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Trip Report |



A very small portion of Death Valley's Badwater Basin salt flats, looking east toward Dante's View. The mountains of Death Valley are some of the tallest on earth (from base to peak altitudes), sharply rising from below sea level to above 11,000 feet.

Death Valley Offers a Unique Getaway

text and photos by Matthew McDaniel



Death Valley is massive. Encompassing 3.4 million acres, it is the largest U.S. national park outside of Alaska.

While covering only 26 miles in a 1.5-hour drive, we'd seen exactly one other vehicle. The temperature hovered in the mid-90s and the reflective surface of the dry lakebed caused me to squint behind my sunglasses. I encouraged my kids to take in the scene. Here we were, miles from anywhere, together, yet alone, standing on a world-famous landscape that only a fraction of a percent of the world's population has ever stepped foot on. The desolation was palpable and the danger in just being there was simultaneously alarming and thrilling. Deep in the emptiness of Death Valley National Park (DVNP), one quickly senses the park's name is not hyperbole.

Death Magnetic

There is something irresistible about remote places. Explorers have endured all manner of hardship to step foot where no man had before. In fact, many didn't live to tell the tale of their discoveries. DVNP may not be as remote as the Poles or the summit of Mount Everest, but it can be every bit as deadly for the unprepared. Nonetheless, over a million people per year are drawn there. As national parks go, Death Valley is massive, encompassing 3.4 million acres. In fact, it covers an area roughly double the size of Delaware and is the largest U.S. national park outside of Alaska. First noticed by the National Park Service (NPS) in the 1920s, the area was designated a national monument in 1933. Over six decades would pass before it was finally upgraded to national park status in 1994. Its primary attraction is not any single location, but its diversity and extremes. Elevations rapidly climb from below sea level to over 11,000 feet in mere miles. Volcanic ridges, towering sand dunes, vast salt flats, incredible painted desert vistas, wildflower carpets and temperature swings from single to triple digits within park microclimates scramble the senses. As such, DVNP can equally appeal to casual tourists and passionate rovers alike. A number

of features appeal to pilots and aerial adventurers in particular. The most obvious are two paved, public-use airports, each capable of supporting King Air operations (at least, on a basic level) within the park. Aviation and Death Valley are far more compatible than the park's ominous name might imply.

I was aware of DVNP's Furnace Creek Airport (L06) for many years before ever landing there. If you're a bit of an "airport collector," like myself, you're probably already aware that it is the lowest elevation airport in the Western Hemisphere with a field elevation of -210 feet. It is also the hottest airport on earth, where scorching summer temperatures can push density altitudes to nearly 5,000 feet, in spite of the field's below sea level elevation. Death Valley's second airport is Stovepipe Wells (L09). It lies above sea level at a lofty +25 feet MSL. Several other airports encircle the park, as well. While most of them can also support King Air operations, they all lay outside the official park boundaries.

Nearly the whole of DVNP is below military airspace. Non-restrictive Military Operations Areas (MOAs) cover the majority of the park's acreage. Additionally, several restricted areas share a common boundary with the park's southern edge. Most of the MOAs do not include the air-

space below 3,000 feet AGL, which allows general aviation pilots to land at Furnace Creek and Stovepipe Wells without penetrating the MOAs. Aerial touring of the park is also theoretically possible between the 3,000-foot floor of the MOAs and the 2,000-foot AGL altitude that all pilots are requested to maintain above national protected lands such as national parks, memorials, wildlife refuges, and other areas administered by the NPS (Refer to AIM 7-4-6 and to Advisory Circular AC91-36). Although, King Airs are not the typical choice for low-altitude sightseeing flights, pilots should check NOTAMS and contact the controlling agency to determine current operational status before operating in, below or adjacent to military airspace.

Located only a mile from the airport, the main park visitor center is adjacent to the town of Furnace Creek and the two resorts there. The Oasis at Death Valley is the newer, more upscale resort. The Furnace Creek Inn has been in operation almost since tourism began in 1927 and includes a lot of history and panache. In the end, either resort will meet your needs for lodging, meals and amenities. The airport itself is perfectly suitable for King Air operations with clear approaches to both runway ends (15/33) and 3,065 x 70 feet of usable asphalt runway. While it's not in perfect condition, it is acceptable. Care should be taken to remain on the paved surfaces at all times, as the shoulders can be very soft dirt. There are four mountain ranges between Death Valley and the Pacific Ocean. Those ranges push Pacific clouds ever higher along the way, keeping Death Valley's average rainfall to less than 2 inches per year. Thus, the area seldom experiences IFR weather conditions and no instrument procedures exist. However, planning ahead is a must. The airport is unattended and no fuel is available. Crews should bring their own chocks and tie-downs. Your cellphone signal may be marginal or non-existent, but a landline phone is available near



Final approach on Runway 33 at Furnace Creek Airport (L06).

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A solitary Union Pacific caboose is just one of the many abandoned items and structures at the Rhyolite Ghost Town Site, near the current town of Beatty, Nevada, and near the entrance to the one-way Titus Pass Road. Titus Pass is one of the most picturesque ways to enter Death Valley from the east.

the bathrooms (adjacent to the parking apron). With pre-arrangement, either resort will pick up incoming guests at the airport. Similarly, arrangements for rental vehicles can be made to coincide with arrival at your chosen resort.

Stovepipe Wells might not check the “lowest airport” or even the “below sea level” box, but it is a viable alternate to Furnace Creek. All the same caveats apply, but L09’s runway (05/23) is a bit longer at 3,260 x 65 feet and in similar condition. Situated essentially across the street from the tiny village, it’s only about a 10-minute walk to the local resort (Stovepipe Wells Village Hotel), with its western style restaurant and saloon, perfectly adequate rooms and amenities. Rental cars here require pre-arrangement and may be more difficult and expensive to reserve. But, if you are looking to avoid the crowds without totally abandoning the civilized trappings of climate-controlled lodging and prepared meals, Stovepipe Wells can fit that bill nicely.

Of course, Death Valley is also relatively close to Las Vegas, opening many additional options for airports, FBOs and high-level aircraft services. Since I’d already flown into Furnace Creek and Stovepipe Wells multiple times, and I was traveling with my wife and two kids, we elected to fly into Las Vegas McCarran International Airport (LAS). Rental cars are plentiful and inexpensive in Vegas, as is lodging, allowing us to get a full night’s rest before launching into DVNP the following morning. We rented a high-clearance vehicle and found the two-hour drive to Furnace Creek to be quite pleasant.

By leaving Nevada on Highway 160 and entering California on Highway 190, you pass through Death Valley Junction and enter the park from the southeast, only a few miles from Furnace Creek.

Ghosts and Aliens

As with most national parks, Death Valley has a tourist season and an offseason. Summers (May-Oct) are brutally hot. So hot, in fact, that the highest temperature ever recorded on earth (134.1° F) occurred at Furnace Creek Ranch in 1913. Thus, November through April are far more popular for tourism, with March and April being particularly common in years when the spring desert wildflower bloom is forecast to be especially abundant. We chose April mostly to coincide with our kids’ school spring break schedule but were pleasantly surprised by the relatively uncrowded conditions and amazing desert diversity on display that time of year. Even at that, the temperatures in the low elevations were hot and we planned our days to be in the valleys in the early morning and again in the evenings, while spending the peak-heating hours in the higher elevations of the park. It’s a strategy that worked well, allowing us to enjoy reasonable temperatures throughout the day, while avoiding most the extremes that Death Valley is famous for.

It’s important to understand that covering the distances between points of interest within DVNP without a car isn’t feasible. For getting the most from touring, a Jeep >



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The view of Panamint Valley from atop Father Crowley Vista Point with spring wildflowers in full bloom.

or other high-clearance vehicle is necessary. Otherwise, many roads will be uncomfortable, impractical or even prohibited. Dirt and gravel paths allow access to some of the most desolate, yet desirable, locations within the park. By skipping them, you'll have missed the true spirit of DVNP. Our exploring began along Highway 190, where we drove through the Twenty Mule Team Canyon before taking in the breathtaking vista of colorful badlands from Zabriskie Point. Then, just beyond Furnace Creek, a quick stop at the Harmony Borax Works provides historical background on the borax mining industry that first brought non-natives to the area (mostly laborers). It was that industry which utilized the famous 20-mule teams to haul wagon trains of borax (weighing in excess of 30 tons). While short-lived (1891-1898), the 165-mile mule trek from the mine sites to Mojave is an image that still endures today in advertising of borax products. Further north, the Salt Creek Interpretative Trail is a great opportunity to stretch a bit, while walking the wooden boardwalks and stopping to watch rare pupfish feeding in the shallow pools of the salt marsh.

Proceeding northeast along Daylight Pass Road (toward Beatty, namesake town of the co-located VOR), a fun excursion awaits just outside the park boundary: Rhyolite Town Site. The largest of several ghost towns near Death Valley, Rhyolite was once home to over 10,000 people (around 1905-1910). Wandering around and through its long-abandoned bank and train depot, one can't help

but wonder how a town so large (50 saloons, 19 hotels, 18 stores, various doctors, dentists and undertakers) can seemingly just evaporate into the dry air. The mute folk art sculptures just add to the eerie stillness of the place.

Leaving ghosts in our rearview, we headed back west. If you have a four-wheel drive vehicle, consider using the Titus Pass Road to re-enter the park. It's a slow



The author's son relaxes at Darwin Falls, an unexpected oasis that provides not only a beautiful hike in green and shaded vegetation, but it is also the sole water source for nearby Panamint Springs.

ride on a rough and challenging road, but the views within and beyond this deep, narrow gorge in the Grapevine Mountains is reward enough. Eventually, you'll exit onto Scotty's Castle Road, from which you can rejoin Highway 190 to continue to the park's western edge. Stop for refreshments as you pass through Stovepipe Wells or Panamint Springs, but don't linger too long. Slightly further west, Father Crowley Vista Point beckons lovers of aviation and believers in celestial visitors. Aviation photographers and plane spotters traverse the globe to set up their tripods on the cliff sides of Crowley. Abeam those cliffs, military fighter and attack aircraft dive steeply through Rainbow Canyon toward the dry lakebeds of Panamint Valley. They bank and strain under G-forces as they navigate between black lava flows and volcanic cinders into a twisting gorge often referred to as "Star Wars Canyon." Small areas of designated airspace allow them to descend to low-level at near supersonic speeds. Often looking down on the fighters as they scream through the gorges and valleys below you, it's a view no airshow can compete with! Search online for information sources about prime viewing times and use hand-held UHF radios for clues of inbound fast movers. Some spectators are

more into E.T. than F-22s and believe this area is ripe with proof of interstellar travelers. Their tripods, long lenses and lawn chairs tend to have a little more flair than those of traditional plane spotters!

Shifting Sands and Water Sources

After the adrenaline rush of Father Crowley Vista, head back east for a brief hike to reconvene with nature. Just before Panamint Springs, take the unmarked gravel road to Darwin Falls. From the trailhead, the scenery quickly changes from gravel dust to green and lush, along the 1-mile (mostly shaded) hike to this desert waterfall. A bit of required scrambling up rocks along the way keeps it interesting. No swimming is allowed though, as Darwin Falls remains Panamint Springs' sole water source.

While DVNP is known for its vast salt basins and high peak overlooks, it also contains some expansive sand dune fields. The most accessible are the Mesquite Flat Dunes, near the geographic center of DVNP, where you can hike across the dunes while staying within a mile of the parking area. This dune field is popular for sunrise, sunset or full-moon strolls. For more aggressive dune hiking, be prepared and equipped for the

conditions and environment. For example, the Panamint Dunes are accessible only by four-wheel drive, followed by a 7-mile roundtrip hike.

How Low Can You Go?

Any visit to DVNP would be incomplete without setting foot on the lowest land in North America. Heading south out of Furnace Creek, take Highway 178 for a daytrip through the park's most famous areas. Many sites along the way, allow for great opportunities to break up the drive with frequent short hikes. Golden Canyon, The Devil's Golf Course, Natural Bridge, and Mormon Point are each unique experiences. Artist's Palette is a 9-mile scenic driving loop through hills displaying many hues and bands of color.

The main attraction of this southeast section of DVNP is Badwater Basin. A sprawling salt flat, the basin's lowest elevation is -282 feet MSL. Walking in the small briny pond areas is not permitted, but one can stroll across the salt flat for miles. Arrive early, as temperatures can reach dangerous levels by midmorning out on the dry lakebed. The salt left behind when the water evaporated a few thousand years ago is up to 5-feet thick in places. Badwater Basin is one of the park's many areas where extremely low elevations rise quickly into towering mountains. Virtually right across the highway, tourist peer down at the salt walkers from the nearly 5,500-foot elevation of Dante's View. The rising sun reflecting off the white salt flat and illuminating this steep rock face make for spectacular morning viewing and photography.

Wildflowers and Racing Rocks

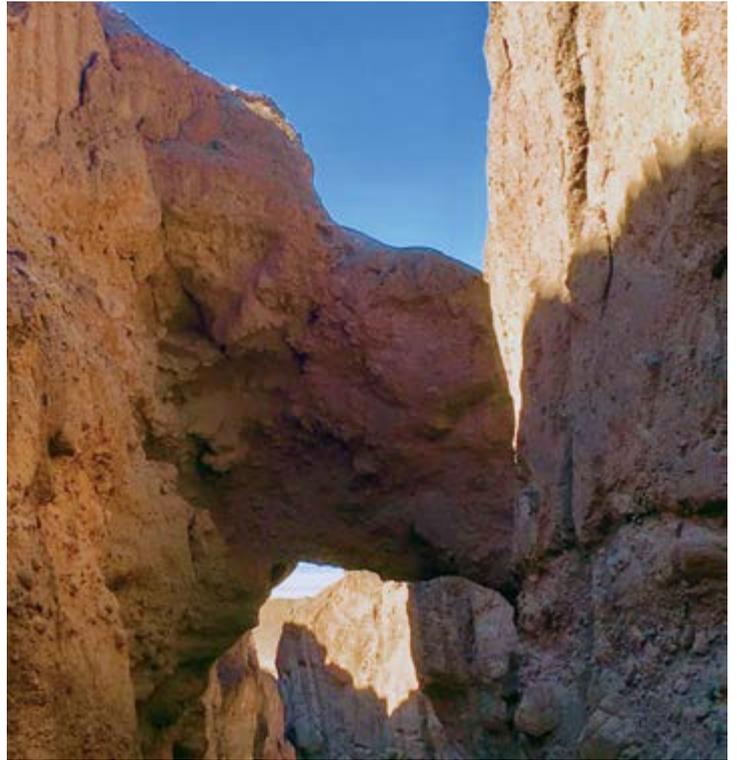
Of all the fascinating features of DVNP, perhaps none is more mysterious than the famous sailing stones of Racetrack Playa. Getting to them is an adventure unto itself. We headed northeast on 190, then up Scotty's Castle Road to where the



Vivid wildflowers carpet the south slope in the northern portions of Death Valley. Ubehebe is a great hiking spot for both easy and strenuous hiking.



Two of the famous “Racing Rocks” resting on the cracked mud surface of Racetrack Playa with their “trails” imprinted behind them. This utterly remote portion of Death Valley shrouded the mystery of these moving rocks for centuries.



Death Valley’s natural bridge with the moon reflecting above.

pavement ends at Ubehebe Crater. Its south face was covered with vibrant wildflowers as visually explosive as the steam eruption that created the crater centuries ago. From the parking area near the north rim, you can take the moderate hike along the rim or the grueling hike to the bottom of the 700-foot crater (and back up again). Be advised, sturdy shoes are required to negotiate the steep terrain and loose rocky soil.

After touring Ubehebe, you are faced with a decision. All points further west in the park are via unpaved roads. You could simply return whence you came, or if properly prepared and equipped, you can choose to venture down one of the dirt or gravel roads to more remote tracts of DVNP. For us, the decision was to brave the notorious Racetrack Road to walk among the mystifying racing rocks. Not to be taken lightly, the 26-mile drive (each way) alternates between tooth-chattering washboard surface to inching across jagged rocks, all while twisting through ruts, gaps, washes, stands of Joshua trees, and the occasional patch of vivid wildflowers. You’ll rarely exceed 20 mph, if you want tires and suspension to remain intact. Yet, who can skip such an opportunity and not regret it later?

Racetrack Playa is a dry lakebed imprinted with the “tracks” of stones (large and small) that “sail” across the surface. At the north end, an island of black rock erupts from the playa in stark contrast to its surroundings. With a quick climb, this “grandstand” provides a perfect viewpoint of the “racetrack” that encircles it. Theories of how the rocks move across the playa’s beige, mud

surface abounded for decades. The remoteness of the lakebed, harsh conditions endured to remain on-site for long-term observation and research, and years between the right set of conditions, have stymied scientists since the 1940s. Finally, in 2013 scientists were there at the right time to narrow down the mystery.

Fortunately, nothing adds to an adventure like a bit of mystery and Death Valley has that in spades. Consider a trip to this remote, yet easily accessible national treasure. Complete with a choice of airports and resorts to choose from, a visit is yet another reason to exercise your King Air and flying muscles. **KA**

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Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI & IGI and Platinum CSIP. In 30 years of flying, he has logged over 18,500 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.



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Hull Claims

by Kyle White

In the October 2019 issue of *King Air*, I stated there are two parts to your King Air insurance policy regarding claims. One aspect – third party liability – was covered in detail. The second aspect is physical damage that occurs to your aircraft. When your King Air is damaged, many emotions are triggered. It is important to be informed and knowledgeable about how to proceed through the claims process. Much like an engine failure after takeoff, there are memory items to be done immediately and a checklist to perform afterward. Being prepared is crucial and enables you to deal with it in a more effective manner.

Turbine aircraft insurance policies are very inclusive to provide coverage when your King Air suffers physical damage. The primary reason for a claim to be denied, or not fully covered, revolves around wear, tear, deterioration, freezing or excessive heat.

Be Prepared

First, let's start at the beginning – being prepared before a claim happens. Aircraft insurance policies should not be bought solely based on price. While cost is important, it should not be the determining

factor. Your insurance broker should explain to you the differences among carriers, coverages and options so you can secure the best value for your needs. The aviation insurance market is changing rapidly; premiums are rising, while coverage and liability limits are being reigned in. When seeking the right carrier for your needs, ask these questions:

1. How long has the carrier been in the aviation sector? Are they financially sound?
2. What is the carrier's reputation for paying claims?
3. How is their service to your broker?
4. Is the carrier flexible when exceptions you may need are requested?

Once you have narrowed down the markets, review your risk profile with your broker. Go over the 30-plus ancillary coverages and see how important they are to your needs, discuss possible claims scenarios and how they would be addressed by the carrier. Review the contracts with your vendors. What do those contracts require of you, and who is responsible should damage occur to your King Air? Specifically, look at your hangar lease!



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Here are a couple of examples of how different the policies could be that you are faced with choosing from:

1. Your aircraft is damaged and you make the repairs: This doesn't affect many of you, but if it does, it is important to understand. Traditionally, when the aircraft is damaged, you'll seek out several repair estimates and then decide which one to choose. For the operator who does their own maintenance, they may want the option to do the repairs themselves. Wording in the policies vary greatly in terms of what the carrier will reimburse you for when you make your own repairs. Some carriers state they will pay the straight, line labor rate at 100% and no overtime. However, there are few carriers that will offer up to 200% or allow overtime pay. The difference between the two can be meaningful.
2. Your aircraft is damaged due to excessive heat (hot start): This is normally excluded from the policy. However, some carriers will allow you to buy the coverage back. Like the first example, this may not be important to everybody, but if you are operating a King Air per the program that allows you to go well past the TBO, you may want to look into this option.

The Checklist

Having the right policy is the foundation for having the smoothest claims experience possible. The next step is having a checklist in place. In my article in the October issue, an ERP (Emergency Response Plan) was mentioned. It may be cumbersome for the owner-operator to implement; however, corporate and commercial operators should strongly consider creating one and regularly reviewing it with their insurance broker.

Often, damage to a King Air is minor, and in some cases, operators don't even turn in a claim. However, there are times when something as simple as hangar rash turns into a nightmare claim. If a third party (an FBO) damages your aircraft, you may find it more desirable to have your insurance company adjust the claim and then subrogate against the FBO, assuming your hangar lease will allow subrogation.

Looking at your policy, you will see a "Conditions" section, which will outline what you are required to do when physical damage occurs. The following is wording from W. Brown & Associates aircraft hull and liability policy form NAC-02-PB1-1215. Under the "Conditions" section of this policy form it states:

APPLICABLE TO COVERAGES F AND G (PHYSICAL DAMAGE)

9) *YOUR DUTIES WHEN LOSS OCCURS. When loss occurs, you agree to:*

- a. *protect the Aircraft, provided you are able to do so, whether or not the loss is covered by this Policy, and any further loss due to the Insured's failure to protect will not be recoverable under this Policy; reasonable expense incurred in affording such protection will be deemed incurred at our request;*
- b. *give notice thereof as soon as practicable to the Aviation Managers, and also, in the event of theft, to the police, but not, except at your own cost, offer to pay any reward for recovery of the Aircraft;*
- c. *file proof of loss with the Aviation Managers, or us, within sixty (60) days after the Occurrence of loss, unless we or the Aviation Managers extend such time in writing, in the form of your sworn statement setting forth your interest and that of all others in the property affected, any encumbrances thereon, the actual cash value thereof at time of loss, the amount, place, time and cause of such loss, and the description and amounts of all other insurance covering such property. Upon our request, you will show the damaged property to us, and produce for our examination all pertinent records and sales invoices, or certified copies if originals are lost, permitting copies thereof to be made, all at such reasonable times and places as we designate.*

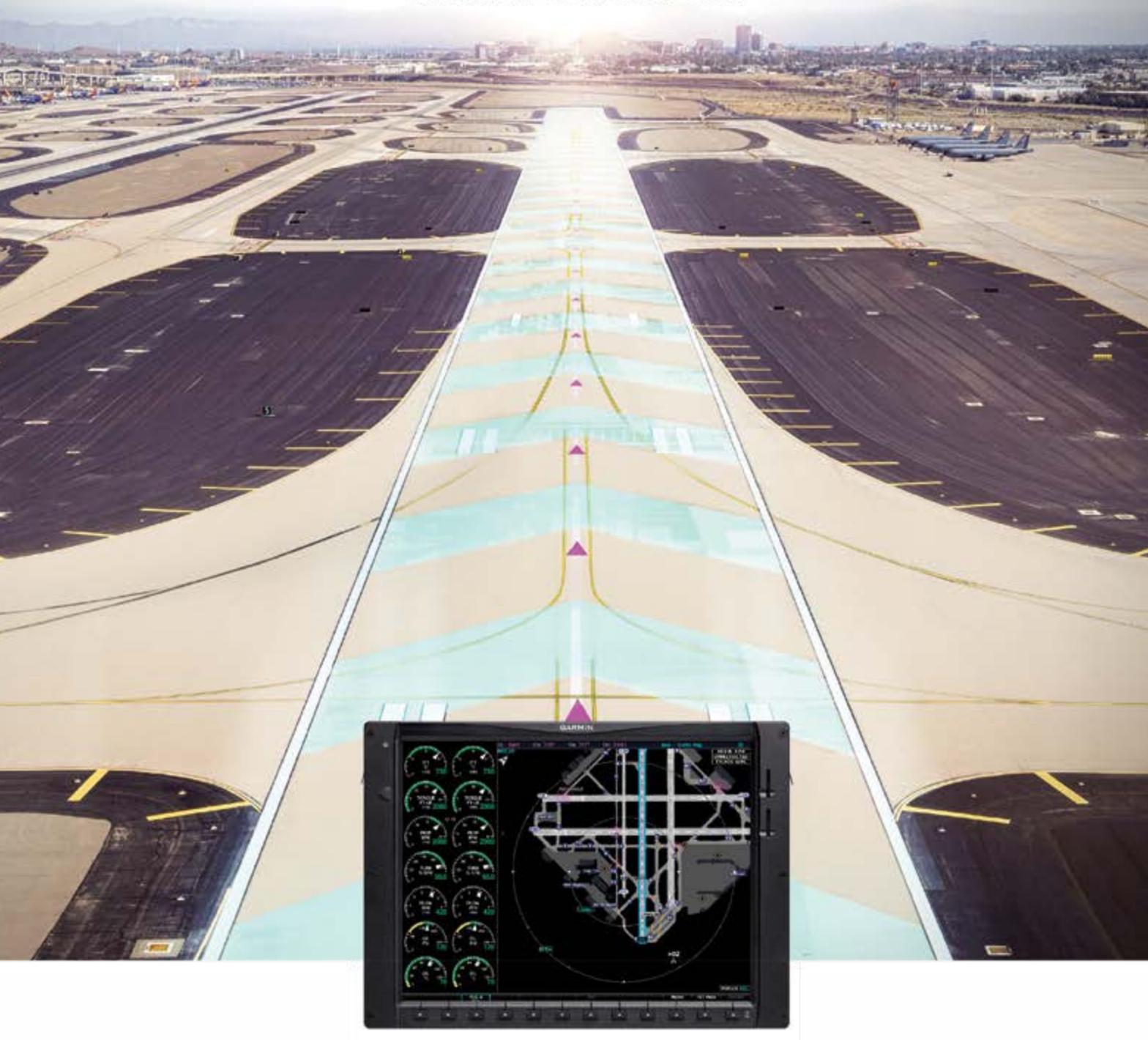
This is the exact language from the contract between the insurance company and the aircraft owner/insured. The wording represents the intent of many aircraft hull and liability policies. When you review yours, you will find very similar language. What does all of this mean? How does the process actually work?

First off, no matter how insignificant the damage is, *notify your broker*. This doesn't mean you are turning in a claim, and it doesn't affect your loss record, it is simply protecting you against the failure to report clause. With this referenced policy, you have 60 days to do so. If you fail to report the claim during that timeframe, they could deny coverage. Though it is rare a claim would be denied under that clause, it is possible.

Assuming you are definitely turning in a claim; *gather all of the facts* as stated in the "Conditions" section. No assumptions, just facts as you know them at the present time. Send all of this information, in writing, to your broker and they will be able to help you through the process of notifying the carrier. The insurance company will assign a claims adjuster and review the circumstances to determine how coverage applies. In the vast majority of situations, coverage is available.

Always keep the process moving. It is up to you to seek repair estimates and submit them for review by the carrier. Remember, you can't authorize payment for the repairs directly, you need approval from the insurance company. Be prepared, most likely not everything on

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the repair bill is going to be 100% paid for by the insurance company. For example, if a time-limited part, such as a propeller or engine, is damaged the insurance company will prorate the hours used against the repair bill. The term is called “betterment.” Insurance is designed to make you whole again, not to profit from. If insurance companies didn’t deduct for this, they’d have claims on PT-6s every 3,599 hours, one hour before they are due for overhaul.

During the claims process, you may need to sign a “partial proof of loss.” This simply means that you are stating partial funds need to be released to begin work. By signing this you aren’t releasing the carrier from their obligations going forward, you will do that once the final bills are to be paid and the document is then called “final proof of loss.”

Depending on which insurance policy you bought, you may be entitled to reimbursement for “trip interruption” or “extra expense for substitute aircraft.” Many aircraft owners don’t realize how valuable these ancillary coverages are until they find themselves with an aircraft that is out of service for months due to the covered loss. *Document these expenses if you have these coverages.* The carrier will pay you the difference between the actual cost to use a substitute aircraft less the D.O.C. (Direct Operating Cost) of your King Air. We typically

see this portion of the claim exceed the actual cost to repair the aircraft.

The claims process to bring your King Air back to life could be a long and stressful event that takes a significant amount of your time and cost you and your insurance company millions of dollars. Proactively prepare for a claim by having a solid insurance program, an ERP in place, a hangar lease contract review and other risk management strategies. Preparing and managing your risk is the key to success in this hardening market. **KA**

Kyle P. White is an aviation insurance specialist for a global insurance brokerage company. He has professionally flown King Air 90s and B200s and holds an ATP and multi-engine instrument instructor license. You can reach Kyle at kpwhite816@gmail.com

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Industry Opposes H.R. 5423 and Changes Coming for NOTAMS

by Kim Blonigen

Aviation Industry Sends Letter in Opposition of Aircraft Noise Reduction Act

In late December, several aviation industry groups* sent a letter to U.S. House of Representatives Committee on Transportation and Infrastructure Chairman Peter DeFazio and Ranking Member Sam Graves, as well as Subcommittee on Aviation Chairman Rick Larsen and Ranking Member Garret Graves, to state their opposition of H.R. 5423, the Aircraft Noise Reduction Act (ANRA), “that aims to severely restrict access to general aviation airports.”

The letter states that by imposing restrictions at the local level, undercuts the “utility and safety of thousands of airports across our nation and reversing course on the need to regulate aviation matters at the federal level.”

Ed Bolen, president and CEO of the National Business Aviation Association, one of the aviation groups that signed the letter, explained the importance of federal oversight of aviation, saying: “For close to 100 years, Congress has recognized that aviation must be regulated at the federal level. The national system of airports would be undermined if restrictions are made at the local level, as the Aircraft Noise Reduction Act is attempting to allow.”

H.R. 5423 would allow general aviation airport operators to impose restrictions on aircraft used for compensation or hire. Not only would these restrictions unnecessarily impede airline and business aviation transportation operations, but critical services – such as air ambulance, organ transport and disaster relief – could be impacted as well.



Engine Condition Trend Monitoring

by Tom Clements

Are you using ECTM? You should be.

Engine Condition Trend Monitoring (ECTM) is a Pratt and Whitney-endorsed program by which PT6 Hot Section Inspection (HSI) intervals may be accomplished on an “as needed” basis instead of on an hourly basis. The first step in ECTM is recording all engine parameters when steady in cruise flight. Unless that raw data is then entered into the appropriate computer program that will print graphs of the three parameters being

tracked (ITT, N_1 or N_g , and Fuel Flow, abbreviated W_f), extending HSI times is not allowed. Additionally, if the data recording does not start soon enough after the previous HSI or contains gaps in which data was not recorded for too many hours, ECTM becomes invalid. Due to these constraints, very few if any non-commercial King Air operators use ECTM for the purpose of possibly extending their HSIs. That is fine with me. After all, if you're flying only a hundred hours or less a year, do you want to go over 18 years without examining the engine's innards?

So why did I write that you *should* be doing ECTM? I did so because ECTM has another, and perhaps more widely held, meaning: The recording of engine cruise parameters even though there is no intent to plot them on a graph nor use them for an HSI extension. In my opinion, the regular recording of engine parameters in cruise is quite important. Let me explain.

Memory can be a fickle thing and the older we are, the more fickle it becomes! For most of us, the ability to view, record, and store all of the engine parameters that ECTM tracks is an impossible task. “Let’s see ... what was the RH Fuel Flow the last time I flew at FL250? How did it compare with the LH side? More? Less? By how much?”

On the other hand, if we have a written record of all engine parameters taken at least once per day while steady in cruise, memory is no longer required. We can merely look up the answers. Here’s an example of why that is useful.

A few years ago, the C90A that I manage for its owner developed a larger split in the ITT readings than I was used to seeing. The change was not large, a little less than 10° C if I recall correctly. Yet over a period of three or four flights the change never went away. It was definitely something different from what I had observed previously. I did a Flow Pack check – thinking that perhaps one

side had become very weak, leaving more P3 air in the engine and hence making it run a bit cooler – but the packs seemed normal in all respects. By looking at the ECTM raw data records that I had been keeping, it became instantly obvious that the shift in ITT readings showed up on the first flight in which ECTM readings were recorded after our previous maintenance event in which Phase 3 and 4 inspections were done together. Back to the shop we went and in short order a relatively minor change in the ITT wiring harness was found and corrected.

Had we not had past readings to analyze, it would not have been obvious that this change came on suddenly following work at the last shop visit. In fact, the ITT change was so minor and all engine parameters were still well within limits that it would have been very easy to shrug our shoulders and merely accept the readings as normal.

Recently a King Air owner/pilot friend of mine had a shock when a badly deteriorated Hot Section was discovered during a routine Phase inspection. The maintenance personnel believed that the ITT was reading much lower than the correct value and hence the pilot had been running the engine much too hard and too hot ... leading to the need for all new CT (Compressor Turbine) blades. There are 58 of those beauties and they aren’t cheap!

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The advertisement features a close-up photograph of an aircraft instrument panel. A yellow rectangular box highlights a specific area containing a gear status light labeled 'NOSE L R' and a 'TAIL FLOOD' indicator. The panel is filled with various other indicators and buttons, such as 'L DC GEN', 'L CHIP DETECT', 'L ENG ICE', 'L BL A', 'WING DEICE', 'L BK DEICE', 'CABIN ALTITUDE', 'LOG/TAXI', 'R DC GEN', 'R CHIP DETECT', 'R ENG ICE FAIL', 'AIR OFF', 'AIR COND N, LO', and 'R PROP PITCH'. The text 'New LED Gear Status Lights For King Air' is overlaid on the highlighted area. The Lumatech logo and contact information are in the bottom right corner.

By 1936 the Model C-34 remained one of the best four-place light airplanes on the market, but it would soon be replaced by an improved version, the C-37.

(Courtesy of Wayne and Dan Muxlow)



Airmaster! – Part Two

Sales success of the Cessna C-34 led to three improved versions of the versatile monoplane before the winds of war forced an end to production.

by Edward H. Philips

The year 1936 witnessed a slow return to economic stability for the United States. Times were still tough and unemployment remained high, but Americans were going back to work thanks in part to President Franklin D. Roosevelt’s “New Deal” policies. By the end of that year the Cessna Aircraft Company had delivered 42 of the popular C-34 cabin monoplane and demand remained steady. The competition, in particular the handsome Fairchild 24W and rugged Waco cabin biplanes, was becoming increasingly stiff. Dwane L. Wallace, who had assumed presidency of the company after Clyde Cessna resigned during the autumn of 1936, knew the time had come to reinvent the C-34.



Armed with only a shoestring budget, late that year Wallace and fellow engineer Tom Salter began thinking how best to improve the existing airplane. High on the list was increasing cabin comfort followed by redesigning the flaps and improving the main landing gear. Production No. 32 of the C-34 served as a prototype for what would become the Cessna C-37.

Changes included:

- Width of the forward fuselage increased 4 inches at the front wing fittings
- Adding 2 inches to the fuselage width at the rear corner of the cabin entry door
- Lowering the engine mount 2 inches
- Firewall narrowed by 1 inch
- Electrically operated wing flaps, although the original manual system was optional (the C-37 was the first Cessna airplane to feature wing flaps)
- Modifying the Warner engine's cowling and baffle arrangement for improved cooling

- Increasing main landing gear tread to 7 feet
- Wheel size increased to 6.50 x 10 inches

First flight of the new ship occurred Dec. 22, 1936, with Wallace at the controls. As a result of these modifications a new Approved Type Certificate (ATC) was required, and ATC 622 was awarded by the Civil Aeronautics Authority (CAA) Feb. 8, 1937. The first production C-37 rolled out of the factory Jan. 22 and was one of 46 airplanes manufactured through December of that year. Price was \$5,490 for a standard C-37, \$6,000 for a "Deluxe" version with upgraded interior.

In addition to the standard airplane, Cessna offered a special version fitted with large windows in the lower forward fuselage and the cabin floor for aerial photography; seven were built. The C-37 was also approved for operation on Edo 44-2425 floats and the option included installation of a Curtiss-Reed metal propeller featuring a lower pitch and greater diameter than a standard propeller. Maximum gross weight was 2,500 pounds and an empty



The Cessna C-37 featured a wider, more comfortable cabin for the pilot and front seat passenger. Only 46 airplanes were built before production shifted to the Cessna C-38 Airmaster. (Robert J. Pickett Collection)

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weight of 1,560 pounds compared to 2,250 pounds and 1,304 pounds, respectively, for a standard C-37.

Although the C-37 was popular and sold well, there was still room for improvement and the next year saw introduction of the C-38. It was the first of the series to be designated Airmaster – an appropriate name for Cessna's little monoplane that, for its price range, mastered the competition in terms of overall value for the dollar.

The C-38 was very similar to its predecessor but incorporated a new main landing gear using a heat-treated, curved tube that increased tread width by 10.5 inches. The tube was made of 4130 chrome molybdenum steel with an outside diameter of 3 inches and a wall thickness of 5/32-inch. In addition, the oil-spring shock struts were improved by installing a new piston with four metering ports to allow more oil flow to better absorb takeoff and landing loads.

Other minor changes included installation of rubber Lord mounts to reduce engine vibration into the airframe structure, and a new tailwheel lock featuring a spring-mounted pin to secure the eight-inch tire in the trailing position until released for full-swiveling action. One peculiar feature of the C-38 was a large, split flap mounted under the fuselage immediately aft of the landing gear struts. It acted as more of a speed brake than a flap, providing a generous amount of drag so the pilot could carry more power on final approach to landing. The flap reduced landing airspeed to about 49 mph.

The flap was operated by a hydraulic pump under the instrument panel that was accessible from either front seat; a cable-operated indicator on the cockpit floor displayed its position. When fully extended the flap caused only a minor pitch change. The vertical stabilizer and rudder were slightly larger than those of the C-37, and the aileron and elevator were hinged using ball bearings to reduce friction. Changes were also made in the cockpit. The control sticks were relocated 6 inches farther forward, and the seats were more comfortable thanks to molded rubber cushions. Plexiglas replaced obsolete Pyrolin for the windows and windshield,



significantly improving visibility for all cabin occupants. The C-37's wind-driven Hodge generator in the right-wing leading edge was retained as standard equipment.

The C-38's maximum speed was 162 mph at sea level with a cruise speed of 143 mph at 75% power setting. Price increased slightly to \$6,490 for a standard airplane. The float-equipped version sold for \$10,000 and featured complete corrosion proofing of the fuselage tubing and float fittings.

The CAA issued Cessna's new *Airmaster* ATC 668 June 25, 1938. Only 16 of these airplanes were built before production was terminated in August of that year in favor of developing the next and final version, the Cessna C-145 and C-165.¹

It was difficult to improve on the *Airmaster* because the basic design was sound and only minor refinements were considered. The chief change was the availability of two powerplants – the 145-horsepower Warner Scarab and the 165-horsepower version of the seven-cylinder radial engine. Initially, the airplane's designation was

to be C-39, but was changed to Cessna C-145 or C-165 depending on the engine installed. The prototype C-145 was completed in September 1938 with the C-165 following in April 1939.

The fuselage of both aircraft were lengthened to 25 feet from the C-38's 24 feet, 8-inches, and empty weight increased to 1,380 pounds for the C-145 and 1,400 pounds for the C-165. Gross weight, however, was the same for both versions at 2,350 pounds. The cable-operated mechanical wheel brakes were replaced by a hydraulically actuated system operated by heel pedals in the cockpit. Only minor changes were made to the wings to accommodate flaps that were mounted immediately aft of the midchord point on the lower surface. The flaps were actuated electrically and were synchronized to extend and retract together. The aft cabin windows were curved to improve appearance and provided a slight increase in viewing area.

To increase the number of paint options, the company offered 27 different colors for the new *Airmaster*, including



Introduced late in 1938, the new C-145 *Airmaster* featured larger rear cabin windows and a comfortable cabin for up to five occupants. This airplane was sold to Ignacio Nogueira, registered in Brazil as PP-THE, and based in Rio de Janeiro.

(Robert J. Pickett Collection)

Dwane L. Wallace owned one of the last Airmasters built, a C-165 registered NC32450, for many years before his death in 1989. The airplane is currently owned by the City of Liberal, Kansas. (Dwane L. Wallace)



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the popular “Pee Wee Green,” “Drake Blue” and “Diana Cream.” Standard practice in the dope and paint shops was brush coats of clear dope on the cotton fabric followed by two spray coats of clear dope to ensure proper tautening. Next, two coats of aluminum-pigmented dope were cross-sprayed followed by water sanding to ensure a smooth surface. Finally, three coats of color were cross sprayed that yielded a lustrous finish that reflected the high standard of workmanship found throughout the Airmaster series. To save weight, only two coats were applied to the bottom of the fuselage, horizontal stabilizer and elevator panels.

In terms of performance there was little difference between the C-145 and C-165, with a maximum speed of 162 mph and 169 mph, respectively. Rate of climb for the more powerful Airmaster was about 925 feet per minute (sea level) and service ceiling was 19,300 feet. Prices at the factory increased to \$7,875 for a standard C-145, and \$8,275 for the C-165. Airplanes built to accommodate Edo floats costed \$10,635 and \$11,035 (C-165).

One other version designated C-165D powered by a 175-horsepower Warner Super Scarab engine driving a Hamilton-Standard, constant-speed propeller. Only three were built, all in 1941. Production of the Airmaster ended that year after the company had delivered 42 of the C-145 version and 38 of the C-165.

During the seven-year production span covering the C-34, C-37, C-38 and C-145/C-165 airplanes, 186 airplanes were built. Today, the Airmaster is remembered as a pilot’s airplane. In 1941 it represented the current state-of-the-art for light aircraft design and construction and had established itself as one of the best examples of a four-place cabin monoplane found anywhere in the world. Few, if any, single-engine ship in its weight and engine cubic-inch displacement class could equal the Cessna’s overall performance and value for the dollar.

In 1936, Wallace flew a C-34 to victory in the Miami All-American Air Races that featured a series of different competitions similar to those held in 1935 by the Detroit News. A C-34 was declared the overall winner then, and Wallace repeated the feat, earning the C-34 the impressive title as “Worlds’ Most Efficient Airplane.” The C-34 and the Airmaster series was (and still is) a truly classic flying machine.² The sleek monoplane kept the Cessna Aircraft Company in business when the economic times were tough and won praise and admiration from pilots fortunate enough to own and fly the patriarch of Cessna Aircraft’s product line. 

Notes:

- 1 It is important to note that in 1938 Cessna engineers were busy completing design details of Cessna’s Model T-50 – the company’s first twin-engine airplane that first flew in March 1939.
- 2 According to the FAA’s Aircraft Registry, as of 2018 there are 49 Airmasters listed in the United States. One Airmaster is flying in Australia (VH-UYG) and at least one airworthy Airmaster is based in England. Worldwide, it is estimated that about 15 airplanes are airworthy. (Information courtesy Dan and Wayne Muxlow, owners of the first C-34, NC12599.)

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.

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Raisbeck Composite 5-Blade Swept Propeller Receives STC Approval

In late 2019, Raisbeck Engineering, Inc., announced the company has received Supplemental Type Certificate (STC) approval from the Federal Aviation Administration (FAA) for its Composite Five-Blade Swept Propeller for the Beechcraft King Air 200 series aircraft. The STC approval allowed the company to begin deliveries to King Air 200 owners and operators immediately.

Designed to improve performance and passenger comfort, the new five-blade composite propeller delivers more than 15% greater takeoff acceleration, over 20% better climb rate and a 30% noise reduction throughout the aircraft.

Manufactured by Hartzell Propeller and constructed of structural carbon fiber composite with nickel cobalt leading edges to protect against foreign object damage, the Composite Five-Blade Swept Propellers optimize airfoil efficiency allowing for a larger 96-inch diameter propeller with less blade tip noise. The new propeller system also offers King Air operators an average of 48 pounds total weight savings versus factory-standard propellers and features unlimited blade life, thereby lowering maintenance and overhaul costs.

The Composite Five-Blade Swept Propeller made its public debut Oct. 22, 2019, at the National Business Aviation Association's Convention & Exhibition (NBAA-BACE) in Las Vegas, Nevada. STC approval efforts began immediately for European Aviation Safety Agency (EASA), Transport Canada and the National Civil Aviation Agency of Brazil (ANAC).

For more information, go to www.raisbeck.com. 





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ATA 21 – King Air Cabin Air Exchange Rate

Questions related to the cabin air exchange rate for the King Air 200 and B300 series have been received from ambulance platforms.

The maximum cabin exchange rate for the King Air 200/B200/300 is up to 24 times per hour. The cabin exchange rate for the B300 models is up to 21 times per hour with the flow packs set in the NORMAL rate.

ATA-31 Pro Line Fusion® Adaptive Flight Display (AFD) 3700 Release of Collins Service Bulletin 4

Collins Aerospace has released Service Bulletin (SB) AFD-3700-31-4 (523-0826373) for the AFDs installed in all Pro Line Fusion equipped King Air models. This SB replaces the A1 circuit card assembly which has been found to cause intermittent blanking as well as several other spurious faults in some AFDs. This modification is covered by Collins for all units currently under Collins 5-year warranty. Textron Aviation recommends that operators have their AFDs updated at their earliest opportunity for increased system reliability. For Phase 1 and 2 aircraft we suggest getting this SB complied with during the Phase 3 software update (see ATA 34 in the Communiqué). Collins warranty coverage under this SB expires June 1, 2021. This SB was installed in Collins AFD production at serial numbers shown below. If you have had an AFD replaced recently, any exchange AFDs from Collins should also have the SB complied with. If your AFD serial number is prior to the production cut below, you can verify compliance by inspecting the AFD dataplate. If this SB has been complied with, MODS block 4 will be marked out as shown on the photo above. If your AFDs require this modification, please schedule them in advance through your service center as the

current turn time is about 10 business days once the AFD is received by Collins. Unscheduled requests for the modification could take longer if the backlog is high.



ATA 32 – Main Landing Gear Static Wick Removal Kit 300/B300

Textron Aviation Engineering has developed a kit to remove the static wick from the main landing gear installed between the wheels on the King Air 300 and B300. The kit part number is 130-3095-0001 for the King Air 300 and B300 with the standard gear and 130-3095-0003 for the B300 for the Heavy Weight models. The kits are available from Textron Aviation Parts and Distribution.

ATA 34 – SAIB – Navigation: Transponder System Fusion-Equipped King Airs

The FAA released an SAIB on December 5, 2019 in reference to TDR -94 and TDR -94D ATC/Mode S Transponders. At this time, the airworthiness is not an unsafe condition that would warrant an Airworthiness Directive. You can read the SAIB in its entirety on the FAA website.

The Bulletin Number is SAIB: CE-19-19. You can locate the SAIB on the FAA.gov website under Special Airworthiness Information Bulletins.

ATA-34 Pro Line Fusion Upgrade to Phase 3 software

Textron Aviation recently released Service Bulletin 34-4171 to provide instructions to upgrade Pro Line Fusion Phase 1 and 2 aircraft to Phase 3 software.

Unit	Rockwell Collins Part Number	Applicable to Serial Numbers	Production Installed Serial Numbers	Production Installed But Not Marked Serial Numbers
AFD-3700	822-3065-001	4C095L and below	4K327K and above	4C095N thru 4K327J



This upgrade introduces reliability improvements and allows all Fusion King Airs to operate at software levels representative of today's production configuration. The upgrades from Phase 1 and 2 to 3 require the upgrade of the Input Output Concentrators (IOC). Collins Aerospace has set up a small pool of the new part number IOCs which will be used exclusively for exchanges of the currently installed units to minimize downtime for the modification. There is a limited number of IOCs in the pool so please schedule your upgrade in advance to ensure the availability of exchange units. We also encourage facilities performing the upgrade to return the removed IOCs immediately so they can be upgraded and returned to the pool. If no exchanges are available or you wish to keep your original IOCs you can still have them returned to Collins for upgrade and returned. When placing the order through Collins, you must specify that they are for SB 34-4171 and that they are Free of Charge (FOC).

NOTE: As a convenience, service documents are now available online to all Textron Aviation customers through a simple, free-of-charge registration process. If you would like to sign up, please visit the Customer Access link at www.txtavsupport.com to register.

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

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