King Air

A MAGAZINE FOR THE OWNER/PILOT OF KING AIR AIRCRAFT

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The King Air Market

An Annual Review

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MARCH 2018 Volume 12 / Number 3

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Photo courtesy of
Paul Bowen Photography

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The King Air Market: An Appraiser'

Pricing is at near historic lows … a good time to purchase a used King Air.

by Jim Becker

s View

Each spring, we take an in-depth look at the market for some of the most popular King Air models. This year we are going to do something a little different. Not only are we going to analyze the market for 2017, we are going to look long term at historic trends.

The King Air has been in continuous production since 1964; during those 54 years, there have been many different models produced. From the original 90 to the current 350i, there have been over 7,000 units manufactured encompassing an impressive 25 separate and distinct models of the King Air. There are at least ten variants of the Pratt & Whitney PT6 engine used, with several distinctive airframes.

With all of the various incarnations of the King Air, there are many submarkets within a market. For example, the B200, which was introduced in 1981, has at least seven submarkets within its production, making it impossible to generalize the entire market. The market for a 30-year-old B200 is different from that of a five-year-old 250.

Because there are so many market types, in this article we will again focus only on the variants that are still in production – the C90, the B200, and the King Air 350.

Although we are not going to discuss the older King Air models here, that doesn't mean those renditions are not active aircraft without upgrade options. All King Air models, except the original 90 and some special mission aircraft, showed sales activity in 2017 and there are avionics, equipment and engine upgrades available for virtually all of these models.

Collins Pro Line 21 avionics were added to the King Air C90GT in 2008, and it was rebranded as the C90GTi.

The C90

For this discussion, I am going to talk about the King Air C90B through the model GTx. When looking at the C90 market, there are several defining points where the market views a production change significant enough to affect value beyond an adjustment for the model year.

The C90B was an improved version of the C90A. Introduced in 1992, this model featured new four blade propellers, Collins avionics, and cabin soundproofing.

The King Air B200 has been in production for nearly 45 years and there have been some significant changes throughout the years, which results in several market segments.
(PHOTO CREDIT: ELLIOTT AVIATION)

All but a handful of 1992 models had Collins EFIS-84 and all had Pratt & Whitney PT6A-21 engines. There are 416 units of this model currently in service. The King Air C90B was relatively uniform for its entire production run and, for the most part, the C90B market is fairly homogenous. It is moving in the same direction with little difference at either end. The average number of days on the market for the C90B in 2017 was 278, with 7.5 percent of the fleet sold. Market activity was up significantly in 2017 with eight more units sold over 2016. For the C90B, prices declined slightly in 2017. The selling prices for an average aircraft were between $750,000 and $1,100,000, which is down around eight percent from 2016.

Produced in 2006 and 2007, the King Air C90GT was an improvement over the C90B as the engines were upgraded to Pratt & Whitney PT6A-135A models. This provided a nearly 30-knot increase in airspeed and created a distinct market segment within the 90 series. The C90GT segment is quite small with only 98 models produced. Prices for an average aircraft range from approximately $1,400,000 to $1,450,000. The average days on the market for a C90GT was 363 days with just over five percent of the fleet selling in 2017. Only five C90GTs sold in 2017, which is a decline of seven units when compared to 2016. The C90GT market appears to be trending downward slightly, with pricing declining around four percent in 2017.

In 2008, Collins Pro Line 21 avionics were added and the C90GT was rebranded as the C90GTi. This further segmented the C90 market and created, at one point, a large value difference between a 2007 and a 2008 model. The C90GTi production run consisted of 125 aircraft with eight units sold in 2017, representing six percent of the fleet. This is a significant decrease from 2016, which saw 12 sales of the model. The average days on the market for those sold in 2017 was 328 days. Pricing for an average C90GTi ranges from approximately $1,600,000 to $1,650,000 and dropped approximately three percent in 2017.

The final change to the C90 market came in 2010 with another rebranding. Winglets and composite swept blade propellers were added and the newest C90 was christened as the C90GTx. It is the most current version of the C90 and has a current production of approximately 165 aircraft. Five preowned units sold in 2017, which represents three percent of the segment, a decline of 50 percent or five units when compared to 2016. Average selling time was 300 days on the market. Pricing for a used C90GTx is between $1,750,000 to $2,350,000 for an average aircraft, which is a reduction of around three percent from 2016.

The C90SE, which was produced from 1994 to 1999, has not been mentioned. This aircraft was produced as a lower cost version of the C90B. It featured Bendix King Silver Crown avionics, three-bladed Hartzell propellers, and a more modest interior; it was equipped like an older C90A. Although priced $600,000 less than a C90B, only 14 units were produced as it wasn't a favorite of the C90 buyers of the day. Today, they trade more closely with the C90A than the C90B.

It appears that the older C90B market was the star of 2017 as it was the only one of the C90 models to show an increase of activity over the previous year. This suggests that the C90 buyer is a price point buyer, focused on inexpensive models.

The B200

The King Air B200 model has been in production for nearly 45 years. Although the airframe has been largely unchanged, there have been some other significant changes throughout the years. As such, the B200 market doesn't necessarily behave as a whole unit. For this reason, I broke down the B200 market into seven segments. The original B200 was an improved version of the King Air 200, produced from mid-year 1981 to 2007. Of the 1981-1984 produced B200s, approximately 280 airframes are still in service. Out of those, 27 sold in 2017, making up around 9.3 percent of this segment, which is four fewer units compared to what sold in 2016. The average number of days on the market for a 1981 to 1984 B200 was 292 days in 2017. Prices for an average aircraft of this vintage are between $850,000 and $1,000,000, down around 10 percent from 2016.

For model year 1985, improvements such as hydraulic landing gear, three element wing spar, and triple fed electrical bus created a separate segment within the B200 market. This segment of the market, produced in 1985 through 1993, contains roughly 250 aircraft that are still in service. Of those, there were eight sales to retail customers in 2017, which is four fewer than sold in this segment in 2016. This represents roughly three percent of that segment. The average hold time for these models that sold was 220 days on the market, and pricing was down around 10 percent from the year before. Expect to pay between $1,000,000 and $1,300,000.

For model year 1994, improvements such as a standard four blade propeller and a cabin noise reduction system created another market sector. In this segment, around 180 aircraft remain in service. Of these, 13 units sold to retail customers in 2017, which is on par for the activity in 2016. This represents six percent of that segment. The average hold times for those aircraft that did sell was 197 days. Expect to pay between $1,400,000 and $1,600,000 for an aircraft of this vintage. Pricing in this segment has shown some softness in 2017 with a decline of around five percent.

The redesign of the B200's interior occurred in 1999, as well as an increased TBO to 3,600 hours. The 1999 to 2003 segment contains approximately 190 aircraft. There were 21 retail sales in 2017, making up 11 percent of this segment. Sales were off by five units when compared to 2016. Average days on the market for those that sold was 147 days. Prices for an average B200 in this segment range between $1,700,000 to $1,900,000, which has declined only around three percent during the past year.

In 2004, the B200 received Collins Pro Line 21 avionics. This was a significant improvement over the previous avionics platforms. Because of this, there is a fairly wide price difference between the 2003 and 2004 model years. This segment was produced during 2004 to 2007, and contains 158 aircraft with 13 sales in 2017, two more than 2016. Roughly eight percent of this segment traded hands last year with an average hold time of 247 days on the market. Pricing on a B200 in this segment is still relatively soft with values declining. Expect to pay between $2,100,000 to $2,300,000 for an average B200 of this vintage, which declined around four percent last year.

Another significant model change occurred in 2008 with the switch to Pratt & Whitney PT6A-52 engines, resulting in the aircraft being rebranded as the King Air B200GT. It has an active fleet of 115 units. There were 12 retail sales in 2017, double of the previous year, representing 10.4 percent of this segment. The average number of days on the market for the aircraft that sold was a lengthy 449 days. Pricing on the B200GT is still soft. Expect to pay between $2,400,000 and $2,600,000 for an average aircraft. The B200GT market lost around nine percent of its value in 2017.

The final model segment was with yet another rebranding in 2011. Composite curved propellers, winglets, and Raisbeck's Ram Air

In 2011, composite curved propellers, winglets, and Raisbeck's Ram Air Recovery were added to the B200GT to make the new King Air 250.

Recovery were added to the B200GT to make the new King Air 250. There have been an estimated 187 King Air 250s produced since its introduction. There were 19 used retail sales of the model in 2017, eight more units than in 2016, representing 10 percent of the fleet. The average number of days on the market for the aircraft that sold was 310 days. Pricing on the 250 is trending downward. Expect to pay between $3,000,000 and $3,800,000 for an average aircraft, which results in the market falling slightly in 2017, losing around four percent of its value.

King Air 350

The King Air 350 debuted in 1990, and although it was largely unchanged until upgraded Collins Pro Line 21 avionics were added in 2004, there are still some areas of segmentation with often different activity levels at either end of the market.

Although the 350 didn't really have any modifications from 1990 to 1997, the newer models perform differently in the used market than do the older ones. For this market segment, there are roughly 180 airframes with 19 retail sales in 2017. This equates to about 11 percent of the fleet in this segment. Compared to 2016, there were eight more sales for this model type, and the average days on the market for these aircraft was 186. Pricing on this part of the 350 market was between $1,400,000 to $1,800,000 for an average aircraft. This represents about a six percent drop from 2016.

For the 1998 to 2003 model years, there are about 195 airframes still in service with 22 retail sales last year, up eight units from 2016. This represents 11 percent of the fleet with an average hold time of 229 days. Expect to pay $1,850,000 to $2,250,000 for an average aircraft. This segment has also declined approximately five percent from 2016.

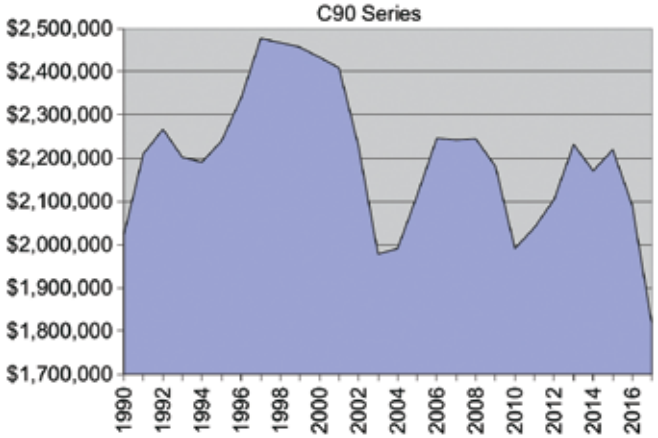
The 2004 to 2009 segment included the change to Collins Pro Line 21 avionics. There are 255 of these aircraft in service with 14 retail sales in 2017, three more sales than 2016. This represents 5.5 percent of this segment with an average hold time of 168 days on the market. Pricing on these 350s are still relatively soft. Expect to pay $2,900,000 to $3,100,000 for an average aircraft, which is a drop of around four percent from 2016.

The 350i was introduced in 2010, and featured an upgraded interior, as well as a sophisticated cabin management system. There have been 404 King Air 350i's produced with 17 retail sales last year, nine fewer than in 2016, representing four percent of the total fleet. The average hold time was 211 days. The 350i market is still trending downward with prices falling around five percent from 2016. Expect to pay between $3,300,000 and $4,300,000 for an average aircraft.

An upgraded interior, as well as a sophisticated cabin management system, was added to the King Air 350 in 2010 and was called the 350i.

The Current Value of a Five-Year-Old King Air

The following graphs depict the value of a five-year-old King Air in any given calendar year since 1990. For example, calendar year 1990 depicts a 1985 model, and 1991 depicts a 1986 model, etc. Data was provided by Aircraft Bluebook, and the numbers were adjusted to the Consumer Price Index (CPI) to reflect 2017 dollars.



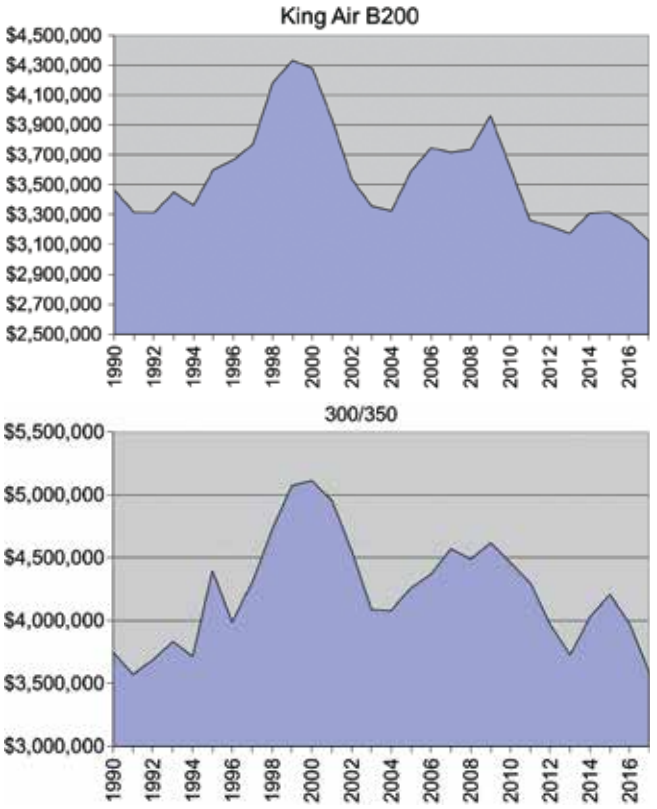
C90 Series: The highest value of a five-year-old C90 was in 1997. Since then there have been three significant periods of decline and two major recoveries. Adjusted prices in 2017 were the lowest in the last 27 years.

B200 Series: The B200 reached the height of its value in 1999. After a steady decline for the next five years, it made a significant recovery in 2008. Not withstanding a small rebound in 2014 and 2015, prices have continued to fall since then.

300 Series: The King Air 350 reached its peak value in 2000. Like the other King Airs, prices fell in the recession years and had several recoveries.

One item of note: There are instances where the graphs show a price increase when the market was declining. This is caused when the five-year-old aircraft had a

significant model improvement. For example, for the B200 and 350 both, prices increased between 2008 and 2009. This is likely because in 2009, the five-year-old aircraft was a 2004 model which was equipped with Collins Pro Line 21 avionics. The market really didn't increase, but the value of the five-year-old aircraft did. You can see this in other models as well.



Summing it Up

As demonstrated, prices are down in 2017 for all of these King Air models. The newer models tend to take the biggest hit as they are still on the steep part of their depreciation curve. Although pricing for the King Airs continues to be soft, we are seeing signs of stability in certain markets compared to previous years.

As you can see from the graphs shown, pricing is at historic or near historic lows. With the growing optimism in the used aircraft market, it is a safe bet that 2018 would be the perfect time to purchase a used King Air. KA

Figures for days on the market and aircraft transaction numbers are courtesy of JETNET LLC. Graph data courtesy of Aircraft Bluebook.

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7 Pilot-friendly Vacat

by MeLinda Schnyder

PHOTOS PROVIDED BY EACH LOCATION

Planning your vacation for the summer or later this year? Fly-in resorts and properties are sprinkled across the United States, offering exclusive getaways that aren't far away. The settings range from the shores of lakes, rivers and oceans, the rim of the grandest of canyons and remote ranches.

Here are only seven of many fly-in vacation destinations available to Beechcraft King Air pilots to give you an idea of what is available.

Eagle Port Lodge at Seeley Lake, Montana

www.thelodgesonseeleylake.com

Owners of The Lodges on Seeley Lake say Charles Lindbergh was a frequent visitor at this resort, where the cabins were first built in the 1920s. They say the famed aviator claimed the view of the mountains from the cabins was one of his favorite in the world.

Eagle Point Lodge, located in near Seeley Lake in Montana, is perfect for pilots as it offers a guest hangar beneath four of the building's lodging units.

The resort is just north of Missoula, Montana, along Seeley Lake, which is flanked by the Mission and Swan mountain ranges. It has grown to include two properties four miles apart. The new structure, Eagle Port Lodge, was built especially with pilots in mind. It is adjacent to the 4,575-foot turf Seeley Lake Airport and offers a 40-by-80-foot guest hangar beneath four of the building's lodging units. A fifth unit is in the structure's tower, which resembles a wooden control tower.

One of the suites is named Beech, and all have spacious living areas, fireplaces and full kitchens. Eagle Port guests have access to the amenities at the sister resort, including a private beach, entertainment lodge, fire ring and boats.

Fly-fishing, water recreation and hiking are popular in the area, which is loaded with lakes and forest, including the 1.5-million-acre Bob Marshall Wilderness Complex.

Nemacolin Woodlands Resort, Pennsylvania

www.nemacolin.com

The 3,900-foot private, paved airstrip at Nemacolin Woodlands Resort sits directly behind two of the resort's three hotels. In all, the 2,000-acre playground offers 320 guestrooms, suites, townhomes and luxury vacation homes.

A King Air taking off from the 3,900-foot paved airstrip at Nemacolin

The resort is in southwestern Pennsylvania, in the Laurel Highlands region of the Allegheny Mountains. With a AAA Five Diamond boutique hotel, 36 holes of championship golf, grooming spa for pets, wellness spa for adults, casino and fine dining options, this can be an excellent choice for a luxury couple's getaway. And with multiple pools, a wildlife academy, zip lines, paintball and a dizzying array of activities, it's a popular family vacation destination in any season.

Nemacolin Woodlands Resort is located on 2,000 acres in southwestern Pennsylvania and offers a wide variety of activities suited for couples or families.

Aviators will want to take a tour of the resort's multi-million-dollar Hardy Family Art Collection, which also includes memorabilia such as signed Wilbur and Orville Wright checks. Take time, too, to explore the collection of vintage planes at the Pride & Joy Airplane Hangar at the end of the private airstrip.

tion Destinations

A ranch house and three chalets are offered for accommodations on the 27,000 acres of Red Reflet Ranch, located at the base of the Big Horn Mountains in Wyoming.

Horse riding is offered on the 100 miles of trails offered at the Red Reflet Guest Ranch in Wyoming and is also available at the Bar 10 Ranch in Arizona.

Red Reflet Guest Ranch, Wyoming

www.red-reflet-ranch.net

Cessna Citation pilots Bob and Laurence Kaplan offer an all-inclusive luxury ranch experience at their Red Reflet Guest Ranch, which has a private 5,000-foot paved runway with GPS approach and lighting.

A working cattle ranch, Red Reflet is near Ten Sleep, Wyoming, at the base of the Big Horn Mountains. The Kaplans bought the 27,000 acres in 2001 and opened the year-round guest ranch in 2005.

Accommodations includes a five-bedroom ranch house and three chalets with one to three bedrooms each. All have high-end finishes, and rates include all meals and most activities. Among the most popular activities is riding horses on the ranch's 100 miles of trails. Others include cattle activities, ATV rides, fishing, hiking, mountain biking, rock climbing. The resort has a pool; fitness center; courts for tennis, basketball and volleyball; shooting range; four-course zip line; and a natural waterpark fed by an artesian well.

Gaston's is in the Ozarks of northern Arkansas offering 400 acres, including two miles of river frontage with 79 different lodging options.

Gaston's White River Resort, Arkansas

www.gastons.com

During a recent telephone conversation, Clint Gaston said a fisherman caught a 20-pound trophy trout in February while

Fishing is a popular activity at Gaston's White River Resort, as well as Madden's at Gull Lake; ocean fishing is available at the Ocean Reef Club in Florida.

staying at his family's Gaston's White River Resort in northern Arkansas.

In addition to what Clint calls the best fishing in the Ozarks, this year-round resort has a 3,200-foot private turf airstrip that regularly welcomes King Airs. It's become a favorite destination for outdoorsmen and families since 1958, when Clint's great-grandfather purchased 20 acres of White River frontage with six boats and six small cottages.

Today, the operation includes 400 acres, two miles of river frontage, more than 70 boats and 79 different accommodations ranging from single-bedroom to a 10-bedroom, 10-bath option.

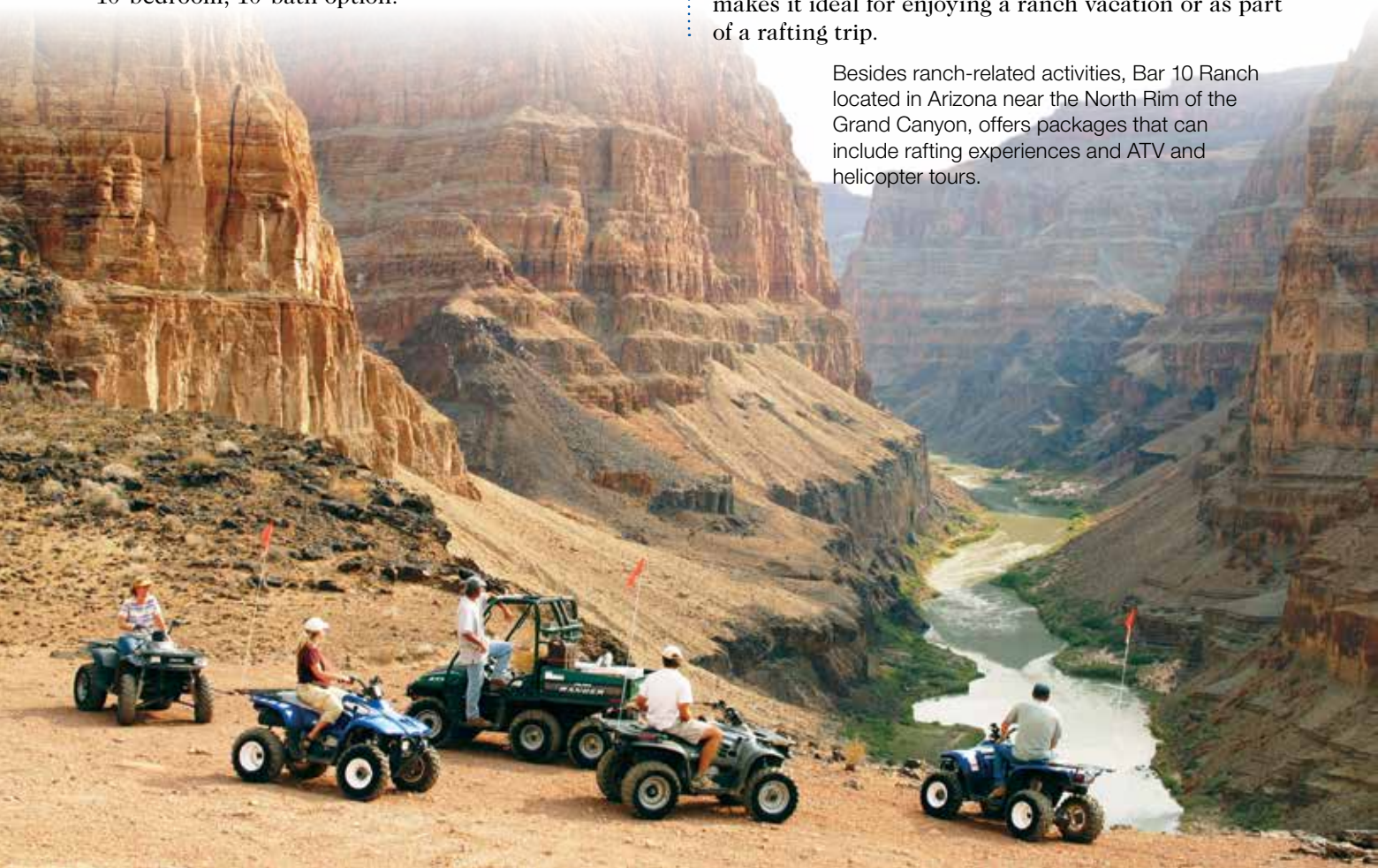
Guests can stay on property to enjoy a restaurant overlooking the river, private club, tennis, fly-fishing school, playground, game room, swimming pool, duck pond and nature trails. Nearby are Bull Shoals Lake, ideal for recreational watersports, and the Buffalo National River, a top destination for kayaking.

Bar 10 Ranch, Arizona

www.bar10.com

The Heaton family has been ranching on the Arizona Strip for five generations, and in the 1970s they opened their ranch to tourists interested in exploring the Colorado River and the North Rim of the Grand Canyon.

Bar 10 Ranch is open mid-March through mid-November, and their 4,500-foot chip and seal airstrip makes it ideal for enjoying a ranch vacation or as part of a rafting trip.



Besides ranch-related activities, Bar 10 Ranch located in Arizona near the North Rim of the Grand Canyon, offers packages that can include rafting experiences and ATV and helicopter tours.

Located in central Minnesota, at the tip of the Pine Beach Peninsula that extends into Gull Lake, Madden's at Gull Lake is on 1,000 acres and welcomes seaplanes to tie up to their private pier. The resort has all the features of a classic lake resort.

The Bar 10 is still a working cattle ranch in addition to welcoming more than 12,000 visitors per year. Guests are treated to delicious country-style buffet meals featuring the ranch's own all-natural grass-fed beef (*Bar10Beef.com*). The ranch crew provides evening entertainment and ranch activities including horseback riding, skeet shooting, hiking and ranch demonstrations. Packages can also include rafting experiences and ATV and helicopter tours.

Accommodations include 14 Conestoga covered wagons with double mattresses, battery operated lantern and a bench seat. A lodge offers five dormitory-style rooms, each with two sets of bunk beds.

Madden's on Gull Lake, Minnesota

www.maddens.com

The 2,600-foot turf airstrip known as East Gull Lake Airport is one fairway away from the main property at Madden's on Gull Lake in central Minnesota. A King Air 250 regularly flies in, said Ben Thuringer, who owns the resort with his parents. Father and son are pilots of a Piper Twin Commanche.

The resort has been in the Madden family since 1932 and the airstrip was added in the 1950s. Located at the tip of the Pine Beach Peninsula that extends into Gull Lake,

A 2,500-acre, self-contained community, the Ocean Reef Club is surrounded by water on three sides in the northernmost part of the Florida Keys. The private club has its own 4,456-foot lighted runway and offers a huge variety of water and land activities to enjoy.

the resort welcomes seaplanes to tie up to their private pier. Guests can earn their seaplane rating while visiting.

The resort includes 1,000 acres and has accommodations for up to 600 guests at a variety of price points ranging from lodge rooms to cabins, cottages and villas. Madden's has all the features to make it a classic lake resort: three golf courses, a tennis and croquet club, three sand beaches stretching over a mile of shoreline, four swimming pools, full-service marina, spa, a kid's program and seven restaurants. The long list of land and water activities includes fishing, trapshooting, bicycling and art classes at an on-site gallery.

Ocean Reef Club, Florida

www.oceanreef.com

Surrounded by water on three sides, Ocean Reef Club in the northernmost part of the Florida Keys is a 2,500-acre tropical private club with its own 4,456-foot lighted runway. The club consists of property owners and social members. Accommodations available to social members and guests include luxury vacation rentals ranging from one-bedroom suites in the 144-room inn to multi-bedroom condominiums, villas and residences.

If you are not visiting as a guest of a member, contact the club's membership department about a guest stay. Unsponsored guest stays are also available during the annual Vintage Weekend, held the first week in December and showcasing vintage automobiles, aircraft and yachts, as well as in conjunction with summer camps for children.

The self-contained community's amenities ensure you would never *need* to leave the grounds while enjoying two 18-hole championship golf courses, tennis and lawn sports, jogging and cycling paths, cooking school, nature center, art league and cultural center, children's programming, spa and salon, diverse dining and shopping options. But it would be hard to not take advantage of the convenience of a 175-slip marina to explore some of the best fishing, boating, diving and snorkeling just offshore surrounding the only living reef in the continental United States. KA

ADS-B, ATC and the NBAA's Top Safety Focus Areas for 2018

by Kim Blonigen

ADS-B News

The FAA issued **Docket No.: FAA-2017-1194, *Change to Automatic Dependent Surveillance Broadcast Services*** which announces *changes in ADS-B services, including Traffic Information Service Broadcast (TIS-B) for a small number of aircraft. The FAA is implementing a filter for certain ADS-B equipped aircraft broadcasting erroneous or improper information when the broadcast information could affect the safe provision of air traffic services. Any aircraft subject to the filter will not have its ADS-B information sent to an air traffic control (ATC) facility nor will the aircraft be a client for TIS–B services. Affected aircraft will continue to receive ATC services within radar coverage using secondary radar information.*

The filter was implemented on affected aircraft beginning on January 2, 2018. For those aircraft that already have ADS-B installed, operators should check to ensure that the ICAO address code (Mode S code) broadcast by their ADS–B equipment matches the assigned ICAO address code for their aircraft. This ICAO address code (Mode S code) can be found at: *http://registry.faa.gov/ aircraftinquiry/NNum_Inquiry.aspx*. Operators can verify what ICAO address code is being broadcast by their aircraft by visiting: *https://adsbperformance.faa.gov/ PAPRRequest.aspx*. Owners and operators whose aircraft are affected by application of the ICAO address filter must contact the FAA Flight Standards Service ADS-B Focus Team at *adsbfocusteam@faa.gov* for guidance on corrective actions and coordination for removal of aircraft from the ICAO address filter.

Also, in one of its latest *SatNav News* publications, the FAA discussed some informative points and gave websites that may be of interest to operators regarding ADS-B:

The Airspace You Fly Reveals the Type of Equipment You Need – If you're flying in Class A airspace, you will need a 1090 megahertz extended squitter (ES)

transmitter. You will also need a 1090ES ADS-B Out transmitter if you operate outside the United States in airspace where ADS-B is required. Always flying below Class A, and not internationally where ADS-B is required? Then you have a choice between a 1090ES or a Universal Access Transceiver (UAT) transmitter. For a detailed look at the ADS-B requirements per airspace, go to *www.faa.gov/nextgen/equipadsb/airspace/requirements.*

The ADS-B Out Mandate Applies to Foreign Operators – The United States' ADS-B-Out mandate will affect foreign aircraft operators. Starting January 1, 2020, all aircraft, including foreign-registered aircraft that operate in, or fly through the United States, must be equipped with ADS-B Out to operate in ADS-B required airspace in the United States. The ADS-B Out equipment must comply with the performance requirements found in *14 CFR sections 91.225 and 91.227.*

And of course, **don't wait to get ADS-B installed**. As you've probably read many times, the closer it gets to the deadline, the more inundated avionics shops will be with appointments. You may be unable to get a service date before the deadline, and you will not be allowed to fly in ADS-B required airspace until your aircraft is ADS-B Out equipped.

Status of ATC Controversy

In mid-February, the White House's Fiscal Year 2019 budget was released and continues to support the administration's view that moving the U.S. Air Traffic Control organization from the FAA to a "non-governmental, independent air traffic services cooperative" would make the system more "efficient and innovative." The report also pointed out that the outcome would be "similar to successful efforts in many other developed countries." If this transition does go through, the initial budget documents propose it could begin in Fiscal Year 2022.

Shortly after the release of the FY2019 budget, the *Wall Street Journal* published an editorial that proclaims that transferring the ATC system to the big airlines will improve efficiency and reduce cost for the traveling public. The article also attacked the National Business Aviation Association (NBAA) for its work in stopping the efforts to privatize ATC; the NBAA, along with other GA organizations, responded quickly. A point-by-point rebuttal to the editorial was released by the NBAA (go to *www.atcnotforsale.com/wsj-wrong* to review). Also stated in the release, "The Journal failed to mention the more than 200 general aviation groups, more than 100 pilot-business leaders, mayors from every state and the majority of American citizens oppose turning over the ATC system to an airline-centric board." NBAA President and CEO Ed Bolen and AOPA President and CEO Mark Baker submitted a letter to the *Wall Street Journal* editors challenging their inaccurate claims that small communities won't be harmed by ATC privatization and requesting the letter's immediate publication.

The NBAA also commented that "the budget proposal released by the president is the administration's blueprint for federal spending in the coming fiscal year," and that "Congress still must take action to reflect its direction on the budget, including the reauthorization and funding of FAA, and other matters related to the nation's infrastructure." Bolen reiterated that "We must let our supporters on Capitol Hill know that business aviation continues to oppose HR 2997 or any other efforts to privatize ATC." They are asking that even if you have contacted Congress before with your position, to please take a few minutes to contact them again.

NBAA Identifies Top Safety Focus Areas for 2018

The NBAA recently released its annual list of Top Safety Focus Areas – topics identified by the NBAA Safety Committee as primary risk-mitigation targets for all business aircraft operators. The safety priorities are intended to help promote safety-enhancing discussions and initiatives within flight departments and among owner-flown operations.

The 2018 NBAA Top Safety Focus Areas are below, with brief explanations pulled for the NBAA's website:

- **Loss of Control Inflight (LOC-I) –** LOC-I accidents result in more fatalities in business aviation than any other category of accident. The NTSB continues to target the issue on its 2017-2018 "Most Wanted" list of safety improvements, citing its linkage in nearly 50 percent of fixed-wing general aviation accidents from 2008 to 2014.
- **Runway Excursions –** Nearly one-third of business aviation accidents are runway excursions, making this the most common type of accident. While often survivable, runway excursions remain a looming safety concern, creating an annual injury and damage toll estimated at $900 million industry-wide.
- **Single-Pilot Operation Safety –** Accident rates are consistently higher for single-pilot operated aircraft than in aircraft flown with a dual-pilot crew. Single-pilot operations are more susceptible to task saturation, and when task saturation increases, so too does the number of errors.
- **Procedural Compliance –** Professional aviators are duty bound to comply with federal, state, local and international regulations, company policies and manufacturer procedures. Yet challenges to procedural compliance remains a significant contributing factor in aircraft accidents and incidents.
- **Ground Handling and Taxi Incidents –** The movement of vehicles and aircraft on non-controlled airport surfaces creates more damage to aircraft each year, as well as associated damage to vehicles, buildings and fixtures on the airport. While there are few fatalities associated with these collisions, the costs associated with aircraft repairs, including time out of service and diminution of value, are significant.

- **Distraction Management** – Distractions result in a loss of situational awareness and continue to be the most pervasive "human" threat to safety in aircraft and other vehicles. Active distraction management of everything from task interruptions to personal electronic devices, is needed in the assessment of risk, as well as management of threats and errors associated with this hazard.
- **Scenario- and Risk-Based Training and Checking** – Increased fidelity and quality of training is the mitigation strategy that will make the most positive impact in aviation safety. This new training and checking approach integrates Aeronautical Decision Making and problem solving via scenarios drawn from operator risk profiles.
- **Positive Safety Culture Promotion** – Most safety data points to the fundamental importance of a positive safety culture, or the lack thereof. An open and non-punitive reporting environment is paramount to the success of any safety program.
- **Inflight Aircraft Collision Risk** – Data has shown over the past year an increase in Traffic Collision Avoidance System Traffic Advisories (TAs) and Resolution Advisories (RAs) as overall demand for airspace continues to rise. Weather impacts traffic flow in busy terminal airspace, and the introduction of NextGen technologies, such as complex arrival and departure procedures, can create challenges.
- **Workforce Competency and Staffing** – Business aviation is always in need of a workforce that can safely manage, maintain, service, design, manufacture, and fly its aircraft. Increased industry workforce needs have recently changed intra-industry workforce dynamics, requiring the business aviation community to attract and retain a current and future business aviation workforce. The business aviation workforce must be timely resourced and prepared with the knowledge, skills and experience to safely lead in business aviation's dynamic environment.
- **Safety Data Sharing and Utilization** – The collection, analysis, and sharing of narrative safety reports and recorded operations data is the basis on which the aviation industry is transitioning from reactive post-accident investigative safety management to proactive, and eventually predictive, safety management. It is imperative that the business aviation community contribute in these communities to further see return on the industry's safety investments.

According to David Ryan, chairman of NBAA's Safety Committee, "This list is the result of spirited collaboration between the dedicated men and women on the Safety Committee, who are committed to not only identifying potential hazards, but also through working with regulators, member companies and other industry stakeholders, to provide the business aviation community with the most effective mitigation tools and strategies."

Each year, during its annual risk-assessment meeting, the committee reviews safety survey results; risk-based safety data; and qualitative input from industry and regulatory partners, other NBAA committees and association members. Following this data-driven review, committee members deliberate and develop a list of safety focus areas for the year.

In addition to the 2018 list, the Safety Committee continues to promote and focus on its five "foundations of safety," considered the heart of the committee's messaging, which are Professionalism, Safety Leadership, Technical Excellence, Risk Management and Fitness for Duty.

For full descriptions and resources, visit *www.nbaa.org/safety-focus*. KA

Heater Operation (and ADF Tuning)

by Tom Clements

Darn it, the heater is out!

Now that we have been in winter's icy grip (well, here in Phoenix, it's more like a warming caress!), your King Air's heater is probably getting some use. This discussion applies to the electric heater in C90s (and all the C90 variants), E90s, F90s, 100s, A100s, and B100s. In these models, the electric heater is a supplement to bleed air heat. Although most useful on the ground, it may also be used in flight whenever bleed air alone is insufficient to comfortably heat the cabin.

On the ground, bleed air is usually quite cool since the compressors are turning slowly at Idle. In fact, there may be no bleed air at all: With the engines not yet started, it surely is nice to be able to heat the cabin using the electric heater in conjunction with a Ground Power Unit (GPU).

Remember that the heater is composed of eight identical elements or grids, four wired together in parallel to make up the Normal heater and an identical four wired in parallel to create the Ground Maximum heater. When all eight grids operate on the ground, it is satisfying how quickly the cabin warms even on the most frigid of winter mornings.

Yet there are some operators who have never fully utilized this wonderful system due to a lack of understanding and/or a lack of recent practice with it. Let's review how to make the heater operate properly and effectively and remind ourselves of some reasons why the heater may not be cooperating today.

First, the vent blower. The heat grids – each using about 36 amps of current – get so hot that they would damage themselves and the heater casing if that heat energy were not carried away by sufficient airflow. Yes, the heater has an overtemperature protection switch, but it is located in the heater's discharge duct, not in the heater core itself. Thus, it will not feel the excessive internal temperature quickly enough to prevent damage. Therefore, the vent blower has an airflow pressure sensor (think pitot tube) that will not allow the Normal or Ground Max heater to operate unless the device senses a good amount of air flow exiting the blower. If ever your vent blower dies, the heater will die with it but then come back to life when the vent blower is replaced.

I suggest that you always position the vent blower switch to the High position when using the electric heater. This not only provides an increased volume of airflow across the grids to move the heat energy into the cabin more quickly, but also ensures that the airflow pressure sensor is more likely to function correctly. In fact, in most serial numbers – LJ-620 and after, LW-120 and after, B-208 and after, as well as in all F90s and B100s – the blower automatically kicks into High speed mode whenever the heater is operating. To prolong the life of the blower, remember to move its switch back to Low or Auto once airborne when the abundance of bleed air heat causes the heater to no longer be operating.

Do a little math with me: 36 amps per grid times four Normal grid elements equals 144 amps. When the Ground Max elements are also running, we double that to 288 amps. Yet, the heater cannot operate without the Vent Blower, so that adds another 20 amps or so. Over 300 amps required to get full heater operation!

With the exception of the momentary demand of the starter motor, this is by far the largest electrical load that the airplane ever experiences in normal operations. A few consequences of this huge demand: First, the GPU must have enough capacity to handle this demand. Using a simple battery cart to run the heater is not a good idea. A powerful GPU is needed.

Second, a single generator has insufficient output to do the job, since its maximum continuous rating is 250 amps. Make sure both generators are on line before running the heater. Also, for you people with three-blade props and hence have your Low Idle speeds set near 50 percent N_1, you will be exceeding generator cooling limits if you apply this much generator load while still at Low Idle. Set both condition levers for about 60 percent N_1 before turning on the heater! And for you people with four-blade props, you may also need to tweak your condition levers a bit forward if the generator load bogs down the engine enough such that the propeller speed drops below the minimum N_p (propeller speed) limit.

Third, the system designers ensured that the high electrical demand of this *comfort* item – the electric heater – would never rob power from more important *safety of flight* items. When switching on any of these anti-ice systems, a relay is activated that prevents the

heater from operating. The heater "Lock Out" systems are (1) windshield heat, (2) propeller heat, and, if so equipped, (3) lip boot heat.

The heater is rarely needed in flight due to bleed air heat. In fact, if you find that the cabin is chilly in cruise and you need to operate the supplemental electric heat to stay warm, the reason is virtually always two weak bleed air flow packs or a single totally dead pack. If you are in cold clouds and need the heater in flight, tough. You're going to be chilly. On the other hand, when you break out on top you can get the heater to join in once your turn off all two or three of your Lock Out items. Remember to get them back on before penetrating clouds in the descent.

Here is how it should go on your next icy winter flight: After starting, make sure your idle speeds are near 60 percent N_1 and then reach for the environmental controls on the copilot's left subpanel. The order is not critical, but here's what we need to do: Bleed Air switches – OPEN, Vent Blower switch – HIGH, Cabin Temp Mode Selector – AUTO; Electric Heat switch – GND MAX.

Immediately the Ground Max heater elements should activate. You will observe a large increase in generator load and, in a few moments, you may notice a rather disconcerting smell of burning material. Relax, it is just the accumulated carpet lint and dirt getting burned off the heater elements that haven't been used in a long time. You will also likely observe in a short time a click sound from another relay and the loadmeters increasing even more. What happened? The Normal heat grids just got added to the Ground Max ones. You see, the Normal heater, in Auto mode, never gets a command to operate until the bleed air has already gotten fully hot. So, it will not come on until the bleed air bypass valves have traveled to the full-hot position. This could take as long as 60 seconds, but it is likely that the bypass valves were probably in a fairly hot position at the end of the last flight (unless a massive cold front passed during the

night!) so usually just a few seconds elapse before the Normal grids join with the Ground Max.

I sometimes teach that the Ground Max heat grids are like the portable little electric heater you plug into the outlet to help the furnace heat that chilly winter bathroom. It has no tie-in whatsoever to the house thermostat or heating system but rather operates in a totally independent fashion. When you position the electric heat switch to GND MAX, it's like you plugged in the portable heater … it operates, period. But the Normal Grids are indeed tied into the environmental system and don't waste energy until the heat of the bleed air – which must come into the cabin for pressurization anyway – is fully exploited.

The electric heat switch is held in the GND MAX position by an electromagnet that is only energized when the appropriate squat switch is activated … weight on wheels. When we lift off at takeoff, this "independent" member of our heating system says good-bye. Even with mediocre bleed air flow, GND MAX will not be needed in flight.

And if you were to forcably hold the electric heat switch to the GND MAX position once airborne, then what? The answer, for you few trivia buffs, is that doing so will indeed cause the Ground Max grids to operate … but the Normal grids, if operating, will shut off! A landing gear uplock switch – not the Squat switch – prevents all eight grids from operating when the gear is retracted.

Remember when I mentioned the burning smell? That can be scary for the passengers so a trick I use is to burn off the lint and dirt periodically by running each heater element for a minute or so on a deadhead cruise leg. To do so, (1) make sure the Lock Out items are off, (2) position the mode selector to MAN HEAT, (3) place the electric heat switch to the center, NORM position (or verify that it is already there), and (4) verify that the loadmeters jump up and the smell begins. After a minute or so, reach over and hold the heater switch up to GND MAX and keep it there for a minute or so to burn off the other grids. Now let go of the heater switch and return the mode selector to AUTO.

By the way, where should you leave the heater switch on warm days? NORM or OFF? It really makes no difference. Realize that in NORM the Normal heater grids never operate until the Bypass Valves get to the full-hot position. So, in this position the normal heater is just *available* to operate, not actually operating. On hotter days, it will never be requested by the automatic heating system.

ADF Tuning

What the heck does ADF Tuning have to do with heater operation?! Absolutely nothing!

I decided to use the remaining article space to throw in a little trick that you may not have been taught. This trick applies only to the Collins Pro Line II tuning heads, the ones that were the standard before Pro Line 21 came along around 2005. The ADF tuning control – like the COMM and NAV control heads – allow a frequency to be dialed into the bottom, Standby window and then it is flip-flopped with the active frequency by momentarily tapping the little transfer switch up and releasing it.

But do you realize that these heads offer an active tuning option? By depressing the little white button just below the tuning knobs for two seconds or longer, the frequency in the Standby window is replaced with dashes and now the upper, active frequency is tuned directly.

Last week I was flying from Houston back to Phoenix on a Sunday in LJ-1190, a sweet 1988 C90A with these types of avionics, and the NFL Conference playoff games

were in progress. How do I find the appropriate AM radio station that was broadcasting the game?

The trick is this: Put the head into the active tuning mode and use the small tuning knob to dial the last two digits to 10. Now use the larger tuning knob to dial in "5." The window shows 510. Listen to the ADF – best to use ANT (Antenna) mode for clearer reception – to find if you hear the game. No? Then move the big knob up one click to get a 6 … 610. Likewise, 710, 810, 910, 1010, 1110, 1210, 1310 to the end of the AM spectrum, 1710. If you are still searching, use the small knob to dial the last two digits to 20 and now repeat the search going down: 1720, 1620, 1520, etc. Try 30 and scan up, 40 and go down, etc. That sure is faster than having to flip-flop from Standby to Active each time, eh?

Before I end this discussion, I will state that my using Direct tuning on a COMM or NAV head is very, very rare but it does come in handy occasionally. For example, suppose I have already entered the Tower frequency in the Standby window while still talking to Approach control in the Active window. The wind shifts, the pattern gets rearranged, and now Approach assigns me another Approach frequency. In this situation I can retain the Tower frequency by going to Active tuning – hold the white button for two seconds – dial in the new frequency, then hold the button again for two seconds to find that the Tower frequency is still waiting in Standby. As I said, rare but handy. KA

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

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

Wichita's Air Racing Legacy Part One

Walter Beech is remembered as one of Wichita's greatest aviation patriarchs, an aviation titan who not only put his name on the best airplanes money could buy, but also was driven by a never-ending quest for speed.

by Edward H. Phillips

Wichita pilot Walter H. Beech sat in the cockpit of the Travel Air *Special*, patiently awaiting the start of the "Free-For-All," 50-mile speed dash at the Tulsa Air Meet in Tulsa, Oklahoma. Beech was one of more than a dozen competitors hoping to cross the finish line first, but as he taxied his biplane to the starting line, Walter told officials that he would be the last to take off! Such an odd decision could only mean one thing – Beech was feeling confident that he was flying the fastest ship in the event.

Suddenly, the starter's flag dropped, and the race was on! The gaggle of airplanes surged forward, kicking up clouds of dust, their engines making so much noise that spectators covered their ears. Crowds cheered for their favorite pilot as the flying machines banked to round the first turn pylon, sometimes flying perilously close to one another. Back at the starting line, however, sat Walter Beech and the Special.

As the last airplane rounded the pylon, Beech shoved the throttle full forward and the 160-horsepower Curtiss engine roared to life. A few seconds later the black and gold biplane was in the air. The competition had opened up a big lead on Beech, but he chose to ease back on the throttle, smoothly flying his steed around the home pylon and onto the back stretch. Walter had plenty of throttle left, but he was content to slowly catch the flyers ahead.

The crowds were on their feet as the sleek Travel Air began to overtake the field, slipping past one and then another of the slower ships. Walter kept a keen eye on the airplanes ahead as the slipstream slapped at his cheeks. He was about to overtake yet another ship, so he skillfully applied right stick and rudder, pushed the throttle farther forward and swiftly left the hapless pilot in his wake. For mile after mile and lap after lap, Beech just kept pushing the throttle forward, passing all but the lead aircraft.

As the last few laps began, Walter applied full throttle and the Special surged forward. He quickly caught the front runners and passed them easily to take the lead. His competitors were stunned by the Travel Air's outright speed – nobody thought the little biplane from Wichita would be so fast! Walter soon found himself five miles ahead of the field and took the checkered flag after flying for 29:26 seconds. He took home a fist full of greenbacks and a handsome trophy for his efforts.

The race was sponsored by the Tulsa Daily World and drew large crowds to the city's airfield outside of town. The team from Travel Air included not only Walter Beech, but company president Clyde Cessna and engineers Mac Short and Lloyd Stearman. Beech struck first by winning the 30-mile race for stock airplanes powered by Curtiss OX-5 engines and beating Travel Air's chief competition, the WACO company based in Troy, Ohio.[1]

As the week-long airshow continued, pilots Mac Short, Stearman and Cessna won six races. Stearman was victorious in the "On-To-Tulsa" cross-country event for the heaviest load carried, and Short took first place in that race for stock (unmodified) airplanes, flying a standard Travel Air Model A. When the Tulsa Air Meet was over, the airmen from Wichita had won five events and placed second in two other races. The trophies awarded to the pilots were displayed proudly in the front window of the small Travel Air factory.

Stearman and Short had been friends for years and both attended the Kansas State Agricultural College (KSAC) before America's entry into World War I in April 1917. When President Woodrow Wilson asked for a declaration of war against Germany and her allied powers, both young men were quick to enlist. Stearman chose the U.S. Navy and Short signed up for the U.S. Army. Although Short completed training as a bomber pilot, Stearman did not win his wings before the Armistice was signed in November 1918.

Short returned to KSAC and spent the next three years earning a degree in mechanical engineering. Upon graduation he became a Junior Aeronautical Engineer at the Army's prestigious McCook Field in Dayton, Ohio. During his brief time at McCook, where he met several soon-to-be-prominent aviators including James H. "Jimmy" Doolittle, Short was involved in

By 1922 Walter Beech was general manager of the Swallow Aircraft Manufacturing Company, had become a talented salesman and was well known in the Midwest region of the United States as an air race pilot.
(SEDGWICK COUNTY HISTORICAL MUSEUM)

many experiments with airfoil designs, drag reduction, engines of all types; supercharging and turbocharging systems, lubricants, fuels, propellers and armaments. Mac resigned from McCook and enrolled in the equally prestigious Massachusetts Institute of Technology (MIT), where he earned a Master's Degree in Aeronautical Engineering in June 1925.[2]

By contrast, after the war Lloyd Stearman went to work as an apprentice architect at a company in Wichita, but in 1919 he was hired by aviation pioneer E.M. Laird as an assistant designer. At that time Laird was beginning to manufacture a three-place, double-bay, open-cockpit biplane known as the "*Swallow*." Lloyd finally learned to fly in 1920 and when Laird resigned and departed Wichita in 1923, Stearman was elevated to chief engineer.

During 1921 he had become friends with Walter Beech, who served not only as general manager of the Swallow Airplane Manufacturing Company, but also developed into a successful salesman, demonstration and exhibition pilot. In 1922-1923, Walter flew various types of Laird airplanes in air races, including one or two that were highly modified Swallow biplanes featuring clipped wings and powered by war-surplus 150-180-horsepower Wright-Hispano Suiza V-type, eight-cylinder engines.

During the late summer of 1925, Short and Stearman approached Walter Beech about building a biplane for

In 1925, engineers Lloyd C. Stearman (right) and Mac Short (center) designed and built the Travel Air "Special" that featured a 160-horsepower Curtiss inline engine. The biplane was built for speed and was flown to victory by pilot Walter H. Beech (left) at many air racing events during the autumn of that year. Maximum speed was 125 mph. (TEXTRON AVIATION)

speed. Initially Beech was reluctant because the priority was building biplanes for customers, not air racers, but he had an insatiable thirst for speed and soon gave his approval. Dubbed the "Special" by Short and Stearman, the new ship would be smaller than production airplanes and feature an entirely different empennage. The fuselage and tail section were fabricated from gas-welded, chrome molybdenum steel tubing for strength and durability. The front cockpit could accommodate two passengers with the pilot seated in the aft cockpit.

Spars and wing ribs were made of spruce, with the upper wing panels spanning 31 feet six inches and the lower panels 25 feet two inches. A positive stagger existed between the wings and all fittings for the landing and flying wires were installed within the wing structure as much as possible to reduce parasite drag. Streamline flying and landing wires, although more expensive than standard wires, were installed. In addition, a small airfoil was fitted between the fixed main landing gear and further reduced air resistance.

The two engineers chose to power the Travel Air with a Curtiss C-6A, inline, six-cylinder engine rated at 160 horsepower. The engine's narrow width and small frontal area would promote smooth airflow, and as a final touch, the powerplant was fully enclosed in hand-made, sheet metal cowling. The coolant radiator was suspended under the firewall and could be raised and lowered mechanically to control water temperature as well as reducing drag. To make the Special just a little more special, the fuselage was painted a high gloss black while the wings were gold, providing a stunning contrast. To accent these colors, the interplane and cabane struts were given a bright, nickel plate finish.

In September 1929, Travel Air engineers Herbert Rawdon and Walter Burnham joined forces to build the Type "R" monoplane. At the National Air Races that year, the powerful and fast *Scarlet Marvel* stunned the aviation world by beating the best speedsters the U.S. Army and Navy could muster, achieving an average speed of 194 mph. (TEXTRON AVIATION)

Soon after the Special's triumphs in Tulsa it was flown by Walter Beech in the inaugural *National Air Tour for the Edsel B. Ford Reliability Trophy.* Henry Ford's son, Edsel, believed in the future of aviation and in 1925 donated a special trophy to the Detroit Board of Commerce. The Board planned an aerial tour of different states aimed at demonstrating to the public that air travel was becoming a reliable form of transportation, and the trophy would serve as a symbol of that event.

Although not an air race, the first "Ford Tour," as it became known, was held in 1925. When the tour ended, 11 pilots had amassed the most points by flying between designated checkpoints. Pilots who landed first won more points, and speed proved to be the key asset throughout the event. In addition to winning cash, the name of each pilot was permanently engraved on the Ford trophy – a monumental object standing four feet high and made of pure gold and silver. Walter Beech and two other pilots flying Travel Air biplanes were among the top finishers, and the trophy was displayed briefly in the Travel Air factory before it was returned to Detroit.[3]

Four years later in 1929, two other engineers at Travel Air created the Type "R" – a single-seat monoplane powered by a nine-cylinder static, air-cooled radial engine rated at 420 horsepower. The engine was manufactured by Wright Aeronautical Corporation specifically for the new racer. The chief designer was Herbert Rawdon, and he was assisted by Walter Burnham. The two men convinced Walter Beech to allow them to build the speedster on their own time but with company money. Chief pilot Clarence Clark flew the Type R for its maiden flight on August 18.

A week later the team from Travel Air arrived in Cleveland, Ohio, for the 1929 National Air Races (NAR). On September 1, Labor Day, the thousands of spectators in the grandstands waited anxiously for the start of Event 26 – the free-for-all race sponsored by the Thompson Products. A story persists to this day that before the race began Walter Beech visited the competition and took bets that the Type R would easily defeat not only the highly-modified military fighters fielded by the U.S. Army and Navy, but the best of the commercial competitors, too.

According to eye witness accounts of the race, the free-for-all speed dash unfolded as follows: "Then the start! All eyes focused on the Army's Curtiss *Hawk* biplane

piloted by Captain R.G. Breene as he jumped into the lead. Close behind him was Navy Lieutenant Commander J.J. Clark in another highly-modified Curtiss *Hawk*. One by one, all seven of the speed demons flashed past the scattering pylon as the crowds stood, cheering at the top of their lungs. Suddenly, they saw the little red Travel Air monoplane flown by Doug Davis catch up with Breene's biplane and pass him to take the lead. Davis kept the throttle all the way forward as the roaring Wright radial gave all it had to keep the racer at the front of the field. The Type R's glossy and highly polished red and black wings strained under the high G-forces imposed by 90-degree banks around every pylon along the course. Lap after lap the Travel Air slowly expanded its lead. 'Only three more laps to go,' thought Davis as he rounded another pylon and streaked down the backstretch at more 220 miles per hour (mph). Then disaster struck! Davis had 'cut a pylon,' meaning that he turned too soon and too tight, flying just inside of the marker. If he did not circle the pylon again he would be disqualified. The time spent correcting that mistake allowed Breene to quickly close the gap, but Davis held onto the lead and soon lapped Colonel Roscoe Turner flying his Lockheed *Vega*. Minutes later Doug and the speedy Travel Air took the checkered flag after flying for 14 minutes and posting an average speed of more than 194 mph."

While Davis was busy in victory circle addressing the crowds and accepting the Thompson Trophy for his stunning victory, Mr. Beech walked around the field, puffing on his ubiquitous pipe and grinning ear-to-ear as he collected bets that reportedly exceeded $8,000.[4]

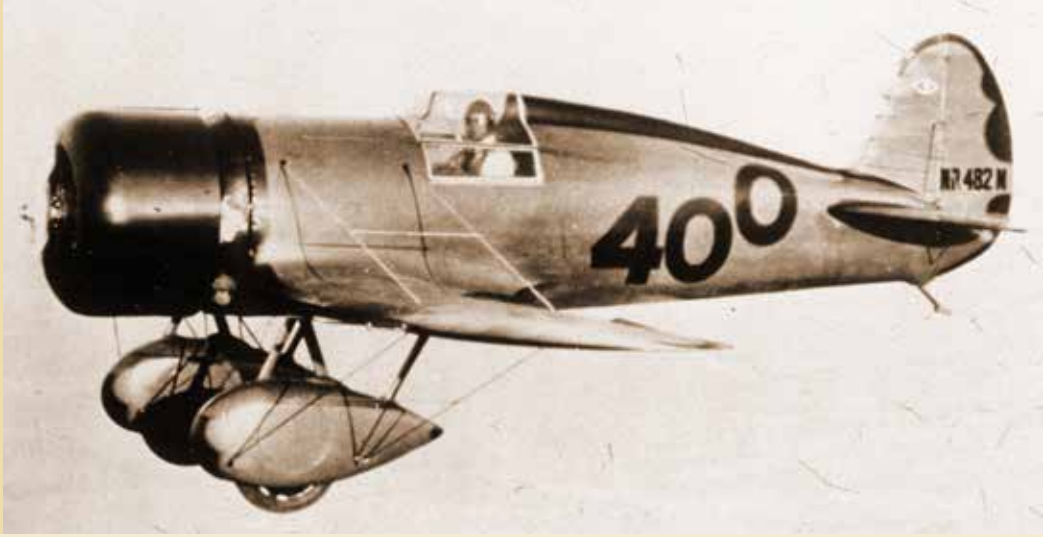
In addition to the little red monoplane's triumph, other Travel Air pilots added to the company's growing list of achievements at the 1929 NAR. These included engineer Ted Wells, who piloted his Type D-4000 equipped with "speed wings" to first place in the Portland-to-Cleveland race, and Louise Thaden, who flew her Type D-4000 biplane from Santa Monica, California, to Cleveland (a distance of 2,500 miles), winning the inaugural Women's Air Derby.[5]

Travel Air's string of victories at the 1929 NAR quickly brought an order from the Shell Oil Company for a Type R custom-built to the specifications of their chief pilot, James H. "Jimmy" Doolittle. The airplane, painted in its dazzling red and yellow scallop scheme, was delivered to Doolittle on March 22, 1930 and cost the oil company a whopping $16,900. Upon Doolittle's arrival at the Travel Air factory, he inspected every detail of the monoplane to ensure that it complied with the specifications. He flew the airplane and, in a letter to the author dated 1982, Jimmy wrote that the *Shell Mystery Ship*, as it was called by the company, was one of the best airplanes he ever flew.

Shell entered the racer in the 1930 NAR where it was flown by James Haizlip, another well-known pilot of the era and an associate of Doolittle's. In the Thompson Trophy Race Haizlip placed second behind Charles "Speed" Holman flying the Laird *Solution* biplane – the only biplane to win the coveted trophy. During the remainder of 1930 and into 1931, Doolittle and Haizlip took turns flying the Type R until it was badly damaged when it collided on the ground with an Army training airplane. Declared as salvage by Shell late in 1930, Doolittle bought the wreckage in March 1931. He planned to sink all of his savings into rebuilding the ship into a powerful air racing warrior.

The reborn Type R was powered by a nine-cylinder, static, air-cooled radial engine built specifically for Doolittle by Pratt & Whitney Aircraft. In its modified form, the *Wasp Junior* was rated at 560 horsepower. Doolittle flew the rebuilt monoplane for the first time on July 18, 1931. The takeoff was spectacular as the ship seemed to leap off the ground and hurled through the air at speeds exceeding 200 mph. A few minutes later, while leveling out barely 100 feet above the ground from a high-speed dive, Jimmy felt the ailerons yank hard on the stick, then the right wing became heavy.

Concluding that he could not regain control of the airplane, Doolittle pulled back hard on the stick,



Famed air racing pilot James Harold Doolittle modified the "Shell Mystery Ship" to compete in cross-country and pylon races. The photograph was snapped just minutes before Doolittle was forced to bail out of the stricken ship on its maiden flight when aileron flutter occurred.
(TEXTRON AVIATION)

The Texas Company ordered a custom-built Type R for the express use of chief pilot Frank Monroe Hawks. He set cross-country and inter-city speed records in the United States and set similar records with *Texaco 1313* in Europe. (TEXTRON AVIATION)

climbed to about 500 feet and bailed out of the crippled ship, which had rolled over on its back. He pulled the parachute's ripcord immediately after jumping clear of airplane. The parachute had barely inflated when he hit the ground. Seconds later the ground shook as Jimmy's expensive racer buried itself into the Illinois sod. Investigation revealed that an aileron push-pull tube had failed. Bruised but not seriously injured, Doolittle walked up to the smoking wreckage, much of it scattered around the area for hundreds of feet and found his ripcord. He considered it a good-luck charm, as he had just made one of the lowest and most dangerous bailouts on record.[6]

Only one other Type R was built to race – the Texaco No. 13. It was specifically constructed to specifications set forth by Captain Frank Monroe Hawks. He took delivery of the ship on July 5, 1930, but an accident occurred on July 11 that put Hawks in the hospital

Walter H. Beech never lost his love of air racing and the quest for speed. In January 1940, Walter and company pilot Tex Rankin flew the prototype Beechcraft Model 18S in the On-to-Miami race for the McFadden Trophy, winning first place. (TEXTRON AVIATION)

and Texaco No. 13 in Travel Air's repair shop. By late July the monoplane was deemed ready for flight and Hawks departed Wichita without incident. Anxious to set a new transcontinental speed record, Hawks and Texaco No. 13 took off from Pittsburgh, Pennsylvania on August 6 and landed in California after flying 14 hours, 30 minutes 43 seconds and establishing a new east-west record. A week later Frank pointed the Travel Air speedster eastward from Los Angeles, California, and landed at New York City's Curtiss Field a mere 12 hours, 25 minutes three seconds later. Hawks had set two transcontinental records in one week. The Travel Air's speed soon gave rise to the statement, "Don't send it by mail, and send it by Hawks!"

Hungry for more glory, Hawks entered the racer in the 1930 Thompson Trophy Race but was forced to land on the third lap because someone had inadvertently taped over a vent on the fuel cap, eventually starving Wright radial engine of aviation gasoline. Hawks flew the Texaco monoplane until April 7, 1932, when the engine failed near North Grafton, Massachusetts. The forced landing seriously injured Hawks and the Travel Air was damaged beyond economical repair. Eventually, it was repaired for static display only and transferred to the Museum of Science and Industry in Chicago, Illinois, where it remains on exhibit in the Transportation Gallery.[6]

During the late 1930s Walter Beech remained very interested in air racing, although his days of competition flying were history as he and co-founder/wife Olive Ann Beech focused their efforts on expanding Beech Aircraft Corporation. In 1940, however, Mr. Beech entered the prototype Beechcraft Model 18S in the "On-to-Miami" Race for the Macfadden Trophy. Company pilot H.C. "Ding" Rankin flew as pilot-in-command with Walter serving as co-pilot in the right seat.

On the bitter cold morning of January 6, the duo took off in the 18S from snow-covered Lambert Field in St. Louis, Missouri, and flew 1,084 statute miles to Miami in four hours, 37 minutes and 50 seconds, speeding across the finish line to the cheers of 10,000 spectators. The Model 18S had easily beaten second place finisher Russell Holderman flying a Lockheed Model 12A *Electra Junior*. Walter Beech and Tex Rankin pocketed $3,000 in prize money for their flight.

The two pilots had flown the Beechcraft at an average speed of 234 mph – the best performance made by a certified commercial airplane in any event sanctioned by the National Aeronautical Association up to that time. Throughout the flight the Beechcraft's two Pratt & Whitney R-985 *Wasp Junior* static, air-cooled radial engines were operated at a power setting of 52 percent of the powerplant's rating of 450 horsepower. Both engines already had accumulated 330 hours of flying time before the race. Total oil consumption was a mere 1.5 quarts for both engines and 208 gallons of fuel were consumed. Three days later the airplane was entered in the Congress Cup Race from Miami to Havana, Cuba. The duo of Beech and Rankin prevailed once again, this time setting a new speed record between these cities by covering 233 statute miles in only 59 minutes.

By the time of his death in November 1950, Walter Beech had long since established his reputation as an aviation entrepreneur, businessman and pilot with more than 10,000 hours in his logbook. It was, however, Walter's enthusiasm and skill as an early air racing pilot that fueled his never-ending desire for speed, speed and more speed. KA

NOTES:

1. Weaver Aircraft Company, universally known as simply "*WACO*" but renamed the *Advance Aircraft Company* late in 1923, manufactured an excellent product line of airplanes that often competed head-to-head with Travel Air. The WACO Model 9 biplane was a direct competitor of the Travel Air Model "A." The company survived the Great Depression and designed the famous CG-4A troop gliders used in the D-Day assault against the Nazi's "Fortress Europe" in June 1944. Advance Aircraft Company ceased airframe manufacture in 1947, and in 1963 rights to the company's name were sold to the Siai-Marchetti company in Italy.
2. In the mid-1920s MIT was one of only a few universities in the United States that offered a thorough course of education specifically designed to graduate aeronautical engineers. Mac Short excelled in that field and later was recognized as one of the best engineers in America. In 1927 he would join forces with Lloyd Stearman again, this time at the Stearman Aircraft Company, located first in Santa Monica, California, and later in Wichita. In the early 1930s Lloyd Stearman resigned from the company and Stearman Aircraft was absorbed into the Boeing Airplane Company.
3. As of 2018, the trophy is on display at the Henry Ford Museum in Dearborn, Michigan, as part of the *Heroes of the Sky* gallery.
4. In 1981 a Travel Air mechanic, who had been working at the races, recalled that later that day Walter Beech split his winnings with all of the team.
5. Famed American humorist and newspaper columnist Will Rogers dubbed the event the "*Powder Puff Derby*" and the name stuck.
6. Doolittle would go on to fame flying the Granville Brother's *Gee Bee* to victory in the 1932 NAR, and in April 1942 led the famous Doolittle Raid on Tokyo flying North America B-25 *Mitchell* medium bombers. He received the Congressional Medal of Honor for his leadership of that mission. He died in September 1993.
7. Of the five Type R airplanes manufactured, only Texaco No. 13 survives.

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.

Nextant Aerospace Receives Final FAA Certification for G90XT

Nextant Aerospace recently announced that it had received the final piece of FAA certification that combines the new single-lever power control system with the previously certified engine and avionics combination on the G90XT turboprop aircraft.

The G90XT features the GE H75 engine along with a fully integrated Garmin G1000 flight deck. In addition to the new power control system, other key technology "firsts" for this airframe include: a cockpit that integrates both engine and fuel monitoring on a digital basis into the MFD, an all-new digital pressurization system, new environmental cooling system that triples the previous cooling capacity of the plane, and an all-new interior that features a new composite shell and incorporates new seats along with an improved cabin layout. In addition to the new technology, the aircraft demonstrates a 20-knot speed advantage at altitude when compared to current production, competitive aircraft.

With FAA certification now complete, Nextant expects that EASA validation will occur within 90 to 120 days. Nextant also announced that it will begin a national demonstration tour featuring the aircraft. Interested parties are encouraged to contact the company for a summary of regional showings at *www.nextantaerospace.com*.

New Flight Deck for the King Air 200

BendixKing, a division of Honeywell, has received certification for the AeroVue™ integrated flight deck for King Air B200 aircraft. The new flight deck is available now and brings business jet technology and functionality to the general aviation cockpit. This is BendixKing's first supplemental type certificate for an integrated flight deck and the first in a planned series of aircraft models.

GARMIN'S #1 AFTERMARKET DEALER BRINGS YOU THE NEXT EVOLUTION OF G1000

The next evolution of Garmin's G1000 is now here, the **G1000 NXi!** At Elliott Aviation, we have completed **more Garmin G1000 installations than all other dealers in the world COMBINED!** Let us offer you the same great installation our customers from all over the world have experienced on a G1000 NXi installation with a 15-day, $3,000 per day guaranteed downtime. For current G1000 owners, the NXi gives you a cost-effective, plug-and-play solution that can be completed in **as little as two days.** As a Factory Authorized King Air Service Center, Elliott Aviation offers on-site training to make sure you are comfortable with your system before you leave.

The Garmin G1000 NXi Features the Following Upgrades over the Standard G1000:

- HSI Map Overlay on the PFD (Flight Plans, Datalink Weather, Traffic, Weather Radar, Relative Terrain and More)
- ADS-B In Technology Using Patented TargetTrend and Terminal Traffic as well as Visual Approaches
- Increased Map Performance with Contemporary Animations and Modernized Design
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- Optional Surface Watch Runway Monitoring Technology

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Per the company, AeroVue includes three high-resolution 12-inch liquid crystal displays with Honeywell's SmartView™ Synthetic Vision System software. The software enhances pilot safety and alertness, especially when flying and landing at night, in bad weather, or at unfamiliar airports. AeroVue includes a track-based flight management system and heads-up display symbols on the primary display that make it easy to "point and fly" exactly where the pilot would like to go. The flight deck also has a cursor control device mounted on the center console that eliminates the need for pilots to reach out to the instrument panel, which can be inaccurate and laborious during turbulence or high workload phases of flight. AeroVue is also compatible with the Aspen Avionics Connected Panel™ Wireless Gateway, allowing updates for navigational aids to happen wirelessly.

These new cockpit technologies bring owners and operators to the digital age with a state-of-the-art integrated flight deck that features a sleek, visually-appealing design and commercial durability. The AeroVue system weighs 125 pounds less than currently-installed equipment, resulting in reduced fuel consumption, greater range and more payload capacity. Finally, AeroVue brings owners into compliance with the Federal Aviation Administration's ADS-B mandate.

Textron Aviation Announces Customer Conference Dates

Textron Aviation is asking their aircraft operators to "Save the Date" for their Customer Conference located in Wichita, Kansas, and held May 14-16, 2018.

Per the company, this year's conference will include knowledge gained from maintenance and operations seminars, exhibits of cutting-edge services and technologies, interfacing with Textron Aviation leaders and experts and networking with other operators from around the world.

More information is forthcoming.

Garmin Announces Expanded Pilot Training

Garmin is pleased to announce expanded pilot training opportunities for 2018 to include additional classes throughout the United States. Instructor-led training classes are available for the GTN 650/750 touchscreen navigator series, the G500/G600 glass flight display systems, and all Garmin Integrated Flight Decks. Supplemental eLearning opportunities are also available, and additional training for the G500 TXi/G600 TXi and G3X Touch series will be added later in the year.

These new training opportunities and locations provide pilots with varying levels of experience and a hands-on approach to learning Garmin avionics in a classroom environment taught by experienced certified flight instructors. Unless otherwise noted, all classes are hosted at Garmin Headquarters in Olathe, Kansas, and include a factory tour, lunch and a Kansas City BBQ dinner.

More details, including the dates and locations for the various courses, can be found by going to: *http://newsroom.garmin.com/press-release/garmin-announces-new-2018-classroom-pilot-training-classes.* KA

The FAA released Safety Alert for Operators (SAFO) 18001 which states the following:

Date: December 19, 2017

Subject: Textron King Air 90-Series Airplane Boost Pump Failure and CROSSFEED Operational Information

Purpose: This SAFO provides safety information to Textron King Air 90-Series airplane owners, operators, and training departments/centers on the possibility of dual engine failure due to improper fuel management during CROSSFEED operation.

Background: The Federal Aviation Administration (FAA) noted in Safety Recommendation (SR) 16.127 that a BOOST PUMP failure in King Air 90-series airplanes leading to automatic CROSSFEED operation could result in dual engine failure if not managed properly by the pilot.

Discussion: With a BOOST PUMP failure and the CROSSFEED switch CLOSED, the High Pressure (HP) Fuel Pump on the side with the failed BOOST PUMP is able to suction-feed fuel from its Nacelle Fuel Tank and both engines continue to operate. During normal operation, the CROSSFEED switch is in the AUTO position and will automatically OPEN in the event of BOOST PUMP failure.

If the BOOST PUMP fails, the emergency procedure in Section 3 of the Aircraft Flight Manual directs the pilot to momentarily close the CROSSFEED valve to determine which pump failed and then open it again, turning off the failed BOOST PUMP. The Emergency Checklist further states "If continued flight with the CROSSFEED closed is required", CLOSE the CROSSFEED and monitor for power fluctuations.

With a BOOST PUMP failure and CROSSFEED OPEN, fuel consumption is double the normal amount from the side with the operating BOOST PUMP. If improper fuel planning allows fuel to be depleted on that side, both engines will most likely flameout while usable fuel remains in the tanks on the side of the inoperative BOOST PUMP.

If that happens, options become limited. If the CROSSFEED valve is subsequently closed manually, the HP Fuel Pump on the side of the inoperative BOOST PUMP may still suction-feed, but if CROSSFEED remains OPEN, the HP fuel pump may instead only suction air through the empty CROSSFEED line. There is no engineering data to determine either way. As such, there is clear risk that a simple BOOST PUMP failure, if not managed properly, could result in dual engine failure.

Recommended Action: During training and operation, King Air 90-series owners, operators, and training departments/centers should emphasize the following:

- In the event of BOOST PUMP failure, if the pilot chooses to continue flight with the CROSSFEED valve OPEN, adequate fuel quantity should be verified on the side with the operating BOOST PUMP considering fuel burn on that side will be double with the CROSSFEED OPEN.
- In the event of BOOST PUMP failure, if CROSSFEED remains OPEN and fuel is depleted on the side with the operating boost pump, a DUAL engine Flameout will most likely occur.
- In the event of BOOST PUMP failure, the CROSSFEED valve must be CLOSED for the HP Fuel Pump to scavenge-feed fuel from the side of the inoperative BOOST PUMP.
- In the event of BOOST PUMP failure, proper fuel monitoring and management is crucial to avoid fuel starvation leading to engine failure and/or fuel imbalance beyond limitations.

Contact: Questions or comments regarding this SAFO should be directed to the Aircraft Evaluation Division's Small Aircraft branch at (816) 329-3233.

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Correspondence

Correction

There was an error in the subhead of Ed Phillip's historical article in the February 2018 issue of *King Air,* titled "Cabin Jobs." The headline and subhead should have read, "Cabin Jobs; *During the 1920s, airframe manufacturers in Wichita, Kansas, produced a series of airplanes that signaled the gradual demise of open cockpit flying in favor of a comfortable, enclosed cabin.*"

Cabin Jobs

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

by Edward H. Phillips

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

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

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

Flying in open-cockpit biplanes was the norm in the mid-1920s, as exemplified here by Walter Beech (front cockpit) and Bruce Goldsborough in a 1928 Travel Air Model BW. As the late 1920s arrived, however, both pilots and passengers began to abandon bulky, heavy flying suits and leather goggles for the comfort of an enclosed cabin. Walter Beech was among the first executives in the evolving commercial aviation industry to recognize that trend. EDWARD H. PHILLIPS COLLECTION

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

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

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Our apologies to Mr. Phillips and our readers for any confusion this may have caused.

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