King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

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Grounded

Staying Sharp During a Global Pandemic

King Air

June 2020 Volume 14 / Number 6

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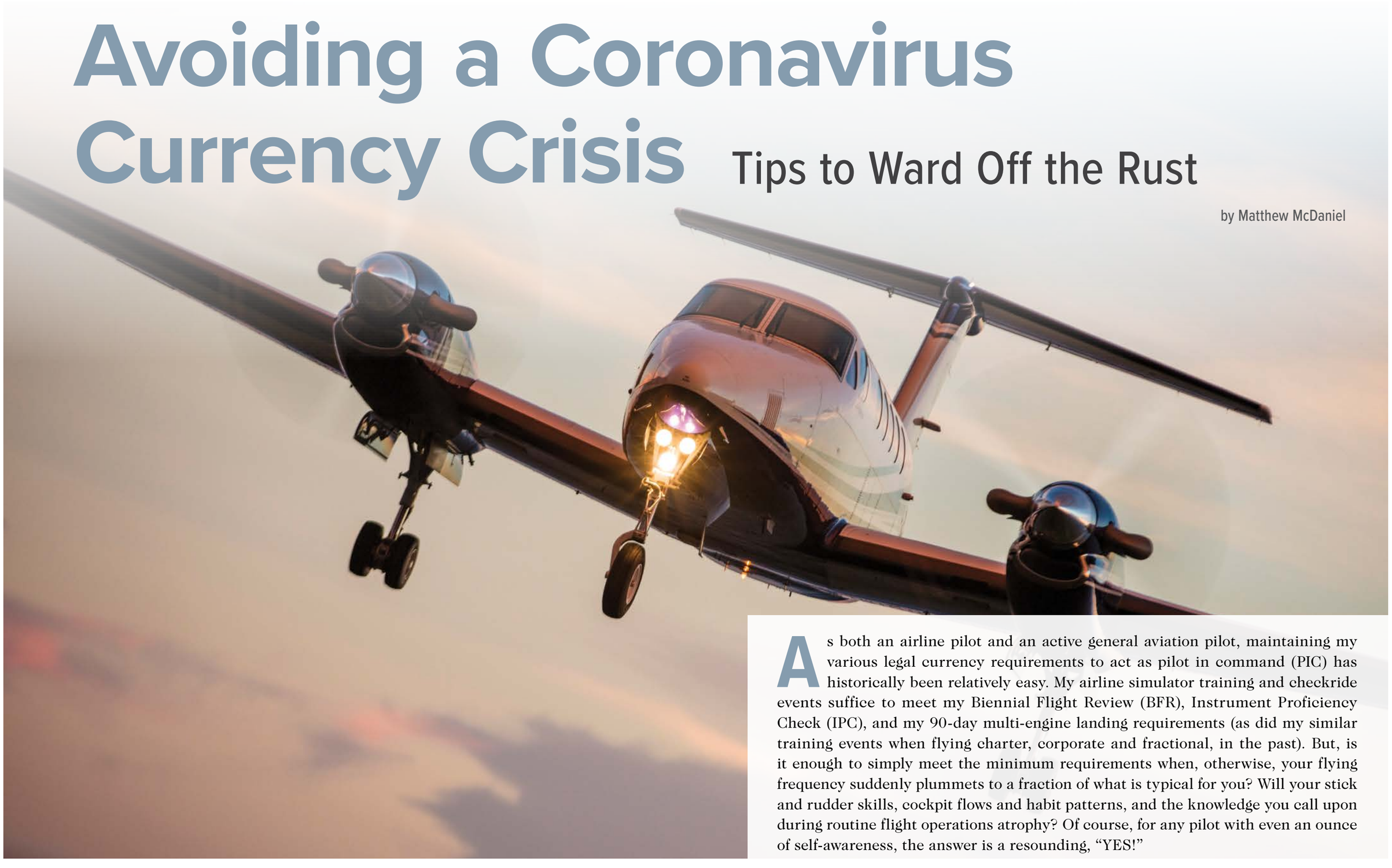
Avoiding a Coronavirus Currency Crisis

Tips to Ward Off the Rust

by Matthew McDaniel



As both an airline pilot and an active general aviation pilot, maintaining my various legal currency requirements to act as pilot in command (PIC) has historically been relatively easy. My airline simulator training and checkride events suffice to meet my Biennial Flight Review (BFR), Instrument Proficiency Check (IPC), and my 90-day multi-engine landing requirements (as did my similar training events when flying charter, corporate and fractional, in the past). But, is it enough to simply meet the minimum requirements when, otherwise, your flying frequency suddenly plummets to a fraction of what is typical for you? Will your stick and rudder skills, cockpit flows and habit patterns, and the knowledge you call upon during routine flight operations atrophy? Of course, for any pilot with even an ounce of self-awareness, the answer is a resounding, “YES!”

Rather than relying on old habit patterns, fly into and out of runways you've never visited before or are shorter than you're used to using regularly.

Steep declines in monthly or annual flight hours are directly proportional to declines in pilot performance, aeronautical knowledge and decision-making skills. These same declines become increasingly difficult to overcome the longer minimum activity levels continue, bringing increasing challenges when it's time to return to flying status. The world continues to grapple with the COVID-19 crisis and experience the most extreme reduction in civilian flying activities ever outside of wartime. Yet, there are still ways to practice and keep pilot rust from developing, whether you are still mostly grounded by the effects of the pandemic or you are returning to regular flying duties after a long absence.

Airports are Open for Business

Flight activities for business, pleasure, passenger airline, charter, etc. have recently been at all-time lows (and remain well below average still). Yet, nearly all public-use airports in the U.S. have remained open for business throughout the pandemic. Most have been labeled as "essential" for their associated communities and exempt from shutdown orders. At many airports that are federal, state, county or city owned, even the various businesses on the airport (FBOs,

maintenance shops, self-serve fuel pumps, etc.) fall under the "essential" designation and have remained open to support said airport's operations. The point being, just because people are flying less does not mean that the country's aviation infrastructure has been scuttled. The opposite is true and is one less obstacle to remaining current and proficient in these otherwise low demand flying times.

Returning to Form

The most obvious advice for keeping your skills sharp is to just practice, and opportunities to do so have likely been at a premium lately. Time has likely not been hard to find. Your chosen aircraft has probably been available too. Air traffic will definitely continue to be a fraction of what was common for your area for some time to come. If you typically fly single pilot anyway, a solo training mission is about as socially distanced as you can get. If you fly exclusively with a Second in Command (SIC), maybe you're being exposed to at least one such person regularly anyway and could conduct training/practice flight operations with that same person, as well. Or, if your operation is reopening, you're likely to be working with your crew members and/or department personnel again soon, regardless. Appropriate distancing measures can be easily observed outside the cockpit and, as necessary, masks, gloves, and sanitation should be utilized on the flight deck.

If you own your own King Air, you only have to answer to yourself for operational expenses (fuel, etc.). If you're an employed pilot in a charter, corporate or fractional operation, practice flights require more coordination. Fortunately, such coordination can typically be done remotely and any flight department of good repute should already be endeavoring to ensure its pilots are given opportunities to remain or regain not only currency, but proficiency, in their assigned aircraft type. So, as finances and bosses allow, go fly as frequently as possible. But, take care to make your flight activities meaningful. Plan your flight as you might plan a flight lesson. Will you focus on VFR patterns and landings? That is, after all, a commonly weak area for turbine pilots who file IFR most the time and rarely fly a purely visual traffic pattern.

Empty airports certainly help to make such practice safer and more efficient than it might be in more normal times. Low air traffic also can make an afternoon of instrument approach practice far more fuel and time efficient. Pre-plan a route that takes you through one approach, into a missed approach, and neatly transitions into the next approach (be it at the same airport or at a different nearby airport). Work with Air Traffic Control (ATC) for a variety of approach setups (radar vectors, full procedures, DME arcs, en route transitions, etc.). Encourage ATC to assign you various missed approaches, as well (published procedures, alternate procedures, holds as published or ATC modified, or rapid vectors ›

Lofty Literature

Are you experiencing less or no flying and far more sitting around these days? Certainly, one upside of pandemic requirements for a slower paced existence is more time to catch up on your aviation reading (as much for pleasure as for study). If you cannot fly enough to fill your aviation needs or are experiencing more FBO downtime than ever, try living vicariously through some of the most interesting pilots in history.

I've been collecting and reading pilot biographies and autobiographies for years. To list them all would be impractical here. However, below are five of my favorites. I'll skip the typical old favorites like Bob Hoover's "Forever Flying," Chuck Yeager's "Yeager" and the quintessential aviation masterpiece, Earnest Gann's "Fate is the Hunter." All are great, but also already very well-known. Most of the following, on the other hand, are far less famous or even out of print. You'll probably not find them in a mainstream bookstore. But, thanks to online resources and used book sellers, nearly anything is obtainable these days via just a few mouse clicks.

5. **"Jimmy Stewart; Bomber Pilot" by Starr Smith.** Many know the Hollywood version of Jimmy Stewart; some probably even know that he was also a pilot. But, few understand just how serious he took his role as military bomber pilot or the details of how his military career took him from an enlisted private in the Army Air Corp to a general in the U.S. Air Force, across the span of more than three decades.

4. **"Calculated Risk; The Extraordinary Life of Jimmy Doolittle – Aviation Pioneer and World War II Hero" by Jonna Doolittle Hoppes.** Many bios of Doolittle exist, but none intertwine his incredible accomplishments with the personal touch and the family side better than this one. Written by his own granddaughter, this look at Doolittle's life and exploits is better than most because it sheds light on his private life and what drove him to become both an aviation and an American hero.

3. **"Magnificent Failure; Free Fall from the Edge of Space" by Craig Ryan.** Nick Piantanida was not a traditional pilot, but an aerial adventurer, as both a record-setting balloonist and skydiver. His story is incredible in its pure audacity. As an underfunded civilian, with zero cooperation from the U.S. government, he actually managed to best the U.S. Air Force record for highest altitude ever achieve in a manned balloon. In the midst of the Cold War, his attempts to set a new free fall parachute altitude record would fade into history almost unnoticed. Learn why his records were deemed unofficial and why you've never heard of him. If you were drawn to the similar missions in recent years by Felix Baumgartner and current record holder, Alan Eustace, this story will hold your attention from bold beginning to tragic end.

2. **"Glacier Pilot" by Beth Day.** First published in 1957 and out of print since the mid-1960s, this is a true gem of an aviation biography. Bob Reeve was the founder of Reeve Aleutian Airways and essentially invented glacier flying. This story of Mr. Reeve and the other Alaskan aviation pioneers is captivating in its writing style, its completeness, and most of all in the harrowing tales it contains.

1. **"The Wright Brothers" by David McCullough.** This is the newest book on my list (released in 2016) and became an instant favorite when I read it. Some might wonder what could possibly be left to say about the Wright Brothers. I can assure you if there had been little more to add to their story, it would not have attracted the attention of Mr. McCullough (who is probably the most gifted combination of writer, biographer, historian and storyteller of the last half-century). It's not often that two-time winners of the Pulitzer Prize dive into aviation writing, but McCullough did so with this book and made it a #1 New York Times Best Seller. I've read many biographies on the Wright Brothers, but none use such unfettered access to the Wright family archives to create such an eloquent, yet totally readable, weaving of personalities, technical details, history and perspective. Hands down, I think this is the best biography on the Wrights available today. KA

Use the extra downtime to refresh on aircraft systems and the use of new and modern flight planning tools. (Photo credit: Garmin)

right into a subsequent approach such as you might experience in high traffic airspace during peak operating times).

Make it a point to utilize airports you are less familiar with. This will not only make your practice or retraining more interesting, it will also prevent you from falling back on previous knowledge of that geographic area, forcing you to think on your feet, rather than relying on old habit patterns. Fly into runways you've never visited before, fly Instrument Approach Procedures (IAPs) you've never had an opportunity to fly (or brief) before. Thus, flex the aeronautical knowledge muscle in a way that "routine" operations would be far less likely to demand of you. Do you or your company operate two or more King Air types? If so, try to fly as many airframes and sub-types as possible. Again, this keeps you on your toes, but it also requires you to stay fresh with the nuances of each individual aircraft's avionics, systems, operating limits and checklist memory items.

If you are still flying some, just much less than you were before the slowdown, or you have recently resumed flight operations, try to make those flights more than just routine. Try to extract the most learning opportunities you can

from them. Request specific departures, arrivals and approaches that will help you regain or maintain your recency of experience in those procedures. Maybe request an alternate runway to keep your crosswind skills up to speed or to fine tune your smaller runway skills (especially if you spend most of your time operating to/from long and wide runways and wish to be prepared for that oddball flight to Smallville when such duty arises).

Make the Most of Ground Time

Such times as these can be ideal for refreshing on aircraft systems, emergency procedures, aircraft performance calculations, and the use of new and modern flight planning tools. Whether it be dusting off old training manuals or loading new applications or software into your shiny new tablet computer, now is a great time to be reviewing and learning. Chances are one (or more) of the King Airs you fly is available to visit for some socially distanced time spent plugged into ground power and practicing some lesser used functions of the avionics. Or, digging into the specifics of systems for a deeper understanding of how they operate in normal, abnormal and emergency conditions. One of the best ways to do this is at the airplane, training manual or POH in hand, where you can see and touch the systems in question (and the associated controls) as you bone up on each. Doing so can refresh long dormant knowledge, making your transition back to normal levels of flight operations a less stressful process.

The recent advances in Electronic Flight Bags (EFBs) and tablet apps is nothing short of mind boggling in both scope and capabilities. But, most of us learned our current EFB and apps on the fly. As a result, we often use no more that 10%-20% of these devices' capabilities. Sure, you occasionally stumble upon a feature by accident and, thereafter, incorporate it into routine use. Nonetheless, really learning what you might be missing within your device is best done while sitting down with it and the operating manual and some alone time to explore its features (both common and obscure). Think of it as binge-watching your EFB for an afternoon and postponing doing the same with your favorite streaming service's hit series for a few more days!

Conclusion

If you are anything like me, too much time away from flying makes you feel anxious to return to the air. It's not just scratching that flying itch though. It is knowing that the more time I am absent from it, the more rusty I will be upon my return. The longer the time grounded, the more difficult the process of coming back up to speed will be. Conversely, staying in a good flying routine not only keeps me sharp, but makes the flying more fun and less stressful too. In times such as these, flight hours are harder to come by and reasons to fly can be outnumbered by reasons not to.

Nonetheless, by the time you read this, much of the country will be well into their "re-opening" phases and many pilots will be getting back to work after long absences or slowdowns. Re-engaging needs to be purposeful, with emphasis on taking a measured and professional approach. Much like the laws of science don't care what your opinions are, the link between recency of experience and proficiency doesn't make exceptions for pandemics. So, here's to your good health ... may you fly often, fly safe and stay virus-free. KA

Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI, & IGI and Platinum CSIP. In 30 years of flying, he has logged over 19,000 hours total, over 5,500 hours of instruction-given, and over 2,500 hours in various King Airs and the BE-1900D. As owner of Progressive Aviation Services, LLC (*www.progaviation.com*), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, he is also an Airbus A-320-series captain for an international airline, holds 8 turbine aircraft type ratings, and has flown nearly 90 aircraft types. Matt is one of less than 15 instructors in the world to have earned the Master CFI designation for 9 consecutive two-year terms. He can be reached at: *matt@progaviation.com* or (414) 339-4990.

“Unable”

by Deanna Wallace

Air traffic controllers are a mystery to some. Through time and experience, most pilots become comfortable talking to air traffic control (ATC) and operating fully within the national airspace system. They adeptly navigate through normal and special use airspace, arrival and departure procedures and instrument approaches into airports. As pilots, we take pride in being able to communicate professionally, effectively and efficiently. This includes being attentive to radio calls, filtering the information down to what needs read back, making those readbacks timely, and carrying out the given instructions as prescribed. There is no small amount of satisfaction that comes with a callback well done. But what happens when you receive an instruction that causes you to pause and wonder if you can, or should, comply?

As students, we are groomed to believe controller instructions are as good as law and the final say in what we are allowed to do when within a controlled environment. The law of primacy tells us that which is learned first tends to stick in your mind better so, because your very first instructor instilled the fear of the ATC gods and compliance in you early on, many of us never learn to *appropriately* question or act contrary to an ATC instruction. Let us take a look at the regulation governing ATC clearance compliance, FAR 91.123, and see how we, as pilots, are really required to act.

91.123(a) clearly tells us once a clearance has been issued, we cannot deviate from it unless:

1. We have prior permission through an amended clearance;
2. We have an emergency that requires a deviation from the original clearance for safety of flight;
3. We are operating in response to a resolution advisory from an installed traffic alert and collision avoidance system … (Note: this is ***not*** referring to all traffic awareness systems, such as

is installed in many general aviation aircraft, but rather to those systems that provide generated traffic resolutions with specific instructions on traffic avoidance);

4. If operating under an IFR flight plan in VFR conditions, the pilot may cancel the IFR flight plan and proceed under visual flight rules, as long as they are not in Class A airspace (above 18,000 MSL); and
5. Perhaps one of the most underused clauses, "when a pilot is uncertain of an ATC clearance, that pilot shall immediately request clarification from ATC." Gentlemen and ladies, please, if you don't understand what is expected of you, think you may have misunderstood an instruction (did they say turn right or left to that heading?), or simply didn't hear (and/or write) the entirety of the clearance down as it was read to you, ATC would much rather you take up a few more seconds of air time on frequency to get it right than not do as instructed because of a misunderstanding or lack of clarification and create a collision hazard.

The way all that reads, our primary instructors were correct in telling us that ATC instructions (within controlled environments, such as Class A, B, C and D airspace) must be complied with, and it is likely

"... any pilot who has operated within the airspace system for any length of time knows controllers, though quite good at what they do, aren't infallible and don't always have insight into the specific needs of our mission and our aircraft."

they also stated you could deviate in the event of an emergency (if you're willing to risk the paperwork, if asked). But any pilot who has operated within the airspace system for any length of time knows controllers, though quite good at what they do, aren't infallible and don't always have insight into the specific needs of our mission and our aircraft. So why don't we hear pilots ask for clarification or use the phrase "unable" more often? Not asking for clarification can be attributed to several factors, including not wanting to be a nuisance by asking a busy controller to repeat or having to admit you may not understand the directions as stated. As far as not saying "unable" to a clearance a pilot feels is outside the scope of their personal or aircraft limitations,

the cause can vary from our inherent nature to not question "authority," as ATC is made out to be from an early stage in our training, to not wanting to admit we or our aircraft may not be capable of something. This is not a trap that only low-time pilots fall into; you are just as likely to see professional pilots in high performance aircraft with the same thought process.

For example, on an IFR flight plan, I have come to expect and know particular descent clearances on routes I fly regularly. Having flown some routes many times, I also know to ask for my descent when the descent clearance isn't given within a certain timeframe past the usual point because I will otherwise have a difficult time getting the aircraft down by assigned crossing points and altitudes. The first time I flew a familiar route in a turbine aircraft at a much higher altitude, I neglected to ask for this clearance when it wasn't given to me because I thought I might be assigned something different. It turns out the controller simply got busy, neglected to issue the clearance at the appropriate time, but still expected me to make the same crossing clearance and altitude that I had come to expect.

The beauty of turbine engines is you don't have to worry about shock cooling them like some pistons and you can somewhat "chop it and drop it" to make a wide range of descent profiles, as long as your pressurization system can keep the cabin comfortable for your passengers. I quickly did the math and determined there was no way I was going to make this descent profile happen and informed the controller I was unable to comply with the crossing restriction but would do the best I could. Did it mess up his arrival flow? Possibly. Was there anything that could have been done about it? Short of a full-blown emergency descent procedure, doubtful. I gave him a solid 2,000-plus fpm descent and still did not make my crossing altitude but, as PIC, I was not willing to ask the aircraft for more, adding unnecessary discomfort to my passengers and putting an undue strain on the pressurization system to keep up. While, as pilots, we try to be as accommodating as possible within the limitations of our aircraft, it is not up to us to be wholly responsible for correcting a lack of planning on a controller's part … just as it is not up to them to correct for our lack of planning in the manner we would prefer.

While there are many more opportunities for mistakes or miscommunication within the IFR environment, VFR pilots are not immune and should certainly remain vigilant for communication or misdirection errors. Accident and incident reports show pilots can and will blindly follow a controller's instructions into the side of a mountain, onto a runway another airplane has been cleared to land or take off from, or off in the opposite direction of their destination leaving controlled airspace. Controllers are human after all, and they, in turn, rely upon a pilot's experience and knowledge to question when something isn't correct or to tell them when the pilot or aircraft is incapable of performing a clearance. Trust me, they would much rather give you an alternative than to have accident reports to file later.

As a last note, don't let fear of reprisal or the dreaded "submit a detailed report … if requested" directive mentioned in section (d) of the same part keep you from deviating if necessary for an emergency or questioning a given instruction. Your responsibility as pilot in command is to make the best decision regarding the safety of your flight and passengers over accommodating an ATC clearance. In some rare circumstances you may have to explain your actions in more detail, but most of the time, both pilot and controller adapt, move on, and keep our airspace operating safely and efficiently without any undue hardship to either. KA

Deanna Wallace has amassed over 6,000 flight hours since she started flying in 1997 and is a 20-year Gold Seal CFI/CFII/MEI with more than 2,000 hours dual given. She holds a Bachelor of Aviation Management from Auburn University and a Master of Aeronautical Science from Embry Riddle Aeronautical University. Deanna is single pilot typed in the King Air 300/350 and flies all King Air variants regularly, including the B100 with TPE-331 engines. Through her East Texas employer, Casey Aviation, she flies Part 91 managed King Airs, ferries aircraft worldwide and actively instructs owner-pilots in the PA46 piston and turbine series aircraft.

What to Expect with Inspections

by Dean Benedict, A&P

In the last few months, I've had several inquiries from King Air owners regarding high-cost maintenance invoices. Most of these guys are new to King Air ownership and their pilots (if they have one) are newbies too. Some sent me their shop invoices for review and I regret to say that I found examples of overcharging. It was clear to me that the shops involved took advantage of these inexperienced owners.

Please, if you are a high-time King Air pilot or a savvy King Air owner, go ahead and turn the page. I don't want to bore you old timers with the basics. And if you're a King Air mechanic or shop owner, *bear with me*. I don't like to criticize aircraft maintenance shops. It's a tough business – a life-or-death business, in fact – and the hurdles are many. The list of challenges faced every day by an aircraft maintenance shop would fill this magazine to the brim. But at this moment, I'm advocating for the owner and/or pilot that is new to the world of King Airs.

Are you Part 91?

A King Air owner going through Phase Inspections for the first time since purchasing his King Air got an estimate from the shop, but when the final bill came, it was double the estimated amount. He was stunned. He compared the quote with the invoice and noted many differences. Was the shop stretching things to their advantage? Or was this normal King Air maintenance? He gave me a call.

The first thing that grabbed my attention were the overhauls on the overspeed governors. This invoice item included outside services, shop labor for R+R (repair and return), plus shipping. *All of it (about $3,700) was totally unnecessary.* King Airs have Woodward prop overspeed governors. Their overhaul schedule is laid out in Woodward Service Bulletin 33580-M. The overspeed governors have a 6,500-hour TBO (Time Before Overhaul) with continuous use. If use is not continuous, the TBO is six years. The criteria for continuous use is 10 hours per month minimum (or 120 hours per year).

But remember, it's a Service Bulletin (SB). *Part 91 operators need only comply with Airworthiness Directives (ADs) and inspections.* Even if a Service Bulletin is labeled "Mandatory," it is not required for Part 91 operators. Any shop insisting that you, a Part 91 operator, must comply with a Service Bulletin either has a greedy eye on your wallet or they're ignorant. Either way, you don't want them working on your King Air.

I saw in the records that this King Air had its prop and overspeed governors overhauled in 2013. The only way these overspeed governors would need to be overhauled again in 2019 would be if the aircraft was Part 135 and not in continuous service at some point since 2013. At the time of purchase, the prop and overspeed governors were within TBO limits; and the new owner, going forward, didn't have to worry about the application of the Woodward SB because he was Part 91.

The Conference Call

A conference call was scheduled between me and the shop. The overspeed governors and the Woodward SB came up immediately. The shop said there was a year of inactivity after the 2013 overhauls, so they had to apply the six-year calendar limit and send them for overhaul. And I said, "He's Part 91. The Service Bulletin doesn't apply."

They fumbled a bit, then said, "Well, we put safety first, so we maintain Part 91 aircraft to the higher standard of Part 135." (I'm staring right at the Woodward SB and thinking, "Hmmm, if they were truly applying 135 standards to this aircraft, then why didn't they do the prop governors as well? They're both subject to the six-year TBO if usage is not continuous…"). This was a crock of excrement.

Consider this: If a shop is going to charge the customer extra to maintain their aircraft at Part 135 standards, shouldn't that be disclosed to the customer beforehand? The whole thing was hinky. The shop wouldn't back down. Their last salvo was classic deflection – blame the customer: "We put the overspeed governor overhauls on his estimate and he approved it."

That's when I decided to write this article. Are you Part 91? If so, then you don't need to worry about prop or overspeed governor overhauls. You need not comply with Service Bulletins, even mandatory ones. If a shop tells you otherwise, walk away. Find another shop. They're out there.

Get an Estimate

Let's say you have Phase Inspections coming due. You need an estimate. If you have a maintenance tracking spreadsheet you can email it to the shop you are considering. You can do this with several shops to compare quotes. These quotes show you the estimated cost for the required inspections and the usual costs for compliance They won't include the remedy of squawks found on inspection.

The aforementioned owner got an estimate, but it was a mishmash. It had squawks on it that were already remedied. For example, on the estimate they put 1.5 hours to drill and extract stripped or frozen hardware from landing gear panels. This is something you don't find until you do the inspection.

The estimate also said the battery failed the capacity test and been replaced. Another suspicious one, as the battery was barely a year old. It's highly unlikely it would fail the cap check. I suspect the shop forgot to top charge the battery beforehand, thus wasting $3,500 of the customer's money. How clever of them to put in a new battery, then put it on the estimate and get owner approval after the fact.

A word about logbooks: Whenever a King Air came to my shop for the first time, I insisted they bring the logbooks, and I pounced on them as soon as they rolled onto my ramp. I don't care how many CAMP reports and spreadsheets they sent in advance. I had to see those logbooks with my own eyes, then I made my own maintenance status sheet to show what was due now, what had been overlooked (if anything), and what was coming due in the future.

However, if you just had a pre-buy inspection with a Phase 1-4 a year ago, then the task of assessing the maintenance status of your King Air is much easier. It won't take long to put together an estimate for a Phase 1 & 2 plus special inspections. I'm not saying a shop shouldn't look at the logbooks, I'm saying the job of putting an estimate together should go relatively fast. Don't forget your own list of squawks. Customer squawks can be included on the estimate if you submit them. Just remember that some things are impossible to estimate before a mechanic gets in there to troubleshoot and evaluate the situation.

As a new owner, I'll assume you're not conversant with King Air maintenance requirements, so I recommend you consult someone who is. Bottom line: *You need to understand what you are looking at* – your bottom line depends on it.

Squawk Approval Required

At this point your King Air is in the shop, the panels are opened up and the inspections are underway. Anything that deviates from normal, whether large or small, is written up as a squawk. How these squawks are remedied can go one of two ways. The less common approach is where all inspections are done first, with no fixing of squawks along the way. The list of squawks is submitted for your approval first. This is how a pre-buy inspection unfolds. Nothing is fixed until all inspections are completed and the squawks are approved. The squawks are divided into two categories: Airworthy (for the seller) and Optional (for the buyer at their discretion).

The more common approach (and not a pre-buy) is where routine squawks are fixed as they go along. The mechanic inspects, observes a discrepancy and writes it up, fixes the routine ones, and keeps working down the inspection checklist. It's a more efficient use of time. A good shop keeps the parts that are consumed at Phase Inspections in stock.

Communication is Vital

Some squawks are a big deal; they're labor-intensive and/or the parts are expensive. They require troubleshooting and maybe research. It's probably airworthy, and the shop knows it must be addressed, but *these squawks must be run by the owner, or whoever is designated for squawk approval.* Decisions need to be made, and you, the owner (or your agent) must be consulted.

Should you get an exchange part or buy outright new? Should you stick with the OEM (Original Equipment Manufacturer) or go with PMA (Parts Manufacturer Approval)? Can it be deferred, and if so, should you? How much time will it take? Is this an opportunity to upgrade, and if so, should you? Last but not least: How much more is this going to cost?

Get Good Advice

This is where inexperienced King Air owners can benefit from an expert that goes to bat for you. It all can be done by phone and email, it doesn't take a huge amount of time, and it will make the most of your maintenance dollars in the end. The above-mentioned owner got hit from every direction. Besides the overspeed governors and the battery ($7,200 and counting), he needed the end play inspection and lube on all three actuators. This comes due every 30 months on King Airs with mechanical gear. It's a very common task. The shop estimated 20.4 hours of labor but spent 40 hours – double the amount – and never alerted the owner that they hit a snag.

Worse yet, they put rigging the gear into a different squawk and spent another 38.8 hours on it. *Rigging the gear is part of the actuator end play and lube task!* Once the actuators are reinstalled, rigging is a couple of minor adjustment on the switches. Easy-peasy (but apparently not for this shop!). In the end, they spent 60 hours total on the actuators and rigging the gear. It should have been no more than 24 hours. What took so long? Why was the owner not informed?

Review the Invoice

No aircraft owner should ever get a final invoice that is double the estimate and have no idea it was coming. As squawks come up, the shop gets squawk approvals from you or your agent. Everyone keeps a running tally, if only in their head. Ballpark estimates of the bottom line are usually discussed at every turn.

The final invoice may be more than you wanted it to be, but it shouldn't be a total shock. Shipping charges, core charges, miscellaneous parts and consumables always drive the final amount higher than you thought. Nevertheless, all the big items should have been discussed before completion of the job.

When you get that final invoice, pair it with the estimate to see where they align or diverge. You should have emails, text messages or phone notes to explain the increases and overages. There are always squawks found on inspection that are impossible to predict in advance. That's just the nature of the beast. Make sure to examine parts prices, shipping costs, consumables and miscellaneous charges. By all means, don't let core charges fall through the cracks. Make a firm note to look for core charge refunds and stay in touch with the shop on this issue.

Feel free to ask questions. You need the education. Just try not to be the annoying customer that fights tooth and nail on every single line item. If you have a good shop it's important not to alienate them.

Invoice Analysis

When I examine an invoice, I am looking for things that shouldn't be there. The usual suspects are excess labor charges, parts prices out of whack, and double-dipping (charging for the same task more than once). On the aforementioned invoice, I immediately saw the overspeed governor overhauls – they shouldn't have been there. Although the shop's estimate didn't mention the Woodward Service Bulletin, I was very familiar with it and knew it didn't apply in this circumstance.

Unfortunately, there's more: I found the shop's R+R labor on the fuel nozzles excessive. I found

double-dipping on the lubrication of the shimmy dampener bolt and on the propeller inspections. The wildly excessive charge to rig the landing gear was also double-dipping since that's part of the actuator end play task, which as I noted previously, was an excessive charge in itself.

There were other issues on that invoice (so many I am sick of talking about it), but one that really galled me was 15 hours to research the logbooks and make an Excel spread sheet to track maintenance. Did they mention this to the owner in advance? It was not on their estimate. Remember, when the owner bought this King Air a year ago, he had a pre-buy inspection done during which he paid for logbook research and an updated spreadsheet for maintenance status. I assume he provided this to the shop.

Fifteen hours is egregious in my book. I conduct pre-buys all the time. I estimate 5-10 hours for logbook research and *rarely* charge more than that. Only an extreme case like a really old aircraft, or logbooks in total disarray, or records not translated from a foreign language would merit charging more than 10 hours. Granted, the shop only charged $90/hour for the research instead of their $120/hour shop rate, but still that was another $1,350. It all adds up.

In Conclusion

This was not the first time I was asked to review an invoice and then duke it out over the phone with the shop. It's not my favorite thing to do, because I'm not confrontational, but I like to see justice done (cliché but true). I hesitated to write this article because the suggestion to seek expert advice looks like I'm shamelessly promoting myself. My wife and others will tell you I am the last person to toot my own horn.

The point is this: Aircraft maintenance is expensive and complicated, but it's a vital part of owning and operating a King Air. I love King Airs – they're reliable, versatile and one of the greatest success stories in general aviation.

I hope every King Air owner "finds their King Air groove" and understands what a great aircraft they have. KA

Dean Benedict is a certified A&P, AI with 45 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

Aviation Organizations Group Together to Support Industry

by Kim Blonigen

Petition FCC to Reconsider 5G Network Approval

A number of aviation industry groups filed a petition May 22, 2020, requesting the Federal Communications Commission (FCC) reconsider its April 20, 2020, approval of Ligado Networks' (formerly LightSquared) nationwide 5G cellular service. It includes the company's failure to sufficiently demonstrate its ability to act as a "good neighbor" and not interfere with other frequencies. The proposed high-speed broadband cellular network would be operating near frequency bands currently used by GPS and satellite communications networks.

The petition specifically noted the FCC's acceptance of the Federal Aviation Administration's (FAA) testing of the network's effects on GPS signals despite the FAA's own admission of flaws with its testing protocols. " … the agency itself stated [the testing] was limited and incomplete for common operation scenarios near the ground" and "over dense urban areas, where interference would jeopardize life and property …"

Steve Brown, chief operating officer of the National Business Aviation Association (NBAA), one of the organizations which signed the petition, stated, "Given our national airspace system's extensive use of GPS, including ADS-B-enabled air traffic control services and GPS-supported terrain warning systems, any question of even the slightest risk of interference should have been enough to pause this approval process," he said. "We believe the FCC should promptly reconsider its order and the methods by which it was granted."

Other organizations signing the petition include the Aerospace Industries Association (AIA); Aircraft Owners and Pilots Association (AOPA); Airlines 4 America (A4A); Aviation Spectrum Resources, Inc. (ASRI); Cargo Airline Association (CAA); General Aviation Manufacturers Association (GAMA); Helicopter Association International (HAI); International Air Transport Association (IATA) and National Air Transportation Association (NATA).

Garmin International, Inc. later announced that it had joined the aviation industry coalition in urging the FCC to "reconsider its Report and Order to repurpose C-band frequency spectrum nearby to the frequency band that is used by safety-critical FAA-certified radio altimeters, including Garmin's GRA 5500 and GRA 55." Stating that "radio altimeters are essential to safe airplane and helicopter operations, allowing pilots to safely land and avoid terrain, particularly during poor weather conditions and low visibility. The industry coalition is working to ensure radio altimeters are appropriately protected from prospective flexible-use applications, including 5G operations." And specifying that the industry coalition doesn't seek to block the repurposing of the C-Band spectrum, but a path that will make it available for purposes while ensuring the full protection of radio altimeters.

Response to CBP Fee Increases at User Fee Airports

The AOPA, American Association of Airport Executives (AAAE), NATA and the NBAA responded to the Customs and Border Protection's (CBP) recent notification of significant fee increases (from 29% to 54%) at several U.S. airports, effective almost immediately, asking for the CBP to consider alternatives in addressing possible budget shortfalls.

The industry groups also sent letters to leaders of the subcommittees of the House and Senate Appropriations Committees on Homeland Security urging Congress to include a provision in the fiscal year 2021 Department of Homeland Security appropriations act or the next COVID-19 supplemental funding bill that would permit CBP to augment the user fee airport fund with appropriations for customs expenses as necessary to maintain operations and prevent adverse impacts on airports.

The CBP's User Fee program funds inspection services at approximately 60 airports, most supporting a significant number of general aviation operations.

The Big Difference in Manual Extension of the Electromechanical Landing Gear on the 90-Series versus the F90-, 100- and 200-series

by Tom Clements

Yes, that is a long title. If you fly a King Air with the electrohydraulic landing gear system, this article is not for you. But if you are flying a C90-1 or earlier member of the 90-series, an E90, most F90s, any member of the 100-series (straight 100, A100 or B100) or a 200 built before the 1985 model year, then there is worthwhile information in this article for you.

The main landing gear got heavier when dual main wheels, tires and brakes appeared with the introduction of the model 100 in 1969, replacing the single wheel, tire and brake used on the 90-series. This system, designed to carry heavier loads, originated in the Beechcraft Model 99 "Airliner" that went into production a year earlier, in 1968. With minor changes, the 99's landing gear system was incorporated into the King Air 100. This is the system that then became standard in all versions of the 100-series, all members of the F90 family (except for the last 11 serial numbers, LA-226 through LA-236), and slightly more than the first 1,100 200s and B200s, up until 1985.

This larger, heavier main gear system required a bigger electric motor to allow for retraction and extension in similar times as had been the norm in the 90-series. The larger motor, in turn, required heavier wiring and the 50-amp circuit breaker on the aft end of the pedestal was replaced with a 150-amp current limiter under the floor.

Operationally, however, the pilot found the systems on the single-tire and double-tire gear systems identical, except for small changes in gear limit speeds. Gear down and up indications, the landing gear warning horn's functionality, even the emergency extension procedures all remained the same … or so it seemed to the pilot.

But, under the floor, there is a big difference when it comes to manual extension. The "Emergency Engage" red-painted C-ring between the pilot's seat and the pedestal is the same on all of these models. After (1) slowing down to the proper speed per the checklist procedure, (2) pulling the landing gear relay circuit breaker (on the instrument subpanel, right beside the landing gear handle), the third step is to pull up the C-ring as far as it will travel – about 2 inches – and twist it clockwise as far as it will go – about 60 degrees – to lock it in the "up" position.

The most significant result of pulling the C-ring up is that the chain that the ratchet handle drives has now been engaged into the landing gear transmission, or gearbox. **Realize that the only malfunction that can be cured by using landing gear manual extension is failure of the motor.** The pilot's muscle power can be substituted for the motor's power. That's it; nothing else. Jammed jackscrew? You're out of luck. Broken main gear drive torque tube? Out of luck. Nose gear chain jammed on a sprocket? Out of luck.

The landing gear system's reliability is not a King Air weakness. Rarely does the crew need to use the manual extension procedure. When they do, the outcome is almost always successful … but not always.

Manual Gear Extender

Suppose that the motor itself jams, becomes unable to turn. There is a second event that takes place when the C-ring is pulled, in addition to engaging the ratchet handle into the transmission. This event, however, is totally different in the single-main-tire versus the dual-main-tire airplanes.

In the LJ- and LW-series – 90, A90, B90, C90 and E90 – the motor gets disconnected from the transmission. How cool is that?! So, in the unlikely event that the reason for manual gear extension was that the motor's armature could not turn – bad bearing, binding on its housing – no problem! Once the C-ring has been pulled, say "bye-bye" to the motor. It is physically removed from the gearbox, the transmission. Hence, the manual ratchet can rotate the transmission and drive the left and right main actuator torque tubes and the nose gear chain just fine.

But that's not so in the F90-, 100- and early 200-series. In those airplanes, a motor's armature that cannot rotate means that manual landing gear extension is impossible. I certainly was not on the 99's landing gear design team and therefore am not privy to the exact reasons why the change was made. With the bigger motor, however, pulling of the C-ring does not disengage the motor from the transmission. Engage the manual ratchet drive? Of course. Disengage the motor? No.

Here's a little "war story" I heard a long time ago involving an early model 200 based in Anchorage, Alaska. Departing without passengers on a positioning flight, the gear failed to completely retract. Realizing the situation, the crew decided to remain in the Anchorage area to pump the gear down manually and return to home base. Uh-oh! The ratchet handle wouldn't move!

Both pilots were also A&P mechanics, they had a good supply of tools on board, and had over four hours of fuel in the tanks. Relaying through their dispatch operation they talked to the Beechcraft factory customer service department and found that the only solution would be to disconnect the motor from the transmission. No sweat! They had the qualified manpower, plenty of time and the proper tools … so they thought.

As one pilot continued to fly in a wide pattern around the airport, the other fellow got out of his seat, rolled back the carpet, removed the appropriate floor access panel, found the motor and proceeded to start undoing the four bolts that connect the motor to the transmission. Unfortunately, he found that he could not remove the fourth bolt. Its nut was in a position that required a specially bent wrench to hold it from turning.

Hours went by in fruitless attempts to remedy the problem. As the sun was getting low – relatively early in the afternoon during the Alaskan winter – the decision was made to land before it got too dark. I was told that a common Anchorage procedure for a gear-up landing in those bygone years was to plow snow back onto the runway instead of using foam. This was done, the 200 landed with relatively minor damage, and was back in service within a few weeks.

Since the motor is still connected to the landing gear transmission in the dual-mains models, it would be bad for the landing gear motor to start running after the C-ring has been pulled. The ratchet handle would be a blur as it rapidly got pulled along with the

transmission to which it was now connected. Thus, there is a second thing that the C-ring does besides engaging the ratchet but it is not the same as in the LJ- and LW-series: It opens the electrical control circuit to the "up" side of the motor.

Now remember, the control circuit breaker (CB) should be pulled *before* the ratchet is engaged by pulling up the C-ring. With the CB pulled, no power can get to the motor, period! Nevertheless, if some careless pilot overlooked the checklist procedure and failed to pull the CB, at least the motor could not start running the gear *up* while he or she was trying to pump it *down*!

To recap: Pulling the C-ring does two things in all cases. First, it engages the sprocket driven by the manual ratchet handle into the landing gear's transmission, allowing the pilot's muscle power to replace the electric motor's power. Second, for the LJ- and LW-series, it physically disconnects the motor from the transmission. Second, for the LA-, B-, BE- and BB-series, it opens the UP electrical control circuit.

A final comment or two: After a manual landing gear extension has been performed either as a training exercise or during a maintenance inspection, be aware that there are a couple of "tricks of the trade" to ensure that all will be well when the system is returned to normal operation. In the 90-series, there is a definite chance that the driving gear from the motor may no longer be aligned with the driven gear in the transmission. If the motor now begins to operate to start gear retraction, there is a chance the gear teeth will take a beating until proper alignment occurs as the driving and driven gears finally mesh. The solution? Don't push the control CB in once the landing gear handle is in the up position asking for normal retraction. Instead, "bump" the circuit breaker a couple of times first. "Bump," in this context, means to grasp the CB by its sides with thumb and finger and push it in just far enough to make brief electrical contact, to hear the motor start to run, then pull it again. If the gears happened to have already meshed perfectly, this doesn't hurt a thing. But if by chance the gears had not yet properly meshed, the minor rotation of the driving gear will ensure that the driven gear has been properly mated.

Since the motor is never disconnected in the dual-tire series, there is no worry about the gears not being aligned. Instead, the problem is that sometimes the gear won't retract when the CB is pushed back in! This is because the switch that disconnected the up circuit may have stuck in the activated position. Before rolling back the carpet and getting the tools, just pull the C-ring back up and let it fall freely back down to floor level. There's a spring pulling it down, so it usually snaps back to floor level quite aggressively. Doing this once or twice almost always frees the sticky switch and now the gear will retract properly.

May all your landings be with all three gear legs down and locked, no matter how they got there! KA

King Air expert Tom Clements has been flying and instructing in King Airs for over 46 years and is the author of "The King Air Book" and "The King Air Book II." 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 books, 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*.

Service Letter MTL-34-01: Navigation – GPS-4000S Global Positioning System Software Update

Issued: May 14, 2020

Effectivity: Beechcraft King Air 90 Series, serial numbers LJ-2151 through LJ-2173; Super King Air B200GT, serial numbers BY-324 through BY-379; Super King Air B300, serial numbers FL-1140 through FL-1222; and Super King Air B300/B300C, serial numbers FM-76 through FM-85

Reason: To correct an anomaly with the UTC Time offset issue starting the week of June 11, 2023, in the Global Navigation Satellite System (GNSS) software of the GPS-4000S, CPN 822-2189-100. The LRU will not support Localizer Performance Vertical (LPV) approaches in the impacted region of +/- 20 degrees around 180 Degrees West Longitude.

Compliance – Recommended: This service document should be accomplished at a scheduled maintenance period or inspection.

Warranty: Eligible airplanes may qualify for parts and labor coverage to the extent noted in the *Labor Hours* and *Material Availability* sections of the document (posted in its entirety online at www.txtavsupport.com).

The information provided in this column may be abbreviated for space purposes. For the entire communication, go to www.txtavsupport.com. KA

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