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AMT
Aircraft Maintenance Technology

Written by aircraft maintenance professionals for the professional maintenance team

Official publication for AMTSociety

May 2011

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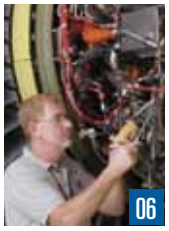

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Today's AMT

More than 100 years later; what would Charles Taylor say?

Ron Donner, Editor

Consider what an extremely diverse group of people the aircraft maintenance technician community is today. The aircraft maintenance technician group, AMT, A&P mechanic, maintenance engineer — call it what you like — consists of a wide variety of people, accomplishing a wide variety of functions, in a wide variety of environments, in a wide variety of locations around the world.

Today's aircraft technicians have a variety of backgrounds, nationalities, education, training, and responsibilities all working on an even wider variety of aircraft and equipment. The flying machines we maintain range from sailplanes capable of effortless flight for hours on end with no power (other than the tow or winch that launched them into the sky) to the other end of the spectrum with aircraft capable of lifting hundreds of thousands of pounds into the sky, finally coming to rest on the other side of the world.

Our group of aircraft maintainers consists of women and men using their talents to maintain personal use general aviation aircraft, business and corporate use aircraft, airliners, military aircraft, museum aircraft, helicopters, sailplanes, and recreational aircraft. In recent years our group now maintains unmanned aircraft with no human beings onboard. We maintain these aircraft for a variety of missions, owners, operators, and companies, in a variety of locations around the world. Within the various segments of aviation you can find people who hold certificates issued by their country's aviation authority, and others who are noncertificated yet have worked in the aircraft maintenance industry for years; more the case with the manufacturing, military, and repair station segments. Does holding a certificate make one an aircraft technician? Many aircraft technicians work in a back shop or component overhaul environment where an entire career could be spent without holding a personal certificate, or for that matter ever putting a wrench to an actual airframe with wings. All of this prompts the question, "What would Charles Taylor say today"? My guess is that his first comments would be, "What a diverse group we have become."

On May 24, the birthday of Charles E. Taylor, the Wright Brothers' first mechanic, we will again celebrate AMT Day in this country. Is your maintenance organization planning on celebrating? If so let the staff of *AMT magazine* know. Send us a photo of your celebration. In this issue of *AMT magazine* we celebrate by offering our readers a diverse selection of articles in print and on our web site *AMTonline*.

Visit page 34 to read about several recent recipients of the Charles Taylor Master Mechanic Award and online for an update on National AMT Day. John Rahilly on page 32 provides a compelling article on inspiring the next generation of aviation professionals; an article that Charles Taylor would have appreciated. On page 30 John Goglia asks and answers the question, "Why Charlie Taylor Should Matter to You." Our technical articles cover aircraft window repair and maintenance, and turbine engine carbon seals. Charles Chandler, *AMT* field editor, spoke with representatives of the Southwest Airlines winning team from this year's *AMTSociety* Maintenance Skills Competition and shares their story.

Happy AMT Day! Enjoy, Ron

On May 24 we will celebrate AMT Day. Is your maintenance organization planning on celebrating? Let *AMT* know.

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Turbine Engine Seal Applications

Constantly working to extend TBO, engine manufacturers and operators use modern materials in seal designs

By Glenn H. Phelps

Modern mechanical carbon materials are being used in a wide variety of applications — a few examples include aircraft gearboxes, air turbine motor starters, and main shaft seals for both aircraft turbine engines and aircraft auxiliary power units (APUs).

These unique, self-lubricating materials are composed of fine-grained, electrographite substances that are impregnated with proprietary inorganic chemicals to improve lubricating qualities and oxidation resistance. These materials are ideal for use in aircraft applications because of their low coefficient of friction, low wear rate at high sliding speed, high thermal conductivity, and resistance to oxidation in high temperature air.

Engine manufacturers and operators, who are constantly working to extend their time between overall (TBO), are using these modern seal materials in seal designs. Their goal is to ensure that carbon main shaft seals will no longer be a factor in limiting time between overhaul (TBO) on new aircraft turbine engines.

Modern turbine engines such as this GEnx engine use advanced materials for internal parts.

These properties also make the materials of interest to designers of other high-speed, rotating equipment, for example high-speed rotary gas compressors and steam turbines.

High sliding speed in shaft seals

Aircraft gearboxes are used to reduce the main engine shaft's rotational speed from as high as 26,000 rpm down to about 3,400 rpm, so the shaft can drive such system components as hydraulic pumps, generators, and air conditioning compressors.

To seal the oil lubricant within the gearbox and protect it from leaking out at the point where the shaft enters and exits the gearbox, most aircraft gearboxes use face seals. The face seals usually contain a carbon-graphite stationary ring and a silicon carbide or tungsten carbide rotating ring. The rings that make the dynamic face seal are both lapped flat and are held together with springs or magnets so that liquids cannot flow between the ring faces even though they are spinning against each other at high rpm.

The two rings in relative motion that make the dynamic seal are sealed to the shaft or the gearbox housing with static seal rings such as polymeric O-rings. Seal designers use spiral grooves, straight grooves, and wedges to channel or pump a thin film of air or oil between the two sliding sealing faces. This creates aerodynamic or hydrodynamic lift, which greatly reduces the friction and wear of the seal faces.

For example, Metcar Grade M-45, from Metallized Carbon Corp., is often used as the stationary ring. It is especially suited for these shaft seals because it is impermeable and thus able to support an aerodynamic film. It also has the ability to run at high speed with low friction and low wear.

Typical face and circumferential seal ring configurations utilizing modern mechanical carbons. Photo courtesy of Metallized Carbon Corporation.

Shaft seals must withstand extremely high shaft speed

Air turbine motor starters typically use the same carbon-graphite versus silicon carbide or tungsten carbide dynamic face seal materials that are used in gearbox seals, but the sliding speed is much higher. These air turbine motor starters are actually small turbines that use the exhaust gas from the APU to create the power necessary to start the main engines. The shaft speed on air motor starters can be as high as 180,000 rpm, or a sliding speed of about 1,000 feet/second, which is nearly the speed of sound. The seals are designed with wedges and gas flow passages to produce aerodynamic or hydrodynamic lift-off. Metcar Grade M-45 is used in air motor starter seals because of its outstanding self-lubricating qualities at the required operating conditions.

Main shaft seals for aircraft turbine engines and APUs

Face seal rings, with carbon-graphite primary rings, and carbon-graphite circumferential seal rings are used in aircraft engine main shaft seals to control the airflow and combustion gas flow inside the engine. They also seal the oil lubricant in the main engine bearings that allow the compressor shaft and the combustion gas turbine shaft to rotate freely. Both circumferential and face type seal rings are used.

For circumferential main shaft seal rings, carbon-graphite segments that fit with close end clearance in slots in the stationary housing are used. The carbon-graphite segments are tensioned against a ceramic or hard metal coating on the rotating shaft using a "garter" spring.

Lifting wedges and machined configurations are used to create lift so that these seals run on an aerodynamic or hydrodynamic film. Rotating speeds can be as high as 26,000 rpm, and temperatures in the seal rings can reach as high as 800 F.

Metcar Grade M-595 type materials are used for aircraft main shaft seals, because the chemical additive in these grades prevents oxidation at high temperature and provides improved lubricating qualities at the required operating conditions.

Typical face and circumferential seal ring configurations. Photo courtesy of Metallized Carbon Corporation.

Commercial aircraft turbine engines have an established TBO. During the overhaul, the turbine engine is disassembled so that internal parts can be cleaned and inspected, and all parts that are out of specification can be replaced. Smaller commercial aircraft turbine engines typically have TBOs on the order of 3,000 to 5,000 hours, and the cost of the overhaul can be as much as $250,000.

Often during the engine overhaul, the carbon main shaft seals need to be replaced. With the use of modern carbon seal materials and aerodynamic lift off seal designs, the hope is that carbon main shaft seals will no longer be one of the factors that limit TBO on new aircraft turbine engines.

APUs are small gas turbine engines that are used to create electric power, air conditioning, or cabin heat, when the main engines are turned off at the gate to save fuel. APUs contain carbon-graphite seals that are similar to, but smaller than, main engine seals.

Unique characteristics

Oil-free, self-lubricating mechanical carbon materials possess a unique combination of characteristics that make them ideal for use in both commercial and military aircraft seal applications.

The materials are self-lubricating, self-polishing, and dimensionally stable, which ensures a good sealing mate. The materials are heat resistant and have a high thermal conductivity which helps conduct frictional heat away from the sliding surface. In addition, these materials are readily machinable to exacting aerospace dimensional tolerances, and they can be supplied lapped and polished to a flatness specification of one helium light band. **AMT**

Modern mechanical carbon materials are self-lubricating, self-polishing, and dimensionally stable, which ensures a good sealing mate.

Glenn H. Phelps is technical director for Metallized Carbon Corp. For more information on mechanical carbon solutions, please contact Glenn H. Phelps at ghphelps@metcar.com, or (914) 941-3738, or by visiting www.metcar.com.

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A Clear Outlook

Repair tips from Aircraft Window Repairs' Bob Cupery

By Charles Chandler

My first aircraft window job was to resurface several cabin windows on a Boeing 707. Repairing and polishing aircraft is a delicate, multi-step, monotonous job. We started the process with soft rubber sanding block and 2000 grit paper, with strict instructions from the crew chief to make vertical sanding strokes only.

For those that have done this job you know 2000 grit paper is about as abrasive as cigarette smoke and takes ages to make much progress.

Passenger cabin windows and cockpit windshields on a Cessna Citation III aircraft. Photos courtesy of Signature TECHNICAir - STP.

After about three hours of sanding my teammate decided that an orbital pneumatic sander with a felt pad and some buffing compound would be a better choice for this job. He applied the sander to the window and after a few quick revolutions; the window turned a white opaque color and glazed rock hard. The end result was the window had to be replaced, and my teammate incurred the wrath of the old crew chief.

If you surveyed the OEMs, the back shops for the airlines, and the window repair companies, you would find that servicing, repairing and replacing aircraft windows is big business. There is a lot of tribal knowledge and expert craftsmanship associated with repairing aircraft windows. Bob Cupery, founder and current CFO and QA manager for Aircraft Window Repairs of Torrance, CA, is the guru of repairing aircraft windows.

Aircraft Window Repairs

Cupery is one of us and a great American success story. He was an AMT for Northwest Airlines and maintenance director for Northrop, and listed in Who's Who in America Industry and Finance. Bob started business in his garage and it became the first FAA certified repair station solely dedicated to the repair of acrylic windows and lenses for pressurized aircraft. Cupery and his wife Kathi have been in the business for about 32 years. I asked him to pass along some of his window repair expertise with a focus on window maintenance and the different types of damage that AMTs should look for. He agreed and provided an abundance of valuable information.

Windows surround us; they literally are part of almost every structure built to move or shelter people, cars, boats, buildings, and aircraft. We rarely notice them until we can't see through them. In fact, windows are so much a part of our lives we often think they are all alike. However, when we as AMTs start treating all windows the same we're asking for trouble. For one thing, not all windows are made of glass. With few exceptions, aircraft windows are formed from stretched acrylic

which provides a relative inexpensive, tough, shatter proof transparency ideal for use on airplanes. What's more (and something many people forget)on some aircraft windows are primary structures carrying the same loads as the metal fuselage.

Cleaning and care

Acrylic aircraft transparencies require careful treatment and protection. They also discolor with age. Even with a conscientious maintenance program, you may still notice some yellowing or milk-coloring. Such color cannot be removed without weakening the acrylic and eventually you'll have to retire those old panels. However, you can extend the life of aircraft windows by following a few suggestions.

First, never use an ammonia-based glass cleaner on acrylic windows. Ammonia may be great for glass, but it's hard on plastic. Even approved plastic cleaners in aerosol applicators should be avoided. While the cleaning agent is safe, the majority of aerosol chemicals can damage acrylic.

To clean a pane properly, apply an approved plastic cleaning agent to the windows. Each time you wipe across the window use a clean side of the towel on each pass; this will remove the abrasives and safely buff the window. You'll use a few more paper towels and cleaner but that costs a lot less than having to refinish your windows or purchase new ones.

When it come to inspections Cupery recommends that an AMT be very diligent and always make a careful, detailed inspection of all windows. Always, remember certain window conditions and minor damage can accelerate to a condition that requires an expensive replacement.

Inspecting the windows

AMTs should be familiar with the characteristics of acrylic materials and the composition of aircraft windows. Windows are a primary component of the aircraft structure and must be carefully maintained. There are some types of damage that an AMT should watch for each time they are around the aircraft.

To inspect properly, Cupery recommends at least a 500 candlepower light. Shine it at the window from every direction; up, down, sideways, forward, and upside down. You want the cracks or damage to reflect back to you. Ultrasonic equipment is also a necessary part of the inspection. You should make an ultrasound inspection of the window before making any repairs. This is to verify that there is enough material to make the repair. Then, inspect again after repairs to ensure windows are above minimum thickness. Cupery suggests that all aircraft windows are subjected to stresses that affect the weak point in the windows. Mounting bolt holes is an example.

Bolt hole cracks

Bolt holes are problematic. Cracks can occur from aircraft stresses and overtorquing mounting hardware. To adequately inspect bolt holes on the edge of the windshield, use a prism. The prism bends the light and allows you to view any damage on the edge of the windshield or around bolt holes. Clean the window well before using the prism or dirt particles will scratch your prism and window. Hold the prism tightly against the outside of the windshield and use glycol as a coupling agent.

Shelling/scaling

Shelling is the in-plane cracking of the acrylic panel that reflects back at you like the inside of an oyster shell when you shine light directly onto it. Typically this damage will be evident around bolt holes and in the outer radius areas of the windows. It may be caused by razor cuts, stress risers on the radius, or overtorquing bolts during installation and is referred to as scaling. It can cause structural failure and the window is usually removed from service.

Debonding

Debonding is a separation of two or more surfaces that have been bonded together through the use of specific bonding materials. This problem is noticed when moist air bypasses the desiccant system and fogging occurs. Once debonding begins, it quickly gets worse. Moisture builds in the bottom of the window and between the panels. As the aircraft goes to altitude, this moisture freezes and spreads the panes even further apart causing additional debonding. This is not a structural problem and is repairable; however, moisture can cause corrosion.

Delamination

Delamination is the separation of the acrylic or glass layer from the polyvinyl sheeting. Causes are usually stresses from normal airframe torquing, age, and UV degradation. Not considered a structural problem, it is actually a form

Passenger cabin window on a commercial airliner. Photo courtesy of Marty Holzer.

of stress relief; however, as this problem progresses it may obstruct vision. Delamination can be distinguished from shelling because it doesn't reflect back at you when you shine a light on it. Instead it just appears as clear bubbles, dull flat, or white discolored areas. Manufacturers have limits for how large an area is allowed.

Sealant damage

Window damage can occur by using the wrong types of sealants. Don't ever let anyone talk you into using anything other than sealants that are approved by the manufacturer. Some quick curing sealants have accelerators that can attack the acrylic.

Others are alkaline and can also cause crazing. Cupery has found several cases of damage caused by someone using the wrong type of sealant.

A word of caution, if one window exhibits this type of damage, then most likely the others will be damaged as well. In fact, when you find damage on one always expect to find the same types of damage on the other windows.

Erosion

Don't forget to inspect navigation and landing light lenses for erosion. These can be polished and hard coated. The motto is to see and be seen in our crowded skies.

I asked Cupery to pass along a bit of his experience to new AMTs and someone wanting to become a window repair specialist. "For the AMTs, when you are working around windows, please think before you act." He has seen many windows in his shop that someone polished and distorted. These windows cannot be corrected and all you can do is chase the distortion around the window.

Aircraft windows are strong but can be easily damaged by a careless act: dropping a tool, dragging an air hose or electrical cord across a window, or wiping it with a dirty shop towel. If you are measuring window damage, measure twice. Even new windows can be at OEM limits. For the person considering becoming a window repairman, this is craftsman work and a labor of love. Repairing and polishing windows is intense, meticulous, unforgiving work. According to Cupery, it is a worthwhile effort "because a clean and polished window in an expensive corporate jet is a safe and beautiful thing." AMT

Charles Chandler was assisted by Bob Cupery in writing this article. For more information on Aircraft Window Repairs, visit www.aircraftwindowrepairs.com or call (310) 212-7173.

Enabling Lean MRO

Controlling operating costs and improving performance by applying lean principles and IT solutions to maintenance operations

By Dinakara Nagalla

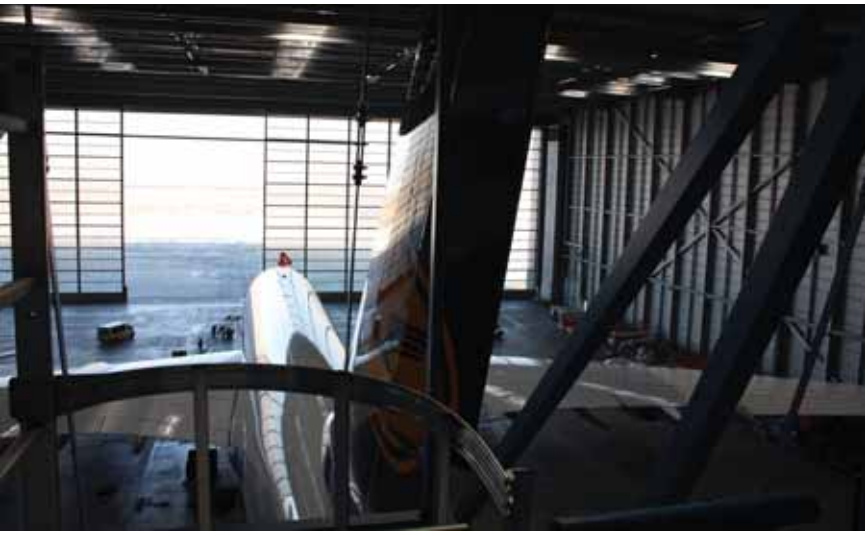
All fleet aircraft operators fly with the same business rule in mind — an aircraft sitting on the ground because of maintenance requirements generates no revenue (commercial) and detracts from overall mission readiness (military).

Driven by ever-changing business models, global competition, high fuel costs, and other unavoidable doing-business costs, fleet aircraft operators (both commercial and military) have developed a simple business strategy — control operating costs across the broad spectrum of the aircraft maintenance cycle by implementing processes designed to mitigate economic fluctuations.

MRO benefits and savings

Many fleet aircraft operators have realized some value and savings by implementing in-house maintenance, repair, and overhaul (MRO) profit centers and/or by outsourcing their aircraft maintenance activities to established MROs. In turn, these MROs are increasingly applying lean/Six Sigma principles and techniques to their operations to achieve dramatic and sustainable performance improvements.

Lean MRO enables MROs to eliminate unnecessary tasks, improve maintenance team performance, and increase the yield of scheduled maintenance actions.



Unfortunately, most MROs never realize peak effectiveness from these initiatives because they have failed to properly support them with an information technology (IT) solution that provides the broad visibility and effective data needed for true knowledge-based decisions.

Today, MRO operations account for 15 to 18 percent of the fleet aircraft operator's total operating costs. Aircraft undergoing scheduled-maintenance actions, or aircraft delayed from being returned to service because of scheduled-maintenance actions, also create the need for additional capital expenditures for the spare aircraft needed to meet flight-dispatch schedules. The significance of these costs highlights the MRO industry as a key business area for targeted transformation.

Lean MRO, in conjunction with an optimized maintenance program, enables MROs to eliminate nonproductive or unnecessary tasks from their process-event critical paths, improve maintenance team performance, increase the yield of scheduled maintenance actions, and increase supply chain effectiveness. With these enhancements, maintenance teams can maximize information re-use, manage the complexity arising from asset variation, and reduce the time spent performing tangential tasks like information searches and data downloads.

When properly implemented, lean with Six Sigma helps reduce and eliminate the root causes of defects and unwanted process variability. When employed together, the following lean/Six Sigma principles have the potential to generate significant performance improvements:

- Define value from the customer's perspective
- Clearly identify value streams in business processes
- Execute work assignments to optimize value
- Assure that every process adds value
- Remove obstacles to value creation

- Continuously reduce or eliminate waste
- Reduce process variability; focus on data and measurements
- Develop a culture intolerant of waste and defects
- Involve every employee in continuous improvement

Performance improvements

Lean/Six Sigma-enhanced production processes provide opportunities to protect future revenues through true competitiveness. Industry statistics suggest that with lean/Six Sigma, MROs can achieve extraordinary performance improvements. Over a three- to five-year period, it is not uncommon to realize significant savings in: labor productivity, inventory reduction, defect reduction, lead time reduction, hangar or work space reduction, increased capacity, and on-time delivery improvements.

In addition to enhanced processes, Lean/Six Sigma-qualified aviation-maintenance subject matter experts provide valuable, enterprisewide insights into maintenance programs and schedules. These individuals possess the background and experience to:

- Evaluate and redesign fleet maintenance programs or schedules to eliminate wasted efforts arising from poorly sequenced, too-frequent, or unnecessary tasks
- Assess planning and proffer advice on optimizing check packages to increase production velocity and flexibility while reducing process complexity
- Help implement an adaptable system response to an FAA continuing analysis and surveillance system (CASS)

Culture change

To achieve the success that will only come with process optimizations and culture changes, MROs must implement the IT designed specifically to support lean MRO operations. Today, success in MRO operations is no longer about simply turning wrenches. It is now all about the tooling that provides reliable, just-in-time information to MRO decision makers.

Software solutions

Any suite of MRO software solutions should provide maintenance and engineering organizations with the planning, execution, analysis, and reporting

Waste Types	Examples of MRO Waste —	Software Providing Lean Solutions
Waiting	Assignments not given timely or unclear; tools and materials not available; tasks improperly sequenced; information not available to mechanics at workstations	✓
Unnecessary Processing	Tasks improperly planned and/or sequenced; maintenance program requirements not critically reviewed	✓
Overproduction	Tasks added without reason; task analysis not completed; critical evaluation of maintenance program not undertaken	✓
Logistics	Mechanic spends too much time off task in order to acquire parts, tools, information, assignments; tasks improperly planned and/or sequenced	✓
Defects	Task improperly performed due to human factors; process variability; incorrect specification; defective materials	✓
Materials Management	Parts and components not available at planned time or location; incorrect material provided; excess materials utilized	✓
Unused Employee Expertise	Mechanics not involved in process improvement and problem solving activities	✓
Complexity	Tasks, process steps, time allocated, parts provisioning, etc., are more involved than needed to achieve customer requirements	✓
Resource Management	Personnel with appropriate training, correct tools, correct equipment, and other resources required for task performance are not available where/when required	✓

solutions required to drive the following lean/Six Sigma initiatives:

- Detailed event planning and execution for heavy, shop, light, and line maintenance actions
- Robust data capture, analysis and reporting for metrics-driven continuous improvements
- Optimal task assignments and material tool allocations
- Real-time status internal/external communications
- Maximization of mechanics' time on assigned tasks
- Integrated analysis of reliability information from aircraft, legacy, and execution information

IT integration

A common problem in achieving a truly lean MRO operation is a less-than-comprehensive/complete lean transformation. Even though MROs spend millions of dollars to transform their facilities into lean machines, many efforts fail because of a lack of effective IT integration throughout the operation.

In other words, ineffective and nonuse of IT systems to enable and support lean methodologies are the two main reasons for lean-implementation failure.

An effective lean IT solution is integral to capturing, managing, and accessing the comprehensive and highly accurate set of information applicable to lean MRO processes and assets. Once this information is collected, it must provide enterprise leadership with the core knowledge needed for effective decision support across the entire product lifecycle. This knowledge can then be leveraged in work flow-driven processes which, in turn, can be tightly focused to achieve metrics-driven lean/Six Sigma MRO objectives.

In closing, lean MRO is a holistic, comprehensive, enterprisewide program designed to be integrated into the MRO's core strategy as an aid to operational transformation. The lean MRO's IT solution enables MRO/Six Sigma strategies by doing all of the following things well: Ensures repeatable processes and systematically provides micro visibility to movement of assets (including technicians) in a cost-effective manner; guarantees both reliability and readiness; and reduces turnaround time (TAT) and cycle time with accurate forecasting of resources by providing just-in-time knowledge. AMT

Dinakara Nagalla is chief executive officer and president of EmpowerMX. EmpowerMX provides aircraft maintenance software and consulting services to the air transport industry. For more information visit www.empowermx.com.

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Preventive Maintenance

For those not well versed in the art of aircraft repair, words of caution: lack of knowledge may end up costing more in the long run

By Jim Sparks

Doing things before problems occur in an effort to prevent inopportune failures? What a concept! The term "preventive maintenance" does have an official definition as well as implications assigned by the United States Federal Aviation Administration.

So just what does it mean? According to the Administrator: "*Preventive maintenance* means simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations." This definition has been tweaked a bit to enable pilots to perform certain functions on their aircraft and the guidelines are presented in Federal Aviation Regulation (FAR) 43.3.

Privileges for pilots include tasks such as troubleshooting and repairing landing light wiring circuits but do not include position and panel lights or similar systems that may be more complex. For those not well versed in the art of aircraft repair, words of caution: lack of knowledge may end up costing more in the long run.

By analyzing the previous repair history of particular units we can identify the parts most susceptible to failure and make arrangements for replacement to extend the component life and overall performance.

Replacing and servicing batteries

Replacing and servicing batteries is another area where frequent attention can prevent missed trips and is suitable for pilots to accomplish. When replacing any aircraft's battery, use only one approved for that make and model; plus preventive maintenance does include adding water and top charging. If corrosion is noted on the terminals or in the battery box area, a baking soda solution works well in aircraft equipped with lead acid batteries. This should be followed by a complete flush with fresh water so no trace of the baking soda remains.

Emergency locator transmitter battery replacement is also permitted provided manufacturer's recommendations are followed. The new expiration date for replacement (or recharging) must be legibly marked on the outside of the transmitter and entered in the aircraft maintenance record.

Navigation units frequently contain internal batteries requiring replacement. In certain cases such as with a portable global position sensor (GPS) change out is most often not a complicated process. Many of these devices are manufactured with substances considered hazardous which will impact acceptable means of disposal. In other systems such as onboard flight management system (FMS) computers, internal batteries are used to assist in the shutdown process in the event aircraft electrical power is turned off prior to complete system termination.

Unfortunately devices such as this are not well advertised and their replacement only becomes realized when a malfunction occurs generally in the start-up process just prior to an important trip. It is worth conversing with the FMS manufacturer and determine if an internal battery is used as well as recommended replacement intervals. In some cases these batteries are not field replaceable or may require an alternate power source be applied

during the change. A thorough inquiry should be made prior to attempting replacement.

Navigation systems

Pilots are also authorized to remove and replace self-contained, front instrument panel-mounted navigation and communication devices, provided they employ tray-mounted connectors secured in the rack. This does exclude automatic flight control system components, transponders, and distance measuring equipment (DME). The approved unit must be designed to be readily removed and replaced and pertinent instructions must be provided. Prior to the unit's intended use, an operational check must be performed in accordance with maintenance instructions and where pertinent, the applicable sections of the FARs. Systems such as the auto pilot often involve complex testing to validate airworthiness and if full functionality is not achieved, operation of the aircraft in certain airspace may be impacted. This is particularly true of air data and auto pilot systems when operating in reduced vertical separation minimums (RVSM) regions.

Transponder and altimeter systems are also off limits to anyone not covered by FAR 43.3 and addressed by either Part 91.411 or 91.413. Some gray areas do exist in who can perform a test of a transponder system after a known disconnect of the digital data link. This is clearly covered in Advisory Circular 43-6b and gives return to service authority to those listed in FAR 43.3.

Updating navigational software data bases is another area where pilots can use their sign off authority. This is provided no disassembly of the unit is required and pertinent instructions and training are provided. This privilege can be based on the type of aircraft operation and the sign off in maintenance logs may be an essential step. Prior to the unit's intended use, an operational check must also be performed.

Heading off failures

Preventive maintenance is by no means limited to pilots. Much of what goes into support initiatives of aircraft today is with the intent of heading off failures. Oftentimes an enhanced situational awareness utilizing many of the body's sensory organs can have a significant impact in heading off potential problems. Routinely comparing flight displays for uniform brightness and clarity will often provide subtle clues that an instrument may be approaching failure. Touching a unit (carefully) can also provide evidence specifically

regarding temperature and vibration. Even audible ques can provide guidance as to the operating state of various components.

As avionic components do depend on electrical power and a byproduct of operation is heat, one of the most important proactive checks is the assurance of proper airflow surrounding the component. Caution must be used when evaluating the location of a device in close proximity to fuselage skin. This is particularly true in aircraft operating at high altitudes for prolonged periods of time. Some documented cases revealed that the heat sink impact of metal component surfaces joined to un-insulated aircraft structure will cause the temperature of the unit to go below the design threshold.

By analyzing the previous repair history of particular units we can identify the parts most susceptible to failure and make arrangement for replacement to extend the component life and overall performance of your avionics. It has been noted that this type of attention will improve system reliability by as much as 50 percent.

Routinely comparing flight displays for uniform brightness and clarity will often provide subtle clues that an instrument may be approaching failure. Touching a unit (carefully) can also provide evidence specifically regarding temperature and vibration.

Coaxial cables are an area that have for the most part, been considered "on condition." After all, what could possibly go wrong with a chunk of wire? Antenna cables are generally tuned for the type of system in which they interact and maybe best considered transmission lines. A coax is made up of at least two conductors separated by an insulating material. Breakdown of a coax will result in initial diminished range and clarity of the transmissions and reception and possibly soon followed by transmitter failure. Breakdown in transmission lines can occur from the results of heat, chemical exposure, or even over tightening of cable clamps.

Of course "preventive maintenance" may not always work for the good. Using certain types of automotive wax on aircraft windows or improper erosion tape on antenna leading edges may reduce the ability of these components to dissipate electrostatic charge.

Many in this business are still firm believers in the old adage "If it isn't broke, don't mess with it." As an ex-airframe manufacturer's technical representative, my first question to someone calling with a problem "had you done anything to the system prior to experiencing the malfunction?" Most of the time the answer was slow in coming and followed by "I'll call you back."

The good news is my phone doesn't ring that much anymore and I attribute that to being proactive rather than reactive when it comes to the maintenance of aircraft in my care. AMT

Jim Sparks has been in aviation for 30 years and is a licensed A&P. 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. He can be reached at sparksjim@sbcglobal.net.

AMT Aircraft Maintenance Technology

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Ronald Donner, *AMT* Editor

Ronald (Ron) Donner is the current editor of *Aircraft Maintenance Technology (AMT)* magazine. He's spent his entire life devoted to aviation and he holds FAA certificates as an A&P/ IA, and a Commercial Pilot with Single and Multi Engine Land, Instrument Airplane and Glider ratings. Ron has worked in a variety of maintenance related roles, both technical and management in general aviation as well as with a major airline.

SPEAKER: Robert Baron

Dr. Robert Baron is the President and Chief Consultant of The Aviation Consulting Group. He has over 23 years of experience in the aviation industry. As a global aviation safety consultant, he has assisted a multitude of aviation organizations in the development of their Human Factors, SMS, CRM, and LOSA training programs. Dr. Baron is also an adjunct professor at Embry-Riddle and Everglades Universities.

SPEAKER: Jerry Allen

Jerry Allen has over 26 years of aviation experience in human factors, error management, and safety. In his current position, Jerry leads the Americas operation of Baines Simmons, providing Safety Management Systems (SMS) implementation, risk reduction, and safety training services to global aviation and other high-risk organizations. He is also a trained accident investigator, A&P mechanic, private pilot, and certified aircraft insurance adjuster.

Southwest Airlines' Winning Maintenance Team

"Aviation's Best" according to industry rankings and AMTSociety's Maintenance Skills Competition

By Charles Chandler

Legend has it that Southwest's cofounder and chairman emeritus, Herb Kelleher mapped out the vision and plan for the airline on a paper napkin while dining at a restaurant in San Antonio. Southwest was incorporated in Texas and commenced service on June 18, 1971, with three Boeing 737 aircraft serving Houston, Dallas, and San Antonio. Today, Southwest has 548 Boeing 737s, employs a staff of about 35,000, and manages about 3,400 flights a day to 72 cities. It is a very successful company and regardless of the category Southwest is continuously being recognized for outstanding achievement:

- Topped the list of the 50 best U.S. places to work by Glassdoor.com (December 2010)
- Named as one of MSN Money's "10 Companies That Treat You Right" (May 2010)
- American Customer Satisfaction Index ranked SWA No. 1 among all airlines for the 17th year in a row (June 2010)
- Named the recipient of the Williams Trophy for Southwest's environmental stewardship and leadership in Required Navigational Performance. The Williams Trophy is awarded to recognize leadership and vision in aviation or space that has enriched the quality of life on Earth (October 2010)
- Named Best Low Cost Airline in North America by *Business Traveler* Magazine (December 2010)
- Recognized as a Top Employer in G.I. Job's 2011 list of 100 Military Friendly Employers

How does Southwest achieve this level of performance and contribution? In my opinion it is rooted in the airline's commitment to its customers, employees, the communities it serves, and the environment. Southwest's commitment to its employees is written in its mission statement, part of which reads, "Above all, Employees will be provided the same concern, respect, and caring attitude within the organization that they are expected to share externally with every Southwest Customer." If you have flown on Southwest, very likely you have experienced that great customer service from the frontline staff. I was curious to see how the Southwest's philosophy is demonstrated in its maintenance organization and by its AMTs.

The MSC 2011 Team Southwest included Chris Wilson (DAL); Corey Fritz (DAL); Eric Dulski (DAL); Mark Mattioli (MCO); Tom Zollars, coach; and Dennis Pelletier, manager of maintenance training; Kyle Acuna (PHX) and Scott McNabb (DAL) were judges for the event Southwest sponsored.

Southwest maintenance

A staff of 1656 aircraft maintenance technicians (AMTs) maintains the fleet of 548 B737s according to the FAA approved Boeing MSG-3 maintenance program. Each AMT is trained to perform all maintenance tasks on the aircraft. They do not have des-

The 2011 Team Southwest included Chris Wilson (DAL); Corey Fritz (DAL); Eric Dulski (DAL); Mark Mattioli (MCO); and Dennis Pelletier, manager of maintenance training. The team coach was Tom Zollars.

ignated "skills" or specialists and are trained as line mechanics.

Of its 16 locations, 10 have full coverage and perform scheduled overnight maintenance; four with hangar facilities perform maintenance up to the C-check level; and the facility in Dallas also performs MSG-3 heavy checks. It outsources a percentage of its heavy maintenance to select MROs.

Southwest culture

I called senior technical instructor Tom Zollars and asked for specific information about the Maintenance Skills Team and if maintenance is influenced by the larger corporate culture. Zollars says, "Our maintenance culture can be described in two words, respect and teamwork. We are part of the larger Southwest corporate culture, and the Southwest spirit runs through all departments.

"It is really a simple approach. Treat employees with respect. Ensure that they feel they are a valued member of the company and reward teamwork. The employees are motivated to do their best and perform their task as quickly as they can. I have worked for several other airlines and companies and it is surprising how many just don't understand how important it is to treat employees with respect."

In the airline community, Southwest's mechanics have the reputation of being very effective and efficient. They wear shoulder patches that read SWA Maintenance "Aviation's Best." I asked Zollars how they developed and maintained that speed and accuracy maintenance philosophy.

"We try to recruit mechanics that have a positive attitude and broad work experiences, then we provide them with in-depth B737 type, systems, and troubleshooting training. The accuracy comes from their experiences and our training. The speed comes with application of that training and repetitive work experiences. The maintenance department gets a lot of respect from other departments and company employees. Occasionally I ride in the cockpit jump seat and I always hear compliments from our pilots about our mechanics."

AMTSociety's 4th Annual Maintenance Skills Competition

This year, Boeing, Alaska Airlines, FedEx, UPS, Southwest Airlines, Australian Licensed Aircraft Engineers' Association (ALAEA), and the Association of Maintenance Professionals (AMP) competed in the Commercial division of *AMTSociety*'s Maintenance Skills Competition held in February in Las Vegas. A total of 26 teams competed in five categories. Southwest Airlines was the defending champion. It also won the William O'Brien Award for Excellence in Aircraft Maintenance for having the fastest score.

The 2011 Team Southwest included Chris Wilson (DAL); Corey Fritz (DAL); Eric Dulski (DAL); Mark Mattioli (MCO); Tom Zollars, coach; and Dennis Pelletier, manager of maintenance training.

The APU maintenance event at the Maintenance Skills Competition was sponsored by Southwest Airlines.

Kyle Acuna (PHX) and Scott McNabb (DAL) were 737 event judges. I asked team coach Tom Zollars, why enter the *AMTSociety* Maintenance Skills Competition. "Like Mark Mattioli says, we have a good reputation and we want to demonstrate that. It's that Southwest competitive spirit. We like to compete and win."

We had the opportunity to see and listen to some of that competitive spirit in *AMTSociety* Skills Competition YouTube video. You got a sense of the Southwest Maintenance Culture. They left no doubt that they were a team of professionals and they were there to win. As Corey Fritz put it, "We are here to win and have a good time." Their team spirit was emphasized by the pink Breast Cancer Awareness ribbon each wore. These ribbons were to recognize one of their teammates that had gone through the training but had to drop out in order to support his wife who was recently diagnosed with breast cancer. That team member and his wife have since received better news.

Southwest's Skills Competition team

I asked team coach Tom Zollars how they chose the team members. "The first year we competed, our management chose the team

members. After that it was by peer review and selection. The standards and requirements for a Southwest Skills Team member are very high. These guys are serious about the standards and winning this competition. They want members on the team that have solid mechanical skills and can perform under pressure and deal with ambiguity. We never know until the competition what the tasks are going to be."

I asked about company support. "We had total support from the company. They provided the uniforms and covered all travel and incidental expenses for the training sessions and for the actual competition. I don't want to talk too much and divulge our winning strategy, but we treat this competition like a training assignment. In January, our training department manager Dennis Pelletier pulled me out of the training rotation and assigned me to train and support this year's Skills Team. The team completed three four-day training sessions."

2012 Maintenance Skills Competition?

After talking to folks like Tom Zollars, it is apparent that the maintenance department and its AMTs are part of and demonstrate that Southwest spirit. Current CEO Gary Kelly puts a sharper point on their commitment to the employees: "Our people are our single greatest strength and most enduring long-term competitive advantage."

How is this company spirit, customer service, respect, and commitment to the employees working? Last year, when many American companies were shrinking, laying off, and going bankrupt, Southwest had a net income $459 million, and 2010 was its 38th consecutive year of profitability.

Southwest won *AMTSociety*'s 4th Annual Maintenance Skills Competition. I asked the reigning champions if they would field a team and defend their title in the 2012 competition. Zollars gave a tentative yes, and said "that you never know what a year will bring, but yes, we are planning to compete and win again next year. As you know Southwest's acquisition of AirTran is moving forward. Our plan is to field two teams, one from Southwest and one from AirTran."

If you are considering competing in *AMTSociety*'s 2012 Maintenance Skills Competition, plan on having fun and I strongly recommend you bring your A game. **AMT**

Charles Chandler is an A&P based in Michigan. He received his training from the Spartan College of Aeronautics.

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State of AMTSociety Address

IA renewal

AMTSociety IA Renewal Consortium program concluded on a positive note Saturday, April 9 in Orlando, FL, in conjunction with ATEC at the 51st annual conference of the Aviation Technicians Education Council. It is nice to report to you that our overall attendance increased again to 1,096, which represents an increase for each of the past three years.

I've already started to work on the schedule for the fall of 2011 and spring of 2012. Please watch the upcoming issues of *AMT* and our web sites for the new schedule.

— *Tom Hendershot*

Membership program

"Refer-a-Friend Program" is effective April 1, 2011; you will receive a free Snap-on ratcheting screwdriver with *AMTSociety* logo engraved on the handle when you refer friends to join. All new members to AMTSociety will also receive a screwdriver. The limited edition screwdrivers will be given as long as supplies last. A $61.25 value, the screwdriver is in addition to all the other *AMTSociety* benefits.

Snap-on ratcheting screwdriver with AMTSociety logo.

Aviation technician groups unite

AMTSociety, the National Business Aviation Association Maintenance Committee, and the Professional Aviation Maintenance Association have agreed to align their common interests on behalf of aviation technicians throughout the industry. Meeting recently at the NBAA Maintenance Managers Conference in San Diego, leaders of each group agreed to collaborate on issues related to aviation maintenance, including regulatory concerns, National AMT Day, and the education of technicians. This intiative puts together for the first time, a prominent force dedicated to promoting the aircraft technician and professionalism within the ranks. Each organization will maintain its autonomy and mission while partnering on issues of mutual interest.

Meeting at the NBAA Maintenance Managers Conference in San Diego, leaders of AMTSociety, PAMA, and NBAA agreed to collaborate on issues related to aviation maintenance, including regulatory concerns, National AMT Day, and the education of technicians.

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Why Charlie Taylor Should Matter to You

May 24: a day of recognition for those who keep aircraft flying safely

By John Goglia

May 24, as some of you may know, is National AMT Day. It took many years and the dedicated efforts of many people to get Congress to declare a day of recognition for the men and women who work tirelessly — and usually without recognition — to keep aircraft flying safely, day in and day out. The date selected for AMT Day is not a coincidence. It is the birthday of the father of aviation maintenance — and engineering and manufacturing — Charles E. Taylor.

Born in 1868 in a small town in Illinois, Charles Taylor went from working as a bicycle repairman for the Wright Brothers to building the engine that powered their historic 1903 flight at Kitty Hawk. Talk about re-inventing yourself! But despite his unparalleled contributions to the history of flight, his accomplishments, like his name, are relegated to the dust bin of history.

Why does this matter?

Some ask, with all the problems facing maintenance workers today, from outsourcing to pay cuts and layoffs, why focus on an obscure mechanic who lived and died more than a half century ago? And I respond, sometimes patiently and sometimes more heatedly, because many of the problems today's maintenance workers face is because few know and appreciate the contributions of our primo mechanic. And how is that, you say?

As important as the Wright Brothers were to aviation, Charlie Taylor's contributions were of equally epic proportions. The failure to recognize the tremendous significance of his work in helping design, engineer, build, and ultimately maintain the first engine for the first powered flight was the beginning of a national, and global, indifference to the men (and now women) behind the machines. The dawn of aviation made heroes of pilots and Orville and Wilbur are household names to this day, more than 100 years after Kitty Hawk. Mechanics, like Charlie Taylor, were relegated to the back pages of history, if they even made it into the history books.

Not surprisingly, pilots have garnered greater public respect and appreciation which generally translates into better pay, better hours, and better working conditions. Recognition of the importance of work performed is a critical step in garnering better pay and better working conditions. I believe that raising Charlie Taylor's profile in the public eye raises the profile of mechanics in general and leads to a greater appreciation for the critical functions they perform.

And the importance of a higher profile maintenance career is not just important to our current generation of mechanics. It's also critical to recruiting the best and the brightest in high school and trade schools to continue in the maintenance profession. While we may retire from the profession one day, we will surely be flying for many years thereafter and expecting the same level of professionalism maintaining our flying machines.

So I would ask each of you to seek out opportunities to raise Charlie Taylor's profile. Write letters to your local papers asking for coverage of Taylor's birth date. Ask to speak about him at your local schools. And certainly attend commemorative events in your area. I will be. **AMT**

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

Management's Responsibility

How to inspire the next generation

By John Rahilly

During the course of my adult working life I have been asked many times what I do for a living. My answer: I am an FAA certified A&P mechanic. Now I have other accomplishments and credentials, however my most prized accomplishment is earning this rating. Maybe it is because it was something I wanted from an early age or because it was the key to many opportunities for me and my family. I also recall the number of friends and business associates whose successful careers were launched by their A&P training and experience.

Unfortunately my enthusiasm is dampened when the recipient of this explanation displays a puzzled look and invariably responds with a host of questions starting with "I never heard of that before." I guess most people think our industry rounds up folks at local automotive service stations and that is the basis on which private and commercial aircraft remain aloft! Sounds farfetched? Not really, when you consider our career field has literally zero visibility with the public in general and very little visibility in the educational community. This lack of visibility is the not failure of any one trade group or professional organization but rather a general malaise within our technical ranks in promoting this career choice.

Participating in local airport events, community services projects, and job fairs are a few examples of promoting interest in aviation within the local community.

Conventional wisdom fosters the idea that doctors run the hospital and hold the preeminent position in the medical field. Well it is true they play a significant role. However, look for a doctor at 10:30 at night and you will quickly realize that the nurses and a plethora of support personnel are operating the facility. Using that analogy aviation technical personnel are the force behind the scenes keeping the aircraft in the air but this is where the analogy differs. The medical profession has done an excellent job of making the public aware of career opportunities. The medical community uses every communication avenue available to promote these career fields including alliances with educational institutions and the hospitals. How often have we been presented with a barrier to conducting a simple school tour because of "insurance reasons" or "someone may get hurt"? This type of exposure is often the spark that ignites a career choice.

Management can make a difference in promoting technical career opportunitities to the next generation. It takes special effort and passion and if we do nothing we will surely have a shortfall of qualified technical personnel. The greater tragedy will be a lack of personnel because individuals do not realize this career field is available. Here are a few thoughts of how we can proactively promote career opportunities.

Family involvement

I always find it sad when you ask a pre-teen or teenager what your parent does at work and they do not know. Now some may not care but others had parents who never took the time to explain what they did at work. Take your child and his or her friends to work after hours, show them what you do and engender a positive attitude about your profession. Remember that little spark that ignites a career? The connection between family and work is undeniable and management should promote family involvement in the workplace.

Community involvement

Working at various maintenance facilities around the country I have heard a common comment from the non-aviation members of the community "I did not know they did that out at the airport" or my favorite "I wondered what all those people were doing in those hangars."

Participating in local airport events, community services projects, and job fairs

are a few examples of promoting interest in aviation within the local community. There are a few maintenance repair and overhaul (MRO) facilities that have done an excellent job in this area. We need to do more if we expect to fill future technical vacancies.

Educational community

A number of years ago I was the general manager of a Midwest MRO and one of the technicians asked if his wife, who was a guidance counselor at the local high school, could host the next meeting of the regional guidance counselors association at our facility. Obviously I agreed and provided a nice lunch coupled with a detailed tour of our facility.

They were delighted, and to this day I remember their stunned reaction to the different career disciplines available to their students right in their backyard. We followed up with individual students sent to us by the guidance counselors and subsequently hired a cadre of hometown students in a multitude of disciplines. Some came in as trainees and others returned two years later after graduating from an A&P school.

Within your own company

If at all possible promote aviation careers with your own company. One size does not fit all. Regardless of whether you are a corporate flight department, an MRO, or a charter/management company we have the opportunity to expose others to a rewarding career field. Your department or division provides a valuable service so do not hesitate to welcome fellow employees and their families and expose them to the opportunities available.

In 1962 I was 13 years old and lived in Boston, not too far from Logan Airport, where seeing the big piston powered aircraft climb slowly into the sky was a daily occurrence. I was always excited to see the airplanes and started a relentless campaign with my father to get a plane ride.

My father finally agreed to take me to visit his brother in Pittsburgh albeit on the Greyhound bus. So we went to Pittsburgh and when the visit was over, and it was time to return home, much to my surprise, we arrived at the Pittsburgh Airport instead of the bus terminal.

My father had booked a flight home to Boston on TWA which included a stop in Hartford, CT (Windsor Locks/BDL). The plane was a Lockheed Super Constellation which mounted four 18-cylinder Wright R-3350 (3,250-hp) engines. It was bigger than life! As we got on board I asked my father if there would be any chance to get a look in the cockpit.

Like most parents he was one step ahead of me. So as we got on board the flight engineer said, "I hear you like airplanes. That being the case, you may want to ride up front with us to see what's going on." I could not believe my good fortune as I was strapped in the jump seat wearing a big headset. We were off to Boston with an interim stop. In Windsor Locks, the flight engineer said he had to inspect the plane before we could take off for Boston and would I like to help him.

It was now night, so he handed an extra flashlight to me and out we went to perform what I would learn years later was a preflight inspection which I would perform many times in my career. As "we" looked the airplane over I asked him exactly what he did and he said he was a flight mechanic but now they call me a flight engineer.

I asked him if he likes his job. I'll never forget his response "fixing and flying on airplanes is the greatest thing you will ever do." Well that was my inspiration and the spark that ignited a lifelong love of aviation and a great career. As managers, we have an opportunity to inspire both on and off the job. Let's all strive to be like the old flight engineer and "pay it forward" for the next generation. **AMT**

John Rahilly has over 36 years of aviation service experience. Based in North Carolina, you can reach him at johnrahilly@rahillyaviation.com.

Master Mechanics

In honor of Charles Taylor, here are a few of the recent winners of the Charles E. Taylor Master Mechanic Award

By Barb Zuehlke

The Master Mechanic Award is named in honor of Charles E. Taylor, the first aircraft mechanic. To be eligible for this award, a recipient must have served at least 50 years as an aviation mechanic and also have been an FAA-certified mechanic for a minimum of 30 years. Along with a commemorative plaque, their honors will be recorded in a permanent leather bound book in Washington, D.C.

Dave Becker

Dave Becker's aviation career began as an Air Force mechanic; after military discharge he attended and graduated from the Spartan School of Aeronautics. He was employed by Northwest Airlines as a DC-6 mechanic, Republic Aircraft, and then he moved to Eastern Airlines, where he had a 29-year career, progressing to lead mechanic and aircraft inspector. Following his retirement from Eastern Airlines, Becker continued plying his skills at Georgia Tech and Raytheon Aircraft. Residing now in Fayetteville, GA, he has served as crew chief on the PT-26 Cornell and the C-45 Expediter at the Dixie Wing of the Commemorative Air Force at Falcon Field in Peachtree City, GA. Koldoff and Becker are only the 14th and 15th Georgia residents to receive the Master Mechanic Award.

Dave Becker, of Fayetteville, GA, and Elmer Koldoff, of Peachtree City, GA receive Charles E. Taylor Master Mechanic Awards. Also shown is Ray "Pop' Wilson who received the "Master Pilot" Award.

Elmer Koldoff

Elmer Koldoff of Peachtree City, GA, began his aviation career with Capital Airlines, that later became part of United Airlines, where he remained until his retirement. He progressed through the ranks of line mechanic, aircraft inspector, maintenance planner, maintenance foreman, and into management positions as operations manager and station maintenance controller. Transferred by United to Atlanta in 1989, he retired 10 years later with responsibility for aircraft maintenance in Atlanta, Orlando, and Tampa. Koldoff has been involved in restoring military aircraft as a volunteer at Falcon Field in Peachtree City, the home of Dixie Wing of the Commemorative Air Force. He serves as maintenance officer for all of the Dixie Wing aircraft and ground equipment.

Harold Lee Summers

Harold Summers, Arlington, VA, director of flight operations and technical services for Helicopter Association International, received his Charles Taylor Award at Heli-Expo in March. He received his A&P in 1960 and early in his career woked at Baxter Aircraft in Yakima, WA; WenAirCo in Wenatchee, WA; and Rick Helicopters in San Francisco, CA.

The majority of his career was spent at Petroleum Helicopters in Lafayette, LA, where he was responsible for the oversight and management of maintenance planning, maintenance training arrangements, and for providing technical guidance to maintenance personnel. He developed standardized quality programs and safety standards to meet both domestic and international customer requirements. He managed the QA departments and assisted in development of industry standards with HAI and

Harold Summers, and his wife, after receiving his Charles E. Taylor Award. Photo courtesy of Ronald Donner.

the American Helicopter Society. Phil Randall, assistant national manager of the FAASTeam, presented the award to Summers.

Gary Underland

Gary Underland of Medford, MN, received both the Charles E. Taylor Master Mechanic Award and the Wright Brothers Master Pilot Award at the 2011 Minnesota Aviation Maintenance Technician Conference. He worked at Rohr Corp., Chula Vista, CA; South Minnesota Aviation Service, Owatonna, MN; Sky Farmer Aerial Sprayers, Waseca, MN; Eagle Aviation, Faribault, MN; and Aerodrome, Owatonna, MN. He's been engaged in rebuilding and restoring antique aircraft since 1961, and had a long association with the late Buzz Kaplan. In 2006 he was inducted into the Minnesota Aviation Hall of Fame. Gary was an apprentice A&P from 1961 to 1968; he became an IA in 1971.

Howard Webster

Howard Webster was awarded the Charles Taylor Award on April 20, 2011, by Jeffrey Halliday, principle maintenance inspector, Allegheny Flight Standards District Office, Pittsburgh, PA. The majority of Webster's career was at USAir; he also worked at Aloha Airlines, Northwest Airlines, Mohawk Airlines, and Allegheny Aviation Consulting Corp. He received training at Vaughn College of Aeronautics and Technology. **AMT**

We congratulate the winners for their dedication to the aircraft maintenance industry. If you have received the Master Mechanic Award or know someone who has, let us know. Send to editor@amtonline.com.

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SMS and Your Organization

On June 8, AMT will be hosting a live webinar on SMS moderated by Ronald Donner

Jon Jezo, Publisher

Safety management systems are a hot topic in the industry and should be on the minds of many maintenance professionals soon, if not already. In order to learn more *AMT* has been meeting with maintenance and training organizations, and has attended the Cygnus Aviation Expo, Heli-Expo, AEA, and the NBAA Maintenance Managers Conference.

There are many questions about the meaning and exact definition of "SMS" today. Hopefully everyone got a chance to read last month's *AMT* online article by Barry Ballenger titled "From The FAA: SMS: What Does It Mean for the AMT?" and Majella McDonald's Management Matters article "What's in Your Toolbox?" If you haven't gotten a chance to read them, Google them and then be sure to visit http://amtonline.com/webinars/ to sign up to view our next webinar (yes, for FREE!) on Safety Management Systems and Your Organization.

On June 8 at 1 p.m. Central Time, *AMT* will be hosting a live webinar on SMS moderated by Technical Editor, Ronald Donner. Ron will be joined by two guest speakers: Robert Baron and Jerry Allen, industry experts on SMS.

The free SMS webinar will feature guest speakers Robert Baron and Jerry Allen, industry experts on SMS.

Once you're signed up, we'll be sure to send you a reminder before the event and in case you miss the live webinar we'll send you a link to view the archived version later, at a time of your convenience. I'd like to thank the guest speakers and sponsors for making these webinars possible; stay tuned for more great information!

Are you connected?

These days there are many social media outlets and networks to get your news from and messages out. Let *AMT* magazine be *your* source of aviation news and we'll be sure to help you stay on top of the latest trends, breaking news, business forecasts, and everything else in the maintenance world.

Be sure to get online and 'Like,' 'Follow,' and 'Join' *AMT* magazine and *AMTSociety* on your favorite social networks today!

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Readers in Action Contest ends soon!

One last reminder to submit your best photos to be included in the contest to be featured on our June issue cover. The winner will also receive $250!

For the Readers in Action contest we are looking for photos of you on the job, in the hangar, working on an aircraft, in the shop, on the ramp, or in the field (extra points if *AMT* magazine is in the shot).

Let us hear from you. You can send high-res photos to editor@amtonline.com with Readers in Action Contest in the subject line. Or you can mail them to: *Aircraft Maintenance Technology*, Readers in Action Contest, 1233 Janesville Ave., Fort Atkinson, WI 53538. Deadline is May 16. Don't forget your contact information so we can contact you if you win!!

Thanks for reading!
Jon

1.2

1.2 billion dollars invested in available inventory means we stock the parts so you don't have to. And you can usually have what you need the next day. Aviall works hard to provide you with exactly what you need, precisely when you need it. **Aviall Delivers.**

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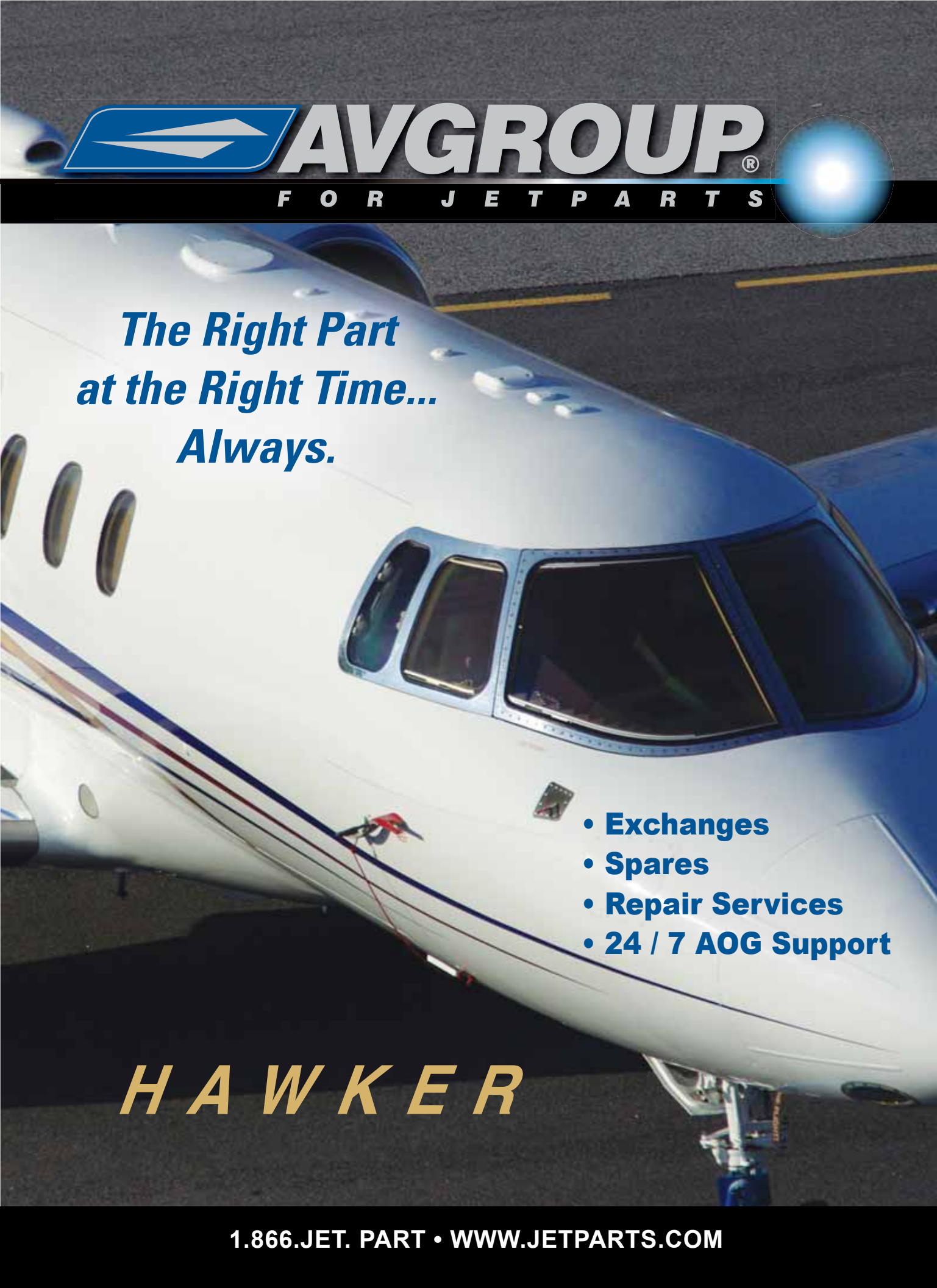
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