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A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

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EDITOR

Kim Blonigen

EDITORIAL OFFICE

2779 Aero Park Dr.,
Traverse City MI 49686
Phone: (316) 652-9495
E-mail: editor@blonigen.net

PUBLISHERS

Dave Moore
Village Publications

GRAPHIC DESIGN

Rachel Wood

PRODUCTION MANAGER

Mike Revard

PUBLICATIONS DIRECTOR

Jason Smith

ADVERTISING DIRECTOR

John Shoemaker
King Air Magazine
2779 Aero Park Drive
Traverse City, MI 49686
Phone: 1-800-773-7798
Fax: (231) 946-9588
E-mail: johns@villagepress.com

ADVERTISING ADMINISTRATIVE COORDINATOR AND REPRINT SALES

Betsy Beaudoin
Phone: 1-800-773-7798
E-mail: betsybeaudoin@villagepress.com

SUBSCRIBER SERVICES

Rhonda Kelly, Mgr.
Kelly Adamson
Jessica Meek
Jamie Wilson
P.O. Box 1810
Traverse City, MI 49685
1-800-447-7367

ONLINE ADDRESS

www.kingairmagazine.com

SUBSCRIPTIONS

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Courtesy of AOPA

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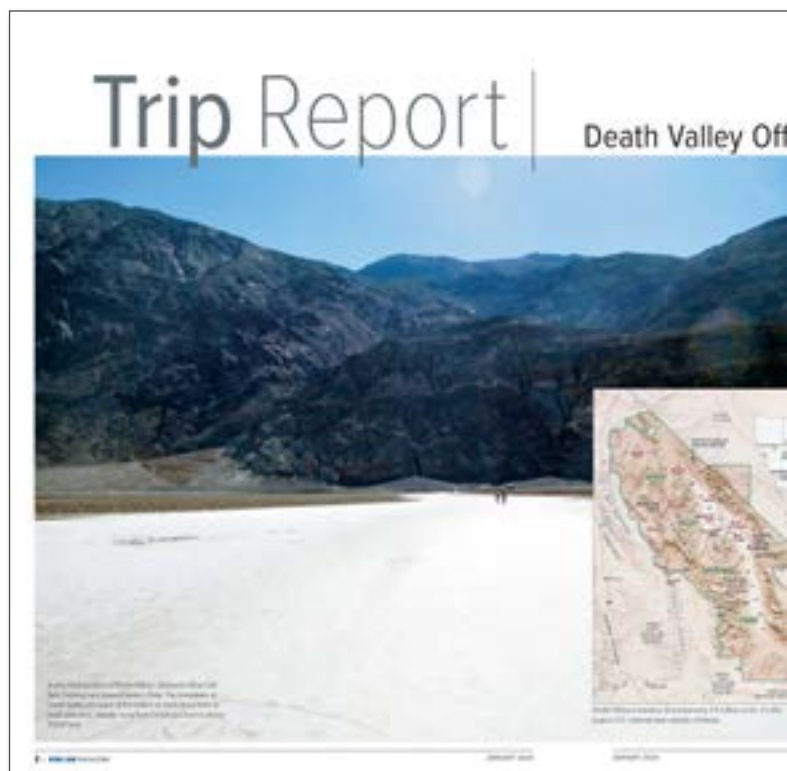
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Comments On Death Valley

In my 17-plus years of writing aviation articles, rarely has one generated as much correspondence as *Trip Report – Death Valley Offers a Unique Getaway* which appeared in the January 2020 issue of *King Air* magazine (written during the summer of 2019). I received numerous emails and phone calls about the article, universally complimentary of its style, photos, information and general content. To say I am flattered would be an understatement.

Many of those contacting me were planning future visits to Death Valley National Park (DVNP) themselves and were looking for additional details and suggestions about the area (in general) and Furnace Creek Airport (in particular). Seems that opinions about the airport's current condition were mixed across "internet-land" and even within several "reliable" sources. As mentioned in the article, my flights to both Furnace Creek (L06) and Stovepipe Wells (L09) airports were in years past and the trip which generated the article began by flying into Las Vegas International (LAS), then driving into DVNP from there. The photo taken on final to L06's Runway 33 (shown right) was also taken on one of those visits from years past. In the course of responding to the many messages I received, I learned the National Park Service (NPS) had issued a news release about the current condition of L06's runway (released after the article was published). Obviously, I encourage all pilots to always check NOTAMs and other sources of information about airport conditions before using any airport or aviation facility. Doing so is not only good aviator-sense, it is required. However, sometimes getting real time and accurate information can be difficult at remote and/or low-utilization airports; such is the case within DVNP. In short, I'm sad to report that the NPS is now reporting numerous cracks and bumps have developed on L06's runway. This runway damage has been caused by its close proximity to the water table and salt-surface heaving from below. The airport does, however, remain open and in daily use. Nonetheless, its runway condition is now stated to be "poor" and pilots are warned to take appropriate precautions. Due to an estimated cost of \$3 million, repairs are unlikely to happen anytime soon. The NPS also stated that Stovepipe Wells airport (L09) is in better condition and remains a viable alternative for pilots flying into DVNP.



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



Article

Offers a Unique Getaway

Text and photos by Matthew McDaniel


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 seemed to us a quiet 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 stopped for us. The desolation was palpable and the danger to just being there was simultaneously alarming and thrilling. Even in the emptiness of Death Valley National Park (DVP), one quickly senses the park's name is not hyperbole.

Again, I'd like to express my appreciation to all those who took the time to contact me with kind remarks about the article. I often learn great information from my readers, just like any good instructor endeavors to both teach and learn from their students. May your future aviation explorations be both safe and enjoyable.

Sincerely,

Matthew McDaniel

ATP, CFII, MEI, Platinum CSIP & 9-Time Master CFI

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Pick of the Little

AOPA Chief Mark Baker adds K



Mark Baker, head of the Aircraft Owners and Pilots Association (AOPA), reached the point in his flying and professional career in 2019 when he could choose any airplane he wanted. He chose a Beechcraft King Air F90.

“If I were to go eeny, meeny, miny, moe on the ramp, I would have always wanted to go for a ride in the F90,” he said. “I always thought they had the coolest ramp appeal.”

er

ing Air F90 to his Fleet

by MeLinda Schnyder

Photos courtesy of AOPA



A pilot since 1977 and an AOPA member since 1987, Mark Baker became president and CEO of AOPA in September 2013. He's owned 100 different airplanes throughout his life, and most recently added a Beechcraft King Air F90 to his personal fleet.



Mark Baker has owned this Piper Super Cub for nearly 30 years. Here he shares it with visitors during an AOPA pancake breakfast.

That's saying a lot for a pilot who has owned more than 100 airplanes and has logged in the neighborhood of 15,000 hours during 40 years of flying aircraft ranging from helicopters to light seaplanes and turbines. Among his ratings and certificates, he has his commercial pilot certificate, single- and multi-engine seaplane ratings, rotorcraft rating, and type ratings in the Cessna Citation 500 and 525S.

Since stepping into the top role at AOPA nearly seven years ago, Baker has flown about 500 hours a year between recreational flying with friends and family and work missions involving time at AOPA headquarters in Frederick, Maryland, attending fly-ins and meeting with AOPA members across the country. AOPA is a nonprofit membership-based organization providing educational and advocacy to more than 300,000 general aviation

pilots and aircraft owners. He also leads International Council of Aircraft Owner and Pilot Associations (IAOPA), a federation of autonomous, nongovernmental, national general aviation organizations in 80 countries.

A lifelong love of aviation

Aviation intrigued Baker as a kid, although nobody in his family was a pilot. His grandfather had worked through World War II putting spark plugs in B-24 bombers at the St. Paul (Minnesota) Downtown Airport, and his dad worked as a cleaner for regional North Central Airlines while in school.

It was the 1970s when Baker started ground school while a high schooler and figured out a way to get to the airport most Saturdays. He worked on his license

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in college and earned his private certificate in a 1968 Cessna 150 that he and a friend bought from a farmer for \$4,200 in 1977.

“I was taking ground school at the University of Minnesota and flight lessons at Anoka County Airport, and drooling out the window looking at cool Barons and other planes that I thought ‘Geez, one of these days...’”

His first job allowed him to put the Cessna 150 to use and he’s been mixing business and recreational flying ever since.

“I grew up with a company called Knox Lumber in the Twin Cities and two of the three founders were aviators,” Baker said. “One was a B-17 navigator and another was a flight instructor during World War II. They mentored me along and allowed me to use my little 150 to run up to stores in Fargo or Sioux Falls, South Dakota, or over to Billings, Montana. When we sold the company to Payless Cashways in Kansas City, I was getting my instrument rating and I belonged to a flying club out of the Twin Cities. I would go back and forth every week between the Twin Cities and Kansas City, initially in a Warrior, then an Arrow.”

Forty years later, Baker has owned more than 100 airplanes. Not only did he get that Beechcraft Baron he drooled over, he has owned 13 different Barons – “basically every model made” – including two he has owned on two different occasions and one he’s owned three times.

“I know about half a dozen F90 owners who are friends and all really like the model,” he said. “It’s an airplane with a kind of cult following.”

He’s also shared his love of aviation by encouraging many within his family to learn to fly. Baker was in the left seat for his grandfather’s first plane ride and he helped his dad get his pilot’s certificate when his dad was 63 years old. He’s also persuaded his son, sons-in-law, a brother and a sister-in-law to become pilots.

His first King Air

Of those 100 airplanes, many were chosen based on the work he was doing at the time. That included seven or eight Cessna Citation jets for commuting to work from his home in the Minneapolis/St. Paul area. In 2008, a position as chief operating officer for Scotts Miracle-Gro Company based in Columbus, Ohio, finally made Baker a King Air owner.

“I’d been in King Airs a lot and flown them quite a lot but this was my first time owning one,” Baker said. “I had gone up to the Citation world for a while because of the range I needed. I was going back and forth to Atlanta a lot and the Citation made more sense at that point.”

He helped a friend shop for a King Air when the friend needed an airplane that could land on gravel airstrips in the western U.S. When that friend later was ready to sell, Baker traded for the 1975 King Air C90 to use to commute between the Twin Cities and Columbus once or twice a week.

“Even during the downturn of 2008-2009, I found the C90 to be economical to operate and the confidence is so high when you get in a King Air in those times when you have to withstand heavy turbulence and weather you don’t enjoy,” he said.

Jobs change, which leads to mission changes, which affects the fleet needed. Baker’s career in retail

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Mark Baker has owned several Beechcraft products through the years, including a Model 18, several King Airs, Barons and Bonanzas. His current fleet of five aircraft includes a 1967 Beechcraft Baron 55D and a 1980 Beechcraft King Air F90. "All the King Airs look great but the King Air F90 stands out in a unique way," he said. "As a personal owner-operator I don't need all the seats of a 200, which has a similar look, and I think the F90's symmetry is especially cool."



management took him to outdoor outfitter Gander Mountain Company (headquartered in St. Paul), The Home Depot (Atlanta) and Orchard Supply Hardware Stores Corp., a leading retailer of home improvement and garden products with corporate offices in San Jose, California.

In September 2013, when Baker became the fifth president since AOPA was formed in 1939, he had returned to commuting in his own Citation.

The F90: A coveted airplane

Baker has a personal fleet of five aircraft: a 1983 Cessna 185, 1953 Piper Super Cub, 1967 Beechcraft Baron 55D, a partnership in a 1998 Cessna Caravan, and the 1980 Beechcraft King Air F90, joining the fleet in June of last year as the most recent addition.

"AOPA has a Citation M2 now so I got rid of my CJ and bought an airplane that I'd always wanted," said



Help AOPA Combat Egregious Pricing

Mark Baker, a pilot since 1977 and a member of the Aircraft Owners and Pilots Association since 1987, hears from hundreds of King Air owner-operators every year in his role as president and CEO of the largest aviation association in the world.

AOPA membership gets you access to aircraft financing, legal services, safety and training programs, media and it gives you a voice in shaping the advocacy focus for the nonprofit organization.

Baker says the top complaint he hears from turbine owner-operators, in particular those flying King Air aircraft, is egregious pricing at some FBOs. AOPA has heard at least 1,500 complaints in the past few years about experiences with unfair pricing practices and cost-prohibitive airport access.

“We want, need and can’t live without profitable FBO businesses, and 90 percent do a great job,” Baker said. “We don’t think you should ever be taken advantage of because there’s potentially a monopoly. If you don’t need services and it’s your choice to go to this airport, you shouldn’t be held hostage if there’s only one place to park there.”

AOPA is working with the industry, regulators and community leaders to ensure that public airports owned by all of us provide fair pricing and access to all aircraft and pilots. So AOPA can continue to make progress on this issue, Baker asks that you report any issues you encounter with egregious FBO pricing through the AOPA website at aopa.org/fbofees.

For current fuel prices and the reported fees at FBOs that choose to report them, you can find the AOPA Airport Directory on the organization’s website at aopa.org/destinations.

Baker, who estimates about 1,000 of his 15,000 hours are in a King Air, including 200 in his F90.

The F90 was an airplane that had caught his attention in the early 1980s when he was a young professional traveling the country. Over the years he had become friends with at least half a dozen F90 owners who all loved the distinct look and feel of the model that was produced from 1979 to 1985. Known as the “Super King Air,” the F90 incorporated the



▲ Besides the striking looks with the T-tail and short body, Mark Baker likes the bigger engines and bigger fuel capacity of the King Air F90. “All in, at altitude, it has like six hours of fuel, five hours you can fly with and an hour of reserve,” he said.

Mark Baker’s 1980 King Air F90 already had Garmin glass flight deck retrofits installed, including dual G600 touchscreens and GTN 750 navigator. ➤

T-tail of the King Air 200 with the fuselage and wings of the E90 and added 400 more horsepower than the C90 at the time.

“I was inspired by a friend, Jim Krivida, who has had his F90 for 25 years, and I’m the only other guy he’s ever let fly it,” Baker said. “I looked at it over and over and knew I loved the look and feel of that airplane. I had decided one of these days I would buy one.”

It wasn’t an easy decision to give up the extra speed of the Citation but the King Air fit his current commuting needs better. He uses it to commute to the Washington, D.C., area from homes in Florida and Minnesota and uses it often for recreational flying. He’s flown it to the Virgin Islands, pheasant hunting in South Dakota, a winter trip to the Bahamas, and he took it for a ski trip in Colorado with his sons in early March.

“We get there just a little slower but I really like the way people in the back like riding in the King Air. They rave about it,” Baker said. “Plus, I enjoy the way it flies and there’s something cool about being up front with a



handful of throttles and the propellers turning around you. It’s a nostalgic feel and I kind of consider this a retro airplane.”

It might feel retro but it doesn’t look it. In the nine months he’s owned it, he’s put in a new interior featuring rich, brown leather and repainted the exterior with the modern scheme of a black tail and big red ‘B,’ which he jokes stands for Baker. While the King Air was in for paint, he had Raisbeck aft body strakes installed.

“The strakes took quite a bit of the wag out that these short-body models are known to have,” Baker said. “It was a big job but it was well worth it. The passengers are happier and I’m happier. The airplane already had



“Flying is still my favorite pastime and it’s a wonderful way to get around North America,” Baker said. “You can go anywhere in an airplane and I never get tired of going different places, seeing different airports and communities, and being engaged with how we can help as an aviation community.” **KA**

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Engine Won't Start?

by Dean Benedict



When you hit the Start/Ignition switch and the engine spools up but fails to light off, what do you do? Is it a fuel problem, an ignition problem or both? Obviously if your engine gauges indicate fuel is flowing, then you've got a problem somewhere in the ignition system. I'd have a tidy sum in the bank if I got a dollar for every time someone suspected the ignition box as the reason for ignition failure. I don't know where it got such a bad rap. In my experience the ignition box is the least culpable of all the components in the ignition system. But I'm getting ahead of myself.

Some would argue that if you don't hear the igniters snapping, you know it's an ignition problem. Unfortunately, the noise of other aircraft running nearby or taxiing to and fro makes the snapping hard to hear. Chances are (if Murphy's law has anything to do with it, and it usually does), you are at an unfamiliar airport, far from your trusted mechanic or a shop that knows King Airs. In the above scenario, you can try the auto-ignition switch to see if you get spark. If you do, the engine starts up and you now know that there is an issue with your Start/Ignition switch or its related relays. If there is still no spark with the auto-ignition switch, then there is an ignition problem at the engine.

Be sure to check your annunciator panel. Go back to the Start/Ignition switch. (Don't forget to clear the engine of fuel if you've already attempted a start.) Turn it on and see if you have an ignition light. It could be yellow or green, depending on the model of your King Air. This light is wired directly to the positive lead at the cannon plug on the ignition box. If your annunciator panel shows the ignition light in start-ignition mode or auto-ignition mode, then you know power is going all the way to the ignition box.

So now what? Your suspects are the ignition box, the igniter leads, and/or the igniter plugs. Believe it or not, most of the time it's going to be the igniters. They get checked at every phase, but if they are within their designated wear limit, they are not replaced. Igniters are expensive and you want to exhaust their useful life before putting in new ones.

Worn Igniters

Igniters wear down to a point where the gap is too large and the spark fails to jump across. There is a maximum allowable diameter for the center hole surrounding the electrode. In the photo (right) comparing a new igniter

with a worn-out one, you can see the center hole is much larger in the old igniter – the gap is too wide. Additionally, the electrode in the old plug is severely worn.

You might be wondering, since there are two igniters per engine, why would both igniters go bad? I suspect they go out one at a time. Let's say the igniter box is a tad low on amperage – it's within limits and doing its job, but the spark doesn't travel quite as far. As the igniters wear down, the gap widens and one plug fails. At this point maybe the starts are a slightly slower or a tiny bit hotter, but these differences are negligible. So many times, gradual degradation in performance escapes our attention. It's just a matter of time until the other plug fails and you have a no-start situation. That gets your attention.

Something that accelerates igniter wear is leaving auto-ignition on all the time. The checklists in the POH for pre-takeoff and pre-landing specify when the auto-ignition switch is to be turned on as a safety measure in the event of engine flameout. I've met many a King Air pilot that worries they will forget to turn their auto-ignition on before takeoff and before landing, so they turn it on early and leave it on. They know that the auto-ignition system goes off automatically once 400 foot-pounds of torque is reached after takeoff, and likewise, it comes back on when the torque falls below

that mark. At shutdown they turn everything off.

There is nothing wrong with doing this, particularly from a safety point of view. The downside to this procedure is that the igniters on each engine are furiously snapping away throughout the whole pre-takeoff routine, the taxi out, the taxi in and the pre-shutdown routine. This is a lot of wear and tear on the igniters.

When I had my shop, I had some customers that could not get 300 hours out of an igniter, and I had others that would get 600-700 hours. I have no problem with anyone that keeps auto-ignition engaged in this manner. I am not being critical and I don't want to mess with anyone's routine. All igniters wear out eventually, so it never hurts to have a spare one stashed in your aircraft. When it comes to ignition failure, igniter plugs are the number-one cause in my book.

Worn Igniter Leads

Igniter leads are disconnected at each Phase Inspection in order to inspect the igniter plugs. These leads have an insulator on the end that goes into the igniter plug. The insulator has a tendency to stick to the plug. When your mechanic removes the nut that secures the lead, he or she often must tug and twist the lead to disengage it. The insulator eventually breaks and this

A comparison of a new igniter (left) and a deteriorated one (right), which portrays the wider gap in the middle and the worn-down electrode.



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allows the high voltage to jump to ground instead of going into the plug and creating spark. Just like your ignitors, you can have one failed lead while the other keeps working. Again, you are down to one igniter on that engine and you might not notice much difference in your starts. But when that second lead fails or its plug wears out, you'll have a no-start situation.

Igniter Box

If the plugs and leads check good, then the igniter box must be the culprit. Remember that your ignition light on the annunciator panel indicates you have power going to the box. Once you exchange that igniter box you should be good to go. Igniter boxes do not fail often. Many vendors don't keep them on the shelf ready to go; they wait until you need one before they overhaul or repair for exchange. If you order an exchange box and it turns out you don't need it, you might be stuck with it. So, make darn sure the igniter leads and plugs check out before ordering an exchange ignition box. Years ago, I had a spare igniter box that I kept around for troubleshooting. One of my customers was stranded in a far-flung location with an engine that wouldn't start. Over the phone, I ascertained the igniters and leads were OK, so I overnighted my spare box to them and it

did the trick. Once home, we got a proper exchange box installed, their core unit went to the vendor, and my spare came back to me. That didn't happen often, but that spare box sure came in handy from time to time.

Here's to many hassle-free hours of King Air flying. Don't forget to stash a spare igniter somewhere ... and remember where you put it! **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). He founded BeechMedic LLC in 2016 to consult with King Air owners and operators on all things King Air related: maintenance, troubleshooting, pre-buys, etc. Dean can be reached at dr.dean@beechmedic.com or (702) 773-1800.



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Update Your Calendar

King Air Gathering 2020 Date Change



The KAG conference features experts in the King Air field speaking on subjects that range from pilot operations, aircraft and engine maintenance, upgrades and modifications and much more.

The King Air Gathering (KAG) that was previously scheduled to be held in late August, has been moved to late October – specifically Oct. 22-24, 2020. The event is still being held in Wichita, Kansas, birthplace of the King Air.

A brief, tentative schedule is as follows:

Thursday, Oct. 22 – Arrivals and Blackhawk Aerospace evening cocktail reception.

Friday, Oct. 23 – Conference of educational speakers and King Air-specific vendor booth/tables, and sponsor party that evening.

Saturday, Oct. 24 – Conference with educational speakers and King Air-specific vendor booth/tables.

Sunday, Oct. 25 – Attendee departures and booth teardown for vendors.

More specific information about this event will be forthcoming. Registration is planned to open July 1, 2020. **KA**



King Air-specific vendors are at the Gathering enabling attendees to have one-on-one conversations with company representatives.

Standards

by Kim Blonigen



Some of the King Airs that flew in for the KAG in 2019 parked on the ramp.

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A person wearing blue gloves is adjusting a BendixKing electronic control unit. The unit has a digital display showing 'ANT 550 12:59 FLT' and several buttons labeled 'USE', 'STBY/TIMER', 'ADF', 'BFO', 'FRQ', 'FLT/AS', and 'DET/TEST'. The unit is being held by the person's hands, and a green wristband is visible on their left wrist.

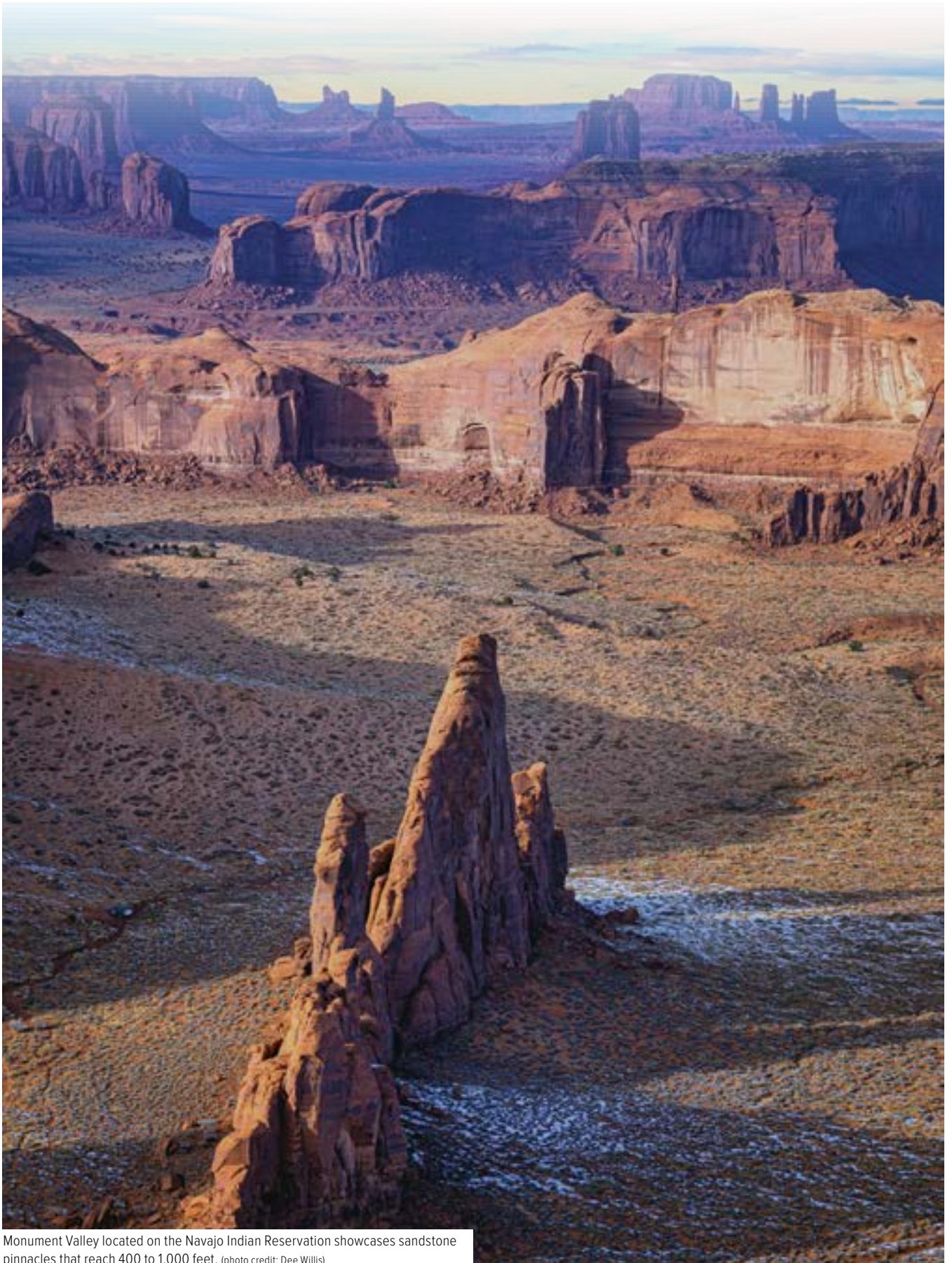
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Monument Valley located on the Navajo Indian Reservation showcases sandstone pinnacles that reach 400 to 1,000 feet. (photo credit: Dee Willis)

The Autopilot's *Aerial Tour Mode*

by Tom Clements

Just yesterday (I am writing this in mid-February 2020), I had the great pleasure of flying a “Flightseeing” tour of northern Arizona in Ron McAlister’s lovely 1984 B200 King Air. I have done this numerous times over the years in a multitude of airplanes, giving out-of-state visitors an aerial tour of our beautiful state, and the scenic wonders it encompasses. The Mogollon Rim above the town of Payson, Meteor Crater southwest of Winslow, Monument Valley on the Navajo Indian Reservation, Lake Powell and its Rainbow Bridge, the city of Page with its Navajo Bridge and Glen Canyon Dam, the Dragon corridor through the Grand Canyon’s Special Flight Rules area, then a landing at Grand Canyon airport. We took a taxi-van into the park and had a delicious lunch in the historic dining room of the El Tovar lodge on the south rim of the canyon. The return flight back to Phoenix’s Deer Valley Airport (KDVT) included a tour of Sedona’s red rock majesty. Wow!

The weather was perfect, no TFRs existed and Ron, his wife Donna, and our passengers were exemplary guests. What a delightful, fun day!

What made it especially easy for me and comfortable for the passengers was my use of the autopilot in modes that are very rarely utilized. In this particular King Air, the autopilot is the Sperry SPZ-4000, the digital version of the very popular SPZ-200A system. If you are flying one of these systems, a King KFC-300 or KFC-400, a Collins AP-105, 106 or 107, an APS-80 or some version of the APS-65, then most or all that I write here will

apply to your system, too. If you have a Century IV or a King KFC-250, then, sorry, but these techniques will not work as well for you.

In days of yore – say, 50 or more years ago in the 1960s and early 1970s – it was rare to see a flight director (FD) and an autopilot (AP) combined into one unit ... an integrated system. Instead, the autopilot – that almost all King Airs had – operated to control pitch, pitch trim, bank, and yaw via its four servos and its own control panel. The relatively few King Airs that also included a flight director – that could direct a pilot how much pitch and bank were needed to satisfy a particular flight condition by the movement of indicators displayed on the attitude indicator while hand-flying – had a separate control panel to program the desired parameters ... heading hold, altitude hold, Nav tracking, glideslope tracking, etc.

Today it is exceedingly rare to find a King Air without an *integrated* AP/FD system. One control panel selects the modes for both systems. Unlike in the earlier, separate, non-integrated systems, we can never have the autopilot tracking a Nav course while the flight director is providing heading information. Weird? A poor choice of modes? Sure! But is it possible in the non-integrated systems? Yes.

Most of us will have the flight director in *Go Around* (GA) mode, *Heading* mode and, probably, the *Altitude Select* mode activated before takeoff and displayed on the Attitude Director Indicator (ADI). When the integrated AP is turned on in the climb after 400 feet above liftoff,



The sandstone canyons of Lake Powell located in northern Arizona.



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it takes over control of pitch and roll to satisfy the FD commands. Very rarely, if ever, do we engage the AP without it immediately following the existing FD commands. But do you realize that it can work *without* following the FD? Yes, it can!

Try this little experiment on a clear, visual, day. Do not select any FD mode before takeoff. The ADI should be blank – no command bars showing. As you depart the pattern – say, with a 10-degree nose up and 20-degree left bank attitude – turn on the autopilot. In some systems, you will find that the airplane maintains the existing attitude perfectly, both bank and pitch. In others, the system may hold the pitch attitude but roll wings level. Try it and see what your system does.

How can we now change pitch and bank while still leaving the FD off? Two ways: First, use the pitch wheel or rocker switch on the AP controller to modify the pitch attitude and use the turn knob on the controller to modify the bank angle. Second, for almost all of you, hold the TCS (Touch Control Steering –

the Sperry name) or CWS (Control Wheel Steering, the abbreviation for the King and Collins nomenclature) button and manually maneuver the airplane to the pitch and roll attitude that you desire, then release the button. Voila, look there! The AP starts holding the new attitude. It's almost like having an invisible co-pilot that you direct, "Here, take the airplane and hold it for me, will you?"

As a side note, most of these systems will hold a bank angle between 30 and 60 degrees. But if 5 degrees or less is requested, the system rolls wings level, reads the heading from the HSI and holds that heading ... even though the heading bug may be nowhere near that heading. That means that there is no rush to get the heading bug under the lubber line and select the FD's HDG mode. Even with the rudder and ailerons not perfectly trimmed, the existing heading will be maintained perfectly.

Don't misunderstand what I am writing: My use of the AP alone without being coupled to the FD is quite rare indeed! There may be only one flight in a typical year on which this occurs. For giving lower-altitude aerial tours, however, how fine it is! Let me explain.

I had used the normal AP/FD combination to climb, level off, track to our next waypoint – the Meteor Crater southwest of Winslow (the INW VOR) – and descend as we neared this site. I muted/disabled the TAWS (Terrain

Awareness and Warning System) so that it would not be yelling at us incessantly as we flew near the ground. (If you don't know how to do this in your airplane, please learn the procedure ASAP!) I leveled off about 1,000 feet AGL. We were now in HDG and ALT mode with the flight director bars in view, being followed by the AP. As we flew abeam the crater, I wanted to make a clockwise turn around it. Instead of moving the heading bug – and doing it again and again and again as the turn progressed – I merely reached down to the pedestal and rotated the turn knob clockwise out of its center detent. Doing this turned off the HDG mode automatically. With no lateral mode to follow, the FD command bars retracted out of view. Now we were in the "uncoupled" lateral mode of AP operation: The AP was still flying (and even holding our altitude in the vertical mode) but no longer following any FD bank commands. By regulating how far I rotated the turn knob on the pedestal, I could easily control bank angle and thereby the radius of the turn. Also, keep in mind that speed plays a role in turn radius so by setting power appropriately that was another tool I used to create a proper circle around the crater.

When we had finished oohing and aahing our way around the crater, I then set the GPS for the town of Kayenta (07V) at the south end of Monument Valley and returned to NAV mode to track there. The engagement of NAV brought the FD bars back into view. I pitched up using the rotary pitch wheel on the AP controller,

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selected ALT SEL for the eventual level-off, and off we went for our next sightseeing. As before, we made a normal AP/FD-controlled descent to get near the surface, then started using the turn knob for our banking left and right around the spectacular monuments. Many John Wayne westerns were filmed here! Now, without FD coupling – which went away as soon as the turn knob was rotated out of its center detent – again the command bars disappeared. However, the ALT mode was still operative. I sometimes call this the “half-coupled” mode, since the AP was still adjusting pitch attitude for altitude control but allowing me – via the turn knob – to select the bank angle I desired. There were times I wanted to go a little lower or a little higher. Rotation of the pitch command wheel on the AP control panel turned off the ALT mode and left us in a completely uncoupled mode of AP operation.

Certainly, I could have done all of this with hand flying. I could have just tapped the electric trim switches on my control wheel – to disconnect the AP but leave the yaw damper on for ride comfort, my preferred method of AP disengagement – and started maneuvering using the pilot's control wheel myself. Sometimes I do exactly that. Call me lazy or maybe just variety-seeking, but today I let the AP keep flying in this cool and rather unusual uncoupled mode. By the way, one of my pet peeves is a pilot who hand-flies while ignoring the FD commands – definitely a bad habit pattern to form. So, when I disconnect the AP to start flying by hand, I always remove the command bars from view. There's more than one way to do this, but a simple one is to merely tap the mode button for the existing roll command, HDG, NAV or APPR.

What a fun time we had! The weather was clear and calm with very little low altitude turbulence. The Arizona scenery was awe-inspiring and the passengers were friendly and appreciative. The lunch in the more-than-a-century-old classic dining room was delicious and came with fabulous service. I thank God for letting me still enjoy experiences like this!

The next time you treat your passengers to a low altitude visual tour of your favorite area or one of our nation's scenic wonders, give these AP modes a try. You'll like them! **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 - Volume 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.

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Year of the Swallow

A century ago, the Laird *Swallow* launched
Wichita, Kansas, on its way to becoming the
“Air Capital of the World.”

by Edward H. Philips

Above: A rare photograph of the first Laird “Tractor” (later renamed *Swallow*) after it was completed in April 1920. A war-surplus Curtiss OX-5 engine powered the biplane. (Joan Laird Post Collection)

In 1920 a number of significant events occurred: the Treaty of Versailles took effect, officially ending World War I; the 19th Amendment became law, giving women the right to vote and Adolf Hitler organized the Nazi Party.

That year, however, also marked the genesis of what became known as the “Roarin’ Twenties” – a decade of explosive economic growth accompanied by massive social change that affected every level of American life. In the wake of “The War to End All Wars,” jobs were plentiful, wages were on the rise, working conditions improved and the stock market, traditionally the domain of the rich and famous, became accessible to the working man and woman.



“Matty” Laird’s first airplane was elementary in design and construction. It featured wing warping for roll control and a four-cylinder engine for power. (Joan Laird Post Collection)



The first Laird Tractor under construction in downtown Wichita. The biplane's chief feature was the front cockpit that could accommodate two or three people. (Joan Laird Post Collection)



The photograph taken in 1920 shows four fuselages under construction in Laird's manufacturing facilities located in downtown Wichita. Simple jigs and fixtures were used to fabricate the wood fuselage. (Joan Laird Post Collection)

In the prairie city of Wichita, Kansas, however, the Roarin' Twenties seemed light years away. Founded in the early 1870s when America was rapidly expanding to the west, by 1919 the town's economy was largely based on agriculture and crude oil. Wheat was still king but an increasing number of wildcat wells dotted the landscape.

Although its citizens could not have known what the future held in 1920, the *Peerless Princess of the Prairie* stood on the threshold of a new era that would replace wheat with wings. In 1919 the Aviation Committee of the Chamber of Commerce had designated a large field north of downtown as Wichita's official "aerodrome." One member of that committee, Jacob Melvin Moellendick, believed fervently in the airplane as a vehicle for commercial transportation, and he was seriously interested in forming a company aimed directly at promoting air travel.

Fortunately for "Jake," as he was known around town, he had the money to make that dream come true. Oil had made him a wealthy man. He often made "air trips" to his drilling sites east of the city flying in the front cockpit of a war-weary Curtiss *Canuck* (a Canadian version of the ubiquitous Curtiss JN-4 *Jenny*) operated by the Wichita Aircraft Company, of which he was a principal investor.

The company and its well-maintained airfield were located northeast of the city. Funded chiefly by Moellendick, the fledgling operation offered flight training, an air taxi service and planned to create a passenger/freight airline route between Wichita, Kansas City, Kansas, and Tulsa, Oklahoma. Thanks to Moellendick's cash, four hangars were eventually erected on the airfield to house three *Canucks*.

By mid-1919 it was becoming painfully obvious to Jake that the public had little or no faith in aviation and investors refused to sink their money into what they believed was a high-risk venture with no future. Moellendick, however, refused to capitulate. He was unhappy with the company's day-to-day management and decided to offer the job to his old friend and aviator, William "Billy" Burke. A native of Oklahoma, Billy accepted the challenge and relocated to Wichita, but he quickly realized that the decrepit *Canucks* had to be replaced.

Burke shared Jake's firm belief that aviation was the way of the future and realized that with Moellendick's money combined with his flying and sales experience, a unique opportunity existed to build and sell airplanes on the Plains of Kansas. Both men seized upon the prospect, but they needed an airplane with good performance, low operating costs and room for two people in the front cockpit.

Burke informed Jake that he knew a young, self-taught designer and aviator in Chicago, Illinois, named Emil Matthew Laird. He knew that if Jake would bankroll Laird's latest design for a three-place biplane, it could prove to be the right aircraft at the right time. Late in 1919 Burke traveled by rail to meet with Laird and offered him a proposition that would redirect Wichita's destiny. It was a tempting offer, and "Matty," as he was known by friends, agreed to meet with Moellendick and Burke in Wichita. After many long discussions, Laird realized he was being offered a chance to manufacture airplanes of his own design that dwarfed his previous efforts up to that time. The final agreement included an investment by Jake and Billy of \$15,000 each. Laird's contribution was his design for a new biplane, plus tools and woodworking equipment.

Matty was generally impressed with the manufacturing facilities that were made available to him in the city's central business district, but instead of only one facility



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Completed fuselages with engines and landing gear were moved to the final assembly area where wings were installed. Note the location of the propeller shaft in relation to the water radiator, and bungee cords wrapped around axles to absorb taxi, takeoff and landing loads. (Joan Laird Post Collection)



Ex-Army Air Service aviator Walter H. Beech posed for an informal photograph with a Laird Swallow. He went to work for Laird and Moellendick in 1921 and soon matured into an accomplished demonstration pilot, a skilled salesman and an effective factory manager. (Edward H. Phillips Collection)

there were three separate buildings. Fabrication of the wood airframe would be housed at the Watkins Manufacturing Company, which had occupied the facility to construct agricultural equipment. Laird bought all of the woodworking machines from Watkins and leased

adequate floor space for manufacturing his biplane. Final assembly of each ship would be accomplished next door in the Forum building before disassembly for transport to the airfield northeast of town. There, each airplane would be reassembled, rigged and tested on the ground and in flight before delivery to customers. Despite these inherent manufacturing limitations, by December 1919 the *E.M. Laird Company Partnership* was ready to build its first airplane.

Laird named his new design the *Laird Wichita Tractor* – a term meaning the engine was in front of, not behind, the pilot. There was nothing revolutionary nor evolutionary about the ship, except that its front cockpit could accommodate two people compared with only one for the aging Canucks. By standards of the era was a two-bay, wire-braced biplane of conventional wood and fabric construction with fixed landing gear and a tailskid (no brakes were fitted). It was larger than any of Laird's previous airplanes with a wingspan of 36 feet, length of 23 feet and height of 8 feet, 8 inches. Maximum gross weight was a mere 1,700 pounds.

A Curtiss OX-5 eight-cylinder, 90-horsepower engine powered the *Tractor*. Laird cleverly integrated the water radiator into forward cowling to reduce drag and improve cooling airflow. Matty chose the OX-5 engine because thousands were available after the war at rock-bottom prices, and he wanted to keep the price of the new ship below \$7,000. He finally settled on \$6,500 – a staggering amount at a time when surplus trainers were still available for as little as \$500-1,000. Despite its steep price tag, the *Tractor* represented a logical step forward in postwar design and Matty believed it was worth every penny. It was up to salesman Burke to convince potential buyers that the ship would make them money in air taxi and flight training operations.

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Laird selected the RAF No. 15 airfoil because it possessed good stall characteristics that contributed to a landing speed of about 38 mph. The four wing panels, all of which were interchangeable, had a chord of 58 inches and the two upper panels attached to a center section that was 30-inches wide. Only 1 inch of dihedral was incorporated to improve lateral stability. The main spars were built up from two laminations that formed a box-type configuration. Ribs were made of spruce battens screwed to basswood webs, and No. 8 hardware was used to brace the wing's internal structure. Cotton fabric was doped and sewn to the ribs, followed by two coats of pigmented dope.

The fuselage and empennage were of wood construction with wire bracing, but the elevators panels and rudder were made of welded steel tubing with brazed joints. The front cockpit was carpeted, featured a thick, well-upholstered seat and a footrest to improve overall comfort of the passengers. Flight controls used a conventional stick and rudder arrangement with steel cables to deflect the ailerons, elevators and rudder. Streamline steel tubing was used for the main landing gear.

Fortunately for Laird, there was a good supply of skilled wood and metal workers in Wichita. Early in 1920 he hired a few men to begin fabricating the first airframe, and that number soon grew to 11 by February. Progress was swift, and in March all of the major airframe assemblies had been completed. Although working conditions in the makeshift factory were less than ideal, an air of anticipation began to sweep through the workforce as the airplane emerged in its final form.


Matty was not a trained engineer, but his years of designing and building aircraft provided him with

a basic understanding of testing airframe structures to determine their ultimate strength. In 1920 the science of stress analysis was still in its infancy and Laird had little or no knowledge of the complex equations that were necessary to compute loads imposed on a structure, such as wings.

Instead, he employed an empirical standard test long used by the Army Air Service and the United States Navy. A fuselage with wings attached was inverted and suspended in a special jig only by the wing attach points. Cloth bags filled with sand at a specific weight were laid on the structure at intervals, beginning at the wing root and progressing outward to the wingtips. During the lengthy process, which often

required days to complete, measurements were carefully taken and recorded to document how far the wings deflected from their original, static position. In addition, inspections of the spars, ribs and other components were made before increasing weight to the next level. According to Laird's notes, 5,400 pounds of sand were applied initially, followed by more weight until the wings supported 10,028 pounds of load. That amount was equivalent to six times the airplane's maximum gross weight of 1,750 pounds. The empennage surfaces were tested in a similar manner.

Early in April the first *Laird Tractor* was completed, disassembled and transported by truck to the flying field where the ship



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was reassembled, rigged, underwent engine runs and flight control systems checks in preparation for its first flight. Always the meticulous designed and cautious aviator, Matty scrutinized every inch of the biplane before pronouncing it ready to fly.

Late in the afternoon of April 8, he donned his leather flying helmet, goggles and a jacket before climbing into the rear cockpit. Ground crewmen primed the OX-5 engine, a mechanic spun the propeller with all his might and the Curtiss powerplant came to life; its eight exhaust stacks spitting out puffs of smoke before the engine settled into a staccato rhythm. Matty checked oil pressure and water temperature before signaling the mechanic to remove the chocks. Satisfied that

all was well, Laird advanced the throttle and began taxiing a short distance across the grass and turned the ship into a light, southeast wind.

At 5:43 p.m., the biplane accelerated steadily, its tail rising easily as it passed by a small group of spectators that were invited to witness the momentous event. After a takeoff run of only 200 feet, Laird's creation lifted gracefully into the sky, and two minutes later had attained an altitude of 1,000 feet. Laird began a series of flight control checks and probed the ship's basic handling characteristics. It flew well; Matty was pleased. He flew above the field for another 10 minutes before descending back to earth, setting his creation down gently on the Kansas sod.

What happened next put the finishing touch on what had been a highly successful flight of the first *Laird Tractor*. Although the story has undergone many modifications during the past decades, apparently William "Buster" Lassen, a former Army Air Service pilot who operated the Lassen Hotel downtown, was among the group who witnessed the flight. As Matty was climbing down out of the cockpit, Lassen is reported to have run up to Laird and exclaim, "She flies just like a Swallow!" His statement struck Laird like a brick: "Swallow" was the perfect name for an airplane that flew so well. He quickly exchanged the name "*Tractor*" for "*Laird Swallow*."

Despite the rapidly waning daylight, Burke took the ship up and after climbing to about 2,500 feet performed a series of aerobatic maneuvers that included loops and spins before landing. According to Laird, Burke then took four passengers aloft on two separate flights before darkness ended any further flying that day. In the wake of those flights, Laird and

Burke agreed to proceed with the manufacture of 10 of the biplanes and made further plans to build and sell 25 ships by the end of the year – an ambitious goal for a fledgling company.

Word about the *Swallow* spread rapidly through the Midwest and gradually to the East and West coasts. Within a few weeks of the first flight, Laird began receiving letters of inquiry and telegrams from air taxi operators seeking more details. Although Matty and Billy welcomed interest in the aircraft, what they needed was sales. Among the first customers was the Heddon Aviation Company based in Michigan that bought three Swallows, and by early summer orders were flowing in from New York, New Jersey and Colorado, selling out production for the remainder of 1920.

As business increased for the E.M. Laird Company Partnership, Burke was busy demonstrating the biplane and signing up dealerships while Laird supervised production. By the end of August workers were completing one airplane per week and Matty had high hopes to build two per week by December to meet demand. Laird's success did not go unnoticed by the local press that embraced the city's latest industry: "Our 1920 pride in our production of one plane per week doubtless will serve for a humorous little commentary. In the present state of the aircraft business a factory producing one plane per week is a large factory ... and the future of the business looks bright." As autumn settled in, the payroll had increased to 45 men. They had already built 10 ships and were building another 10.

Although the E.M. Laird Company Partnership claimed that the *Swallow* was "America's First Commercial Airplane," a surprising variety of new, non-military airplanes were already available as

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early as 1919. These included the Ordnance Engineering Company (ORENCO) Type F *Tourister* that accommodated three passengers and the pilot; the Dayton-Wright O.W. 1 *Aerial Sedan* and the K.T. 1 *Cabin Cruiser* that had seating for up to four occupants; the two-place Vought VE-7, Thomas-Morse Type S6 and the Boeing and Aeromarine seaplanes, to name only a few. In response to the loss of military contracts after 1918, airframe manufacturers attempted to win new business by developing commercial aircraft. These companies' aircraft, along with the E.M. Laird Company Partnership, were the first attempts to serve what they hoped was an emerging marketplace.

The 1921 Biennial Census of Manufacturers compiled by the Department of Commerce reported that there were 21 companies building commercial and military aircraft in the United States. Of these, only the E.M. Laird Company Partnership was listed as active in Sedgwick County, Kansas, where Wichita was located. Laird was correct to state that the *Swallow* was not a rebuilt, ex-military machine, but he was quick to point out that what set his design apart from other would-be competitors was that it was built specifically to address the "exacting requirements of commercial aviation," according to Matty. By "exacting requirements," Laird meant that the *Swallow* would make money for its owners.

A letter from Reed E. Davis, sales manager for the North Platte Aircraft Company in Nebraska, reflects the *Swallow's* success:

"Arrived OK with the Swallow and made the trip from Wichita here in three hours 30 minutes using 26 gallons of gas. The first Swallow we got grossed us about \$3,000 in the two weeks we have had it and I believe business will



Four factory-fresh Swallows awaited flight tests before delivery to customers. The Laird company flying field was flat and expansive and hailed by local and transiting pilots as one of the best facilities in the Midwestern United States. (Joan Laird Post Collection)

be equally as good for the next few months. The planes are certainly giving satisfaction to us and the performance is surprising everyone who has used the OX-5 motor in Canucks and JN-4Ds. We have no difficulty getting in and out of small fields carrying two passengers and full tanks of gas, and we have flown the Swallow at altitudes as high as 4,500 feet."

During his first two years in Wichita, Matty Laird had achieved a number of important goals. The *Swallow* was in limited production and selling well, the factory had sufficient orders to remain busy into the early months of 1921, and most important, the company had sold every airplane built and the business was on a firm financial footing. According to the 1920 annual report of the E.M. Laird Company Partnership and its manufacturing subsidiary, the Wichita Laird Airplane Corporation, Laird and Moellendick each held 122

shares of stock and the company was capitalized at \$25,000.

The Laird *Swallow* was the genesis of Wichita's phenomenal growth into America's centerpiece of the early commercial airplane industry. Looking back 100 years later, it should never be forgotten that the city owes an incalculable debt of gratitude to E.M. Laird, Jacob Melvin Moellendick and William "Billy" Burke for recognizing the town's potential to become a major hub of aircraft manufacturing that continues unabated. **KA**

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.

VALUE ADDED



Constant Aviation Treating Aircraft with MicroShield 360 at over 150 Airports

Constant Aviation says it is working around the clock to treat business and private aircraft with MicroShield 360, an FDA-approved* antimicrobial shield. Application crews are now present at more than 150 airports nationwide, and technicians have streamlined the process to less than two hours even on large-cabin aircraft.

“We recognize the urgency operators have to treat their aircraft to help protect passengers, crews and maintenance technicians from bacteria and germs,” said Constant Aviation Chief Executive Officer David Davies. “That’s why we have dedicated more resources to this program. Our objective in expanding the applicator network to airports nationwide is to make it as convenient and efficient as possible for aircraft to be treated.”

MicroShield 360 is a proprietary antimicrobial coating system that kills 99.99 percent of bacteria. It has been >

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-Henry Maier, President and CEO, FedEx Ground

tested for effectiveness and durability, ensuring that treated surfaces are reducing germs 24/7. The coating is clear, colorless, odorless, non-toxic and hypoallergenic and safe for humans and animals.

Each MicroShield 360 application consists of a three-step process: First, an electrostatic disinfectant is applied to all surfaces; then a second, specially formulated disinfectant is applied; finally, a proprietary coating imparts a biostatic finish to treated surfaces, preventing pathogens from living on them going forward.

Since it constantly reduces microbial contamination of bacteria, viruses, mold, algae, yeast, mildew, fungi and odors, the MicroShield 360 coating can play an important role in helping to protect passengers and crew from a wide range of illnesses. These include MRSA, E. coli, Norovirus, C. diff, flu strains, gram-positive and gram-negative bacteria, enveloped viruses including the common cold and more than 90 additional diseases and conditions.


MicroShield 360 is available for all commercial, private and business aircraft. It is offered exclusively through Constant Aviation, the only aircraft maintenance repair organization with access to the treatment. For more information on MicroShield 360, visit constantaviation.com/microshield360.

* FDA-Approved for Direct Food Contact Surfaces

Elliott Aviation Mobile Maintenance Capabilities to Include Inspections

Due to recent uncertain events with COVID-19, Elliott Aviation has announced its mobile maintenance capabilities are available for aircraft inspections and due items. The company's mobile maintenance teams are available for maintenance events for the King Air, as well as the Beechjet/Hawker 400XP, Challenger, Citation, Hawker, Phenom, Premier and TBM aircraft.

"We understand how challenging this time can be for customers including how difficult it can be to logistically plan an inspection or other maintenance events in this environment," said Michael Parrish, VP of Maintenance, Paint, and Interior Sales at Elliott Aviation. "By offering mobile maintenance solutions, customers can ensure their aircraft stays current on a number of calendar or flight time and cycles maintenance items without having to leave their hangar."

Requests for mobile maintenance can be sent to maintenance@elliottaviation.com. 



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Service Bulletin MTB-57-01: Wings – Inspect the Aft Upper and Lower Wing Bolts for Correct Washer and Replace if Needed

Date: March 5, 2020

Effectivity: King Air 90 (applicable variants within defined LJ serial number range), LJ-2055 through LJ-2129; Super King Air 200/B200, serial numbers BB-2019 through BB-2021; Super King Air 200C/B200C, serial number BL-171; Super King Air B200GT, serial numbers BY-152 through BY-261; Super King Air B200CGT, serial number BZ-1; Super King Air B300, serial numbers FL-817 through FL-1065 and Super King Air B300C, serial numbers FM-53 through FM-66.

Reason: To inspect the aft upper and lower wing bolts for incorrectly installed 95-110025-3 Washer, and if installed replace with a new 95-110025-7 Washer.

Compliance – Recommended: This service document should be accomplished at a scheduled maintenance period or inspection, not to exceed 200 flight hours.

A service document published by Textron Aviation may be recorded as *completed* in an aircraft log only when the following requirements are satisfied:

1. The mechanic must complete all of the instructions in the service document, including the intent therein.
2. The mechanic must correctly use and install all applicable parts supplied with the service document kit. Only with

written authorization from Textron Aviation can substitute parts or rebuilt parts be used to replace new parts.

3. The mechanic or airplane owner must use the technical data in the service document only as approved and published.
4. The mechanic or airplane owner must apply the information in the service document only to aircraft serial numbers identified in the *Effectivity* section of the document.

5. The mechanic or airplane owner must use maintenance practices that are identified as acceptable standard practices in the aviation industry and governmental regulations.

No individual or corporate organization other than Textron Aviation is authorized to make or apply any changes to a Textron Aviation-issued service document or flight manual supplement without prior written consent from Textron Aviation.



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Textron Aviation is not responsible for the quality of maintenance performed to comply with this document unless the maintenance is accomplished at a Textron Aviation-owned Service Center.

Service Bulletin 34-4171 R1: Navigation – ProLine Fusion Upgrade to Phase 3 Software

Original Issue: November 15, 2019

Revision 1 Issue: March 12, 2020

Revision Compliance – No Effect: Airplanes previously modified by this service bulletin are not affected by this revision.

Description: Note: This revision replaces the original issue of SB 34-4171 in its entirety.

- A. Updates Step 1 for Aircraft Personality Module (APM) strapping.
- B. Updates Steps 15B(1) and 15C(1) to go thru Step 15H.
- C. Updates Step 22 to provide more instruction for the Pilot's Operating Handbook and FAA Approved Flight Manual.
- D. Updates the Flight Crew Operations Summary.

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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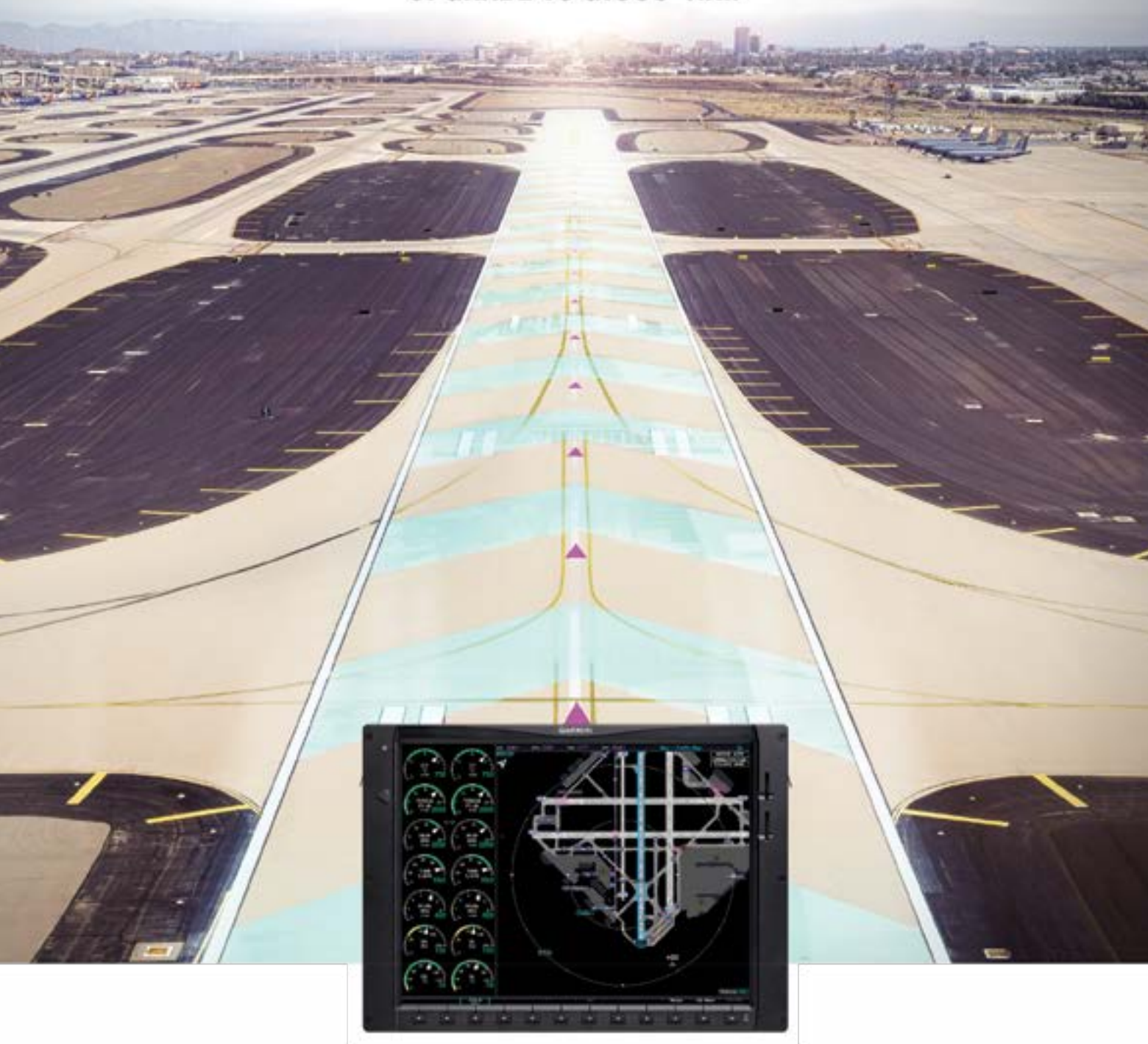
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