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The New Ta

How It Affects You and Your Aircraft

by Daniel Cheung

Editor's Note: With the recent Tax Reform bill signed into law in the United States, and some of it strongly affecting prospective and current aircraft owners, a deeper explanation on what this means to the many U.S. King Air operators was imperative.

The Tax Cut & Jobs Act (TCJA) signed by President Donald Trump in late December was the first tax reform legislation in over 30 years. The TCJA has already influenced the economy, corporate spending policy, and has also made a major impact on the general aviation industry. Business corporations that can utilize a business aircraft for transportation, as well as small companies who have rented aircraft for their transportation needs, should examine how the income

ax Bill:

Depending on your income tax situation, the new tax plan allows you to depreciate your aircraft 100 percent in one year or a lower percentage on a more traditional schedule.

tax benefits can help a company justify the addition of an aircraft as an essential business tool. In this article we will discuss the various tax provisions that will affect the decision to purchase and operate a business aircraft.

1. **100 percent bonus depreciation – this provision applies to all new *and used* business aircraft. Immediate expensing is available in the year of acquisition.**
2. **Section 179 Expensing increases to $1 million, with phase-out beginning at $2.5 million.**
3. **Entertainment use of a business aircraft is no longer tax deductible.**
4. **Elimination of Section 1031 Like-kind Exchange for business aircraft; recapture of tax depreciation is immediately taxable as ordinary income.**

Bonus Depreciation

A tax incentive first introduced in 2001, Bonus Depreciation has always been a valuable tax incentive for businesses aircraft acquisitions. Instead of depreciating an asset over five or seven tax years, a taxpayer can elect to depreciate 100 percent of the acquisition costs or improvements to a business aircraft. This incentive, from its inception, has always only applied to new aircraft, to stimulate demand and create manufacturing jobs. With the implementation of TCJA, Bonus Depreciation has been extended to *new and pre-owned* aircraft; and 100 percent bonus depreciation is in effect until tax year 2022. It will then begin a phase-out of 20 percent annually.

The bonus depreciation also applies to improvements made to an existing aircraft. Avionics upgrades, interior refurbishing, paint, etc., can all be deducted immediately.

With the amount of depreciation available from a business aircraft, it is paramount that taxpayers and their tax advisors consider the various compliance requirements in order to benefit from the sizable tax benefits.

This is a significant boost to the pre-owned aircraft market, as buying a new or used aircraft is now on a level tax playing field with the same tax incentive available. Understand that 100 percent bonus depreciation is available at 100 percent, or zero percent. Therefore, depending on your income tax situation, you may elect to depreciate the aircraft on a traditional five- or seven-year schedule. Bonus depreciation applies also to improvements made to an existing business aircraft. Avionics upgrades, interior refurbishing, paint, etc., can all be deducted immediately.

Below is an example of a purchase of a $3 million business aircraft in 2018, assuming 100 percent business use and combined federal and state individual income tax rates of 40 percent.

Tax Year	2018
Bonus Depreciation	100%
Tax Depreciation	$3,000,000
Income Tax Savings from Depreciation	$1,200,000

Section 179 Expensing

The Section 179 Expensing limit has steadily risen, and with TCJA it has increased to $1 million for 2018.

Section 179 is another option to depreciate a business aircraft or improvements. U.S. taxpayers have the option to elect a specific amount that fits their current year tax situation. Section 179 is a good option for companies that may not need 100 percent bonus depreciation.

For example, a taxpayer purchases a business aircraft for $2 million in 2018. Based on current year taxable income, the taxpayer can elect to expense $800,000 in 2018 and depreciate the remaining $1.2 million over the use life of the aircraft.

Depreciation Deductions	2018
Section 179 Expensing	$800,000
MACRS Depreciation Expense (20%)	$240,000
Total Depreciation Deduction	$1,040,000
Income Tax Savings from Depreciation	$416,000

Entertainment Use of Business Aircraft

Historically, the general rule of IRC § 274 disallowed all entertainment expenses unless directly related or associated with the active conduct of the business. Therefore, the entertainment of clients, prospects, company retreats and other entertainment events where business was conducted immediately before, during or after the entertainment, has been a deductible use of a business aircraft. Flying clients to a sporting event has been considered a deductible business use of an aircraft.

Effective January 1, 2018, TCJA disallows all entertainment expenditures, regardless of whether they are directly related to a business goal or connected to the taxpayer's business activities, which includes entertainment use of a business aircraft. The taxpayer can continue to utilize the aircraft for business entertainment, but these expenditures are no longer tax deductible.

The Elimination of 1031 Like-Kind Exchange

Recapture of depreciation occurs when a depreciated aircraft is sold. The sale price exceeding the remaining tax basis is taxed as ordinary income. For example, a fully depreciated aircraft sold for $500,000 will result in $500,000 taxable gains. Section 1031 Like-kind Exchange is a provision that allowed for the deferral of the recapture gains historically. TCJA has eliminated the applicability of this provision to equipment and business aircraft. Beginning in 2018, a sale of a depreciated business aircraft will result in gain recognition immediately, taxed at the ordinary income tax rate.

The loss of this deferral provision should not create any hardship for taxpayers, as long as a replacement aircraft is purchased in the same tax year. With 100 percent bonus depreciation available for new and used

aircraft, investment in a replacement aircraft will create new depreciation deductions that should offset the gains recognized on the sale of the current aircraft.

In summary, with the amount of depreciation available from a business aircraft, it is paramount that taxpayers and their tax advisors consider the various compliance requirements in order to benefit from the sizable tax benefits. Numerous Internal Revenue Code provisions can impact and limit the utilization of bonus depreciation – basis limitation for pass-through entity, passive activity rules, listed property, entertainment use, hobby loss, etc. It is important that an ownership structure should also comply with state sales and use tax laws and FAA Regulations.

A sound and tax efficient ownership structure should maximize income tax benefits available for a business aircraft, and also mitigate the chance of inquiry from the various government regulatory agencies. KA

Daniel Cheung is a member of Aviation Tax Consultants, LLC, and is a certified public accountant who specializes in aviation tax compliance matters. He has established great working relationships within the general aviation community with business aircraft owners, pilots and aircraft sales professionals. Daniel is a frequent speaker at aviation events and aviation tax conferences around the country and a frequent contributor to aviation trade journals.

Effective January 1, 2018, TCJA disallows all entertainment expenditures, regardless of whether they are directly related to the taxpayer's business activities, which includes entertainment use of a business aircraft.

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Minimizing the Risks of Selling your Aircraft or Spare Parts

by Kyle White

General aviation has had a great tailwind lately. Fuel prices have been low and stable, insurance premiums continue to be at historic lows, avionics manufacturers are developing new products, and there seems to be enthusiasm to upgrade cockpits in conjunction with ADS-B installations. There also appears to be quite a bit of action for people entering, or trading up in, aircraft ownership.

Engaging in commerce does come with risk. Thankfully, the perils can be covered in your aircraft insurance policy, provided you have it customized to your needs. During aircraft ownership, there are ways to manage your current and future risks. Like most things in aviation, it is always a good idea to have a plan, be proactive and prepared. While we all hope we never have one, airplanes have claims filed every day. Thankfully what you read in the NTSB reports does not paint an accurate portrait of what the insurance industry sees on a daily basis. Most claims never make it to the highlights that appear in your social media feeds or make the news.

Do you remember what happened to golfer Payne Stewart? In 1999, the Learjet he was a passenger on crashed, and many businesses and people were initially named in lawsuits. They all had to plead their case of what they did or didn't do to the aircraft wasn't contributory to the accident. If your name is in the log book, if you were an owner of the aircraft at one time, or involved in the transaction of selling/purchasing the aircraft, odds are you will be brought into the action, just like many were during that high profile loss. Allegations can be as simple as, you, the aircraft owner, didn't properly maintain it. Or, the shop you had perform the maintenance did "cheap" work and you should have known better than to take it to them.

During one of my first jobs in aviation, I was an aircraft maintenance assistant for a Fortune 500 company. I was 17 and oblivious to "the real world." I'll never forget the moment when the director of maintenance gave me a hammer and told me to destroy an old delaminating windshield we had taken out of the King Air. He could see the look of confusion on my face, "Why on earth do I need to beat the old windshield to a pulp?"

He wanted to ensure it would not be "recycled" on to another King Air, where it could be involved in an accident, and then be traced back to our company. That experience stayed with me, and I now fully understand the risk with aircraft ownership and used/spare parts. Our flight department was also insistent on using new parts when repairing the aircraft. There were two reasons for this, liability and resale value. We kept many spare parts in our inventory. When the flight department closed, all of the new parts were sold, and some parts were destroyed. Your aircraft policy protects you for "aircraft ownership, use, and maintenance." However, you may not want to take the "off the shelf" policy. Consider customization; there are many ways to do this, but the following are two for consideration:

1) Have the time frame for "liability for sale of aircraft and aircraft parts" extended beyond the cancelation date of your aircraft policy, perhaps you can get one additional year, or more. This is a complex request and isn't as simple as it seems on the surface, but it is possible. The wording and situation needs to be right for your exposure and situation.

2) Purchase a tail policy for a set amount of time, maybe three years, or longer.

Another consideration should be the maintenance shops you use for your aircraft maintenance. As discussed, YOU have coverage if you are sued as it relates to the "ownership, use, or maintenance" of your aircraft. When working with service providers,

it is prudent to make sure they not only do good work, but that they have the necessary insurance coverage in place. Plaintiffs go where the money is, and if it isn't there, they will come back to you. The time to find out your shop doesn't have insurance isn't during the discovery process in court.

As owners and operators of cars, most states require we show proof of insurance in order to register it. Not so with general aviation; only commercial operators (Part 121 and Part 135) are required by the Department of Transportation to carry insurance. Also, FBOs and repair stations are not required to carry insurance. In some cases, the airport authority, as their landlord, may require the businesses on their airport to carry insurance.

During aircraft ownership, there are ways to manage your current and future risks. Like most things in aviation, it is always a good idea to have a plan, be proactive and prepared.

OEMs really like the General Aviation Revitalization Act, as it limits their risk to 18 years. The aircraft owner and maintenance shops then become the source for the settlement. There are even some maintenance shops that refuse to work on aircraft older than 18 years of age because of this. Some insurance companies also shy away from insuring older aircraft and shops that agree to work on older aircraft.

Your maintenance provider should be carrying a couple of different coverages under their General Liability policy. If their shop rates are "cheap," this might raise a red flag that they may not be buying the appropriate coverage, or have any coverage at all. For example, there was a mid-size business jet operator that patronized a specific FBO because they had "cheap fuel." Later it was discovered that the FBO used homemade tow bars, which unfortunately broke during use. When the tow bar broke, the jet kept rolling … right into the tractor they were using as a tug, causing about $1,000,000 in damage. The "cheap fuel" FBO only had $250,000 in coverage. The FBO on the other side of the runway had $50,000,000. It is time well spent to read any contract the FBO wants you to sign waiving your rights to compensation when it is negligent. Additionally, ask for a "To Whom It May Concern" certificate of insurance that verifies the hangar keeper's limit, and their product and completed operations limit.

If you want to get additional reassurance, you can ask to review any endorsements that broadens/enhances what is covered under the FBO's policy. Then, don't be afraid to ask your insurance broker to review it and offer their input.

An example: An aircraft owner was having a maintenance shop work on his/her aircraft. The mechanic thought the work was done, so he started up the aircraft and then realized there was no oil pressure. The engine was immediately shut down and upon inspection it was determined that there was no oil pressure because a safety wire had been left inside the engine. Once the oil screen was pulled, they found that the engine was trashed. Not good. The policy for the maintenance shop was an "off the shelf" policy, meaning it had not been customized to their needs. The claim was denied because the aircraft had not been "returned to service," therefore the "product/completed operation" was not "completed."

What if you've owned the aircraft, you've maintained the aircraft, and you outsourced some of your maintenance to a professional shop. It is equally important you understand how to exit aircraft ownership in a prudent fashion: Intelligent aircraft brokers will have you sign a contract pushing the liability of the sale back to you should they get brought into the suit under the premise the aircraft was unintentionally misrepresented to the buyer. The intelligent and professional aircraft brokerage company will have you sign a contract AND they will have purchased professional liability coverage, which may or may not be needed for your agreement with them.

Your aircraft policy applies and responds to an "occurrence" as defined by your aircraft hull and liability policy. Most likely, "occurrence" is defined as a situation that involves "bodily injury or property damage" as a result of "aircraft ownership, maintenance, or use." So, if the aircraft is sold, you cash the check, and the new owner discovers the air conditioning system only cools the aircraft to 70° F on a 90° F day, but the broker assured the buyer it would easily cool the aircraft to 65° F. What happens? Most likely, the new owner will sue you and the aircraft broker. Be sure your broker has the assets and/or the appropriate insurance coverage to respond to an allegation such as this.

The final strategy for minimizing your risk is through the purchase agreement between the seller and the buyer. Everyone has a different comfort level and desire for what they want this to look like, so I'll just give you one example: A King Air owner entered into an agreement to sell his aircraft and decided to exit aircraft ownership. In doing so, he wanted to minimize his litigation risk as much as possible. He had the aircraft buyer sign a contract that was recognized by the aircraft buyer's insurance company through a certificate of insurance evidencing so. The aircraft buyer agreed to indemnify and hold harmless the aircraft seller, as well as waive rights to subrogate against the seller for liability claims arising from the new owner's operation, ownership, and maintenance of the aircraft. The buyer recognized, per the contract, that the aircraft was being purchased "as is, where is" and that no condition of the aircraft was being guaranteed (the buyer did do a very thorough pre-buy though). The contract also stated that if the buyer sold the aircraft within three years, the new buyer will also recognize this contract and provide the same guarantees and certificate of insurance to the original owner.

There are many ways to manage and/or transfer your risk. Contracts, insurance, attorneys and a knowledgeable insurance broker can guide you through this process. Be aware, you still have exposure once you sell your aircraft and/or your aircraft spare parts … and many times it's the new owner that could do something beyond your control that brings you into the courtroom. KA

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TEXTRON AVIATION PHOTO

Who is Really the Pilot-In-Command?

by Scott Williams, Esq.

If you are flying alone, or with only non-pilots in the aircraft, you already know that the Pilot-In-Command (PIC) is you. However, what if there are two rated pilots in crew seats? Does it matter if one pilot has more experience, higher ratings, or is giving flight instruction? The answer might be as clear as … low IFR.

Liability versus Logbook Time

To clarify, the purpose of this article is to discuss who will likely be held responsible by the FAA, the NTSB, and the civil courts in the event of a mishap. The more esoteric discussion about who is eligible to actually *log* PIC time is for another day.

14 C.F.R. § 1.1 states that the PIC means the person who:

1) *Has final authority and responsibility for the operation and safety of the flight;*
2) *Has been designated as pilot in command before or during the flight; and*
3) *Holds the appropriate category, class, and type rating, if appropriate, for the conduct of the flight.*

Further, **FAR** §91.3(a) states: *The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.*

In Part 135 (air taxi) and Part 121 (airlines), the PIC is predetermined by those who schedule the pilots. If there are two pilots, one is the Captain (PIC) and the other is the First Officer (SIC). However, for us Part 91 pilots, several factors will determine who is PIC, and who can be held responsible for the flight.

The most common two-pilot situation in a Part 91 operation is flight instruction. In the case of a private pilot who is taking instrument lessons, if the flight is operated IFR (even in severe clear), the instructor must be PIC. A non-instrument rated pilot is not legal to operate IFR, period. To make things more interesting, how about a private pilot under the "hood" in VFR conditions with an instructor? Again, since the pilot receiving instruction is not rated to operate solely by reference to the instruments, the instructor has to be the PIC. In all examples so far, a mishap would almost certainly fall 100 percent on the instructor, and none on the airman receiving instruction.

Similarly, if one pilot does not possess a current medical certificate, and the only other pilot does, the only medically qualified pilot will be deemed the PIC. Interestingly enough, some pilots ask a buddy to be their "safety pilot" to build some hood time, but forget to verify that their buddy has a current medical. In this case, who would be PIC? Answer: nobody! No pilot was independently qualified to operate the aircraft, the entire flight would be illegal, and we would expect some certificates to be pulled.

Now, let's spice it up a bit. An ATP who is properly rated and current in all respects is getting a flight review from an instructor. Clearly, since the pilot receiving instruction *could* be PIC even without the instructor, does the instruction matter? Established NTSB precedent says YES: *"[r]egardless of who is manipulating the controls of the aircraft during an instructional flight, or what degree of proficiency the student has attained, the flight instructor is always deemed to be the PIC."* Admin. v. Hamre, 3 NTSB 28 (1977). This principle was reaffirmed in Admin. v. Walkup, 6 NTSB 36 (1988). Flight instructors, time to review your personal insurance coverage.

Who is PIC during a check ride? The examiner is required to hold a current flight instructor certificate, so common wisdom would suggest they would be presumed to be PIC as well. With the exception of a private check ride given to a student pilot, FAR §61.47(b) expressly states that examiners are ***not*** the PIC; end of discussion.

Another common situation is two pilots, both rated and current, but neither is a flight instructor. They share stick and radio time interchangeably, so which one is PIC? First, let's be smart here and ask, "Is one of them *not* covered by that aircraft's insurance?" If not, it is strongly recommended that only the *covered* pilot perform takeoff and landing, and that there be a clear understanding before flight that PIC is the covered pilot. An email exchange to put this on the record before takeoff isn't a bad idea. The last thing any pilot needs is a prop strike where the carrier won't pay. Insurance coverage aside, what would the FAA or NTSB say?

Assuming there are no insurance issues, and the usual circumstances where neither pilot makes any express indication of PIC before flight, the determination of which pilot is PIC will rest on the facts and circumstances of the situation. For example, if there is a TFR incursion, the FAA will likely find the PIC to be the one who had the controls (or the last one to engage the auto pilot). However, what if the PIC had delegated the pre-flight briefing or in-flight navigation functions to his buddy, who is not PIC? The answer is: regardless of who is determined to be PIC, both pilots face liability. In Admin v. Thomas, N.T.S.B. Order No. EA-4309 (1994), the FAA held responsible the non-PIC pilot for a near gear-up landing: *"An aircraft [that] requires only one pilot does not support a conclusion that a second pilot (or even a non-pilot) participating in the inflight operations is not accountable for his own actions."*

Reading the Thomas case carefully, it further narrows the affirmative defense doctrine that

a pilot might rely on called "reasonable reliance." An example of reasonable reliance would be a non-owner pilot renting an aircraft from a flight school, but the aircraft has an Airworthiness Directive that has not been complied with. Even the heavy-handed FAA would not expect a renter pilot to research the maintenance logbooks for AD compliance before every flight. However, if two rated pilots are participating in any aspect of the flight, and if a mishap occurs, expect the FAA to hold both pilots responsible for the adverse consequences.

Further complicating this discussion, most civil courts allow for comparative negligence determinations. For liability purposes, one pilot could be held 90 percent liable, and the other 10 percent liable, regardless of the FAA's determination as to who is, or is not, PIC. If you are the 10 percent pilot with deeper pockets (or insurance), expect to become the recovery target.

Final recommendations: whenever possible, establish who is PIC before the door closes. If both will share PIC duties, verbalize "I am now PIC," to the other pilot to reduce the likelihood of confusion, and to further promote good crew resource management. KA

Scott Williams, Esq. represents buyers and sellers in aircraft transactions, and provides FAA certificate enforcement defense to all pilots. He is a panel attorney for AOPA's Pilot Protection Services.

Maintenance Records – LOGBOOKS

by Dean Benedict

In recent months I have been swamped with buyers considering King Airs for purchase. They have asked me to scrutinize the logbooks to figure out where the aircraft is maintenance-wise. In doing so, I encountered some really frustrating situations that could have been avoided if the log entries were clear, concise and complete. Over the course of my career I've slogged through a lot of logbooks, and early on formed some strong opinions on what makes a good log entry. Is this a topic of interest to the average King Air owner? Maybe not, but bear with me.

Crucial to Value

Accurate logbooks are crucial to the value of any aircraft. When an aircraft changes hands, the logbooks come under intense investigation. What about your log books? When it's your time to sell, how will they hold up?

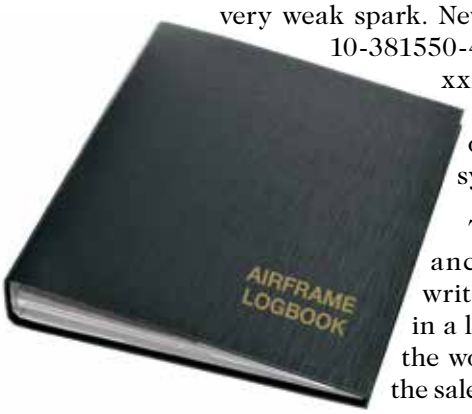
Too Vague

Here's a real example of a very poor log entry: "Complied with all lube items currently due."

This blew my mind! King Airs have lube item requirements due every 12 months plus a host of others due at 200-, 400-, 600-, 800-, and 1200-hour intervals. Each is a special inspection unto itself; they're all different. Some contain service items (replace a gasket, service a filter) in addition to specified lubrication tasks. There is no overlap or duplication. Unless the shop can produce detailed write-ups and lube item checklists from their work order that prove exactly what was done, everything must be done at the seller's expense.

Too Much Information

Another real example: "Pilot reported aircraft's RH engine would not ignite. Troubleshooting carried out, igniter box Unison p/n 10-381550-1 s/n xxx found with very weak spark. New exciter Unison p/n 10-381550-4 s/n xxx (A.P.I. SO-xxx-xxx) installed. Aircraft ground run and operation of ignition system checked OK."



This is the discrepancy and disposition write-up. It has no place in a logbook. It belongs on the work order. And what's the sales order number doing in there? If a warranty issue cropped up down the road, you'd call the shop, they'd research the work order kept on file, and they'd take it from there. Keep clutter out of the logs.

My version of what the above entry should be: "Installed igniter box in new condition, R/H position, p/n 10-381550-4 s/n xxx; removed p/n 10-381550-1, s/n xxx."

I put detailed squawk and disposition write-ups in my client invoices. I want the customer to see what it took to sort out and resolve their squawk. It's important to the customer, but superfluous in the log entry.

Hobbs is not Enough

I see way too many airframe log entries with nothing but the Hobbs reading at the top. That doesn't cut it. Hobbs meters fail and when replaced, they start over at 0.0 hours. The only acceptable proof of compliance with any hour-based requirement is by linking it to Aircraft Total Time (ACTT).

Recently, on a job, I struggled to find compliance for the lube items, the instrument air filter replacement (600 hours), and the power lever pin inspection (1,200 hours). I was faced with a long string of Hobbs-only entries in the airframe records. Was this the original Hobbs meter? I had no way of knowing. I rummaged through the records, looking for an entry that had Hobbs and ACTT. Finally, after going back quite a few years, I found an entry with both numbers. Eureka! I moved forward from there and calculated the ACTT for each entry based on elapsed Hobbs. In the end, I found proof of compliance for all those hour-based items. That seller lucked out. (And, by the way, it was not the original Hobbs.)

Engine Logs Need Airframe Time

All too often I find engine log entries with engine times and cycles, but no ACTT. This is my biggest pet peeve in log entries. Even the FARs, which give precious few specifics for log entry content, require that every log entry contain the ACTT (Ref. FAR 43.11). If you've only owned airplanes with original engines (which means the Engine Total Time and ACTT are the same number) consider yourself lucky. Engines come off one airplane and go onto another all the time. Great care is usually taken with the log entries at installation and removal. All the airframe information (registration, serial number in addition to ACTT) is put on the engine entries. The problem comes after installation. Somebody does an

engine log and only puts in Engine TSO (Time Since Overhaul), and then everyone afterward does the same. I've seen this go on for 15 years. Then I come along, trying to calculate the time left on the starter generator, for example, and I'm stymied.

Starter generators are considered an airframe item even though they are attached to the engine. Their 1,000-hour overhaul belongs in the airframe book, but this is an area of great confusion. Many mechanics and shops don't understand this. They think if it's attached to the engine, then it belongs in the engine book. So, in my research, I bop back and forth between the engine and airframe books. In this example, I found an entry for the starter generator in the engine book with Engine TSO only. The engine wasn't original to the airframe. Ultimately, I had to go back to the log entry when that engine was installed on that airframe to set the record straight on the starter generator. If the engine logs referenced the ACTT, I would have had a much easier time.

I heard a horror story about a Hot Section Inspection (HSI) performed 800 hours earlier than necessary because of a simple mistake in the logbooks. The engines were mismatched, and this was the "younger" of the two, but somewhere along the line a figure got transposed. Again, the engine logs only showed TSO with no reference to Airframe Total Time – an expensive omission. A cross reference to ACTT could have brought the problem to light before the engine was torn apart for no reason. When it hits you in your wallet it gets your attention! The log entry example on the next page shows the full array of airframe data included on an engine log.

Format

In addition to keeping my log entries very concise, I've always composed them in a numbered list format. The most important maintenance items like ADs, major inspections, and required items come first; bulbs, o-rings and less consequential issues come last. It makes it so much easier to find what you're looking for when doing research. Paragraph-style entries drive me nuts, and I'm clearly not alone. I see paragraph entries where someone before me used a highlighter to pick out the salient points, separating the wheat from the chaff.

Unfortunately, the FARs don't dictate format, but in conversations with FAA and NTSB personnel, I found a strong preference for concise log entries formatted as a numbered list.

Bring Logbooks to Maintenance

When your King Air goes in for maintenance, bring the logbooks! Some of those Hobbs-only airframe entries are because the shop never saw the books and could not compute the ACTT.

Each time a new shop sees your King Air, they need to research what's been done and what needs doing.

KING AIR SHOP
1000 KING AIR RD; KING AIR TOWN, 00000

LOG ENTRY— L/H ENGINE—DATE: 0-0-2018

A/C Model: King Air E90	Eng Make: Pratt+Whitney
A/C Reg: N000XX	Eng Model: PT6A-28
A/C S/N: LW-XX	Eng S/N: PCE-00000
ACTT: 11,263.7	Eng TTSN: 6235.8
Hobbs: 1263.4	Eng TSO: 2099.8
A/C Cyc: 11,281	Eng TSHSI: 00.0
	Eng Cyc: 6,450
	Eng CSO: 2269

1. C/W Phase Inspections I, II, III and IV per Beechcraft M.M.
2. C/W 1000-hr oil filter replace.
3. Installed new igniters, inbd and outbd positions.
4. C/W Hot Section Inspection; components repaired and reinstalled by Dallas Airmotive (RPR 0X0X0).
5. Installed O/H bus bar p/n 3027628, s/n=HR11xxx.
6. Installed O/H temp harness p/n 3117923-01, s/n=NR18xxx.
7. C/W compressor turbine wash.

I certify this engine has been inspected IAW Phase Inspections I, II, III and IV per Beechcraft M.M. and was found to be in airworthy condition with respect to the work performed.

MR. MECHANIC, A&P/AI 00000000

An example of what an entry in an engine log showing all the information that should be included in any entry, including airframe information (registration, serial number, in addition to ACTT).

If you've been going to the same shop for a decade, you should still bring your books. It never fails: If you leave your logbooks at home, the shop will run across something that needs logbook research. So, bring your logs to maintenance.

If you subscribe to a maintenance tracking service, they can send their report to the new shop. Just be aware of the pitfalls. These reports are long, complicated and contain errors. The data entry clerk who loads your logbook information into their system often has no clue what they're looking at. Mistakes can run rampant. After 45 years in this business, I found nothing replaces having my own eyes on the logbooks. Bring your books!

Parting Shots

Check all log entries for Aircraft Total Time. If it's missing, make the shop put it in. When a shop hands you a log entry in paragraph form, IN A FONT ABOUT THIS BIG, can you get them to reorganize it as a numbered list? Probably not. But ACTT is an FAR requirement. Stand firm.

You should also get a debrief after maintenance. Each time I returned a King Air to service after a Phase or major maintenance, I did a thorough debrief with the pilot or owner/operator. I went through the entire work order, squawk by squawk, discussing every item, with the log entries on the table for reference. I wanted my customer to review their log entries before they go in the book and out of sight.

When it finally comes time to sell your King Air, brokers and prospective buyers will be crawling all over your logbooks. Hopefully they will stand up to the scrutiny. In the meantime, however, enjoy the heck out of your King Air! KA

Dean Benedict is a certified A&P, AI with over 40 years' experience in King Air maintenance. He's the founder and former owner of Honest Air Inc., a "King Air maintenance boutique" (with some Dukes and Barons on the side). In his new venture, BeechMedic LLC, Dean consults with King Air owners and operators on all things King Air related: maintenance, troubleshooting, pre-buys, etc. He can be reached at *dr.dean@beechmedic.com* or (702) 773-1800.

An InFO, the ATC Bill and the FAA's New Leader

by Kim Blonigen

FAA Issues InFO on Acceptable Procedures for PED Inflight Fires

In late December 2017, the Federal Aviation Administration (FAA) issued InFO 17021, which clarified its policy on the use of fire containment products such as kits/bags and acceptable firefighting and containment procedures for inflight fires involving portable electronic devices (PED).

Per the InFO, several manufacturers are marketing fire containment products (kits/bags) as being "FAA certified," "successfully tested by the FAA" or "meets FAA standards." The FAA wants to point out that "the Fire Safety Branch of the FAA William J. Hughes Technical Center and the Aircraft Certification Service emphasize that there are no FAA test standards for these containment products, nor is there a mechanism in place for the approval of these products."

Regardless of how effective the containment kits/bags are, the InFO states "the highest risk may lie in the transfer of a burning or overheated battery to the containment kit/bag." The FAA does not object to the use of these containment products provided the procedures stated in the **Safety Alerts for Operators (SAFO) 09013, dated 6/23/09, "Fighting Fires Caused By Lithium Type Batteries in Portable Electronic Devices"; Advisory Circular (AC) 20-42D, "Hand Fire Extinguishers for use in Aircraft"; and AC 120-80A, "In-flight Fires"** are followed.

Some manufacturers of certain containment kit/bags may recommend that a crewmember move a burning, smoking or hot device associated with a lithium battery, and the FAA continues to recommend that a crewmember should not move any device that is burning, smoking or exhibiting any evidence of overheating until that device has been thoroughly cooled. A device that is burning, smoking or hot is inherently unstable and therefore unpredictable.

ATC Threat Still Alive

Government affairs officials from the National Business Aviation Association (NBAA) told two regional business aviation groups in mid-January that "the threat of ATC privatization hasn't dissipated and the entire general aviation (GA) community is needed to mobilize in 2018 to defeat the proposal in Congress."

They noted in their presentations that although Rep. Bill Shuster (R-9-PA), the bill's sponsor, will be retiring at the end of the congressional term, he is still committed to focusing on and raising the necessary support to pass his privatization bill.

The ATC Not For Sale website and 833-GA-Voice phone line have been specifically set up to make contacting Congress simple and quick. They recognized that in 2017 the GA community responded by making their voices heard via call, emails, tweets, personal meetings and more, but the fight continues.

New FAA Administrator Appointed

In early January Dan Elwell was appointed the new administrator of the FAA, as acting administrator Michael Huerta's had filled the position's five-year term. Elwell had been acting as the FAA's deputy administrator since June 2017.

Elwell's background experience includes being a former airlines executive with industry, government and association experience, including serving as the FAA's assistant administrator for aviation policy, planning, and environment from 2006 to 2008. Before rejoining the agency, Elwell previously had been president and managing partner of his own consulting firm, Elwell & Associates, and involved with the Trump administration on issues such as the independent air traffic control organization proposal. KA

The Autopilot's IAS Mode

by Tom Clements

If your particular autopilot/flight director system does not have the IAS mode – the mode that adjusts pitch attitude to hold a particular Indicated Airspeed – then this article is not for you. Turn the page; I'll see you next month.

But for those who have this mode, let's talk a bit about its usefulness. I would wager that the IAS mode is typically used very rarely. It is only when ATC assigns a reasonable speed while providing vectors for an approach – for example, 180 knots – that pilots sometime select the IAS mode. Realize that this is one of the vertical autopilot modes and vertical modes are mutually exclusive. For example, Altitude and IAS modes cannot be selected at the same time. You can have the autopilot hold an altitude or a speed, but never both. (It would take auto-throttles to do both, and that is a system almost never seen on King Airs.) Likewise, IAS and VS (Vertical Speed) modes are mutually exclusive; same with altitude and glideslope.

When Approach Control wants us to hold 180 KIAS, it is easy to adjust power to attain that speed in level flight and then tap the IAS button when we are assigned a descent. Now our reduction of power will cause the descent to begin, as the autopilot pitches down to keep the assigned 180 KIAS speed. The more that power is reduced, the greater the rate of descent. As the next assigned altitude is captured, the IAS mode automatically disconnects and now we add power to maintain 180 KIAS while the autopilot controls pitch to maintain the assigned altitude. Have you utilized this procedure? It's rather easy and "cool," no?

But IAS mode lends itself to an even better utilization in many airplanes, and that comes into play while doing a non-precision approach or a precision approach without glidepath coupling. It is widely reported that many King Airs with the Collins Pro Line II avionics suite and with early versions of an EHSI cannot be converted so to conduct coupled LPV approaches. The Pro Line II setup was a popular factory installation in the late 1980s and throughout the 1990s. Some owners of these models have elected to do a complete panel makeover, replacing the original "steam gauges" with a Garmin G600 display, perhaps receiving input from the popular Garmin GTN 750. Now autopilot coupling in the vertical axis can be easily incorporated. But coupling without installing a G600 is virtually never done due to compatibility issues.

When updating an older, non-WAAS GPS to a WAAS version – or when adding a new WAAS-enabled GPS – many installation shops include a simple mechanical display of lateral and vertical deviation. Although this display is useless most of the time, it is often the only place in which a GPS-derived glidepath can be displayed. When we are conducting an RNAV (GPS) approach that has a glidepath – LPV or LNAV/VNAV or LNAV+V – this simple mechanical indicator shows glidepath deviation.

Since the autopilot cannot be wired to couple to this glidepath, the pilot is forced to do it manually. It is common to keep the autopilot engaged in the NAV or APPR mode so that it can track the approach course. Then pitch attitude is manually adjusted, by use of the autopilot's pitch command wheel or rocker switch, to follow the glidepath in the descent. This works fine. However, I find that this is a case in which the IAS mode makes the pilot's job a bit easier.

Here's how it goes: Let the autopilot track the approach course, outside of the FAF, in the lateral mode you prefer: HDG/GPSS, NAV, or APPR. Engage the ALT mode to hold the proper glidepath intercept altitude. Adjust power and extend approach flaps and landing gear so that the airplane is exactly at your desired approach speed as the glidepath is intercepted.

Now tap the IAS button and set the power to what you estimate will be correct for the descent. Tapping IAS disconnects ALT and now the autopilot is adjusting pitch to hold the IAS. From past experience, you have set an appropriate torque but, of course, wind, and weight all cause the need for power adjustments. If the glidepath deviation needle shows you starting to go high, pull torque back a bit, perhaps 100 ft-lbs. Wait and observe the result. Starting to center the glidepath again? Then add 50 ft-lbs or so. Still going high? Pull off another 100 ft-lbs. By making timely and smooth, small power adjustments, you will find that it is exceedingly easy to stay centered on the glidepath.

For those systems that do indeed couple to a GPS-derived glidepath, then the LPV approach is flown identically to an ILS approach … letting the autopilot adjust heading and pitch to remain on the proper path while we adjust power to hold the desired speed. Thus, the only difference in the procedure we are discussing now is that pitch is being used to hold airspeed and power is being used to follow the glidepath instead of the other way around.

The old "Dive and Drive" non-precision approaches are becoming less and less common, being replaced with GPS-derived precision approaches, yet there are still hundreds that exist. When executing one of these approaches, obviously the IAS mode can again be used to ease the pilot's workload and to guarantee a nicely stabilized approach speed. As discussed before, have the

airplane properly configured with approach flaps and gear down by the FAF, and with power adjusted to reach the desired speed. Tap IAS when over the FAF and then reduce power sufficiently to develop a 1,000-fpm rate of descent. Have the next stepdown altitude preset into the altitude alerter window – or the MDA, if no intermediate stepdown is required – and add power to maintain speed when you observe the IAS annunciator extinguish as the altitude capture begins. Repeat as necessary for other descents down to minimums.

Although I find the IAS mode easy and fun to use, I have no complaint with those pilots who still prefer to adjust pitch attitude manually via the autopilot's pitch wheel or rocker switch. The only drawback of that technique is needing to move the right hand back and forth between the power levers and the pitch command wheel/rocker.

I do have a bit of heartburn, however, with those who use the Collins' APS-65 DSC (Descent) mode during non-precision approaches. First, the nose-over is too smooth! It doesn't start the descent in as timely a manner as is desirable. Second, the descent stabilizes at too high of a rate for my liking: 1,200 to 1,500 fpm. Granted, oftentimes the rate of descent does not reach that great of a value since the next altitude capture has canceled the DSC mode, yet is it wise to be using that as the target rate? I'd much prefer to be able to control the rate myself, via power adjustments, while the autopilot takes care of airspeed.

I cannot close this discussion without again touting the virtue of knowing the "magic numbers" for your King Air model. Those wonderfully useful power settings and configurations have been covered in a previous article in this magazine. They may also be found under the "Clements Corner" section at *www.kingairacademy.com*. Here is the exact link:

https://drive.google.com/file/d/0B_t5NXYD7vUbQzFQWW44UkxXWlE/edit

Having those magic numbers in mind makes the necessary power adjustments a piece of cake!

Give the IAS mode a try on your next non-ILS approach, preferably in visual conditions before using it "for real." Works well, eh? KA

King Air expert Tom Clements has been flying and instructing in King Airs for over 44 years, and is the author of "The King Air Book." He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his book, contact Tom direct at *twcaz@msn.com*. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

If you have a question you'd like Tom to answer, please send it to Editor Kim Blonigen at editor@blonigen.net

Cabin Jobs

During the 1920s, airframe manufacturers in Wichita, Kansas, produced a series of airplanes that signaled the gradual demise of open cockpit flying in favor of a comfortable, enclosed cabin.

by Edward H. Phillips

In February 1921, the indefatigable Jacob M. Moellendick announced to the Wichita newspapers that the Wichita Laird Airplane Corporation was planning to launch an air service from Wichita to Tulsa, Oklahoma, and Kansas City, Kansas. Always ready to generate publicity for his infant company, Jake always believed that the city of Wichita, that "Peerless Princess of the Prairie," was destined to become a haven of civil aviation. Although Jake's dream of a regional airline never materialized, he continued to harbor visions of a grand air service flying a fleet of Laird airplanes along routes stretching from Wichita across the entire Midwest region of the United States.

Moellendick, however, did have an airplane in mind for his proposed airline. It would be twin-engine, open-cockpit biplane powered by two Curtiss OX-5 engines each rated at 90 horsepower, but its most salient feature would be an enclosed cabin that could accommodate up to six passengers. Jake's partner in the company, E.M. Laird, began construction of the *Laird Limousine* in December 1920. Moellendick hoped that he could sell the biplane to would-be airline moguls for about $15,000. The Limousine was only slightly larger than the three-place, open-cockpit Laird *Swallow* that sold for $6,500.

The cabin biplane had a wingspan of 47 feet and a length of 25 feet. The pilot and one passenger sat in the open cockpit forward of the cabin section, while the passengers relaxed in the upholstered interior complete with large windows on each side. Four seats were arranged in a club-type configuration. A large door on the left side of the fuselage allowed easy entry and egress for travelers.

Flying in open-cockpit biplanes was the norm in the mid-1920s, as exemplified here by Walter Beech (front cockpit) and Brice Goldsborough in a 1926 Travel Air Model BW. As the late 1920s arrived, however, both pilots and passengers began to abandon bulky, heavy flying suits and leather goggles for the comfort of an enclosed cabin. Walter Beech was among the first executives in the evolving commercial aviation industry to recognize that trend. (EDWARD H. PHILLIPS COLLECTION)

Laird's creation was the first enclosed cabin design built in the city, but it was grossly underpowered for its proposed role as a short-haul airliner. It had a maximum gross weight of 4,000 pounds, a useful load of 1,500 pounds and carried 180-gallons of fuel to feed the thirsty Curtiss powerplants. First flight occurred in mid-summer of 1921 with George "Buck" Weaver at the

The *Laird Limousine* appeared in the skies over Wichita in 1921 and could carry four people in its cramped cabin. Designed by E.M. Laird, the Limousine underwent a series of modifications that included installation of a water-cooled Packard 12-cylinder V-type engine rated at 250 horsepower. Unfortunately for Laird, the biplane was plagued by technical problems and poor performance (noise from the exhaust stacks must have been deafening). A heat exchanger was mounted below the cockpit on each side of the fuselage to maintain coolant temperature. (JOAN LAIRD POST)

controls. Unfortunately, it was immediately apparent that the war-surplus OX-5s were completely inadequate, and after a few flights the ship languished in storage until May 1922 when Laird decided to replace the two Curtiss engines with one 12-cylinder *Liberty* engine rated at 450 horsepower. That engine, however, was never delivered. Disappointed but determined to re-engine the Limousine, Laird turned to his good friend in Chicago, Charles Dickenson, who agreed to sell him a 12-cylinder Packard 905 rated at 250 horsepower.

Laird had a host of improvements in mind for the cabin ship that included changing the wings to a single-bay design to reduce weight, streamlined interplane and cabane struts to reduce drag, and a new empennage featuring a vertical stabilizer instead of the three used on the original airplane. In addition, two large water cooling radiators were mounted on either side of the fuselage below the cockpit to keep the Packard from overheating.

Laird put Lloyd C. Stearman in charge of the rebuilding project but kept a watchful eye on the proceedings. Work began in August 1921 and completed early in 1922. The reborn Limousine flew in February with Walter Beech at the stick. As flight testing progressed Walter noted problems with cooling the big Packard, which gulped enormous amounts fuel and limited flight time. Trouble with the engine persisted. Finally, in 1923 Laird had the Packard removed and installed a 400-horsepower, 12-cylinder Liberty engine in its place. That powerplant was plagued with failures and only a few brief flights were made by Beech that ended with forced landings.

In 1925 Travel Air engineer Lloyd C. Stearman designed the Model BH cabin biplane powered by a 180-horsepower Wright-Hispano V-type engine. Four passengers could be accommodated in the cabin forward of the open cockpit. Featuring a wingspan of 42 feet, the Model BH was a large airplane and performed well, but only one was built. It was used by the Gerbracht Aeronautic Corporation. *S-200* and *Pegasus* were not official designations used by Wichita's Travel Air Manufacturing Company. (EDWARD H. PHILLIPS COLLECTION)

After two years of time and money expended in an attempt to make the Limousine into an airliner, Moellendick's patience ran out. He ordered the biplane flown to Arkansas City, Kansas, where it would be placed in storage to await its fate. A local pilot named Irl Beach (no relation to Walter Beech) was hired to make the short flight. Soon after takeoff, the engine rebelled and Beach was forced to land the Limousine in a field near the campus of Fairmount College.

Unsure of what to do next, Irl telephoned Jake and asked for instructions. Moellendick's answer was succinct: "Burn it!" The column of smoke rising above the Kansas countryside marked not only the Limousine's final resting place, but a fitting epitaph for Jake's dream of creating an airline.

Wichita's next enclosed cabin airplane was the Travel Air Model CH that could accommodate four passengers in a cramped cabin forward of the open cockpit. Built in 1926, the biplane featured a 180-horsepoer Wright/Hispano Suiza V-8 engine turning a Hamilton Standard fixed-pitch, twisted steel propeller. The first airplane was built for the Gerbracht Aeronautic Corporation in Iowa. Travel Air built one additional Model CW biplane in 1926 that saw service in Alaska. A redesigned version designated the Type 7000 was built in 1928.

A pre-production prototype of Travel Air's Type 5000 enclosed cabin monoplane arrived on the scene in 1926. It was based largely on a private venture design by Clyde V. Cessna that first flew in June of that year. It was powered by an Anzani 10-cylinder static, air-cooled radial engine that produced 110 horsepower. The five-place cabin could be converted in minutes to an air ambulance configuration, and when Walter Beech flew the ship he was impressed by its overall performance.

In the wake of that flight, Travel Air engineers embarked on a design that would become the Type 5000 aimed at small regional airlines. The prototype flew for the first time in December 1926 with Clarence Clark at the controls. Kansas City, Missouri-based National Air Transport ordered eight of the Type 5000 for service on short-haul routes in the Midwestern United States.[1]

By 1928, Walter Beech had become acting president of the Travel Air Manufacturing Company after the departure of Lloyd Stearman and Clyde Cessna to establish their own companies. Eventually Beech was formally elected president by the company's board of directors. One of his first initiatives was to conduct an extensive market survey to determine if air-minded businessmen would buy a modern, enclosed cabin monoplane for exclusive use as a business aircraft. Walter knew that the Type 5000 was a resounding success for National Air Transport, and he believed that the time had come to design and build a larger, more powerful cabin ship specifically for executive transportation.

To test the market's waters, Beech intentionally leaked information about the proposed aircraft to the local press, stating only that the company planned to develop a "sedan model." The businessman that flew was a new market for the fledgling small airplane industry, and Beech sensed an opportunity. He was not the first to do so. Other men, such as Giuseppe Bellanca, had realized the potential of selling airplanes with enclosed cabins. In 1922 he introduced the Anzani-powered Bellanca C.F. that was among the earliest attempts in America to build an enclosed cabin monoplane.

In an effort to determine if there was sufficient interest in such an airplane for executives, Travel Air mailed hundreds of market surveys to companies and their

The patriarch of all Beechcraft King Airs was the Travel Air Type 6000 "cabin job." Designed and developed in 1927, the handsome monoplane could seat six passengers and two pilots and was powered by a nine-cylinder Wright J5-series static, air-cooled radial engine rated at 200 horsepower. The ship was flown extensively around the United States on demonstration tours, often with salesman extraordinaire Walter Beech at the controls.
(EDWARD H. PHILLIPS COLLECTION)

chief pilots. The response clearly indicated that if Travel Air offered the right airplane at the right price with the right performance and cabin comfort, orders would be forthcoming. That was sufficient evidence for Walter Beech to order development of what would become the Type 6000.

Following months of design work, on April 15, 1928, a prototype was rolled out into the Kansas sunshine. Beech billed the airplane as the "Limousine of the Air" – an airplane that, at least from a purely historical viewpoint, could be considered the patriarch of all future Beechcraft business aircraft. In addition, it set the tone for Mr. Beech's marketing strategies for what an executive transport should be. The Type 6000 also put Travel Air ahead of its competitors in the lightweight aircraft segment.

The prototype was powered by Wright J-5C, nine-cylinder radial engine rated at 200 horsepower. Six wicker-type seats were installed in the spacious cabin. The seats were designed for quick removal that allowed a generous volume for hauling cargo and bulky items. In executive configuration, passengers entered the heated cabin through a large door on the right side of the fuselage. A second, smaller door on the right, forward fuselage allowed entry/egress from the cockpit for the flight crew. One feature of the cabin was the installation of automobile-style, plate glass cabin windows that could be rolled down for ventilation.

Basic specifications included a wingspan of 48 feet 7 inches, length of 30 feet 10.5 inches and a height of eight feet 8.5 inches. The monoplane weighed 2,200 pounds empty and had a maximum gross weight of 3,800 pounds. Cruising speed was 105 mph. Travel Air's chief pilot, Clarence Clark, flew the ship on a series of test flights to probe the airplane's flight characteristics. Rate of climb was about 700 feet per minute with a service ceiling of 12,000 feet. Fully loaded, takeoff distance was 720 feet and landing rollout was 300 feet with heavy application of the mechanical brakes.

In 1928, Clyde V. Cessna's Wichita-based Cessna Aircraft Company introduced the handsome CW-6 cabin monoplane powered by Wright J-5 radial engine (note front-mount magnetos that were later relocated to the rear accessory section). The airplane's outstanding feature was its full cantilever wing that was a Cessna hallmark. The showroom-new Dodge Brothers and REO automobiles on display would be worth a fortune in 2018 dollars.
(ROBERT PICKETT COLLECTION/KANSAS AVIATION MUSEUM)

By the early summer of 1928, production plans for the new airplane were well underway, and Beech wasted no time gathering orders for the monoplane. In June he flew the ship on the Kansas Air Tour where more than 10,000 people saw the airplane, including a number of prospects who later signed up to buy the handsome Travel Air. Later that month Walter took the ship to the East Coast where he managed to secure another 14 orders. Although pilots and businessmen like the Type 6000, they asked that the cabin be enlarged and more powerful engines made available to improve performance. Beech listened, and Travel Air engineers redesigned the airplane into the Type 6000B that entered production later that year. The first production Type 6000B, serial number 790 and registered NC6469, was delivered to Wilbur D. May.

As 1928 progressed, overall business for the company was very strong as the front office received about $12,000 in orders for new airplanes every day. It was no surprise to Walter Beech, however, that a growing number of orders were not for the company's tried-and-

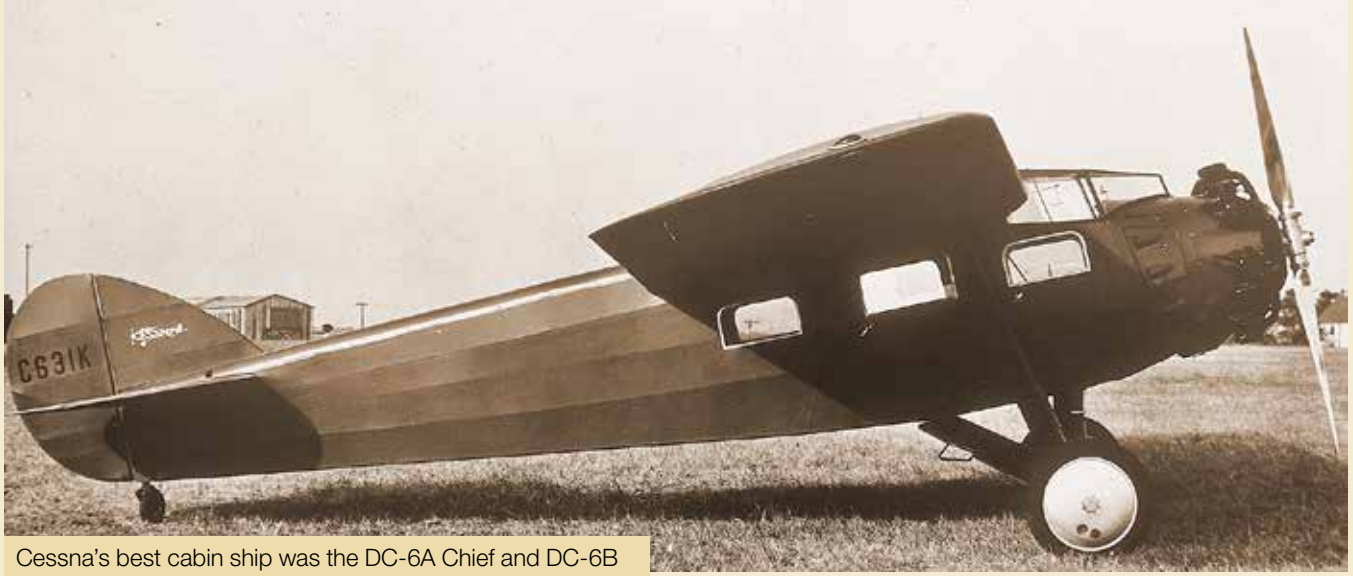
true Type 2000 or Type 4000 open-cockpit biplanes, but for the new cabin monoplanes. After consulting his marketing analyses, Beech concluded that the ratio of production open-cockpit to enclosed cabin ships would be about 60 percent in favor of biplane and 40 percent for monoplanes.

By 1929 it had become clear that Travel Airs with one wing and a comfortable cabin were the way of the future. By the end of 1929 the company had certificated the six-place Type 6000B (300-horsepower Wright J6-9 engine), the Type A6000B powered by a 420-horsepower Pratt & Whitney R-985 radial engine, and the four-place Type 10B and 10D (Wright R-760 rated at 225 horsepower and J6-9, respectively). More than 150 "cabin jobs" had been delivered before the stock market collapse in October 1929 severely affected sales of new airplanes. By the end of 1930, production was down to a trickle and the factory closed its doors in 1931.

Meanwhile, across town at the Cessna Aircraft Company, Walter Beech's friend and now competitor Clyde V. Cessna was enjoying initial success of the Model AA cabin monoplane, the first example of which was delivered to Edmund A. Link in February 1928. Cessna had been a strong proponent of the monoplane since 1911 when he attended an airshow in Oklahoma City, Oklahoma. Clyde watched famous European "bird men" Roland Garros, Rene' Simon and American Charles Hamilton flying Bleriot monoplanes. Cessna was particularly impressed by Garros' 12-minute flight in his Bleriot as the pilot circled the crowds below while climbing the machine ever higher. Later in his career Cessna would remark that monoplanes were "worth more to see than any of the biplanes" that dominated early aerial exhibitions.

Clyde's goal was to design, build and sell monoplanes featuring a full-cantilever wing with no supporting struts. It was not a new concept – Anthony Fokker had been building such airplanes for years and the new Lockheed *Vega* cabin monoplane of 1927, designed chiefly by Jack Northrop, was both handsome and fast. Cessna's best-selling airplane was the Model AW. Certificated in September 1928, the four-place monoplane featured a seven-cylinder, 110-horsepower Warner *Scarab* static, air-cooled radial engine and a maximum speed of 128 mph. In terms of overall value for the dollar (standard-equipped price of $7,500), the Model AW offered pilots good performance and fuel economy without sacrificing useful load and payload.[2]

Clyde's next step was to design a six-place cabin ship that would expand the company's product line. In 1929 Cessna introduced the Model DC-6 (17 years before the Douglas DC-6) powered by a six-cylinder Curtiss *Challenger* radial engine rated at 170 horsepower. Grossly underpowered, only five were built before production changed to the superior Model DC-6A and DC-6B. Certified in September 1929, the DC-6A



Cessna's best cabin ship was the DC-6A Chief and DC-6B Scout series that entered full production in 1929. Although clearly an evolution of the CW-6, the DC-6 was highly refined and available with a Wright J6-7 (225 horsepower) or J6-9 (300 horsepower) radial engine. Only a small number of each version were manufactured before the stock market collapse in 1929 practically destroyed demand for new airplanes of any kind. As of 2018, only one example of the DC-6 is known to exist – a DC-6A undergoing restoration in Minnesota. (ROBERT PICKETT COLLECTION/KANSAS AVIATION MUSEUM)

Chief was a handsome cabin monoplane that rivaled Travel Air's Type 6000B, as well as excellent designs by manufacturers Stinson, Buhl, Verville and others. More importantly, it used the popular and powerful Wright J6-9 radial engine that produced 300 horsepower and gave the DC-6A a respectable cruising speed of 130 mph and a service ceiling of 18,500 feet. Only 22 were built before production ceased in 1930 due to the nation's severe economic downturn.

The Chief's sibling was the Model DC-6B *Scout* powered by a 225-horsepower Wright J6-7 engine. Essentially identical to the DC-6A except for its engine, the DC-6B was priced slightly lower ($10,000) and had a cruising speed of 120 mph. The debacle on Wall Street kept production to only 22 airplanes, but in 1934-1935 the revived Cessna Aircraft Company built three Scouts from parts left over from 1931, but these used Wright J6-7 engines rated at 250 horsepower.

A few miles north of downtown Wichita the Stearman Aircraft Company, led by Lloyd C. Stearman and an aviation-savvy board of directors, was busy filling orders for the C-3B open-cockpit biplane along with the M-2 *Speedmail* that was designed specifically to serve the growing U.S. Air Mail network. Stearman and his chief engineer, Mac Short, took the M-2 and reworked its rugged airframe into the CAB-1 *Stearman Coach*. Introduced in April 1929 at the aviation exhibition held in Detroit, Michigan, the CAB-1 represented the Stearman company's attempt to compete in the increasingly crowded enclosed cabin segment of the small airplane market.

The ship made a good impression on attendees at the Detroit show with its two-tone cream and tan color combination that was complimented by a contrasting scheme of cream and red with a black band and striping. The airplane's major feature that set it apart from competitors was its voluminous cabin that was surrounded 360 degrees by large windows. The insulated and heated cabin was appointed with four plush, deeply upholstered seats. A baggage compartment door on the left side of the fuselage allowed easy loading/unloading of suitcases. The engine of choice was the Wright J6-9 rated at 300 horsepower turning a ground-adjustable

Shown here is one of the few photographs made of the sole CAB-1 *Stearman Coach* cabin biplane. By the time it was completed in 1928 its outdated biplane configuration was a serious liability compared with modern monoplane designs. The CAB-1 featured a sesquiwing arrangement, a spacious cabin, and windows that provided a 360-degree view outside for the passengers. (WALTER HOUSE COLLECTION)

propeller. The cockpit featured indirect lighting and a complete set of instruments for "blind flying" was standard equipment.

Flight tests revealed a maximum speed of 135 mph and a cruising speed of 115, and the ship's large wings of generous span and area provided a gentle landing speed of 47 mph (no wing flaps installed). The service ceiling was 16,000 feet with a rate of climb (sea level) of 900 feet per minute. Maximum gross weight was a hefty 4,270 pounds with a payload of only 780 pounds. After the Detroit event, the Stearman Coach was flown on a nationwide air tour to demonstrate the airplane to Stearman Aircraft's dealer/distributor network. Unfortunately, the CAB-1's biplane configuration worked against its acceptance by potential customers. Just as Walter Beech had already learned with the Type 6000, by 1929 air-minded businessmen preferred cabin monoplanes that represented the way of the future for business aviation. Plans to begin production 60 days after the Detroit show were scrapped when the marketplace showed little interest in the CAB-1. The sole example was disassembled and quickly disappeared from the company's sales literature. By the end of 1929, the Stearman Coach was only a footnote in the history of the Stearman Aircraft Company.

In yet another effort to capitalize on the M-2's basic airframe, Lloyd Stearman and Mac Short created the LT-1 (Light Transport) that was slightly larger than the M-2 and accommodated four passengers in a cramped cabin forward of the pilot's open cockpit. Airmail was stowed in a compartment aft of the engine. The first LT-1 built flew in July 1929 and was powered by a Wright *Cyclone* engine of 525 horsepower, but the three other airplanes manufactured used the Pratt & Whitney *Hornet* nine-cylinder, radial engine that also produced 525 horsepower.

The LT-1 was a large cabin biplane with a total wing area of 490 square feet. Weighing in at a heavy 6,250 pounds, the biplane still managed a respectable cruising speed of 115 mph and a range of 690 statute miles. Only four of the hard-working LT-1 series were built. Three of these soldiered on into the 1930s after Interstate Air Lines was absorbed by American Airlines.

Although Wichita's airframe manufacturers were not alone in selling enclosed cabin airplanes, their products were often at the leading edge of design and offered good performance, comfort and economy for the dollar. Today's Beechcraft owners and operators may view Travel Air's Type 6000, Stearman's LT-1 and Cessna's DC-6 as nothing more than antiquated artifacts from a bygone era, but they played an important role in laying the foundation for the future of business flying. KA

NOTES:

1. The Travel Air Type 5000 prototype was the first commercially-built airplane to fly from California to the Territory of Hawaii. That flight occurred in July 1927. One month later, a Type 5000 built specifically for the Dole Race to Hawaii won that event after flying for more than 24 hours from Oakland, California, to Wheeler Field, Territory of Hawaii. The airplane, named the *Woolaroc*, is on static display at the Frank Phillips Museum near Bartlesville, Oklahoma.
2. The Model AW was Cessna's best-selling airplane although less than 50 were delivered before the stock market crash in 1929 sent sales into an unrecoverable flat spin. In 1934, however, Cessna's nephew Dwane Wallace, with help from young engineers Tom Salter and Jerry Gerteis, redesigned the Model AW into the Model C-34 that became known (unofficially) as the *Airmaster*. More than 170 C-34, C-37, C-38, C-145 and C-165 airplanes were built before the Cessna factory transitioned to wartime production in 1940.

Ed Phillips, now retired and living in the South, has researched and written eight books on the unique and rich aviation history that belongs to Wichita, Kan. His writings have focused on the evolution of the airplanes, companies and people that have made Wichita the "Air Capital of the World" for more than 80 years.

Another design by Lloyd Stearman and engineer Mac Short was the LT-1 cabin biplane featuring a 525-horsepower Pratt & Whitney radial engine. An evolution of the highly successful Stearman M-2 *Speed Mail*, the LT-1 could haul four passengers and hundreds of pounds of mail or small cargo. Only four were built.
(ARCHIVES OF THE WICHITA AREA CHAMBER OF COMMERCE)

Textron Aviation Announces Aircraft Technical Review Sessions

Textron Aviation has invited owners/operators to a LIVE Tech Session with your aircraft experts. Sessions will include updates to customers regarding current and pending field programs, as well as, discuss service and maintenance issues.

The company also says it is the customer's chance "to connect with Textron Aviation and your peers, ask questions and make suggestions."

The King Air Tech Session will be held Wednesday, February 28, 2018 at 10:00 am (CST) and last one hour. Those interested must register for the session at *register.gotowebinar.com/register/2778837906180529411*. If you have any questions, contact *txtavsupport@txtav.com.*

Gogo Business Aviation Announces Platform for Turboprops

Gogo Business Aviation recently unveiled AVANCE L3, a new inflight connectivity system that delivers the benefits of the Gogo AVANCE platform to passengers and flight departments in a small, lightweight form factor, with affordable pricing options. Gogo's platform lets users customize their inflight experience based on their unique needs, and can be installed on business aircraft of all types and sizes, but is an ideal solution turboprops and light jets.

Using AVANCE L3, anyone onboard the aircraft can stay connected to email; send text messages and make voice calls with Gogo Text & Talk (service plan required); access their favorite flight apps such as moving maps, weather and flight information; or watch movies and TV shows using Gogo Vision (service plan required). For customers looking for full internet connectivity, AVANCE L3 can be enabled to connect to the Gogo Biz data network delivering a 3G experience.

Three service offerings will be available to deliver performance and flexibility:

Core – For customers primarily interested in email, voice and light internet browsing capabilities; enables up to five devices. Hourly and monthly service plans available.

Plus – For customers looking for full internet connectivity in addition to email; enables up to seven devices. Monthly service plans available.

Max – Delivers similar capabilities that Plus does, but enables up to 25 devices. Monthly service plans available.

Additional AVANCE L3 features include:

- 802.11ac dual-band (2.4GHz and 5.0GHz) for improved Wi-Fi performance
- Advanced router functionality
- Multi-bearer data and voice management
- Cabin management system (CMS) integration with many CMS systems
- Remote diagnostics and service activations and changes
- 4G/LTE terrestrial modem for free internet on the ground in more than 120 countries

Gogo is accepting orders now for AVANCE L3 with shipping expected to begin later in the first quarter of 2018.

PWI Announces Poster Promotion with LED Retrofit

PWI, the pioneer in airplane interior lighting systems, has announced that they will grant owners an 18 x 24-inch poster of their King Air with the purchase of an LED Retrofit. (Owners will need to provide a high-quality photo for the poster.)

PWI's line of LED cabin lighting retrofits are available for King Air 300, 200, 100, and 90 models. These retrofits are "plug 'n play" style, so they are designed to be simply swapped out for the existing lighting fixtures and power supplies, removing the need to redo the interior or change harnesses. They also feature the up-to-100,000-hour lifespan, run cooler than the fluorescents, and almost never need replacing.

The poster promotion will run through March 31, 2018. For more information on the promotion or PWI's LED lighting, call (316) 942-2811.

King Air Technically...

RECENT SERVICE BULLETINS, ADVISORY DIRECTIVES AND SAFETY COMMUNICATIONS

From Multi-Engine Turboprop Communiqué # ME-TP-007

Date: January 2018

ATA 23 – Cockpit Voice Recorder (CVR) and Flight Data Recorder (FDR) 90-Day Underwater Locator Beacon (ULB)

In 2015, the FAA revised Technical Standard Order (TSO) C121a for ULBs. TSO C121b was released to provide standards for ULBs with a battery capable of lasting for 90 days after activation. At the same time, they implemented a restriction against any new 30-day ULBs being developed and approved under the previous version of the TSO. The longer battery life can provide critical additional time for search crews and accident investigators to find CVRs and FDRs after an accident into a body of water. As of December 1, 2015, all newly certified ULBs must have batteries that meet the 90-day performance standard.

Textron Aviation recently began installing 90-day ULBs in new production CVR and FDR installations on all King Air product lines. Fielded aircraft with L-3 Aviation Recorders CVRs and FDRs can easily upgrade to the 90-day ULBs through the L-3 service bulletin applicable to that model recorder. The bulletins provide information for kits which provide the parts required to install the 90-day ULB in place of the current 30-day ULB. This upgrade can be performed without returning the recorder to the vendor or removing it from the aircraft. The installation adds a MOD DOT to the recorder's identification plate but does not change the part number of the recorder, so no additional aircraft manufacturer approvals are needed. To determine if your aircraft has the 90-DAY ULB, refer to your time life or equipment serialization records. Factory installed 90-day ULBs are listed as L-3 P/N 266-E5542-00. For additional information please contact your nearest authorized service center.

ATA 32 – Nose Landing Gear Strut "Leaking"

There have been reports and questions regarding leaking nose struts on the King Air series aircraft. This oil, that was seen leaking, was not red hydraulic fluid; it was motor oil, brown in color.

All new, overhauled or rebuilt nose struts may have brown oil leaking onto the piston, and possibly the tire for a short time after installation. This does not indicate a leaking strut. This brown oil is coming from the lubrication pad that is saturated in an appropriate lubricating oil per the Component Maintenance Manual (CMM), during overhaul or rebuild. The lubrication pad will only hold a certain amount of oil and will release all excess oil, which can make the strut appear to be leaking. This leakage is to be expected, especially if the pad is over saturated. Some mechanics have lightly squeezed the lubrication pad after saturating it to attempt to remove excess oil. This, however, can remove more oil than intended and it is not recommended.

If a nose strut has this condition, wipe off the excess oil and protect the tire until the leaking stops. If it is determined that red 5606 hydraulic oil is leaking from the strut, investigation is required before further flight.

ATA 33 – Cabin Floor Spar Light Spares Replacement Kit

FL-1 through FL-910; FM-001 through FM-055; FA-001 through FA-231; FF-001 through FF-019

The manufacturer of the spar lights installed in the King Air 300/B300 series announced that they will no longer be supplying the spar lights. Textron Aviation has developed a kit as a spares replacement for these lights. The kit is required because the replacement spar lights require a change in connectors. The kit comes with two LED spar lights and all the instructions to complete the installation. The part number of the kit is 130-3068-0001.

ATA 79 – King Air C90A; C90GT & F90 Drain Oil Hose Spares Replacement Kit

LJ-1063 through LJ-2096; LA-2 through LA-236

The King Air C90A, C90GT and F90 have a requirement to replace oil drain hose part number 109-389009-1 every five years. This hose is very expensive. Textron Aviation has developed a new hose which is less expensive. The new hose can be installed via kit P/N 90-9096-0001. The kit is required because there is a slight variation to the installation and routing of the new hose. The kit provides the parts and information for both engines.

The above information may be abbreviated for space purposes. For the entire communication, go to www.txtavsupport.com.

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