Higher Living

In this newsletter we welcome N2129C, a Cessna 172S Skyhawk, to our fleet. Also returning is N3816Q, another Cessna 172 that many of you may have previously flown. Both airplanes are currently at KTTA. N3816Q is ready to fly and N2129C is getting an annual inspection and will then be ready to fly.

Spring has begun and so has pollen so if you have allergies, you may be looking at various remedies to allow you to be out. Remember that many decongestants are restricted for use during flight. Also, the flight restrictions can persist for several days after your last dose. Be sure to read the instructions and refer to the FAA restricted drug list at https://www.faa.gov/pilots/medical_certification/media/OTCMedicationsforPilots.pdf.

At KTTA you have probably already noticed that some of the closest ramp parking areas are marked with white paint and the rest are yellow. Please don't use any of the four white marked spaces because they are reserved for transient aircraft. All the yellow spaces are available.

Just a few days ago the first production model of the Beta Technologies CX300 electric aircraft, N916LF, made a visit to KTTA. It is designed as a cargo plane with a pusher propeller. Next versions of it will have four top mounted propellers to allow VTOL operations.

Come fly with us.

- David Williams, Editor

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Redbird TD2	$40/hr

Cessna 172S N2129C

On the ramp now at KTTA is Cessna 172S Skyhawk N2129C, it has many great features to make it a perfect IFR travel and training aircraft. It was flown here from Greeley Colorado, KGXY. The Cessna 172S is one of the most popular light aircraft models used for training, general aviation and recreational flying.

Built in 2003, it has 4 seats, and a fuel injected 180 HP engine. It also includes a Garmin G5 for attitude indicator, Garmin GTN 650 GPS, twin VOR receivers and autopilot.

The cruising speed is about 122 knots with a max speed of around 126 knots. The range is expected to be about 640 nautical miles, and it will likely be able to climb at 800 ft/min.

Those are all figures from the POH and of course the conditions on any given day can affect them.

What is FICON?

FICON, short for "Field Condition", is a system used in aviation to communicate the state of the runway and taxiway conditions to pilots. It provides important information about the airport's ground conditions, which is especially critical during adverse weather conditions like snow, ice, or rain.

Here's how FICON is typically used:

FICON reports are used to convey the condition of runways and taxiways. These reports include information on the surface type (e.g., asphalt, concrete), and whether there are hazards such as snow, ice, water, or debris. The conditions are assessed and reported using a numerical scale, commonly ranging from 0 (completely closed or impassable) to 6 (dry and clear conditions).

The FICON report is issued by air traffic control or the airport authority and provides information about the runway surface, which is vital for pilots to know before takeoff or landing. Pilots use this information to adjust their procedures, such as speed during takeoff and landing or deciding on alternate airports if conditions are not safe.

The system uses a set of standardized codes to report conditions. These codes include factors like:

Surface type (dry, wet, icy, snow-covered, etc.)

Depth of contaminants (e.g., snow accumulation depth)

Braking action (poor, fair, good)

This allows pilots to understand the level of risk they may face during operations on the ground.

An example would be:
RWY 01 FICON 1/2/2 100 PCT ICE, 100 PCT 1IN SLUSH, 100 PCT 1IN SLUSH

That would mean that the approach end of runway 01 is at level 1 condition and is 100% ice. The middle portion of the runway is level 2 and the text reads 100% with 1inch of slush. Finally the last third of the runway is also level 2 with 100% with 1inch of slush as well.

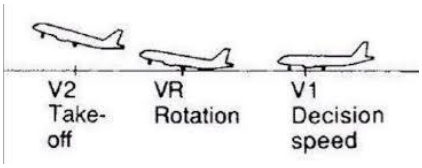
If you would like to see the very in depth FAA notice on FICON it is available as FAA NOTICE N JO 7930.107 at: https://www.faa.gov/documentLibrary/media/Notice/N_JO_7

930.107 Field Condition (FICON) Reporting.pdf

What are V1, Vr and V2?

Have you ever heard the callouts for V1, Vr and V2 being made? While V1 and V2 only apply to multiengine aircraft it's interesting for us flying singles to learn the terminology.

Each of the three callouts can occur during takeoff of a multiengine prop or jet aircraft



V1 is known as takeoff decision speed. Before reaching this speed, it will still be possible to stop the plane on the remaining runway should one of the engines fail. Faster than V1 and there is a very good chance that even with best effort the plane would run beyond the runway end when attempting to stop. Therefor V1 marks the speed before which you can stop but faster and you should continue the takeoff.

Vr or rotation speed is the speed at which the nose should be raised for takeoff. All aircraft have this speed noted in their Operating Handbooks.

Very shortly after Vr comes V2 or takeoff safety speed. Technically V2 should occur at 35 feet above the runway. At V2 and faster a multiengine airplane will be able to climb out of ground effect safely with one failed engine.

If you ever begin flying multiengine planes V1 and V2 will surely be part of your training and preparation for each takeoff.

What Does Mach 1 Really Mean?

I seriously doubt I will ever fly at a speed greater than Mach 1. When the Concorde was flying it was routine for it to exceed Mach 1 and now today there are airplane being designed that could carry commercial passengers at or exceeding Mach 1. So how fast is it and why is it a thing?

Mach is named after the physicist and philosopher Ernst Mach in honor of his achievements. The naming was proposed by an aeronautical engineer, Jakob Ackeret in 1929 and the naming stuck.

Mathematically anything moving at Mach 1 is moving at exactly the local speed of sound. I said local because Mach 1 at a particular location varies with air temperature. So really Mach is a ratio between your speed and the local speed of sound. This is why Mach 1 has also been called the sound barrier.

Since temperature is the main driver in the speed of sound in air and temperature normally falls with altitude the speed of sound also decreases with altitude. Assuming the standard temperatures, Mach 1 is 761mph at sea level and 660mph at 36,000 feet.

The photo above shows a jet aircraft in the process of exceeding Mach 1 and producing a visible shock wave. When an aircraft exceeds Mach 1, a large pressure difference is created just in front of the aircraft. This abrupt pressure difference, called a shock wave, spreads backward and outward from the aircraft in a cone shape. It is this shock wave that causes the sonic boom heard as a fast-moving aircraft travels overhead. A person inside the aircraft will not hear this. The

higher the speed, the narrower the cone; at just over Mach 1 it is hardly a cone at all, but closer to a slightly concave plane as the photo shows.

Mach 2 or 3 are simply double or triple the speed of Mach 1.

As examples an Airbus A320 can fly at Mach 0.82 and an F-16 is said to be able to exceed Mach 2.

How are Maximum Elevation Figures (MEF) on Charts Calculated?

The Maximum Elevation Figures shown on every Sectional Chart appear as the circled number is the illustration below.

They act as a guide to tell us what the lowest altitude we can safely fly at in that quadrant of the chart. How are they calculated?

Step 1: Determine the MSL altitude of the top of the highest obstacle in the map quadrant, whether man-made or natural.

Step 2: Add 100 feet to that because the altitude from step 1 might not be quite correct.

Step 3: If the obstacle is not man-made then also add another 200 feet to that to allow for some clearance due to growth of foliage.

Step 4: Round the resulting altitude up to the next 100-foot level.

That's it. By using these numbers, you can be assured to avoid all objects attached to the ground so long as you stay at a greater altitude than the MEF.

Why Does a Change in Weight Change Va?

The first thing I want to say here is don't try ANY of these maneuvers on your own. They can be truly dangerous to experiment with. Leave it to the test pilots. None of us are test pilots.

Do you remember what Va defines? It is known as maneuvering speed. It is the speed below which you may fully deflect a single control, aileron, elevator or rudder and the plane is supposed to not suffer structural damage. Moving more than one control fully has no guarantee of what will happen. Read about what happened to American Airlines Flight 587 regarding moving more than one control in dramatic fashion.

As an example, for us, let's look at Va for our Cherokee Warrior. The checklist says that Va is 93 knots at 1700 pounds but 111 knots at 2440 pounds. So why the difference? Logically it would appear that if we could damage a lighter airplane at 93 knots why do we need to speed up to break a heavier version of the same airplane?

The answer is in the understanding of what an accelerated stall is and how an accelerated stall can save us from damaging our airplane. We also must know our design load limits, which for a Cherokee Warrior, is 3.8 positive Gs.

An airplane wing can stall at any attitude and any airspeed. Yet most airplane handbooks publish only flaps-up and flaps-down stall numbers, and most pilots practice stalls only at those speeds. Many stalls happen at speeds higher than these slow, controlled speeds. They're called accelerated stalls, and they can happen if the airplane is headed straight up, straight down, or anywhere in between. Generally, accelerated stalls are brought on by turning or by making abrupt control inputs. Are you familiar with understeer in a

car, you turn the wheel hard but the car plows ahead rather than turning? You will likely only see this when attempting to drive on a slippery surface. This is similar in effect to what happens in an accelerated stall.

If we are flying, say at 90 knots, in a lightly loaded airplane and suddenly pull back on the yoke what will happen? Below Va the plane will go into an accelerated stall, rather than a rapid climb, and the wing loading will be unable to reach the 3.8G limit which could damage the plane. Above Va we will be generating enough lift to force the plane into a very rapid climb which could easily exceed the 3.8G load limit (and perhaps remove the wings from the plane). In other words, at Va, or less, for the airplane weight you will stall before you damage the plane.

So why the faster Va if we are heavy?

A heavy airplane must fly at a greater angle of attack to maintain level flight than a lighter version of the same plane (assuming same airspeed). So, at the 90 knots in our example the heavier airplane is already closer to its critical angle of attack and will go into an airplane structure saving accelerated stall with a bit less effort on our behalf. Therefore, to make all things equal the heavier plane can fly faster, thereby reducing its initial angle of attack closer to what the light airplane was experiencing before it enters a stall rather than bending metal.

There is a formula to calculate Va at any airspeed. Just Google "formula for maneuvering speed".

What Does STNR Mean?

If you had been reading NOTAMS in our area on March 17 you could have seen this one:

ZDC AIRSPACE DCC FARMVILLE STNR ALT RESERVATION WI AN AREA DEFINED AS 371400N0784900W TO 371400N0780400W TO 365000N0781900W TO 364600N0784700W TO 365200N0790300W TO POINT OF ORIGIN 5000FT-12000FT 2503191415-2503191515

A "STNR ALT RESERVATION" refers to a stationary altitude reservation. It is used in NOTAMS to indicate an altitude reservation encompassing activities in a fixed area, such as aerial refueling, rocket firings, or similar operations. It is in a fixed, stationary area, as indicated by the collection of latitudes and longitude pairs defining the area. This is the opposite of a moving or changing area. The reservation is used to ensure airspace safety and prevent conflicts with other non-participating aircraft.

How to Get a Seaplane Rating

A while back I was thinking about how to keep my pilot skills updated and decided to investigate getting a seaplane rating.

I met with Mr. Henry Joyner and his son David at the NC18 Rat Landing for a 2-day course. At the time I was there he had a Piper Cub but now they fly a Husky.

The FAA does not specify a fixed number of hours that are required to add seaplane to your pilot certificate. Altogether I received about 5 hours of flight time which ended with a flight test on the second day. The cost they currently list on their web site is $2500.

The location is the Chowan River, which is quite wide at their training site, but we also did some landings in narrower areas. I had been curious how it felt to take off and land. After all, the takeoff and landing are the only water related issues because once in the air you are flying a plane like you normally would. If there is any wind it will naturally rotate the plane in the water, so you are facing the best direction, terrain permitting. Taking off involves accelerating the plane enough to have the floats ride up high in the water and in my case, I had to roll the plane slightly to one side at lift off to raise one float first to reduce friction. During landing you must be careful not to misjudge your distance to the water. The day I was flying the water was very calm which reduces your concept of distance to the surface. Once you touch down you hold the nose back and the water decelerates you very quickly but smoothly.

Once I got past the nuances of takeoff and landing my challenge was to bring the plane up close to the dock. It wasn't easy. The wind constantly tries to rotate the plane in the water and the current of the river has other plans. There is a separate water rudder that helps but I still struggled with making the dock and the plane meet at the proper place.

It was great fun and I recommend you trying it. One downside to this is that I don't know of ANY place in the area where you can actually rent a seaplane so I consider this to be mostly a bucket list activity.

If you are interested in adding this to your pilot certificate please check out the Chowan River Rats web site at: www.chowanriverrats.com to see how you can become a seaplane pilot.

Question of the Quarter

When you roll the trim wheel DOWN in a Cessna which way does the trim tab surface on the horizontal stabilizer move? Up or down?

Answer:

It moves down. Trim tabs work by deflecting the elevator in the opposite direction of the trim wheel. For example, to make the nose of the plane go up, you roll the trim wheel down, which deflects the trim tab down. This causes the elevator to deflect slightly upward, which pushes the tail down and the nose up.

You just learned something new.

The "Higher Living" newsletter editor can be reached at david@execft.com Your feedback and article subject suggestions are welcome.