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# AMT

## Aircraft Maintenance Technology

*Written by aircraft maintenance professionals for the professional maintenance team*

*Official publication for AMTSociety*

**September 2011**

# Time To Upgrade Your INTERIOR?

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Wicker not leather was the standard for seats in this Ford Tri-Motor. Photo courtesy of Tim Kern.

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AMT Aircraft Maintenance Technology
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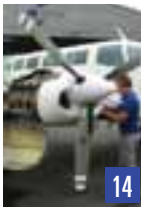


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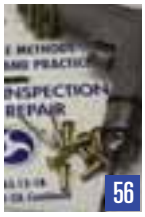


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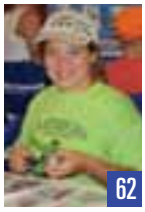


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# Business Aviation

## Celebrate what business aviation brings to communities large and small

Ron Donner, Editor

Last month while visiting family in my home state of Wisconsin I stopped at Wausau Municipal Airport to also visit with an old aviation friend; we attended high school together and his father also taught me to fly. Lyman now operates the small one-person maintenance shop there, and on this Sunday was answering the phone, pumping fuel, and basically keeping the doors open.

I compare operating a small airport FBO to farming; a 24/7 jack-of-all-trades type of role. It was a quiet afternoon and other than a couple walk-in customers we were able to spend some uninterrupted time catching up, admiring the model airplanes hanging from the office ceiling, talking about the good old days, mutual friends, current realities of the aviation business, and speculating some on what would be next for people like us and other friends who have faced job change late in their careers.

I couldn't help but reflect back to life several decades earlier when so many of us began our aviation careers at small town airports answering the phone, pumping fuel, working in the shop, and doing whatever it took to keep the doors open. Coincidently, at one time I worked at this airport doing the same things.

Early on in our careers my friend was hired by a local company and flew a variety of single- and multi-engine reciprocating engine aircraft as a corporate pilot. Eventually the firm he last worked for upgraded to a new King Air. Nice! Unfortunately this didn't last and like many companies facing a down economy, fears of recession, and possibly the impact of criticism from Washington, D.C., a few years ago, the airplane was sold abruptly ending his flying career; at least for now. I often felt he was fortunate being able to remain in the hometown area and have one of the few corporate aviation jobs these small communities generally have to offer.

Arguably there are areas around the country or the world where business aviation is more active, even thriving, and finding similar work would be easier. But not everyone automatically chooses relocation for work and being close to family, friends, and familiar surroundings becomes more important.

Small communities also need aviation people to maintain and grow the aviation services they have to offer. While reminiscing this day I was reminded of a small local manufacturing firm that purchased a new Cessna 172 in the mid-1970s in order to better conduct business at other rural communities in the upper Midwest. I learned this company eventually became two larger companies with two larger airplanes, a small town business aviation success story. As difficult as it may be, I commend my old friend for maintaining our roots and continuing to support small town aviation.

The week of Oct. 10 the business aviation community will gather together at the National Business Aviation Association's 64th Annual Meeting and Convention. Celebrate the greatness that business aviation brings to communities large and small. Show your support to this industry by attending. See you there, *Ron*.

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# Mr. President, I Respectfully Disagree

By Nick Sergi

Having made my living in the corporate and general aviation workplace most of my life, I believe I have a right to the following opinion. Mr. President, I humbly, but emphatically, disagree with your characterizing the use of business aircraft as "fat cats flying around on their corporate jets."

Borrowing from NBAA, business aviation employs 1.2 million workers, and contributes more than $150 billion to our GDB each year. Kansas, alone, employs more than 30,000 aerospace workers, generating more than $7 billion to its economy each year.

While many of the country's industries have been sending jobs overseas, business aviation has been keeping jobs here. And, aren't jobs the crucial issue of this economy? With an effective unemployment rate of approximately 15 percent, shouldn't our legislators be providing incentives for employers to grow jobs here? Why remonstrate an industry that has proven to be a job keeper and producer, requiring both skilled and unskilled workers.

As many of you have read, we are currently experiencing unfavorable numbers with our balance of trade, buying more products made cheaply overseas, than those made here. Speculating for a moment, if the political climate for our corporate and general aviation manufacturers continues to be hostile, I, for one, would not be surprised to see these companies begin to ship work overseas.

It is difficult as it is, in the economy, for businesses to succeed, especially small subsidiary manufacturers and service organizations, of which there are hundreds, that are subject to the vagaries of supply and demand and an unfavorable regulatory environment. Think of all the suppliers that support our OEMs. Does this railing against the industry give them cause to stay, much less invest? Instead of pillorying the industry, I suggest the industry's activities and accomplishments be encouraged and praised as truly American.

Don't we lead the world in the manufacture of corporate jets? Mr. President, I recommend you support it and find ways to help it grow!

Perhaps the advisors in the administration do not know, understand, or much less, appreciate the economic advantages business jets provide. Not only for the big hitters, but, just as importantly, for the mid-sized and small industries that dominate our economic landscape.

For instance, take our geography. There are more than 5,000 airports in the U.S., but airlines service only 500. The midsize and small companies that use the other 4,500 rely on business jets and other general aviation aircraft to reach their customers and facilities.

## Business and political tool

Mr. President, did you not criss-cross this country nine times during your run for office? I fail to see how you can forsake the benefits of your experience. And, do not many of your fellow politicians use business and general aviation aircraft to regularly travel from their districts and states to D.C.? For instance, I would consider a 757, configured especially to the past speaker's needs, that went coast to coast on a weekly basis, a business jet. Forgive me, but I did not hear the White House disparage this activity.

Look, I just want to be fair. I've been in this business since Convairs, Fairchilds, and DC3s served as corporate aircraft. And, yes, some of these were "golden chariots." But those days are gone.

Business aircraft are essential tools permitting our industries to compete on a global basis. The continued rise in the importance of this tool has enabled the U.S. to maintain and grow its leadership in the manufacture and support of these weapons of commerce.

A final word, just because the business aircraft industry may appear to cater to the rich and offer itself as low-lying fruit to politicians hungry for a patsy, is no reason to mischaracterize its importance to our economy. Nuff said.

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# Interior Care and Maintenance

## What you do, what owners need to do

*Left: Attention to detail is key when cleaning and maintaining leather seats and fine carpets such as in this Lear 45.*

*Above: Interior photo of a Ford Tri-Motor. Photo provided by Tim Kern.*

By Tim Kern

Care, cleaning and maintenance of interiors — seats, carpets, and furniture — is something of a different world. Where airframes, avionics, props, and power all have detailed maintenance instructions and procedures, we're often on our own when it comes to the part of the airplane our most-important clients see every day. Asking experts — suppliers and maintainers — how to keep interior components in good shape is pretty much the only way to get decent answers.

As with most things aviation, interior maintenance should follow the No. 1 rule for safe flight: Never let a bad trend continue. Whether it's a spill, an ink spot, a crack in the leather, a loose seat track, a tiny water leak at the faucet, or a cabinet that shakes, waiting will not make the ultimate fix any easier.

Having fussy crews is a real blessing here, but cockpit crews rarely concern themselves with things that don't make the aircraft fly (or not fly). Cabin crews need to be cultivated and trained — by us — so that they keep us informed of those little squawks, before they become expensive ones.

Routine cleaning, vacuuming, and spot cleaning, is the first line of defense. Ink, once dry, is difficult to remove; a quick look after every flight is your only recourse; and an "ink stick" will get rid of the ink, if applied in time. Vacuuming after every

flight will preserve the carpet, help find trouble, and save time in the long run. If your aircraft is one that follows best practices and keeps a spare set of carpets, you'll spend a lot less time cleaning the ones in the aircraft than you will changing them.

## Care and cleaning

Tariq Deir, director of operations for Jet Connections at the London Oxford Airport, offers the following advice, "When steam cleaning the carpet while it is still installed on the airframe, it is difficult to judge how much water is being retained; the risk of rust or corrosion becomes much higher. We recommend either waiting for the aircraft to go into maintenance, where we can perform a full carpet shampoo with steam cleaners and detergent, and give sufficient time for the carpet to fully dry. If the carpet cannot be removed, we shampoo the carpet by hand using an enzyme-based product that organically breaks down soil and stains. This allows our team to control exactly how much liquid is applied to an area, whilst taking a minimal amount of solution on board the airframe."

Deir goes on to say, "Corrosion is very difficult to spot and is commonly caused by moisture retention. After a spillage or spot stain, the crew may panic and use any nearby liquid-based substance to remove the stain. This results in the carpet's absorbing far too much of the liquid. We recommend using a foam-based germicidal cleaner, sprayed directly on the infected area; it lifts the stain from the carpet fibers, where the stain can be slowly wiped away with a plain towel. This results in minimal or no water retention."

## General wear and tear

Aircraft carpet can cost $2,000 per square yard, and Deir notes that "the most common cause for carpet replacement is the general wear and tear in high traffic areas, such as the entry steps and areas around the galley. I would recommend either cutting out a number of mats from the same material as the carpet and placing them in such areas, or buying a number of decorative rugs. Area rugs are intended to absorb the bulk of the wear and the dirt — and they do. Replacing a mat or rug is inexpensive vs. a whole carpet; as a bonus, it requires no downtime." He added that you might consider a similar strategy for couches and chairs, using covers and pads where possible.

> **"Area rugs are intended to absorb the bulk of the wear and the dirt — and they do. Replacing a mat or rug is inexpensive vs. a whole carpet; as a bonus, it requires no downtime."**
>
> — Tariq Deir, Director of Operations, Jet Connections

Deir warns that uninformed or inattentive crew can contribute to the problem: "Other hidden surprises are floorboard deterioration or even floor beam cracks, results of carrying a heavy load or perhaps storing it in an area not best suited for such weight. Age also plays a common factor along with metal fatigue and dissimilar metal contact, all of which can only be revealed once the carpet, panels, etc., have been removed."

*Interior maintenance can require diverse and specialized skills such as upholstery, avionics, and mechanical.*

## Leather

Leather, tough as it is, is vulnerable to light, heat, dry air, water, and even some things we don't often notice, like certain perfumes. The key is to make frequent and careful inspections, "treat" only when necessary, and clean as unobtrusively as possible — and at least daily with a clean dry cloth. If leather dries out (particularly likely near windows or air conditioning outlets), it can crack and finally split. It's good to encourage the use of protective coverings in these areas, and also to encourage keeping window shades drawn whenever possible.

Off the shelf "treatments" can cause more harm than good. A lot more. Leathers are best

treated only with whatever is recommended by the supplier, which should include a UV protectant. If leather gets too soft, the stitching can elongate the needle holes; at worst, the stitches can pull out.

**Interior work differs from regular airframe, engine, and avionics work in that technicians are homegrown: "There is no special licensing; they're trained on the job."**

— Tony Bailey, Vice President of Operations, Comlux Aviation Services

## Maintenance and repairs

Furniture repairs usually entail scratch removal. Brian Barber, vice president of sales and marketing at Bizjet in Tulsa, OK, says that it is hard to overestimate the delicacy of the work, or the amount of patience required, in polishing the finish of veneers. The veneers are so very thin to begin with that those scratches, assuming they do not penetrate to the adhesive, leave an extremely thin layer of wood between the bottom of the scratch and the substrate. Not removing the full depth of the scratch leaves … a scratch.

*Seemingly unimportant looking details such as proper replacement of insulation must receive the same proper treatment as anything else on the aircraft.*

*Wood veneers are very thin and often times damage results in replacement of the veneer.*

Going too deep will expose the honeycomb material beneath.

Tony Bailey, vice president of operations at Comlux Aviation Services in Indianapolis, IN, notes that interior work differs from regular airframe, engine, and avionics work in that technicians are homegrown: "There is no special licensing; they're trained on the job. In our system, we have AMTs and A&Ps; we have avionics specialists. In interiors, [formal aviation-related] training is

nonexistent. Then there are specialties: woodworking; finishing; fabrication; upholstery; cabinetmakers; installers — then there are the finish fabricators and finish installers. These all require specialized skills, but there is no formal training available."

Even unimportant-looking details fulfill important duties, and must receive proper treatment: "It's important to know what you're dealing with," Bailey says. "Sound barriers need to be re-installed exactly right, or you're just adding weight without any benefit. Get the right parts, the right order, and the right fit."

So, where does he find qualified workers? "We find them in small shops, or sometimes from the big completion centers." He adds, "A beautiful thing is an A&P that can do interiors *and* avionics. These guys can write their own ticket."

Aircraft interior materials, components, and procedures are not commonly known. "You can hire a local cabinetmaker," Bailey says, "but the certification and weight restrictions — glues, weights, expansion of parts, especially paperwork — all are so important. Especially with woodwork, you'll find that gaps change at altitude. Temperatures as well as pressures can change dimensions. Not all veneers will work in all circumstances. Everything matters — even the moisture content of the woods. You need to have all sorts of special skills, and sometimes special tooling.

*Interior shops require craftsmen with specialized skills such as seat upholstery.*

"It's not like getting an MRO spec on a particular aircraft, where you get a book with specific instructions," he says. "Even avionics, which differ more radically, at least have good documentation. But interiors — every single interior is unique to that owner. Five or six airplanes, with sequential serial numbers, will not have the same 'fit,' one to the other, even with the same interior components. You may find an aircraft that is set up with, say, a wiring harness that is intended to be used in the future — if you do not know why it's there, what do you do with it?"

Dier sums, "Assuring the crew takes pride in the fantastic machine they are flying while providing a little TLC, will ensure longevity of an interior." **AMT**

*Tim Kern is an aviation writer, aircraft builder, and private pilot. He is based in Anderson, IN, and can be reached at info@timkern.com. The following companies provided information and photos for this article. Jet Connections, www.jetconnections.co.uk; Comlux USA, www.comluxaviation.com; BizJet International, www.bizjet.com; and MJ Aircraft Interiors, www.mjaircraftinteriors.com.*

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# Cabin Modifications

## Business jet owners upgrade cabins for many reasons

By Stan Younger

Aircraft owners wanting to update or upgrade cabins and cabin systems, whether to increase resale value or because they are out of date, worn, or not to their tastes, have a full range of options in the service industry.

From reconditioning seat coverings to fully replacing seats, refinishing cabinetry to stripping and re-covering it, adding Wi-Fi or modernizing entertainment systems, factory-owned facilities can be a single stop for upgrades. Modifications come in a variety of costs and, depending on extent of work, take varying amounts of time. These facilities draw on the best aviation products available, from Wi-Fi systems to Blu-ray players and cabin controls. Many upgrades can be done while aircraft are in for scheduled maintenance.

### Reasons why

Owners, of course, upgrade cabins for many reasons. Preserving and increasing resale value is the primary motivation. Just as when selling a home, first impressions drive many sales. An aircraft might have the latest avionics, but the condition and age of the seats and cabinetry — or whether passenger can easily use a laptop or iPod — can seal the deal.

Many owners or companies wish to personalize cabins, to reflect their own tastes or the company image. Factory-owned facilities can rely on experienced aircraft designers for modifications, and team members can work directly with refurbishment customers to create a personalized interior.

More than any other communication tool, business executives desire ready access to the Internet and the up-to-date contact it provides. Aircell systems provide several options for cabin Wi-Fi. In addition, high-definition televisions and other options are among modernization features, keeping owners just as connected in the air as on the ground.

A growing number of owners seek to get the most out of their aircraft by turning unused flight time into revenue. Aircraft can be used for medical and other missions, and companies such as Cessna can support and make multiple uses a reality. For instance, convertible aircraft interiors can accommodate stretchers or other equipment.

### Seat and upholstery upgrades

Seats and other upholstery can be returned to like-new appearance using a number of

approaches. One quick and simple method is re-dying the seat leather, which is a lower-cost option but limited by the original hue.

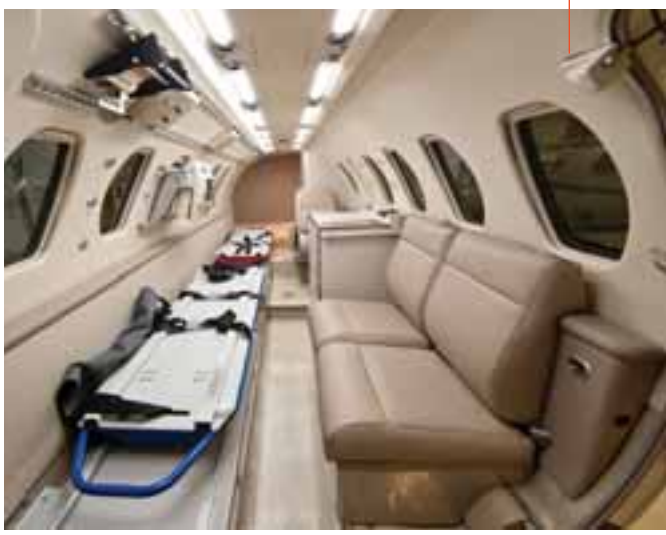
A midlevel option is re-covering the seats using existing cushions. The method has unlimited color options but cannot incorporate upgraded tailoring. Replacing the coverings and cushions is a more extensive alternative with countless color options, access to upgraded tailoring, and the certainty of extended life, as all parts are replaced. The most dramatic update is full replacement of the seats, with numerous options specific to each aircraft type.

## Cabinetry refurbishment

Just as with seats and other soft goods, cabinetry can be refurbished through a number of approaches.

The most basic approach is reconditioning. Cabinets are buffed to remove scratches and then polished to look like new. With refinishing, the existing finish is stripped and new high-gloss or stain finish is applied.

Most extensive is surface replacement, where the existing veneer or laminate is removed and a new selection is installed. This is more time-intensive but allows for customization to personal taste.



*Cessna Citation Service Center converts a Citation V for an air ambulance role.*

## Wi-Fi and other electronics

Staying Internet-connected is vital, and companies can provide the tools to keep in touch via high speed.

For example, operating via 3G mobile technology and a network of ground stations, allow full web surfing, email, and the use of any Wi-Fi enabled device. A variety of monthly service plans are offered, from unlimited use to set monthly fees with usage limits and per-MB fees when the limit is surpassed.

Entertainment options can be improved as well. Many companies offer interfaces for iPods, MP3 players, USB inputs, Blu-ray players, and high-def personal and bulkhead viewing screens. Many owners take advantage of time allotted to other interior refurbishments and maintenance to perform electronics upgrades.

In conclusion, many aircraft cabin options are available and new technology has opened up the possibilities. **AMT**

*Stan Younger is vice president, Service Facilities, Cessna Aircraft Company. For more information visit www.cessna.com.*

## Focus on Safety

Earlier this year the NTSB released a study that showed that general aviation airplanes equipped with airbags provide additional protection in accidents involving survivable forward impacts.

Airbags are designed to mitigate head and upper body injuries and are installed in the lap belt or shoulder harness portions of the restraint system. They were first approved for use in GA aircraft in 2003. Today, more than 60,000 commercial and general aviation aircraft seats are equipped with this innovative technology and new seats are added daily, according to AmSafe, the leading provider of engineered restraint systems.

The NTSB study confirmed that correctly installed shoulder harness/lap belt combinations provide significantly greater protection in GA accidents than lap belts alone. Based on more than 37,000 GA accidents, the Board concluded that the risk of fatal or serious injury was 50 percent higher when an occupant was only restrained by a lap belt as compared to the combination lap belt and shoulder harness.

AmSafe Industries Inc., based in Phoenix, assisted the NTSB with the study and how the technology works. AmSafe believes NTSB Chairman Deborah Hersman was correct when she observed that, "$3,000 for a two-seat retrofit may not be cheap, but when you consider it relative to the safety benefit, and to the cost of a new airplane – which can be more than half a million dollars – it is a good investment."

According to Joe Smith, vice president and product line manager of Airbag Products for AmSafe, no one else in the industry offers the product it does. Aircraft owners can go to an authorized service center or check the AmSafe web site which will direct them to an authorized location to install the airbag kits. The kits are approved for various Cessna, Diamond, Mooney, Cirrus, and other aircraft models, with more in development.

AmSafe unveiled its next-generation seatbelt airbag for commercial aviation at the 2011 Aircraft Interiors Expo in Hamburg, Germany, this year. And at last year's NBAA convention AmSafe, together with B/E Aerospace, announced the availability of seatbelt airbags on side-facing divans for business jets. For more information visit www.amsafe.com.

*— Barb Zuehlke*

# The GA Shop in Rural Europe

## AMT visits Star Airservice in the Netherlands and notes similarities and differences

By Ronald Donner

Star Airservice is located on Teuge Airport, a small general aviation (GA) airport in a rural part of the Netherlands, approximately 100 kilometers east of Amsterdam. It holds a European Aviation Safety Authority (EASA) 145 authorization as a GA maintenance organization providing maintenance services for most single- and multi-engine general aviation (GA) aircraft, Robinson helicopters, and provides parts and equipment distribution representing several GA-related OEMs.

Partners Marc Westenberg and Erik Moen are the two principles of Star Airservice. I first met Westenberg in February while attending the Inspection Authorization (IA) renewal seminar at the FAA International Field Office (IFO) in Frankfurt, Germany. Along with his EASA Part 66 certificate as a ground engineer, he also holds an FAA Airframe and Powerplant Certificate with an Inspection Authorization.

*Theo Hendricks inspecting a Cessna 172 at Star Airservice.*

The reason for my visit was simple: to learn more about GA maintenance in Europe. It didn't take long after arriving before we became immersed in conversation about similarities and differences between GA maintenance in Europe and the USA.

> **"Even though most of the work we accomplish is under the authority of EASA we still have to consider requirements from other National Aviation Authorities and the FAA."**
>
> — Marc Westenberg

The day of my visit I found technicians busy with two Cessna 172 inspections and a Cessna 404 near the end of a lengthy Supplemental Structural Inspection Document (SSID) inspection program. Other aircraft filled the hangar and at first glance all appeared similar to any GA shop in the States. Then I noticed the first difference; most of the aircraft had registration numbers from a variety of different countries.

### The aviation micro-community

Westenberg explains, "Aviation in Europe is kind of a micro-community. Currently we have aircraft in the shop with Dutch, Belgian, Austrian, and U.S. registration. Our EASA 145 certificate authorizes us to maintain aircraft registered by an EASA member state." He went on to talk about the challenges sometimes encountered when working on aircraft from multiple countries, "Even though most of the work we accomplish is under the authority of EASA we still have to consider require-

*The Star Airservice hangar in the Netherlands is full of GA aircraft.*

ments from other National Aviation Authorities (NAA) and the Federal Aviation Administration (FAA)."

The staff consists of four technicians or ground engineers who hold EASA Part 66 certification and several others who are in the process of acquiring certification. Depending on workloads, two additional EASA Part 66 ground engineers who also hold an A&P/IA are called upon to assist.

Theo Hendricks was checking the magneto timing on a Cessna 172 and says, "I've been an aircraft mechanic all my life working on general aviation aircraft and on WWII aircraft restoration." Hendricks holds an EASA Part 66 certification and has held an FAA A&P/IA certificate for 25 years.

Rubin Reitsma, one of the younger mechanics, explains, "I've been working as a mechanic for three years and soon plan to get my ground engineer certificate and my A&P."

Westenberg says, "Having an FAA A&P/IA in Europe is important, whereas in the States few GA technicians have EASA Part 66 certificates. There are many aircraft that are owned and operated here in Europe that remain N-registered and we work on them often. We must have the A&P/IA and follow the FAA rules."

Star Airservice participates with a Dutch aircraft maintenance school by providing a place for students to gain practical experience as part of the school's internship program. Two of the mechanics are currently aircraft maintenance students. Students participate in their first internship program in year three of their studies, and then again in year four they participate in a longer internship period. Additionally, an internship slot for a trainee from MTU, a larger MRO based in Germany, is provided. This latest trainee is a young woman from Germany

emphasizing the point that aviation in Europe has no borders.

One similarity I noticed was the age of the staff; a mix of senior experienced people, younger folks, and students, and really no one in-between. We spoke about this and many of the same concerns heard in the U.S. were voiced about aircraft maintenance in Europe; an aging work force; where will the next generation of aircraft technicians come from; aviation may be losing appeal as a career; a tough regulatory environment; and airlines shifting heavy maintenance work to other regions of the world.

## A complex system

"The EASA system is more complex than what you guys in the States have with the FAA," says Hendricks, "I question if the complexity really makes it safer; it does create more administrative work." Sometimes the aviation micro-community can cause confusion between requirements from EASA and a given country's NAA.

*A Star Airservice technician prepares this Cessna 404 for an engine run.*

One example given was a request made for a ferry permit. Similar to what often occurs here in the States, a small GA aircraft needed to be flown from one location to another for an inspection. This also meant moving it from one country to another. Westenberg says, "I spoke with the NAA of the country and EASA, and was first under the impression no one was sure who

was responsible to provide the ferry permit. It was finally resolved; but it took a few phone calls."

Westenberg says, "About once a month we will be asked by a customer to travel to another country to work on an aircraft. Our Maintenance Organization Exposition (MOE) which is similar to your FAA repair station manual contains a process for determining if we go or not. There is an approved check-

**Star Airservice participates with a Dutch aircraft maintenance school by providing a place for students to gain practical experience as part of the school's internship program.**

list we must follow and if we can't meet the requirements we don't go, even if the aircraft is just across the border, an hour drive away."

## The CAMO

Star Airservice has an additional yet separate company called Bon-Air Aircraft Management B.V. Bon-Air is a continuing airworthiness management

*Marc Westenberg, left, and Erik Moen, right, partners at Star Airservice, with AMT editor Ron Donner.*

organization (CAMO), managing the airworthiness of approximately 25 single engine and a few multi-engine GA aircraft.

"Having a CAMO manage the airworthiness of your aircraft is not a requirement of the maintenance provider, it is a requirement of EASA. In the early days it was intended to be a convenience to the aircraft owner," explains Moen.

The FAA places the responsibility for ensuring the airworthiness of an aircraft on the owner/operator. The CAMO as it was explained is a stand-alone

organization intended to be a controlled environment for management of airworthiness; a technical bookkeeping process to ensure the airworthiness of an aircraft.

Moen says, "Sometimes problems arise so there needs to be a good relationship between the owner, the CAMO, and the maintenance organization."

*Rubin Reitsma paging through his technical documentation.*



The opinions regarding the CAMO requirement for small GA aircraft were apparent, and I was told some feel it's become a burden on all parties; the owner, the maintenance provider, and the CAMO. Moen says, "Many GA people feel there really was no problem with airworthiness, yet the industry was given a requirement as if there was a problem."

Westenberg and Moen both agreed that many of the same challenges are felt by other GA maintenance organizations in other European countries. "Sometimes it looks like all the requirements are straining the entire system and causing frustration. I hope it doesn't end up hurting general aviation," Westenberg says.

My short visit concluded yes there are differences, and that challenges operating a small GA maintenance organization can be found on either side of the Atlantic. There also are similarities, the first being we are all aircraft maintenance professionals tasked with the same important role.

The people at Star Airservice were enthusiastic about aviation, eager to discuss their views, and a most gracious host allowing *AMT* to experience a day of general aviation maintenance in the Netherlands. Visit its web site at www.star-airservice.nl. **AMT**

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# Parasitic Loads

## Are they taking a toll on your aircraft battery?

By Dr. Dave Vutetakis

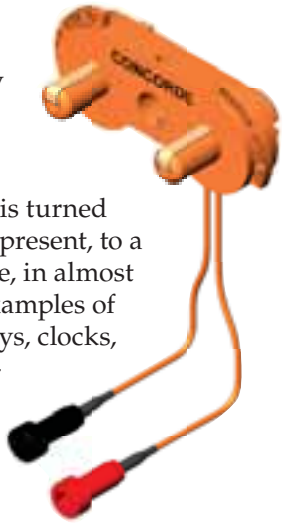
Just when you thought you knew everything there is to know about proper maintenance of aircraft batteries, there may be something new you haven't had to deal with: Parasitic loads.

Parasitic loads on aircraft are not uncommon, but they are getting more attention these days because many aircraft are spending more time on the ground and less time in the air. This operational change means more time for the parasitic load to drain the battery.

*The parasitic drain of an aircraft battery can be directly measured with a digital multimeter (DMM) equipped with an ammeter function. Photos courtesy of Concorde Battery Corporation.*

The deeper the battery is drained between flights, the greater impact it can have on the aircraft electrical system and on the battery itself. A partially discharged battery can make it harder to start the aircraft engine, especially turbine engines. Repetitive cycling of the battery due to parasitic drain can shorten its service life. In extreme cases, the battery may be completely drained by the parasitic load and the aircraft may have to be grounded until a replacement battery is installed.

### What is a parasitic load?



*Concorde Battery Parasitic Load Tester*

A parasitic load is a small, continuous flow of DC current that takes power from the battery even when the aircraft master switch is turned off. Parasitic loads are present, to a greater or lesser degree, in almost all modern aircraft. Examples of parasitic loads are relays, clocks, radios, avionics equipment, and on-board computers. These loads are generally low amperage (typically under 100 milliamperes), but since they are continuously present they can deplete the battery's capacity if the aircraft is inactive for an extended time. In some aircraft, the parasitic drain is so high that the battery becomes noticeably depleted within a few days.

The parasitic load slowly drains the battery capacity. In the case of lead acid batteries, this drain causes the plates to become sulfated. Sulfated plates make the battery harder to recharge and can lead to premature failure of the battery. A long-term, low drain rate can deeply discharge the battery, deeper than what can occur with normal aircraft loads. Repeated deep discharges of this nature will shorten the battery life substantially. A battery deeply discharged in this manner may not be recoverable with normal charging methods. If the parasitic drain is high, the battery will become completely discharged in a few days and render the aircraft inoperable.

### Can the parasitic load be eliminated?

The items responsible for the parasitic load are generally imbedded in the aircraft electrical system and alteration may affect FAA certification. In some aircraft, modifications can be

made to reduce or eliminate the parasitic drain. The aircraft manufacturer should be contacted for more information on this subject. Another option is to disconnect the battery plug from the battery, which stops all parasitic loads. This procedure is often referenced as part of the aircraft maintenance manual or pilot's operating handbook. However, if not specifically referenced, the aircraft manufacturer should be contacted to verify acceptability of this practice.

## How to measure the parasitic load

The parasitic drain of an aircraft battery can be directly measured with a digital multimeter (DMM) equipped with an ammeter function. Most DMM's have separate jacks for low current (typically 200 mA maximum) and high current (typically 10A maximum) measurements. The ammeter jacks contain a fuse to prevent damaging the internal electronics. It's always best to start measurements using the high current jack, and then switch to the low current jack if the measured current does not exceed the low current jack's rating. The low current jack will give a more accurate measurement of typical parasitic currents (generally 1-100 mA).

**Parasitic loads can deplete the battery's capacity if the aircraft is inactive for an extended time and . . . render the aircraft inoperable.**

Concorde has recently developed a Parasitic Load Test Adapter (PLTA) that makes it very easy to measure the parasitic load of aircraft batteries equipped with an MS3509 style quick disconnect receptacle. The PLTA is designed to connect between the battery receptacle and the aircraft's mating plug, with separate test leads for connection to the DMM. The PLTA is rated for loads up to 10 amperes. Step-by-step instructions for the PLTA can be found in document number 5-0409 available on Concorde's web site (www.concordebattery.com).

## Protecting the battery from parasitic loads

To protect the battery from being depleted by the parasitic

load, the following procedure is recommended:

Measure the parasitic load as described previously. Determine how long it will take to deplete 10 percent of the battery capacity using the following formula:

*Time (hours) = 0.10 x C1 x 1/Ip, where*

C1 is the battery's rated capacity in Ah, and Ip is the parasitic drain in amperes.

For example, if C1 = 28 Ah and Ip = 0.05 amperes (50 milliamperes), then

*Time (hours) = 0.10 x 28/.05 = 56 hours = 2.3 days.*

If the aircraft is inactive for more than the time calculated in step (2), either: Disconnect the battery plug (preferred) or connect a maintenance charger to the battery.

*Concorde RG-390E battery installed in Sikorsky S-76B helicopter.*

It should be noted that repetitive cycling of the battery by a parasitic load may shorten the battery service life. Therefore, the sooner the battery plug is disconnected or a maintenance charger is connected, the less impact it will have on the battery life. Also, if a maintenance charger is used, make sure the charger puts out the correct "float" voltage. Excessive float voltage may shorten the battery life even more than the parasitic load. For Concorde RG Series batteries, the correct float voltage is 13.3 volts for 12-volt batteries and 26.6 volts for 24-volt batteries.

## Lessons learned

Over the past few years, Concorde engineers have had the opportunity to measure the parasitic load on a wide range of aircraft. Measured values have ranged from under 1 milliamp to as high as 1.29 amps (1,290 milliamps). For the majority of aircraft, the measured values have fallen between 1 and 100 milliamps.

One particular aircraft will be used as a case study, although the make and model will not be

*Concorde RG-380E/44 battery installed in a DHC-8 aircraft.*

disclosed. Concorde's RG-380E/44 battery is original equipment on this particular turboprop aircraft. From time to time, operators complained that the battery would not hold a charge between flights, causing engine start issues.

The problem normally occurred on aircraft with low hours per month or when there was a long time between flights. It was suspected that a parasitic load was responsible and measurements on several different aircraft confirmed a drain rate of approximately 16 milliamps. At this rate, the battery capacity would be reduced by 25 percent in 28 days.

**To remedy the issue, disconnect the battery plug after each flight or connect a maintenance charger when the aircraft is inactive for more than a few days.**

To remedy the issue, two options were recommended: a) disconnect the battery plug after each flight, or b) connect a maintenance charger when aircraft is to be inactive for more than a few days. Some operators have gone with option (a), others with option (b), and still others use a combination of both options. Recent feedback from operators has been very favorable and the occurrence of low battery conditions is no longer an issue. **AMT**

*Dr. Dave Vutetakis has a Ph.D. in chemical engineering from the Ohio State University. After college, he spent 10 years at Battelle Memorial Institute working on advanced battery systems for military aircraft. From there, he went to work at Douglas Battery where he developed a full product line of valve-regulated lead-acid batteries for motive power and stationary applications. Since 2005, he has been employed by Concorde Battery Corporation as Director of Advanced Battery Technology. He can be reached by email at dvutetakis@concordebattery.com or by phone at (626) 813-1234 Ext. 278.*

# Flight Displays

## They increase situational awareness and reduce wiring. Here are some maintenance tips

By Jim Sparks

Enhancing situational awareness has long been a desirable circumstance in the world of aviation while providing the flight crew with necessary and wanted information has been a constant challenge for designers. Available space for equipment and instruments is almost always at a premium.

Minimum requirements are most often dictated depending on the basis for airworthiness. The majority of small single engine aircraft, at a minimum, will have an airspeed indicator, altimeter, and a compass. Living in the information age causes many to strive for more data and given technological advancements in recent times provides availability of precision navigation along with enhancements to protect against controlled flight into terrain (CFIT) as well as in-flight collisions.

Throughout the first 70 years in aviation anytime new technology was to be made available for flight deck viewing, an evaluation had to be conducted to assess available real-estate to locate the new instrument. In some situations it became necessary to combine displays in one device.

**Delayed startup has been misinterpreted as a failure and displays have been replaced simply because ample time was not allowed for warmup to occur.**

A well-equipped vintage machine may have every square inch of instrument panel occupied by some type of gauge or switching device and in the world of transport category aircraft, redundancy has always been an important facet requiring duplication. In an electro- mechanical environment swapping inputs to flight deck instruments requires significant engineering and finesse to accommodate the wide array of analog gizmos and gadgets.

### Technological breakthroughs

The past 30 years has yielded significant technological breakthroughs in the realm of avionics. Electronic flight instrument systems started to appear and were fed digital data. It was realized early on they would revolutionize the flight crew's ability to increase awareness plus reduce wiring along with ancillary components.

The concept enables flight crews to not only view required information but to also choose what supplemental data can be highlighted. Information transfer capability can provide immediate relief in the event of a single display failure. When reversionary modes are used it is often possible to transfer information from a failed indicator to a second display where the operator can choose to observe multiple or composite indications.

### Cathode ray tube

A cathode ray tube (CRT) is a vacuum tube which consists of one or more electron guns, possibly internal electrostatic deflection plates, and a phosphor target. The entire front area of the tube is scanned repetitively and systematically in a fixed pattern called a "raster." An image is produced by controlling the intensity of each of the three electron beams, one for each primary color (red, green, and blue) with a reference signal.

In all modern CRT displays as well as televisions, the beams are deflected using varying electric fields produced by coils and driven by electronic circuits within the case. The brightness, color, and persistence of the illumination depends upon the type of phosphor used on the CRT screen. Phosphors are available with persistence ranging from less than one microsecond to several seconds. For visual observation of brief transient events, a long persistence phosphor may be desirable. For events which are fast and repetitive, or high frequency, a short-persistence phosphor is generally preferable.

Color tubes use three different phosphors which emit red, green, and blue light and

are packed together in stripes or clusters called "triads." Color CRTs have three electron guns, one for each primary color, arranged either in a straight line or in a triangular configuration (the guns are usually constructed as a single unit). A grille or mask absorbs the electrons that would otherwise hit the wrong phosphor. This type of display does have a tendency to degrade with age and over time will loose luminescence resulting in costly replacement. Display intensity can be controlled either by an external dimming circuit or by an ambient light sensor.

It has been observed that when a CRT has gone through a repair process, the biasing of the internal dimming circuits may no longer be calibrated to the aircraft circuitry and in some cases when full brightness is selected an over bias condition occurs resulting in some loss of definition in the display. Another rather negative tendency is the "screen burn in effect," where an image can be etched in the display if allowed to remain unchanged for extensive periods of time. This coupled with the effects of heat should always be considered when deciding how long a system should remain energized during a maintenance event.

CRTs can emit a small amount of X-ray radiation as a result of the electron beam's bombardment of the phosphors. The amount of radiation escaping the front of the monitor is widely considered safe; however, they may contain toxic substances, such as cadmium within the phosphors.

At low refresh rates (below 50 Hz), the periodic scanning of the display may produce an irritating flicker that some people perceive more easily than others, especially when viewed with peripheral vision. A high refresh rate (above 72 Hz) reduces the effect. Computer displays and televisions with CRTs driven by digital electronics often use refresh rates of 100 Hz or more to largely eliminate any detectable flicker.

## Liquid crystal display

The liquid crystal display (LCD) is the current panel of choice for many avionics manufacturers. LCDs are more energy efficient and offer safer handling and disposal than CRTs. Its low electrical power consumption enables use in many energy critical conditions such as backup instruments where emergency battery power may be required. It consists of an electronically modulated optical device made up of any number of pixels filled with liquid crystals and installed in front of a light source

(backlight) or reflector to produce images in color or monochrome. Unlike the CRT there is no need for high voltages driving internal components resulting in lower risk of electrical shock to repair personnel. The earliest discovery leading to the development of LCD technology was the recognition of liquid crystals in the late 1800s.

In addition to low power consumption, LCDs are usually light weight and compact as compared to their predecessors. Depending on the method used for backlighting they provide little or no image flicker or geometric distortion. "Screen burn in" is also eliminated with this type of technology.

Viewing angle can cause variations in color and brightness and when left on for significant time periods without ample air circulation, partial screen overheat has been known to occur resulting in a discolored appearance of at least part of the displayed image. This is a temporary occurrence and will usually be self-resolving once cool down occurs.

Heat is only part of the dilemma. Cold will also impact proper operation. Many LCDs utilize an internal heating element which is activated any time power to the display occurs and ambient temperatures are below a certain threshold. In this situation, operation of the display may be inhibited until the internal components come up to a preset value which may take five minutes or more. This delayed startup has been misinterpreted as a failure and displays have been replaced simply because ample time was not allowed for warmup to occur.

## Replacement

In some cases replacement of lamps used for backlighting is an approved line maintenance function. Care should always be employed as damage can occur in the replacement process. Component or maintenance manuals should always be consulted for guidance prior to performing any actions.

Even though the use of electronic displays often provide pilots relief in the event of malfunction, the aircraft minimum equipment list (MEL) should always be consulted to determine which indications or indicators are considered critical for flight. **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.*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# Supreme Court: FAA vs. Cooper Damages

## Will the U.S. Privacy Act of 1974 lose its effectiveness?

By Stephen P. Prentice

When Congress put together the Privacy Act of 1974, Public Law No. 93-579, it included specific language providing for damages to be paid by the government when some agency violates the Act when dealing with the personal privacy of a citizen. The federal law allows an individual to sue the agencies concerned by creating a private cause of action for its willful and or intentional violation.

Congress clearly sought to provide safeguards for citizens against breach of their personal privacy for any misappropriation or mismanagement of personal information that might be in government records. The only way to enforce it was to include a provision for damages to be paid to the aggrieved citizens.

The specific language of the statute protects against threats and hazards that might result in "… substantial harm, embarrassment, inconvenience, or unfairness to any individual on whom information is maintained." This of course includes just about every citizen.

In order to maintain such confidentiality, the Act controls the disclosure of any information from one agency to another and to third parties. Before any information is exchanged between agencies prior written consent of the person concerned is required by the law.

*Stephen P. Prentice is an attorney whose practice involves FAA-NTSB issues. He has an Airframe and Powerplant certificate and is an ATP rated pilot. He is a USAF veteran. Send comments to aerolaw@att.net.*

### Stanmore Cooper vs. FAA

Let's review for a moment … Stanmore Cooper vs. FAA et al. was a case that evolved from an FAA program called Operation Safe Pilot that was developed during 2002. It was devised with the cooperation of the Office of Inspector General of the FAA, the Department of Transportation (DOT), and the Social Security Administration (SSA). The whole program was designed to double check on what medical information pilots (and other airmen) put down on their regular medical exam forms (Form 8500-8). They wanted to know if the people were telling the truth about their medical conditions.

So, the FAA asked the SSA to provide information on any recipients of Social Security aid because of medical problems that were compensable through Social Security disability payments. By cross checking they could determine if any airmen were fibbing regarding any of their disabilities. (Incidentally, the question of disabilities payments is now included on the medical exam form.)

The operation was devised by some energetic inspectors who wanted to make a name for themselves. The FAA requested information for some 45,000 airmen in the San Francisco area. The information consisted of names, Social Security number, dates of birth, and genders. Social Security provided data which showed airmen who were receiving disability payments and for what. This action was found to be contrary to the law!

Cooper was only one of many airmen who were caught up in what I have previously described as an illegal witch hunt. However, Stanmore Cooper was only a private pilot, who also happened to be HIV positive.

As we all know, HIV is a virus that damages the immune system and can lead to AIDS. Cooper had applied for and received disability payments for a brief period of time, six months. This was clearly confidential medical data that Cooper believed he did not have to report to anybody, much less the FAA. So that is how it all started.

He later had his medical and pilot certificates revoked and was forced to plead guilty to providing false information to the FAA. Needless to say he appealed to the 9th Circuit Court of Appeals. He won his case based on a violation of the Privacy Act. His certificates were returned and his conviction was reversed by the court.

Now, according to current FAA guidelines, if you are HIV seropositive, (without an AIDS manifestation) and on an FAA approved anti-

viral medicine, you can obtain a Medical Certificate under Special Issuance rules. However, this was was changed after Cooper's case.

## Damages

Typically, any injured party can recover, under the Privacy Act. The statute says, damages, for willful and or intentional violations of the Privacy Act, are recoverable. The question is do damages in this law include those for emotional harm? In Cooper's case, the 9th Circuit said that such harm could be included … indeed other circuit courts have said that it did include such damages and awarded accordingly. However, there is a split among the appeal courts. Some say yes, some say maybe, and others say no. The Supreme Court was asked to decide.

My previous article on Cooper dealt with his case in the U.S. District Court in San Francisco and the following appeal in the 9th Circuit Court of Appeals. Cooper prevailed in these cases. The court found that the government violated the Privacy Act and it now boils down to what Cooper's damages will be … all or nothing.

## Certiorari

"An order of a superior court to call up the records of an inferior court for review." Before the case could come back to the District Court, where damages are routinely decided by a judge or a jury, the defendants in the case, the DOT, the FAA, and the SSA, all petitioned the U.S. Supreme Court to review the case and decide the matter of what damages, if any, Cooper could recover.

The conduct of these agencies was reprehensible to say the least and could almost be considered criminal and yet they now say in effect, "Oh well, we were found to have been guilty of violating the law, and Cooper won his case but he is not entitled to any damages because he did not lose any income or suffer any other pecuniary loss."

We all recall that Cooper was not an airline pilot using his license to make a living. He did not earn any income from the use of his pilot's license. But that's not what the law says … quite the contrary, damages generally are defined as also including mental and emotional distress, among other nonpecuniary damages for the agencies' violation of the Act.

Cooper certainly suffered. Many would suggest that the government's willful and intentional conduct should provide for substantial punitive damages as well! Needless to say, there is no information on whether or not the investigative personnel were sanctioned in any way for their unlawful conduct.

## Petition for certiorari to the 9th Circuit Court of Appeals

The three defendants, DOT, FAA, and SSA, fearing the worst, did not want this case to go back to the trial court for a decision on damages. A jury or a judge would lower the boom on them for their seriously egregious conduct. So, they elected to ask the Circuit Court to present the case to the U.S. Supreme Court, which they did do.

The U.S. Supreme Court accepted the case for further decision on damages in late June. Interestingly, the notice of their acceptance of the case was published at the same time that the decision in the Walmart case in favor of Walmart and against the class action lawyers on behalf of thousands of female employees for discrimination, was decided. The Cooper case was buried in the notoriety of the more popular Walmart case.

The granting of "certiorari" in the Cooper case, however, is a much more significant case than the Walmart case and will affect privacy law for years to come. The result will not be seen for some time, perhaps more than a year in the Supreme Court's next term.

The Privacy Act has a huge audience of potential plaintiffs: every U.S. citizen and perhaps other non-citizens as well. It is a pervasive piece of legislation and applies to the whole of the U.S. government not only the FAA, which is only the vehicle used to bring the issue up in the court. This is why this case is significant and important to everybody.

So now the Supreme Court has agreed to review the case on the matter of damages and decide whether or not Cooper will recover his nonpecuniary damages and in the process, no doubt, examine the statute in detail. Perhaps, in an effort to protect the assets of the government, it will come up with some disjointed logic to deny Cooper damages for his pain and suffering in his long-fought battle.

The Supreme Court may come up with an expansive or a narrow decision. We don't know. But it has limited damages awarded in one Privacy Act case in the past and it might do so again. If this should occur it will remove the last remaining penalties to the government and essentially makes the Privacy Act of little practical use to the average citizen. Who wants to win his or her case and then have no damages awarded for the trouble and pain of a lawsuit against the government?

## The formal question:

The formal question presented to the Supreme Court will be: "Whether a plaintiff can establish actual damages under the Privacy Act's civil remedies provision, 5 USC ss552a(g)(1)©-(D) and (g)(4), through competent evidence of real and appreciable mental and emotional distress caused by a federal agency's intentional or willful violation of the Act." We shall find out next year. AMT

# It's Easy, Just Change The Rule

The repercussions of changing rules can be like either a ripple or a tsunami, the effects felt throughout many industries and lives, not just aviation.

By Stephen M. Carbone

In conversations with mechanics, pilots, air traffic controllers, and flight attendants, I think the six words I hear most often are, "It's easy, just change the rule." Barney and Andy said it down at Floyd's barber shop and … well, maybe not Andy, but Barney was raising cane and threatening to get out his bullet. Go get Thelma-Lou! But all these folks have the same opinion for saving the world of aviation as we know it: just change rules.

To change rules (or regulations) takes an act(ion) of Congress, specifically Title 5 published by the Office of Law Revision Counsel of the U.S. House of Representatives. The FAA, a branch of the Department of Transportation, gets our marching orders from Congress, who provides funding. Considering how slow the wheels of government turn, the changing of a rule isn't a simple matter. I asked Kim Barnette of AFS-300: what's the price tag to change a rule? It depends on the change; it could take three years and cost $200,000 or two years costing $2,000,000. Complex rulemaking may take many years before completion.

**Considering how slow the wheels of government turn, the changing of a rule isn't a simple matter.**

Recent events raise the will of government agencies, advocacy groups, and accident victims' families into the headlines; their initiatives are personal, the importance unquestionable, and their agendas are to honor those lost; I won't trivialize their motives. But the repercussions of changing rules can be like either a ripple or a tsunami, the effects felt throughout many industries and lives, not just aviation.

## Rule adjustment vs. change

A recommendation may initiate a rule adjustment, because not all recommendations rise to rule changes. Most recommendations can be satisfied through other methods, e.g. policy revisions, which are handled internally and meted out to offending certificates without affecting everyone else; regional procedural modifications can funnel surveillance to saturate a certificate for a local problem. What about statute (law) changes? If the NTSB recommends a statute change, the FAA can't help; only the executive, legislative, and judicial branches of government can change statutes.

The U.S. Congress assigns rulemaking to the FAA, who gathers the professional resources vital to making rule changes, e.g. in FAA Order 1110.139B, which focuses on performance-based rulemaking; changing rules to meet assumed needs. So how does a rule get changed? Let's reference Title 5, Part 1, Chapter 5, subchapter III: the FAA (being a government agency) may "establish a rulemaking committee to negotiate and develop a proposed rule." A rule change begins its life as a focus group. In its infancy, a change requires subject matter experts (SME) to study that change's cause and effect, analyze costs to the industry, legal ramifications to all involved (especially the flying public), and if the rule change will continue to be effective down line a few years.

## Analyzing the cost

Now everyone in this industry lives in or near a place known as Beancounterville: all of us account for each action accomplished.

If you change a tire which aircraft is charged, how long did it take to overhaul an actuator, who worked it, or who is this annual charged to? Every aspect of our workday is itemized.

When we opt to change a rule, the dollars allotted to that project must also be accounted for, thus the multimillion dollar price tag. Each team member is given their assignments; some are more tedious than others, requiring research or analysis that is involved. Let's say a maintenance training rule was highlighted. The analysis might look at: locations, industry standards, feasibility, and/or the different impacts on 121, 135, or 145 certificate holders. This is a time-intensive part of the process.

## Meetings and information

As the change goes into its adolescence, what follows is loaded with meetings; all members bringing to the group the fruits of their labors — the information needed to move forward. For the focus group, industry plays an important role in the process; manufacturers, operators, unions, and individuals are tapped to mold the rule in this new image. SME, both FAA and industry, tap their experience and guidelines to feed the analysis that takes input to continue the development of the rule. Months pass, debates subside, and the rule moves onto the next stage.

## Comments from industry

Before the writing of the rule, the *ex parte* (without the presence of the other party) phase dictates that all outside entities, e.g. manufacturers, operators, etc., be removed from the process; the FAA composes the rule alone. When it drafts a final product and it's submitted for review, the 'product' (new rule) needs streamlining. Publications takes this rough draft and polishes the language; the clarity of the product is honed before numerous FAA departments review it and clean it up even more, review, clean, and review again. On the surface it seems a futile process, but the broader view injects accuracy while assuring words like 'and' or 'may' don't confuse the intent of the changed rule; some NTSB law judges have ruled on the strength of one word.

Now to communicate a change on a certificate can be a minor ordeal; it could be relayed with a shift meeting to inform everyone (ripple), while other changes can be as catastrophic to a certificate as changing the way they do business or where (tsunami). To debilitate a certificate, no matter how small, without their opinion cultivates insecurity and can move through industry like a flash fire. Many lobbying to force rule changes may say, 'Too bad, the rules need changing! Let them deal with it for safety's sake!'

This is a naive view; in the United States, certificate holders — both individual and corporate — deserve to be heard especially when their futures may be drastically altered; it doesn't make sense to punish all for the sins of a few. To alleviate these fears or at least throttle them back a bit, the government encourages comments through Notices of Proposed Rulemaking (NPRM).

What is the NPRM? Created by the Administrative Procedure Act (1946), the NPRM enables the industry to view upcoming rules and directives brought to light by the FAA and other individual government agencies. Through this process all in the various industries get to see what's coming down the pike that's regulatory or required for an operator's equipment. After review, the industry folks can comment, disagree vehemently (yet respectfully), or even offer up a better idea to meet the same end. It's designed to forego surprises and allow the industry to prepare for changes that will result in safe commerce and sound practices.

**When we opt to change a rule, the dollars allotted to that project must be accounted for, thus the multimillion dollar price tag.**

But the NPRM is also a tool that can push information out-to-in; manufacturers, as do all, have access to feedback in the public domain. They can recognize opinions and concerns raised by individuals and organizations that make up their client base; those actually working with their equipment daily.

Conducting business is like working a machine; all operates on cause and effect. Likewise, rule changes are dependent on what's input for proper output; longtime veterans of this industry can testify that the eventual output can be unexpected … or worse. We need to measure twice, cut once; make the rules work to make *everybody* safe. Rule changes aren't impulsive; they are well thought out, analytically tailored to provide safety to everyone of us who rely on this industry. They can't … just change. AMT

*Stephen Carbone is an aviation industry veteran of 28 years. He works at the Boston regional office in the Flight Standards Airworthiness Technical Branch. He holds a master's degree in aviation safety systems.*

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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: Charles Chandler

Charles Chandler has been involved in maintenance training and leadership development for most of his career. He developed curriculum for maintenance training at FlightSafety International and American Airlines' Maintenance Training Academy. He received his A&P from Spartan College, BA from Tulsa University, and MS in Adult and Occupational Education from Oklahoma State University.

### SPEAKER: John Rahilly

John Rahilly has over 36 years of aviation service experience. Currently he works with Global Jet Services. He has an A&P certificate and private pilot license, instrument rated. He graduated from Northrop Institute of Technology and received an associate degree in Aeronautical Technology from Wentworth Institute of Technology.

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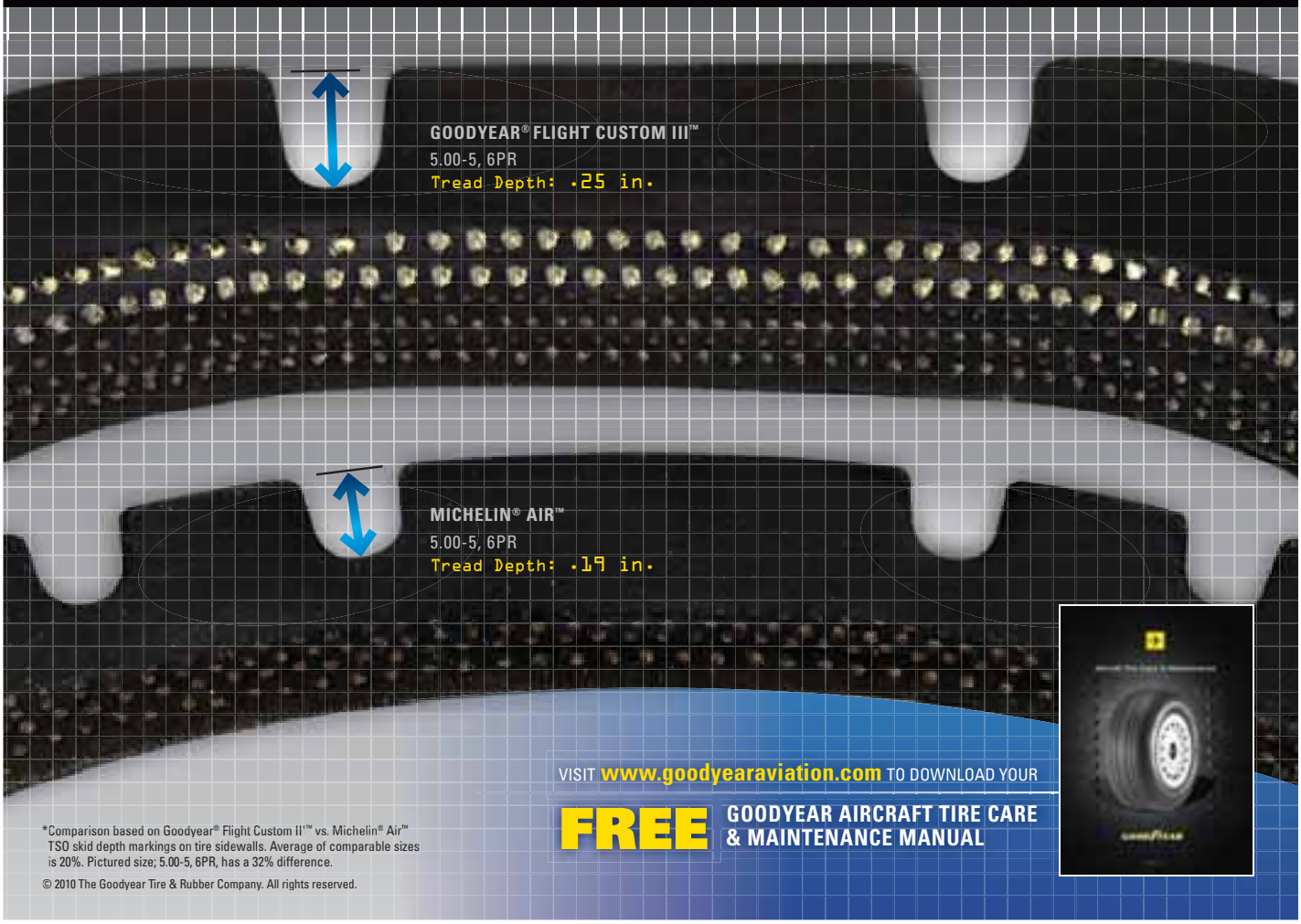


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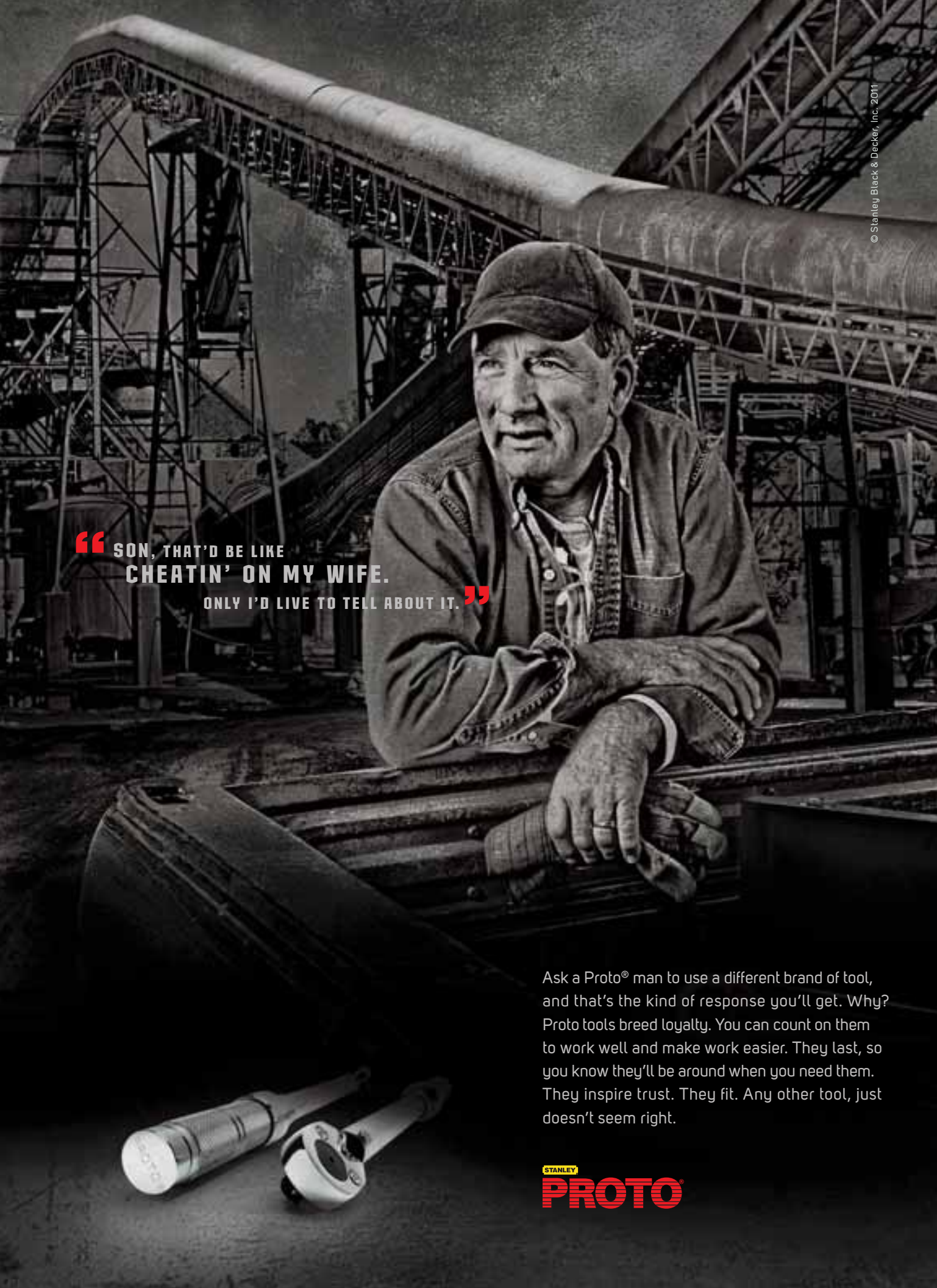




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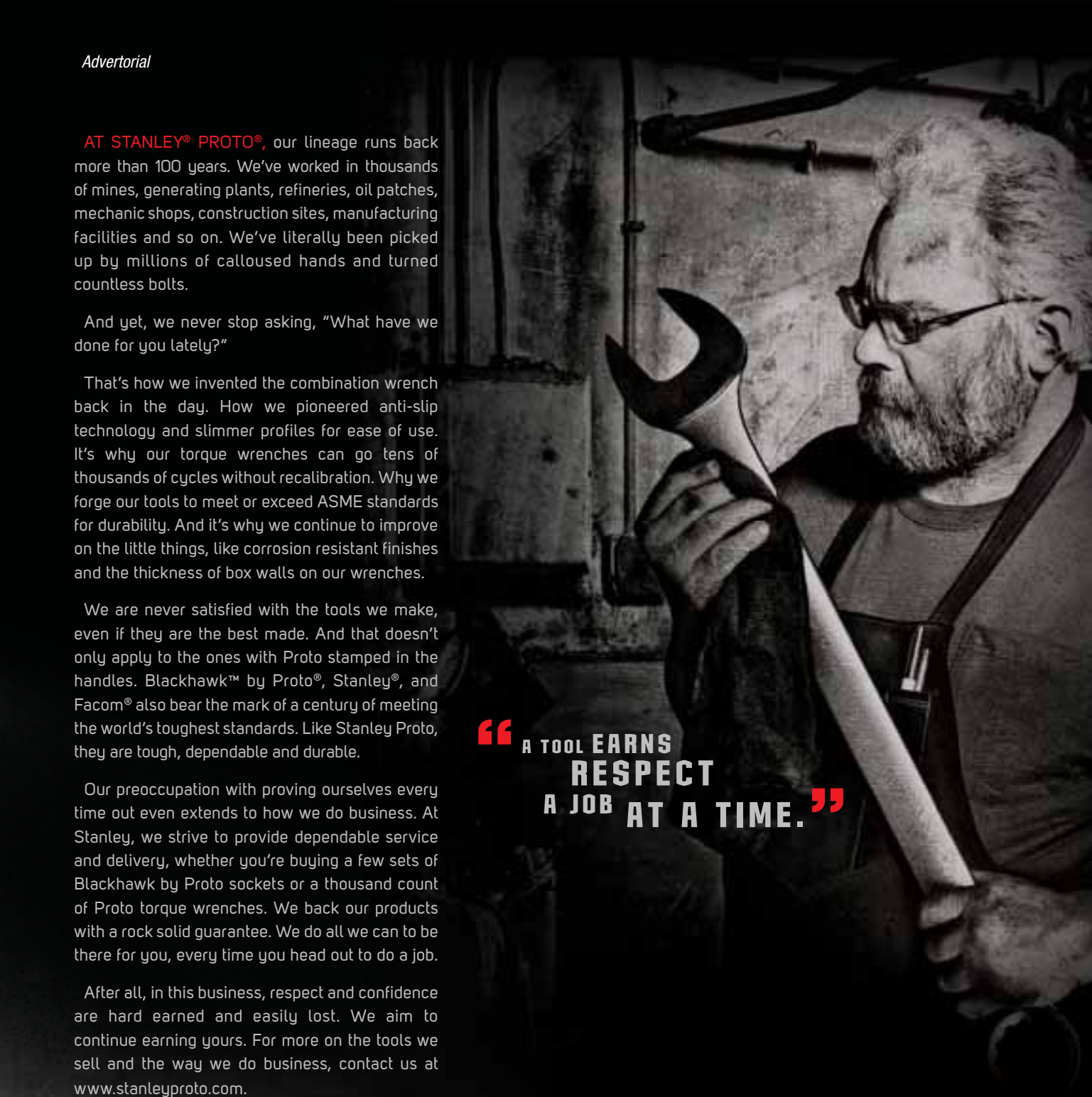


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| REGISTRATION | 12:15 PM |
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## AMTSociety State of the Industry Address

### Actively Engaged

For those of you who are not aware the policy clarifying the definition of "actively engaged" for purposes of Inspection Authorization policy becomes effective Sept. 6, 2011. The FAA views the actively engaged requirement as providing maintenance experience relevant to conducting inspections. Similarly, the two-year period provides the receiving of experience in maintenance performance or supervision necessary to conduct inspections.

"The FAA previously determined involvement solely in an academic environment is not actively engaged. Refresher training attendance alone does not satisfy the requirements."

To see the explanation in the *Federal Register* visit http://www.gpo.gov/fdsys/pkg/FR-2011-08-04/pdf/2011-19741.pdf.

### CFR Title 14: Aeronautics and Space, FAR 65 Subpart D – Mechanics § 65.91 Inspection Authorization: FAR 65.91 (c) (1) – (4)

*(c) To be eligible for an inspection authorization, an applicant must —*

*(1) Hold a currently effective mechanic certificate with both an airframe rating and a powerplant rating, each of which is currently effective and has been in effect for a total of at least three years;*

*(2) Have been actively engaged, for at least the two-year period before the date he applies, in maintaining aircraft certificated and maintained in accordance with this chapter;*

*(3) Have a fixed base of operations at which he may be located in person or by telephone during a normal working week but it need not be the place where he will exercise his inspection authority;*

*(4) Have available to him the equipment, facilities, and inspection data necessary to properly inspect airframes, powerplants, propellers, or any related part or appliance;*

### § 65.93 Inspection Authorization: Renewal

*(a) To be eligible for renewal of an inspection authorization for a two-year period an applicant must present evidence during the month of March of each odd-numbered year, at an FAA Flight Standards District Office or an International Field Office, that the applicant still meets the requirements of § 65.91(c) (1) through (4). In addition, during the time the applicant held the inspection authorization, the applicant must show completion of one of the activities in § 65.93(a) (1) through (5) below by March 31 of the first year of the two-year inspection authorization period, and completion of one of the five activities during the second year of the two-year period:*

*(1) Performed at least one annual inspection for each 90 days that the applicant held the current authority; or*

*Carol Giles with Melvin O. (Mel) Cintron, Division Manager, General Aviation and Commercial Division, AFS-800, and Tom Hendershot. Photos courtesy of Rick Groth.*

Carol Giles giving Tom Hendershot a hug following his remarks at her retirement party.

Melvin Cintron, Carol Giles, Tom Hendershot, and John Allen, Flight Standards Service.

Tom Hendershot and Rick Domingo, Acting Manager Flight Standards Northwest Mountain Region, ANM-200.

*(2) Performed at least two major repairs or major alterations for each 90 days that the applicant held the current authority; or*

*(3) Performed or supervised and approved at least one progressive inspection in accordance with standards prescribed by the Administrator; or*

*(4) Attended and successfully completed a refresher course, acceptable to the Administrator, of not less than 8 hours of instruction; or*

*(5) Passed an oral test by an FAA inspector to determine that the applicant's knowledge of applicable regulations and standards is current.*

*(b) The holder of an inspection authorization that has been in effect:*

*(1) for less than 90 days before the expiration date need not comply with paragraphs (a)(1) through (5) of this section.*

*(2) for less than 90 days before March 31 of an even-numbered year need not comply with paragraphs (a)(1) through (5) of this section for the first year of the two-year inspection authorization period.*

*(c) An inspection authorization holder who does not complete one of the activities set forth in § 65.93(a)(1) through (5) of this section by March 31 of the first year of the two-year inspection authorization period may not exercise inspection authorization privileges after March 31 of the first year. The inspection authorization holder may resume exercising inspection authorization privileges after passing an oral test from an FAA inspector to determine that the applicant's knowledge of the applicable regulations and standards is current. An inspection authorization holder who passes this oral test is deemed to have completed the requirements of § 65.93(a)(1) through (5) by March 31 of the first year.*

Under the new definition, on meeting § 65.91(c)(1) through (4) requirements, refresher training attendance alone does not satisfy those requirements. **In addition to *AMTSociety*'s IA renewal training, you must also comply with the "actively engaged" requirements in FAR 65.91(c)(1)-(4) to meet the requirements of IA renewal.**

## Carol E. Giles retires

On Wednesday, July 20, 86 former co-workers and individuals from the industry gathered for dinner and a retirement program for a longtime friend and advocate of *AMTSociety*, Carol E. Giles. After 31 years of service to the FAA in many job assignments, and the last three years as the division manager of the Aircraft Maintenance Division AFS-300 in the Flight Standard Service located in Washington, D.C.,

Carol has strongly committed to the *AMTSociety* Scholarship Golf Outing and also the Maintenance Skills Competition in Las Vegas. Thank you for all you have done for the mechanics in the diversified areas Carol, and happy days in your retirement. We will surely miss you. Thank you all very much for your involvement in *AMTSociety*.

*The 2011 General Aviation Award winners with jackets from AMTSociety: Judy Ann Phelps, Vicki Lynn Sherman, Russ Callender, and Joe Morales. Photo courtesy of Ronald Donner.*

## General Aviation Awards

Recipients of the 2011 National General Aviation Awards are Joseph "Joe" Morales (A&P, IA, CFI) of Lakewood, CO, AMT of the Year; Russell John "Russ" Callender, FAA repairman and pilot of Houlton, WI, Avionics Technician of the Year; Vicki Lynn Sherman, MCFI of DeLand, FL, FAASTeam Representative of the Year; and Judy Ann Phelps, MCFI-A of Santa Paula, CA, Certified Flight Instructor of the Year.

Since national FAA representation was noticeably absent because of the shutdown, a plan B for Wednesday evening's awards presentation at Theater in the Woods was engineered. Valerie Palazzio, Great Lakes Region FAASTeam program manager, and JoAnne Hill, National General Aviation Awards Program Chairman, explained the Industry/FAA Awards program to an audience of approximately 3,000 AirVenture attendees. They outlined the nomination process and encouraged the audience to nominate worthy individuals in the four GA awards categories. They also explained that the program's expenses and the gifts for the four national winners are provided by the industry's program supportsers/donors.

In lieu of FAA Administrator Randy Babbitt, four previous national award winners, one in each categoty, were recruited to present each 2011 winner with his or her plaque. As 2003 National AMT of the Year, Tom Hendershot presented the plaque to Joe Morales. Al Ingle, 2003 National Avionics Technician of the Year presented to Russ Callender.

The GA Awards Committee hosted a luncheon on Thursday July 23 at EAA that was attended by 65 people. The award recipients received gifts from the industry, including monogrammed jackets from *AMTSociety*.

## *AMTSociety* IA Renewal Consortium Program

Saturday, September 17, 2011, Crimson Technical College, Los Angeles (LLAX)

Wednesday, September 28, 2011, Del Mar College, Corpus Christi, TX (CRP)

Wednesday, October 12, 2011, NBAA, Las Vegas (LAS)

## International corporate sponsor

Welcome to David Van Den Langenbergh, airworthiness manager for ABELAG Premier Private Jet Services located at the Brussels National Airport, Zaventem, Belgium.

He communicated to Tom Hendershot saying, "Our maintenance department is 95 percent focused on in-house maintenance of the ABELAG fleet. Of course we do support those that are in need on our apron. Since we are the only business jet operator and FBO at the Brussels Airport, we provide AOG support, etc.

"We can share a lot of experience on EASA Part 145 and Part 66 maintenance aspects. Running a Part 145 department in Europe can be a challenge.

"I'm not looking for exposure as a company, just think it is important to be part of the worldwide aviation family."

Very well stated David, and on behalf of *AMTSociety* board of directors, we welcome you.

## AMTSociety annual golf outing

Please sign up for the annual *AMTSociety* Scholarship Golf Outing at the Rio Secco Golf Course in Las Vegas, NV, on Sunday, Oct. 9, 2011. There are some really great awards, and you'll be sure to have a good time. Visit www.amtsociety.org to register.

*— Stay safe. Tom Hendershot*

## Scholarship fund donation

Attached is a letter from one of our members where he makes a donation to the Charles E. Taylor Scholarship Fund and tells us about his great friend. This is one way to help us pursue our goal for the education of people in the aviation maintenance/avionics areas.

Please accept the enclosed donation to *AMTSociety*'s Charles E. Taylor Scholarship Fund. It is given in memory of Gregory Schaffer, a good friend of mine who passed away June 3, 2011 while working in Israel. Greg started out his aircraft maintenancne career working as a mechanic on B52 bombers while in the Air Force. I worked with him in the '70s and '80s while we were A&P mechanics at North Central and Republic Airlines. Greg then moved on to start a very successful career at FedEx and put in more than 25 years there as a mechanic, maintenance representative, and most currently worked in the aircraft acquisition area. Greg touched people all over the world. Here are some excerpts from his guest book: "I first met Greg in August 1975 when we started at North Central Airlines. I have many great memories of working with Greg on MSP night line for both North Central and Republic. He will truly be missed by everyone who knew him."

"Greg worked in my group in Airframe Vendor Management at FedEx for many years. He was a dedicated and knowledgeable aviation professional and a great person that was always a pleasure to be around. He will be dearly missed by all of his friends at FedEx."

"Working with Greg was always a pleasure. Not only was Greg a wonderful co-worker but a dear friend as well. He was always a pleasure to be around."

"Greg's dedication and commitment to creating outstanding experiences through his role, along with living the "Purple Promise" each day, are what bind us together now in spirit."

"Greg was an awesome guy who I truly enjoyed working with. The aviation community has lost a true gentleman and professional." As all of us AMTs know, the aviation community is actually a small close-knit group. Greg has touched a lot of us. Aviation has lost a very good person.

*— Daniel Broten, Instructor, Alabama Aviation Center, Ozark, AL*

## Corporate Member: Vaughn College

Vaughn College of Aeronautics and Technology was established more than 70 years ago in New Jersey. Now based near LaGuardia Airport in Flushing, NY, it offers degrees in aircraft operations, airport management, airline management, aviation maintenance, electronic engineering technology, aviation maintenance management. The Aviation Training Institute was created in 2001 which offers the aviation maintenance certificate program. Students can earn their FAA airframe and powerplant certificate in as little as 16 months. Aviation maintenance training is one of the college's most popular academic offerings. More than 400 of Vaughn's total student population of 1,500 were enrolled in the Aviation Training Institute in 2011. Students hone their mechanical skills, working on


*First international corporate sponsor: Left is David Van Den Langenbergh of ABELAG Aviation, on the right is Oliver Faupin of Falcon Customer Service, and Ron Donner AMT editor in the center.*

more than a dozen aircraft ranging from the piston-power Cessna 182, Piper Seneca, and Aztecs to the complexities of turbine aircraft such as King Air.

Vaughn's Aviation Training Institute offers state-of-the-art nondestructive testing (NDT), enabling students to prepare for real-world problem-solving. In the composites lab, students study both wet lay-up and pre-preg applications of advance composite materials. The proper use of bagging procedures as well as hot bonding repairs are also extensively covered.

The college's turbine engine test cells provide ample run-up opportunities for students on PT-6s and CJ610s. A newly renovated FAA-authorized Lasergrade test center provides students with all written exams offered by the administration, including the general, airframe, and powerplant exams.

Vaughn College has housed a student chapter of *AMTSociety* since 2009, and the College's Executive Director of Training, Domenic Proscia, has served on the Aviation Technician Education Council board of directors for more than seven years.

For more information visit www.vaughn.edu or call (719) 429-6600.

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# AIRCRAFT MAINTENANCE TECHNICIAN TRAINING

# APPROVED FOR IA RENEWAL

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- September 17, 2011 Inglewood, CA
- September 28, 2011 Corpus Christi, TX
- October 12, 2011 at NBAA – Las Vegas, NV (Registration is handled through NBAA)
- October 19, 2011 Sunrise, FL
- October 26, 2011 Mahwah, NJ

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Questions? Email angela@amtsociety.org or call 800.827.8009 x3322.

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This training is acceptable towards 8 hours of training for IA renewal and the FAA AMT Awards Program. Meets the requirements contained in FAR 65.93(a)(4) for Inspection Authorization (IA) Renewal Training. In addition to AMTSociety's IA renewal training, YOU MUST also comply with the "actively engaged" requirements in FAR 65.91(c)(1)-(4) to meet the requirements of IA renewal.

## REFER-A-FRIEND PROGRAM


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# Aircraft Fasteners

## How to select the correct type of fastener

By Marty Holzer

In the world of aircraft construction and repair, aircraft fasteners are utilized to assemble detail parts that are combined together with other parts into assemblies, which are assembled into installations that finally end up as a complete aircraft.

An interesting statistic is aircraft fasteners make up half of the 6,000,000 parts used to fabricate a Boeing 747-800 aircraft.

The purpose of the fastener is to connect all the different parts together in primary structural areas, secondary structure, pressurized and nonpressurized applications, and to transfer loads from one part to another in both production and repair applications.

Fastener information may be found in various sources which may include the specific


aircraft maintenance manual chapter 20, the specific aircraft structural repair manual, or aircraft production and repair drawings. Advisory Circular 43.13-1B and the Aircraft General Handbook which can be found online at the FAA web site www.faa.gov also contain fastener information.

### Fastener utilization and types

When engineers design an aircraft many things are considered when choosing the correct type of fastener. The type of joint the fastener will be exposed to in its application; shear or tension. What types of loads will be transferred through the joint. Aircraft loads may include those experienced during towing, normal flight operations, wind-gusts, pressurization, engine-out operations, landing, and more. All of this will determine how thick or thin the structure will have to be, the material type of the original structure, and the associated fasteners.

Fasteners must be able to achieve the transfer of load from one part to another. An example of this is the load transferred from an engine to a pylon, the pylon load to the wing, and the wing to fuselage. Fastener numbers and diameter are calculated to transfer this load. Other criteria are also needed to select the best fastener for the installation. This could include weight, inspect ability, tooling requirements, aerodynamic smoothness, access, corrosion protection, and of course cost.

Fasteners can be placed into many groupings which may be used as structural fasteners that take aircraft loads, to nonstructural fasteners that connect nonload bearing parts. There are restricted access applications or blind fasteners such a Huck Lock Bolts, Composi-Locks Fasteners, and CherryMAX fasteners.

For areas with access to both sides, standard rivets, structural bolts, and Hi-Lok fastening system fasteners are used. Materials for these fasteners include aluminum, steel, and titanium and are coated to prevent dissimilar metal corrosion. Styles of fastener heads vary from countersunk to protruding head based on the aerodynamic requirements of the aircraft.

### Fastener codes and orientation

Fastener coding can be designated by the fastener manufacturer such as a CR3233 CherryMAX rivet, by an industry standard such an AN4 bolt, or by the airframe manufacturer as in a BACR15CE5D3 rivet from Boeing. Coding descriptions can be found in various fastener books, on the repair drawing, or on the production blueprint. Also fastener codes may be used to simplify repair and productions drawings. These fastener codes may be

found in the upper-left part of the drawing quadrant.

It is standard for the head of a fastener to be installed head-up, or head-forward. However, the blueprints and repair drawing will give proper orientation in the fastener quadrant, normally the upper-right corner of the fastener quadrant, and will call-out the fastener head near or far based on the view of the drawing.

Some aircraft doublers applications can be creative, such as requiring a thin titanium doubler installed on the inside of the aircraft skin. In this specific example, the head of the rivet is on the inside of the fuselage and the outside skin is countersunk 82 degrees with the rivets bucked into the countersunk then shaved to flush for smoothness.

## Joint design

In the design of a fastener joint the fastener must remain intact and not fail based on the ultimate load design of the joint. If the fasteners were to fail, the joint would simply come apart. In an ultimate joint failure the idea is for the joint to tear apart. If an improper joint is designed, the result could be a material shear-out failure, material tension failure, or fastener shear failure which is generally caused by the wrong diameter or material fastener, or insufficient fastener edge-margin.

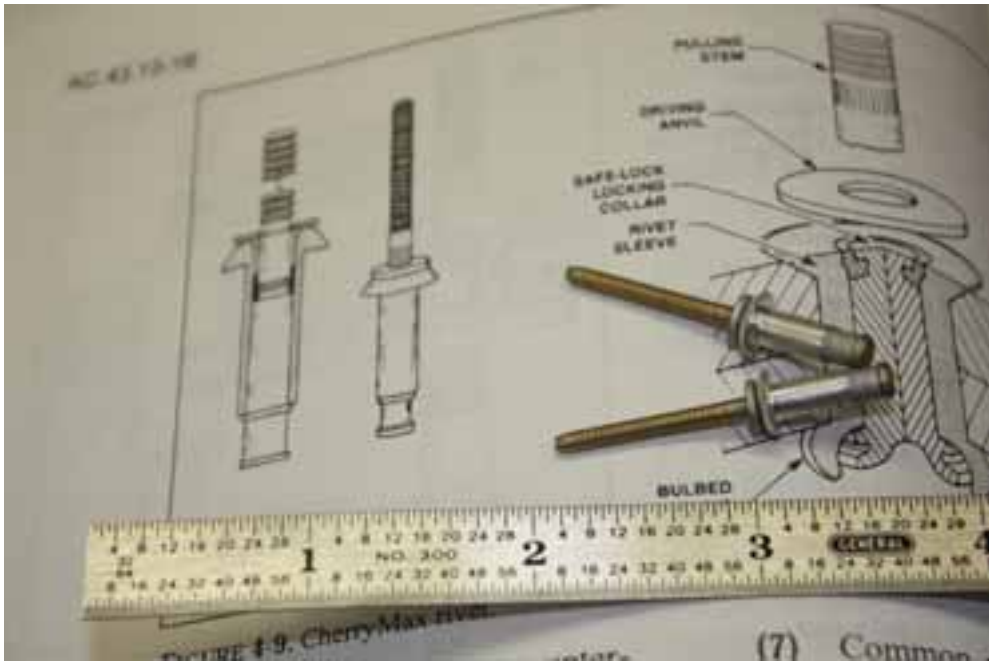
Requirements for edge-margin, the distance from the center of the fastener to the edge of the part, and the distance from the center of a fastener to the center of the next fastener must be observed to ensure a proper joint. During aircraft fatigue testing it has been found that an equally spaced fastener joint will outperform a staggered fastener joint design. However, a staggered fastener joint design is favored in fuel tank applications as they provide a greater faying surface sealing area.

## Process driven

Adherence to proper process is critical for the installation of aircraft fasteners. Like the aviation saying "Inspection cannot build quality into a part, it merely verifies its presence" applies to aircraft fasteners. Once a solid rivet is bucked, the Hi-Lok collar is tightened, or the blind-rivet is pulled, the quality of both the hole and countersink are not visible.

Traditionally when countersinking, it is acceptable to have the fastener a little above flush rather than below flush after installation. The only exception would be near an area having specific aerodynamic smoothness requirements such as near the reduced vertical separation minimums (RVSM) critical part areas. Countersinking below flush can create a knife-edge condition between the layers of materials and can eventually cause a crack emanation or shearing of the fastener head.

Proper fastener-hole size and finish must be maintained based on the fastener type and material the fastener is going through. Rivets are traditionally installed in a clearance-fit whereas the hole is larger than the fastener. Bolts and Hi-Loks are installed in a transition-fit hole where the fastener and structure are roughly the same size. In some cases a fastener being installed into steel or titanium requires a close-ream hole to prevent the removal of protective coating on the fastener during installation. To get an exact and quality size and finish hole the use of reamers and core drills are



required. The key is to have all of the fasteners in an area or repair to "load-up" together.

## Inspection/removal/substitution

Criteria for inspection, removal, and substitution of aircraft fasteners must be closely followed in order to carry the load through an aircraft structure. The criteria may be found in the previously mentioned references. If removal of a fastener is required for additional access or because of improper installation, care must be observed to prevent damage to surround structure and the fastener hole itself. Some fastener substitutions are allowed per the airframe manufacturer if the replacement fastener meets or exceeds the original strength, diameter, and corrosion protection characteristics.

After the aircraft, engine, or component manufacturer, or the repair engineer designs an assembly or repair, adherence to the maintenance and repair process is critical for loading and unloading of the fastener joint throughout its service life. **AMT**

*Marty Holzer is a certified AMT currently working as a line maintenance technician for Delta Airlines. Over the last 25 years he has worked in aircraft manufacturing, MRO, line maintenance, and as a technical instructor. Holzer has developed and taught structural repair courses which including reading and interpreting drawings for structural repair on commercial airline aircraft. He can be reached at email narrowbodytrainingint@yahoo.com.*



# Aircraft Interior Refurbishment

## Beware of unapproved parts

By John Goglia

Aircraft mechanics are being asked to do work that in flusher times may have been sent to specialty shops. With high fuel and maintenance costs, owners — even corporate owners — are looking to save money where they can. Interior refurbishment is one of those areas that to save money, aircraft owners may ask you to take it on. So instead of redoing an entire interior, an owner may ask for just one or two seats to be replaced.

While any licensed mechanic knows the critical nature of, for example, flight control systems, some tend to be more complacent when it comes to cabin repair or replacement issues. But cabin interior maintenance can be just as critical to safety as flight controls; a seat that lets go under rapid deceleration after an aborted takeoff can injure or kill its occupant just as surely as an engine failure from improper maintenance. So, mechanics taking on these assignments need to beware of common pitfalls.

**Unapproved parts are not just poorly made, counterfeit parts. An unapproved part is also any part not specifically approved for aviation uses or, more specifically, for use in the aircraft you are maintaining.**

### Unapproved parts

One area that continues to be a problem is unapproved parts. While the FAA has spent considerable effort in eliminating these parts for 121 and 135 operators, much less effort has been spent educating GA and corporate aircraft mechanics on what to look for in assessing whether a part is appropriate for use in an aircraft, especially that particular aircraft. Unapproved parts are not just poorly made, counterfeit parts. An unapproved part is also any part not specifically approved for aviation uses or, most specifically, for use in the aircraft you are maintaining.

Remember, too, that an unapproved part can be a perfectly good part in another context and not approved for aviation uses. So marine and auto parts that are perfectly manufactured for their intended uses in cars or boats, would be completely unacceptable for use in aircraft. Sounds elementary, but it is amazing how many mechanics seem to forget that when they are rushing to complete a job. So something as deceptively simple as marine fabric used to repair seats or carpeting may not meet aircraft flammability standards.

### Retrofits

Be aware also that a part approved for another model of the aircraft you are refurbishing — or a newer version of the same model — may not be approved for retrofits. The problem frequently comes up when a mechanic is supplied parts by an owner. For example, an owner sees a newer version of a seat installed in the aircraft, buys the seat and asks you to install it. The seat is from all appearances the same size and dimensions and fits perfectly. But it's still incumbent upon you as the mechanic to determine that that specific seat was approved for the specific aircraft in which you intend to install it. Just because it fits, does not mean it's legal or safe to install.

Being a mechanic means paying attention to all these details, big and small. And learning to withstand the pressure from owners at times to do what is expedient but not necessarily safe or legal. After all, it is the mechanic's license that is on the line not the owner's. 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.*

# Hit The Road Jack

## You need to spend more time on the hangar floor

By Wayne Fry

I remember sitting in a meeting with a handful of managers discussing some proposed changes to our repair station procedures. We were planning on implementing a new system that would streamline the movement of serviceable parts through the facility. Naturally, we needed to understand the current system to see if the proposed system improved the process.

After we began the discussion, we quickly realized that no one *really* knew how it was actually done. This was because everyone in the meeting had been working behind a desk for the past five years. None of us had actually done the work ourselves or moved a single part through the building. It didn't help that our manual was so vague that there was no way to read it and know how the parts flowed from area to area. If we couldn't figure it out, how could we expect the mechanics in the shops to figure it out?

To fix this, we all spent some time in the shops and then brought in one of the shop managers to walk us through the process. It turned out that there were many processes for moving parts around. And not one of them was even close to what we had written in our manual. Once we determined how we wanted the flow to go, we were able to make our changes. If you're not in the shops or on the hangar floor on a regular basis, you don't really know what's going on. Honest.

### Know what's going on

As a manager, you need to know what's going on. But I don't want you to go out and make a whirlwind tour of the shops. Don't spend 10 minutes with the hangar crews and think you've figured it all out. To know what's going on, you need to spend some real time there.

I had a boss who used to send all of his managers into the shops or out to the field locations on a regular basis. We had a dozen or so bases in Texas and Louisiana along the Gulf of Mexico, where we supported our fleet of helicopters to support the offshore oil rigs. When a maintenance manager from one of our bases took a vacation, one of us from Galactic Headquarters would take his place. We didn't just grab a company car and stop by for coffee; we spent a week there and worked. After we had been there a day or so, the field mechanics (who often had only a very tentative connection to the head shed) forgot that we were 'spies' for management and treated us with the same amount of respect that they treated their regular boss; painfully little.

On each of those trips, I learned a great deal about what was working, (and what wasn't) where the real problems were, and got a lot of suggestions on how to fix problem areas. Plus, as an added bonus, I got to go out and put my hands on real live aircraft and do some honest work. The repair station seemed to have a life of its own, and was forever evolving. If you didn't completely immerse yourself in the system, you would occasionally bump up against a surprise, sometimes a good one, sometimes a bad one.

### But I don't have time

But, you say. I don't have time to go to the field or to the hangar floor. Yes you do. No, you say, I'm too important; this place will fall apart if I'm not here. No it won't.

For you to do your job, you need to know what's going on. And you won't always do that sitting behind your desk or talking on your cell phone. You just have to find the time to do it. No matter how good your organization is, if you don't monitor and update your procedures, they will change of their own accord.

People *like* to find new and better ways to do their work. Aircraft mechanics may be the worst (or best, depending on how you look at it). The typical A&P mechanic is continually fixing things that are broken. This includes the aircraft, the tugs, the plumbing in the hangar, and the company processes and procedures. What he may not do is let you know that he's "fixed" some of your broken policies. This means that there may be nonstandard procedures being used that you don't know about.

## Location, location, location

It was my experience that the further a field base was from the main hangar, the more likely our company procedures weren't being followed. Geography can be a huge challenge. As managers, we had a tendency to spend more time at the nearby facilities because they were easy to get to. Those bases that took more than a day to get to were often overlooked.

When you get to the base and talk to the mechanics over lunch, or on a break, you will get an earfull. And you need to listen. But your visit should not be limited to a cup of joe or a trip to the pizza buffet. You need to visit with the stores and parts folks. If you don't think that their job is critical, try keeping your fleet up without them. You need to find out if the trucks are being maintained, if the tools are being calibrated, and replaced when needed.

All of these people are crucial to your success, and you need to know how they're doing. If there is something that prevents them from doing their job, maybe it's something that you can fix. There are dozens of opportunities for you to learn, teach, network, and socialize. And here's one of the big bonuses: If people know your face, they're more likely to call you when there's a problem.

If you haven't been to your field bases or down to the shops or to the hangar floor in a while, don't feel alone. It's easy to find yourself in this position. Many managers are hands-on until someone puts them behind a desk. Suddenly you're dealing with budgets, capital expenditures, manning levels, and all sorts of important issues.

Meanwhile, despite your best efforts, there's a whole world of maintenance happening out there that can slip away from you. There are also a lot of good ideas, clever innovations, and alternate procedures that can help you and your company perform better. But if you don't go to them, they probably won't come to you. So walk to the hangar or grab the keys to the company Chevrolet and hit the road. **AMT**

*Wayne Fry joined the FAA in 1997. His current position is Assistant Manager for the office that has oversight of American Eagle Airlines. Fry has worked in Washington, D.C., at FAA Headquarters, at the Southwest Region Flight Standards Division, and in several field offices. He is an Airframe and Powerplant mechanic and private pilot.*

# KidVenture 2011

## Creating aviation enthusiasm in thousands of youngsters

How do you create enthusiasm for aviation among youngsters? One way is to take them to KidVenture. During this year's EAA AirVenture 450 volunteers putting in more than 10,000 volunteer hours significantly raised the awareness of aviation, in particular aircraft maintenance, to thousands of youth between the ages of 4 to 17.

Dan Majka, EAA director and KidVenture chairman, enthusiastically says, "The KidVenture volunteers all believe in the mission of passing the torch to the next generation. If we don't repopulate the species aviation will become extinct. You never know how your efforts will affect a young person's life path, and we hope at KidVenture we influence them in a positive way." Well said Dan!

Cleveland sponsored wheel and brake learning exhibit. Photos by Ronald Donner.

KidVenture 2011 was sponsored for the second year by United Technologies Corp. and it had three divisions there; Sikorsky, Pratt & Whitney Canada, and Hamilton Sundstrand. Many of the 39 exhibits and learning stations provided hands-on opportunities to learn about, build, or repair a variety of aircraft-related items.

Majka explains, "Hamilton Sundstrand provided kits to build a model Ram Air Turbine and more than 2,000 of these small wind generators were assembled by the kids. Pratt & Whitney brought two PT-6 turbine engines and showed kids how to borescope the blades and check safety wires."

The propeller booth which was supported by Hartzell was a big hit and kids fabricated 1,144 small wooden propellers. The riveting booth, supported by Van's Aircraft, taught kids how to buck solid rivets, using tools supplied by Avery Tool Company. Those who wanted to learn more were able to work on a real RV-12 kit donated by Van's. The kids made themselves 1,200 riveted


Dan Majka, chairman of EAA KidVenture, shows some of the tools given to youngsters for task series completion.

name badges. Majka states the sponsorships were fantastic and explains, "If the kids were among the first 400 to complete the series of tasks they were given tool sets donated by Apex Tools. Hundreds more

This young lady is assembling a model Ram Air Turbine.

received tools donated by Ace Hardware, Ford Motor Company, and individuals."

The kids participating in the Future A&P program were taught many skills typical of the A&P technician. Those completing all of the Future A&P tasks received a Future A&P pin and two hours of official FAA credit toward their A&P license.

Majka followed up by saying, "My best estimate is that 24,000 kids and parents passed through KidVenture during the week." Congratulations go to Majka and all the volunteers for inspiring one of the next generations of aviation professionals. AMT

## Maintenance service in Russia

FL Technics Ulyanovsk, a complex aircraft technical support and maintenance services provider, has expanded its services network. On Aug. 17, 2011, FL Technics Ulyanovsk was granted a residence certificate for operating within the free economic zone in Ulyanovsk, Russia. The certificate was presented by the Minister of Economic Development and Trade of Russian Federation Elvira Nabiullina. The new construction of a hangar complex of FL Technics Ulyanovsk will be situated in the aviation cluster in Ulyanovsk.

## UAS alliance

AME Unmanned Systems and AAI Unmanned Aircraft Systems (UAS), an operating unit of Textron Systems, have entered into a strategic alliance agreement regarding unmanned systems development. The companies have agreed to work together to provide a more comprehensive UAS offering to U.S. and international customers by exploring solutions for electronic warfare and other special missions. The two companies also intend to work together on integration of AME's Fury UAS with AAI's UAS launcher and ground control products.

## UAS training

Sinclair College of Dayton, OH, and the Unmanned Applications Institute, of Grand Forks, ND, have signed a teaming agreement for innovative training in the emerging industry of unmanned aerial systems. These classes will serve as the foundation for an emerging UAS program to be hosted by Sinclair College. The new class offerings will focus on the information technology side of unmanned aerial systems, including data analysis and full motion video where there is an enormous need for trained technicians. Sinclair and Unmanned Applications Institute will leverage one another's strengths to make each of their communities more competitive in the emerging UAS industry.

## ARINC adds hangar

ARINC Engineering Services adds 62,000 square feet of workspace at its second hangar at Will Rogers World Airport at the ARINC Aircraft Modification and Operations Center. It is currently working on two Air Force KC-135 Stratotankers, one U.S. government OC-135 Open Skies surveillance aircraft, and a C-130 Hercules transport aircraft at the OKC Center. The first hangar can house three of the large aircraft, and this second hangar will be capable of handling up to four more.

## Hendershot honored

*AMTSociety* Executive Director, Tom Hendershot, received a unanimous endorsement for induction into the OX5 Aviation Pioneers Aviation Hall of Fame. Hendershot will be the only inductee from the U.S. at the organization's 56th Annual Reunion. The OX5 Aviation Pioneers was organized in 1955 in Latrobe, PA. The OX5 Aviation Pioneers Aviation Hall of Fame ceremony will take place in Hammondsport, NY, on Sept. 23-25, 2011.

## Dreamliner certified

The European Aviation Safety Agency (EASA) issued a Type Certificate for the Boeing 787-8 aircraft. This certificate recognizes that Boeing has demonstrated compliance to the EASA Type Certification Basis with applicable airworthiness and environmental requirements. Boeing received the FAA Type Certificate simultaneously at a joint ceremony in Seattle. The FAA and EASA worked closely together during the certification of the aircraft, the FAA being the primary authority for all American designs, and EASA the validating authority in Europe.

The Boeing 787-8 has now completed all certification requirements prior to its entry into service later this year with the Japanese Airline All Nippon Airways (ANA). The first European airline to operate the Boeing 787-8 will be Poland's national carrier LOT with the first delivery expected in March 2012.

## Chromalloy now in South Korea

Chromalloy has established a new subsidiary in Seoul, South Korea – Chromalloy Korea Ltd. The addition of Chromalloy Korea Ltd. – which will serve as a sales, marketing and customer support office – follows a two-year growth pattern in Chromalloy's Asia operations. Chromalloy currently has locations in 17 countries.

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# General Aviation Award Winners

## Tom Hendershot presented the 2011 National AMT of the Year award plaque to Joe Morales.

Jon Jezo, Publisher

One of this summer's highlights was attending the EAA AirVenture air show and along with that the presentation of the National General Aviation Awards. It was a beautiful evening in Oshkosh, WI, at the Theater in the Woods on the EAA grounds and *AMT* magazine along with *AMTSociety* attended the GA awards program.

Tom Hendershot, the 2003 National AMT of the Year, presented the 2011 National AMT of the Year award plaque to Joe Morales. Morales is the quality control manager and repair station chief inspector for Doss Aviation at the U.S. Air Force Academy. He is not only an A&P with IA but he is also a CFI and captain in the Civil Air Patrol. Morales is also a FAASTeam representative and spoke highly about his appreciation for all those professionals who have helped him along the way.


*Alexander "Sandy" and JoAnne Hill presenting industry awards to 2011 GA Award Winners at celebratory luncheon.*

*2011 National GA Award Winners: Russ Callender, Avionics Technician of the Year; Judy Ann Phelps, Certified Flight Instructor of the Year; Vicki Lynn Sherman, FAASTeam, Representative of the Year; and Joe Morales, AMT of the Year.*

Russ Callender of RC Avionics was recipient of the 2011 National Avionics Tech of the Year. Callender holds a private pilot license, repairman certificate and has been servicing aircraft for more than 30 years. His dedication to aviation technology and religion support his passion and help produce a successful business.

Judy Phelps of CP Aviation was the recipient of the 2011 National Certified Flight Instructor of the Year. Phelps specializes in emergency maneuvering, tailwheel, and spin training. She gives back by volunteering in her spare time and she is also dedicated to the 99s and the International Aerobatic Club.

Vicki Lynn Sherman, a three-time Master CFI was the recipient of the 2011 National FAASTeam Representative of the Year. Sherman is a flight, ground, and simulator instructor and also a crew member at the FAA Production Studios in Florida.

Congratulations to all GA award winners; we appreciate your hard work and dedication to the aviation industry!

### Your *AMT* magazine

As we start to plan for the 2012 editorial and webinar content we want to hear from you! What subjects and articles would you like to read about? What maintenance tasks need a fresh perspective? Come across something unusual in the hangar? Tell us about it!

Please take a minute to drop a note to editor@amtonline.com and let us know what matters to you.

Until next time we'll see you online: forums.AMTonline.com.

Thanks for reading!

*Jon Jezo*

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