The ThunderWord

Thunderbird Field EAA Chapter 1217 February 2022 Scottsdale, Arizona

RESIDENT'S CORNER

Greetings from my corner of the hangar. At the January meeting our guest speaker was Steve Ziomek the driving force behind the Thunderbird Field II Veterans Memorial. The Stearman hanging outside the Scottsdale Airport Terminal Building in its dedicated enclosure was the final piece in putting together the memorial.

The good flying weather is here and its nice to see so many of our members out flying their planes. I now have my planes in annual and look forward to some fun fly-ins and giving rides.

In the your not going to believe this crap category, the FAA has changed the meaning of the term NOTAM. In order to non-gender identify the term the new definition is Notice to Air Missions. According to the 176-page rule from the FAA, the name change complies with the Federal Women's Program (FWP) suggestions, as the term Notice to Air Missions is "inclusive of all aviators and missions."

See you around the aerodrome!

Curtis

FEBRUARY CHAPTER MEETING

The February meeting of Thunderbird Field EAA Chapter 1217 will be held on Thursday, February 17th, beginning at 7 pm in the Thunderbird Room Scottsdale Airport Terminal building. The address is 15000 North Airport Drive.

This month Chapter VP Terry Emig has lined up Ed Newberg to be our guest speaker. Ed is one of those guys with flying in his veins. He took his first airplane ride when he was eight in a Cessna 182 and was totally hooked. His Grandfather ran the airport in Saint James, Minnesota and he would spend summers there. What could be more perfect for a kid who loved airplanes.

Ed went on to be a crop duster and had one of the largest spraying operations in the Midwest. He also collected a few of his favorite planes along the way, and was inducted into the Minnesota Aviation Hall of Fame a few years ago. He is now retired and splits his time between Minnesota and Mesa, Arizona, and has fun flying cool airplanes. Besides the flying Ed has written and performed many aviation songs and Terry said we might get to hear a couple of his favorites!

Guests are always welcome!

NEW MEMBERS

At the January Chapter meeting, we had two new members sign up. Welcome aboard to Chuck Kline who is building an RV-14 and Lyle Parker who has built and flies two planes, an RV-6 and an Aircam.

COPPERSTATE FLY-IN

The Copperstate Fly-In/Buckeye Air Fair will take place February 17-20, 2022 in Buckeye, AZ. Copperstate Fly-In is a non-profit organization with a focus on youth education in the field of aviation.

Of special interest this year will be the first ever STOL drags in Arizona. You are invited to see legendary race pilots and Youtube sensations compete for over $10,000- in cash and prizes. The STOL drags will go on each day for two hours.

If you are flying in it is very important to read the NOTAMs for field closures. Go to www.Copperstate.org and it will have all the details for flying in.

READ THE NOTAM

COPPERSTATE.ORG

This month's guest speaker Ed Newberg with his wife Connie and their Timm

TURBOPROP CONNIE

In January 1957: A United States Air Force Lockheed YC-121F Super Constellation departed Long Beach Airport in California, at 10:22 p.m. with a crew of five on board. Flying at an altitude of 27,000 feet (8,230 meters) the Lockheed flew 2,033 nautical miles across the continent to Andrews Air Force Base in Maryland. The airplane crossed overhead at 6:05 a.m, 26 January, Eastern Standard Time for an elapsed time of 4 hours, 43 minutes. The YC-121F had averaged 424.66 knots (488.69 miles per hour per hour) between Long Beach and Andrews.

Unable to land at Andrews because of adverse weather conditions, the YC-121F proceeded to Dover, Delaware, where it touched down at 6:29 a.m. The total duration of the flight was 5 hours, 7 minutes.

The YC-121F was one of two assigned to the 1700th Test Squadron, Military Air Transport Service (MATS), at Kelly Air Force base, San Antonio, Texas, along with turboprop-driven Boeing KC-97 Stratocruisers and Douglas C-124 Globemaster. The airplanes were used to test various combinations of engines and propellers.

Lockheed Aircraft Corporation built four R7V-2s at its plant in Burbank, California for the U.S. Navy and later transferred to the Air Force. The YC-121F made its first flight in April 1955.

The R7V-2/YC-121F was the ultimate variant of Lockheed's Constellation series. It was normally operated by a flight crew of five, and could carry 106 passengers, or 24,210 pounds of cargo. The airplane was 115 feet, 10 inches long, with a wingspan of 117 feet, and overall height of 25 feet, 6 inches. It had a total -wing area of 1,615 square feet. The airplane could be equipped with wingtip fuel tanks, which increased the overall span to 119 feet (36.271 meters). The YC-121F's empty weight was 72,387 pounds, and it had a maximum takeoff weight of 148,540 pounds.

The YC-121F was powered by four Pratt & Whitney YT34-P-6 turboprop engines. The T34 was an axial-flow engine with a 13-stage compressor, 8 flame tubes, and a 3-stage turbine. The T34 had a normal power rating of 4,750 shaft horsepower at 10,500 r.p.m., and also produced 1,125 pounds of jet thrust. The military power rating was 5,300 s.h.p. at 11,000 r.p.m., and 1,250 pounds of thrust (30-minute limit). The takeoff power rating was 5,500 s.h.p. at 11,000 r.p.m., with 1,250 pounds of thrust (5-minute limit). The engines drove three-bladed, 16 foot, 0 inch Hamilton Standard propellers through a 0.0909:1 gear reduction.

The YC-121F had a cruise speed of 310 knots at 25,000 feet, and maximum speed of 386 knots) at 10,000 feet. It had a maximum rate of climb of 4,600 feet per minute from Sea Level at combat weight. The service ceiling was 26,400 feet, but it could reach 32,900 feet.

Continued on page 4


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The transport had a maximum combat range of 1,998 nautical miles

YC-121F 53-8158 was later used by Lockheed as a test bed for the Allison 501D turboprops for the L-188 Electra. It was nicknamed "*Elation*" (*EL*ectra + Constell*ATION*). Both YC-121Fs were salvaged to rebuild two Flying Tiger Lines transports to the L-1049H configuration.

United States Air Force Lockheed YC-121F Super Constellation

YC-121F Super Constellation

CACTUS FLY-IN

The 64th annual Cactus Fly-In will be held at the Casa Grande Airport Friday and Saturday, March 4 and 5, 2022. Even though the event has a large turn-out of antique and classic planes there are usually a good showing of homebuilts and warbirds. There is something for everyone.

This Fly-In has suffered some reorganization pains with the organization that runs the event. That coupled with a really bad wet event and two years of COVID related restrictions and uncertainty has caused a huge down turn in attendance. Hopefully the weather gods will smile on this year's event and the old planes will turn out in force.

64TH ANNUAL
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WWW.CACTUSFLYIN.ORG

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LUKE DAYS ARE BACK

Luke Days, the premier air show in the Phoenix area, will be returning to the skies on March 19-22, 2022.

The USAF Thunderbirds demonstration team will headline the free event, along with dozens of aerial acts performing throughout the two-day show. Luke Days is the first show on the Thunderbirds' 2022 schedule.

"We are incredibly excited to welcome the USAF Thunderbirds back to Luke to headline the return to Luke Days," said Brig. Gen. Gregory Kreuder, 56th Fighter Wing commander. After a couple of tough years tackling COVID-19, we are all looking forward to welcoming all our communities and guests to celebrate the pinnacle of aviation performance this year!"

Concerns surrounding the COVID-19 outbreak led to the cancellation of Luke Days 2020. Luke AFB leaders decided against attempting to host an air show in 2021 to prioritize the safety of the community.

As the date gets closer, more information about the annual event will be available.

RUBBER MEETS THE RUNWAY

Every time an aircraft touches down, the tires are spun up rapidly. As a result, some rubber is left at the touchdown zone. As time goes on, more rubber is accumulated at the touchdown zone. How is this rubber removed from the runway surface?

Rubber build-up at busy airports can get pretty substantial. This rubber must be removed: not only does it build up on the surface, but it builds up in the runway grooves. The runway grooves act like treads on a tire and channel water away from the surface to keep the tires in contact with the runway. When runways are contaminated with water, snow or in this case rubber, aircraft performance calculations for stopping are out the window.

A friend of mine works right off one of the main runways at very busy airport with a lot of UPS cargo and commercial traffic. This runway is closed for several hours every Tuesday for cleaning and rubber removal; the other runway is closed on Wednesdays for the same treatment. There is some highly specialized equipment used to remove the rubber.

DENSITY ALTITUDE & PERFORMANCE REVIEW

By Steve Krog

We are all familiar with the term density altitude, or at least should know of it. But seldom do we take it seriously enough to actually take the time to calculate its effect on our flight on a warm day. Instead, one might think: "It's a bit warm and humid today. I guess it will take a little more runway to take off." That is about the extent of it for many pilots, unfortunately, when considering density altitude.

What exactly is density altitude? How does it affect aircraft performance? And why should a pilot be concerned about it?

In the simplest of terms, density altitude is pressure altitude adjusted for nonstandard temperature. Pressure altitude can easily be found by setting your sensitive altimeter to 29.92 inches in the Kollsman window and then reading what the altimeter is indicating. Using that altitude and correcting it for the nonstandard temperature, we can find today's density altitude.

In today's flying environment, it is quite easy to acquire the density altitude because most all the airports that have automated surface observing system or automated weather observing system services include the density altitude at the end of each recorded briefing.

Understanding density altitude is important for many reasons. It affects engine, aircraft, and propeller performance. Combined, they can create an uncomfortable situation if the pilot has not taken this seriously into consideration.

The most simplistic analogy I have come up with when explaining density altitude to students is as follows. Assume for this discussion that at sea level and 59 degrees Fahrenheit every cubic foot has 100 molecules of air in it. The aircraft we are flying is a Piper J-3 Cub with an 85-hp Continental engine. The propeller is metal, 71 inches long with a 45-inch pitch, commonly referred to as a 7145. According to the manufacturer, the engine will deliver 85 hp when turning at 2575 rpm at sea level and 59 degrees Fahrenheit.

Let's assume the current temperature is 90 degrees Fahrenheit. Since the air is less dense, there are only 75 molecules of air in each cubic foot, but our aircraft needs to experience 100 molecules per cubic foot to perform as desired. Consequently, the airplane's performance will be significantly affected in this situation.

If the engine cannot get 100 molecules of air per cubic foot and is only getting 75 molecules per cubic foot, it will not be able to provide a full 85 hp. The fuel-to-air mixture generated by the carburetor will be on the rich side because of the lack of adequate air, further reducing horsepower. We may only be able to generate 70 hp. How does that affect everything else? Performance is reduced. If you have a fuel mixture control on your aircraft, it can and should be adjusted for density altitude.

Next, let's consider the propeller in simple terms. If it cannot get a full 85 hp delivered to it to obtain 2575 rpm, the rotation speed is slightly less. It can't move the aircraft forward 45 inches with every revolution (under ideal temperature and rpm settings). The aircraft is being pulled through the air at a slower-than-anticipated airspeed. To maintain a constant 60 mph climb, the pitch attitude will have to be lowered to a lesser angle. By lowering the nose, you will gain airspeed but now the rate of climb is reduced.

If you try to maintain the usual climb pitch attitude, the airspeed will suffer and probably only show 50 mph. At this airspeed, you are in a nose-high attitude nearing the back side of the power curve, meaning you cannot climb due to the steepness of the nose. Now you are nose high, cannot climb, and possibly approaching the stall speed of the aircraft. This is where power-on stalls occur.

By lowering the nose to reestablish a 60 mph climb, you may soon find the airplane is only able to gain altitude at just a few feet per minute. Again, this is important to know and

recognize if departing from a runway with obstructions of any kind at the departure end.

Aircraft performance is affected by all the above. If the airplane needs to have 100 molecules of air per cubic foot moving over and under the wing to generate enough lift for flight, the only way to provide that much airflow is to move faster through the less dense air. In a high-density altitude situation, your airspeed indicator may only be showing 40 mph when your true groundspeed is 50-55 mph in a no-wind condition. The same sensation can occur when landing with a high-density altitude.

Again, the airspeed may indicate a proper 60 mph on approach, but your groundspeed is somewhat to significantly greater.

High-density altitude significantly affects the performance of the aircraft systems and, therefore, the entire aircraft.

For example, let's use a common training aircraft that has a 2,300-pound gross weight at takeoff. The outside air temperature is 86 degrees Fahrenheit, the density altitude is 3,000 feet, the surface wind is light and variable, and the runway is turf.

Applying this data to the aircraft performance chart for calculating takeoff distance, the aircraft will need an estimated 1,185-foot ground roll. And to clear a 50-foot obstacle, the distance increases to about 2,115 feet. But these numbers apply to a hard surface runway.

Found in the fine print accompanying the performance chart, there is a statement that says, "For operation on a dry, grass runway, increase distances by 15 percent." Adding this figure, our takeoff roll now becomes 1,363 feet, and we'll need an estimated 2,432 feet to clear a 50-foot obstacle. But the turf hasn't been mowed in more than a week and is about 6 inches tall.

The turf runway we intend to use is 3,000 feet long and has high tension power lines on one end. If you intend to take off toward the power lines, you'll still have 568 feet of runway to spare without factoring in a safety margin for the taller grass. There is no true rule of thumb for operating in taller grass other than it will have some impact on the ground roll. A good, safe, and proficient pilot will usually add 15-20 percent to the ground roll to compensate for the taller grass. As a good, safe, and proficient pilot, would you proceed with the takeoff in this situation?

Surface winds are light, somewhat variable, and appear to be slightly favoring a departure toward the power lines. For safety, though, you decided to take off in the opposite direction to avoid the obstruction. After studying the surface wind, it appears you have an estimated 4 mph tailwind on takeoff. What does that add to the ground roll distance?

Once again, the fine print states, "For every 2.5 mph of tailwind, add 10 percent to the ground roll." In this example, you have an estimated 4 mph tailwind. For safety reasons, you should add 20 percent, giving a ground roll of 1,636 feet.

Are there any other factors a good pilot should consider before making the decision to depart? Consider this:

The published data found in the aircraft pilot's operating handbook (POH) was determined by using a brand-new aircraft — airframe, engine, and propeller. The aircraft you are using is nearly 40 years old, the engine has a little more than 1,000 hours since the last major overhaul, and the propeller has been reconditioned at least once. One can assume the empty weight of this aircraft is also quite different than a new airplane of the same make and model.

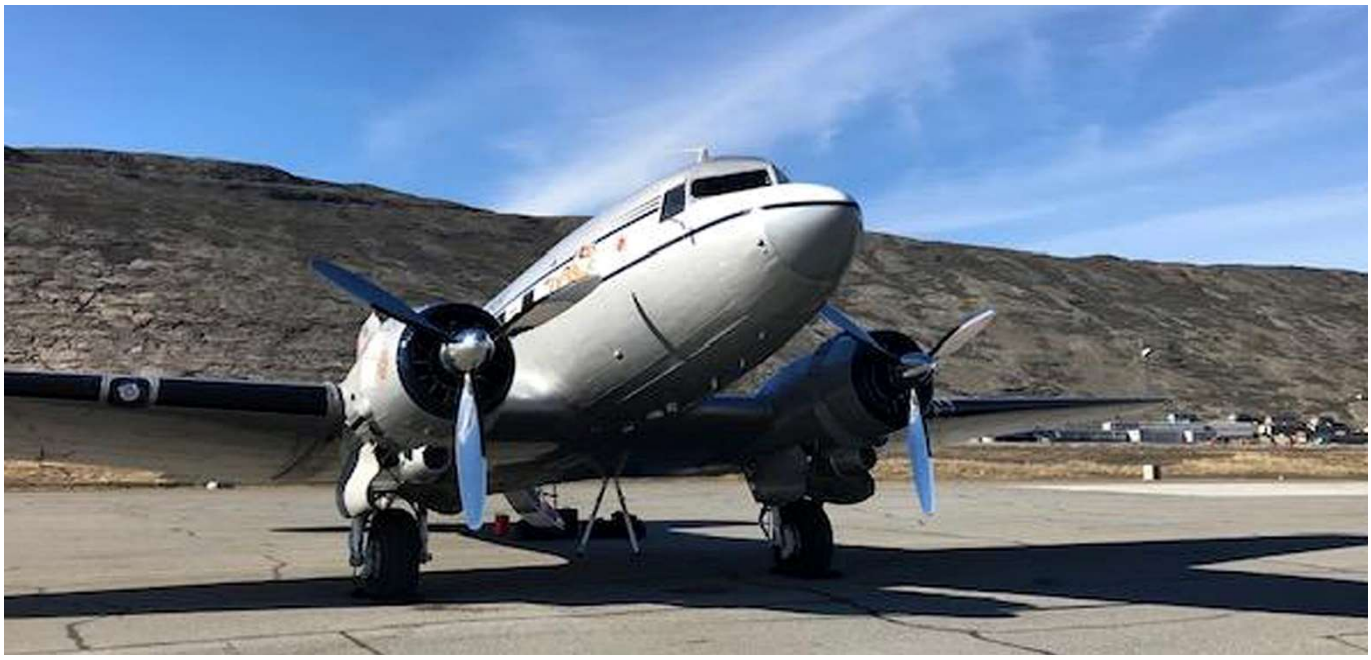
Many pilots I know will, after calculating the takeoff distance using the performance charts, also apply their own established rule and add it to the performance of the aircraft. Some add 10-15 percent to the calculated figures while others add 25-30 percent for a larger safety margin. Much depends on where you are doing most of your flying. If in the Midwest flatlands, 15 percent may be a good number. But if you're flying in hill country, 25-30 percent would be a much safer number to employ when calculating takeoff distances.

Neglecting to consider aircraft performance can cause an incident — or worse. An acquaintance of mine learned this lesson one day last summer when he made an early morning landing at his planned destination. He intended to depart for his home base in the early afternoon. Before taking the time to calculate the required runway, he assumed he could easily make it.

Thankfully, this individual was practicing the rule of picking a “no go” point on the runway. The first attempt was aborted at the “no go” point. Giving it some thought, he decided to try a short-field takeoff. That made little difference and was shut down again at the “no go” point. The third attempt was a combination of a turning move and a never-stopping blend of a short- and soft-field takeoff. Again, “no go.”

At that point, my acquaintance made two smart decisions. First, he retrieved the POH and determined that the aircraft would never get airborne under the current conditions. And second, he parked the airplane and waited until early evening after the temperature had dropped and then made a safe departure.

There are small airports that, under certain conditions, allow you to land safely but will not have enough runway to allow for a safe takeoff. Take a moment and know what you’re getting into before something unforeseen happens.



In 2019, this DC-3 flew to Normandy for the D Day Rememberance

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LONGEZ AND SONEX
Tom Partin has decided to stop flying and has two airplanes for sale at Thunder Ridge air park (AZ28), a 180hp LongEz and a 120hp Sonex. Contact Bertha Partin at bmpartin@gmail.com

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