention Center, Room S320AB
Presented by: Daniel Wolfe, CAMC; Eric Black, ORBAA; Lisa Swartzwelder, ORBAA; and Dr. Tara Harl, Aviation Workforce Development

This session will introduce you to the benefits realized by operators with a history of successful aviation internship programs. Internships are essential to our industry, purposefully creating paths to experiential learning not available in the classroom while developing new business aviation professionals. Materials will also be provided that assist you with your business case, program agenda and sample project lists. This session is eligible for CAM application and recertification credit.

Unmanned Aircraft Systems: Opportunities for Business Aviation

1:30 p.m. - 2:30 p.m.

Location: Orange County Convention Center, Innovation Zone (Booth #288)

New applications are being developed everyday for the use of Unmanned Aircraft Systems (UAS.) Join us as we discuss the commercial future of UAS, how the business aviation flight department should be involved, and the new technologies it will take to keep manned and unmanned aircraft flying safely together in the NAS.

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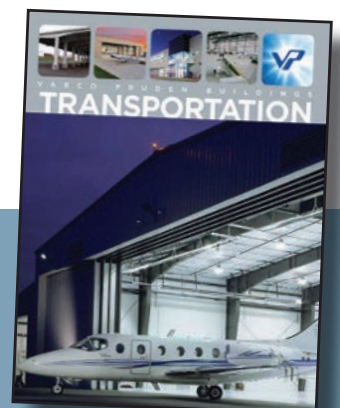
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a. Total Number of Copies (net press run)		32591	31386
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e. Total Nonrequested Distribution (Sum of 15d (1), (2), and (3))		10533	9575
f. Total Distribution (Sum of 15c and e)		32211	30983
g. Copies Not Distributed		380	403
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* If you are claiming electronic copies, go to line 16 on page 3. If you are not claiming electronic copies, skip to line 17 on page 3.

Aircraft Maintenance Technology	Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
16. Electronic Copy Circulation		
a. Requested Electronic and Paid Electronic Copies	11,627	12,311
b. Total Requested and Paid Paid Copies (Line 15c) + Requested/Paid Electronic Copies (Line 16a)	33,305	33,719
c. Total Copy Distribution (Line 15f) + Requested/Paid Electronic Copies (Line 16a)	43,838	43,294
d. Percent Paid and/or Requested Circulation (Both Print & Electronic Copies) (16b divided by 15c x 100)	59.1%	59.2%
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1:30 p.m. - 2:30 p.m.

Location: Orange County Convention Center, Room S320E

Presented by: *Phil Crowther, Jackson & Wade, LLC; Doug Stewart, AircraftLogs; and Jed Wolcott, Wolcott & Associates*

From flight logs to important tax documents, business aircraft operators are faced with a variety of complex record keeping requirements. Having a robust system in place to maintain these records is critical when preparing for IRS audits and other interactions with regulators. In addition to understanding which records should be maintained, operators are now faced with a wide array of software choices to assist with the record keeping process. Learn what records to keep for federal compliance purposes and strategies to retain necessary files.

Dassault Falcon 2000 Series M&O

2:15 p.m. - 3:15 p.m.

Location: Orange Cty. Convention Center, Room S330B/C/D

Bombardier: Learjet 20/30/55 Technical Update

2:30 p.m. - 3:30 p.m.

Location: Orange County Convention Center, Room S330E/F

Building Blocks to a Better Safety Culture

3:00 p.m. - 4:30 p.m.

Location: Orange County Convention Center, Room S320F
Presented by: *Jim Cannon, IBAC*

A safety culture can be validated via the SMS Stage 3 characteristics and performance indicators as described in the IS-BAO Audit Procedures Manual. These 10 characteristics and 28 performance indicators are essential to know for any operator. This session is eligible for CAM application and recertification credit.

Communication Bootcamp for Aviation Professionals

3:00 p.m. - 4:30 p.m.

Location: Orange County Convention Center, Room S319
Presented by: *Mary Eisenstein, Melmar Enterprises*

This program will cover the skills and techniques for being an effective communicator. You will gain confidence in communicating with people of different backgrounds, identify basic behavioral styles and techniques to communicate effectively, and identify generational values and beliefs for better communication.

Maximize Your Training with an Evidence-Based Training Management System

3:00 p.m. - 4:30 p.m.

Location: Orange County Convention Center, Room S320G
Presented by: *JR Russel, ProActive Safety Inc.; Steve Hall, CAE; Caleb Taylor, ProFLight; and Al Mann, Reynolds Jet Management*

The ultimate purpose of a safety management system is to allow an organization to be more proactive and at times, even predictive of the threats present in their operation. Training can be an effective option to mitigate the level of risks associated with those identified threats. Learn how to go above and beyond a 61.58, 125.287, or 135.293 check and best utilize training to address the threats present in your operation.

Operating and Doing Business in China

3:00 p.m. - 4:30 p.m.

Location: Orange County Convention Center, Room S320C/D
Moderated by: *Jay Mesinger, Mesinger Jet Sales*

Presented by: *Ann Holmes, Bloomer deVere; Gary Brock; Robert Molsbergen, President EJM and COO Global Aircraft Management of Netjets, Inc; Roger Whyte; and Michelle Wade, Jackson & Wade*

Hear from company representatives who are currently engaged in joint venture operations, bringing to the region business solutions for aircraft management, MRO, and other critical sectors, by embracing the cultural understanding of those in the region with long-term, real-world business aviation experience. Explore the legal environment required to successfully build contracts and complete aircraft transactions, moving aircraft in and out of the region.

The Direct Approach to Transformational Leadership

3:00 p.m. – 4:30 p.m.

Location: Orange County Convention Center, Room S320AB

Presented by: Jim Lara, Gray Stone Advisors and Steve Brechter, Gray Stone Advisors

Have you ever wondered why certain aspects of your role as a leader are more difficult to perform than others? The answer likely lies within you. Self-awareness and Transformational Leadership go hand-in-hand, but most approaches to leadership development stop short of the most important component, a clear understanding of 'self.' The primary measure of success as a Transformational Leader is your 'fit' in the role. In this seminar, we will explore the role that

the 'self' plays in becoming a Transformational Leader and how you can succeed by understanding yourself and the various roles a leader must play. This session is eligible for CAM application and recertification credit.

Pratt & Whitney Canada PT6 Turboprop Engines

3:00 p.m. – 5:00 p.m.

Location: Orange County Convention Center, Room S330G

Bombardier: Learjet 40/45/60/70/75 Technical Update

3:30 p.m. – 4:30 p.m.

Location: Orange County Convention Center, Room S330E/F

Dassault Falcon 10/20/50 Series M&O

3:30 p.m. – 4:30 p.m.

Location: Orange Cty. Convention

Center, Room S330B/C/D

NBAA/CAN Soiree, an Evening with Angels

6:00 p.m. – 11:00 p.m.

Location: Hyatt Regency Orlando, Regency Ballroom

THURSDAY, OCTOBER 23, 2014

Careers in Business Aviation Day: General Session

9:00 a.m. – 10:00 a.m.

Location: Orange County Convention Center, Room S320A/B

Moderated by: Peter Korns, NBAA

NBAA opens its doors to future leaders of the industry by welcoming middle school, high school, and college students interested in exploring careers in business aviation.

NBAA/UAA Career Seminar for College Students

10:30 a.m. – Noon

Location: Orange County Convention Center, Room S320C/D

Presented by: Peter Korns, NBAA

Explore the many faces of this industry and hear from experts from a variety of fields. Roundtable discussions will be hosted to provide an opportunity to talk with professional leaders from all across the business aviation industry. Gain valuable insight into how you can get the best out of your education to launch your chosen career path. This session is open to all students attending University Aviation Association (UAA) schools. Please contact NBAA's Peter Korns (pkorns@nbaa.org) for complimentary registration.

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A company's prosperity comes from satisfying clients and getting executives and customers to events and meetings on time, every time. Therefore ...

CORPORATE FLIGHT departments often institute much higher standards than those required by parts 43 (maintenance), 91 (general operating), and 145 (repair stations). Ensuring continued airworthiness for businesses and executives cannot be based upon minimum standards; there is too much at risk. A company's prosperity comes from satisfying clients and getting executives and customers to events and meetings on time, every time. Therefore, corporations demand more stringent quality control and assurance elements than do the regulations set forth in 14 Code of Federal Regulations (CFR).

Companies setting higher standards does not equate to the Federal Aviation Administration (FAA) enforcing those requirements. It is one thing to institute more safety measures than those required by the regulations; it is another thing altogether to pay fines to the government for failure to meet those higher standards. Thus, when a corporate flight department pilot or mechanic is questioned by an Aviation Safety Inspector (ASI), it behooves that individual to know what the agency can demand and what it can "request."

QUALITY ASSURANCE: VOLUNTARY DISCLOSURE

For example, the company may have a robust quality assurance system; that does not mean all the elements need to be incorporated into a Part 145 certificate's manual(s). Since the

Part 91 operation does not have the ability to self-disclose potential violations of the regulations, the information from the Part 145 system can be used against the company's individual certificate holders. Therefore, the company should seek to ensure

for the company's repair station. A *qualification* for the supervisory position is that the individual is certificated. However, the repair station is performing the work and issuing the approval for return to service. Knowing what hat you are wearing

When a corporate flight department pilot or mechanic is questioned by an Aviation Safety Inspector (ASI), **it behooves that individual to know what the agency can demand and what it can "request."**

all information from its quality assurance system is treated as a voluntary disclosure under the Part 145 certificate. Additionally, the company's individual certificate holders (both pilots and mechanics) must take full advantage of the Aviation Safety Reporting Program under Advisory Circular 00-46.

MULTIPLE HATS

However, even more importantly, the individual certificate holders must understand they are wearing multiple hats. While the pilot may not be the owner of the aircraft, s/he is definitely going to be considered the operator for FAA compliance purposes. A mechanic working for the company will be exercising the privileges of the Part 65 (airmen other than flight crew) certificate sometimes, but not all the time. That same person may be a supervisor

when specific tasks or operations are being performed will ensure protection against unnecessary questions and confusion with the FAA.

The individual certificate holders are usually the only ones in a corporation that know anything about aviation safety regulations. Most executives assume that the standards set by the company can be enforced by the agency. Therefore, it is important for the certificate holders to recognize the difference between the company's standards and those imposed by the government. It is all well and good to exceed the FAA's minimum standards; your job depends upon understanding the company's directives. Knowing the distinction between what the FAA can demand and what it can request will help stop legal action from the agency against individuals or the company. **AMT**



SARAH MACLEOD is executive director of the Aeronautical Repair Station Association (ARSA), an organization she helped found more than 25 years ago. For more information visit www.arsa.org.



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SELECT → The Select Program covers scheduled and unscheduled events without accruing for Life Limited Components, which results in lower hourly fees.

UNSCHEDULED → The Unscheduled Program provides protection from unforeseen and often costly maintenance expenses with one simple payment each year, based on annual utilization.

AIRFRAME PROGRAMS

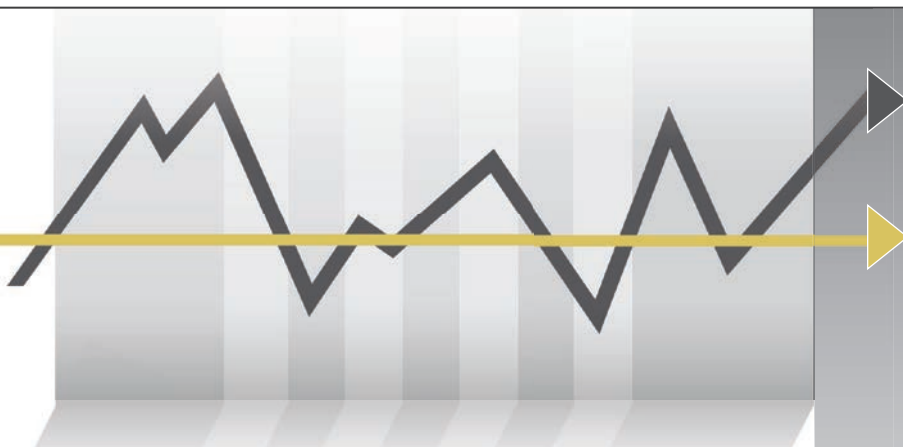
TERM → The Term Airframe Program is the most comprehensive airframe program in the world. It covers virtually every part, component, assembly and system of the airframe, including all parts and labor for scheduled and unscheduled maintenance.

CHECK-TO-CHECKsm → The Check-to-Check Program adds the flexibility of customized contract terms to provide coverage through the next major scheduled airframe maintenance inspection. Check-to-Check enhances residual value, is fully transferable, and assures aircraft buyers that they will have coverage for an upcoming major inspection.

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The JSSI APU Program covers scheduled and unscheduled events, as well as Life Limited Components. Unlike other APU programs, there is no buy-in requirement and only one easy annual payment.

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Celebrate with AMT!

The November/December issue will mark the official 25th anniversary of our publication. We've been the industry resource for 25 years, starting out as



Aircraft Technician in 1989.



Aircraft Maintenance Technology has progressed along with the rest of the industry but we remain dedicated to presenting the information you need to know: the best practices and latest news and technology regarding aircraft maintenance to be safe and profitable.

Be a part of history, join us in our celebration! To be a part of the 25th anniversary issue of *Aircraft Maintenance Technology* issue, please contact one of our sales representatives:

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IT'S THE RESPONSIBILITY OF A LEADER TO CREATE THE MARKET!

IF YOU HAVE HEARD ME SAY IT ONCE, you have heard me say it a thousand times: It is the responsibility of the industry leader to create the marketplace. So to better service the aviation industry, *Aircraft Maintenance Technology*, has stepped into the ring and unleashed a cutting-edge look and feel as well as a refined editorial direction! Leadership is more than a word; it is a way of thinking and carrying oneself. At *AMT*, we see being an industry influencer as being a rock-solid leader. Leadership is something you can look up to and learn from. With that said, we have decided to make major improvements in our print and digital brands, beginning with our digital a few months ago and now this print issue.

While we all like to say we are No. 1 ... what does that mean? At *AMT* it means financially investing in staff and technology to offer superior digital and print products that ensure we bring the industry the information it needs and wants. Knowing you rely on more than magazines, we have invested in a comprehensive multimedia branding to bring the right message, to the right audience in the right media. Whether it is our magazine, website, daily eNewsletter, video newsletter, or multiple other custom offerings, we can help you develop and maintain your leadership in the market.

NEW TECHNOLOGY

We launched a state-of-the-art website using responsive design technology that automatically knows what device you are using and adjusts the page to optimize your user experience. Look at www.AviationPros.com or our daily eNewsletter on a Tablet and rotate the screen, see how it goes between two and three columns to optimize your reader experience. It also learns what you like to read and guides you to like editorial to enhance your experience ... pretty smart stuff! We do the work so you don't have to!

Now this issue: the redesign starts with a bold new cover that will feature eye-catching industry-related photos. While the look and feel are important for a pleasant reading experience, the heart of any magazine is its editorial content. We have been putting out a strong product for 25 years, and because being a leader means working even harder to stay ahead, we decided to take our editorial focus to the next level based on what you, the reader, is looking for.

DUE TO POPULAR DEMAND, we have again invested to improve our digital daily eNewsletter with industry information and to keep you informed of what is happening every day. Keep in touch with what more than 31,000 of your peers read to stay informed, subscribe today.

Since starting with AviationPros in January of this year I have learned that *AMT* is a respected industry brand. We have spent countless hours and financial investments to bring the *AMT* brand back to the leadership position we have held for 25 years. Make sure you too are showing your leadership position, investing in your product and services to ensure it is best in the market, then make sure your message is shared with your clients. Join *AMT* and create the market in a positive way to keep it growing.

Leadership is strong, it can be fun and entertaining at the same time, and it brings new technology to market. *AMT* magazine has been the leader for 25 years and we look forward to leading the next 25 years! While we are proud of what we have accomplished ... we are far from satisfied and have many new projects in the works to help you in your leadership role.

Email me at Brett@AviationPros.com with your thoughts or suggestions of topics and technologies you would like to see in *AMT*. Together we will lead the industry and create the marketplace. **AMT**

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