# The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

August 2019

## Editors

Phil Corman & Jim Price

## Contributors

Bruce Jaeger | Bob Kromer | Tom Rouch | Geoff Lee | Linda Corman

## Departments



## Features



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# From the Editor

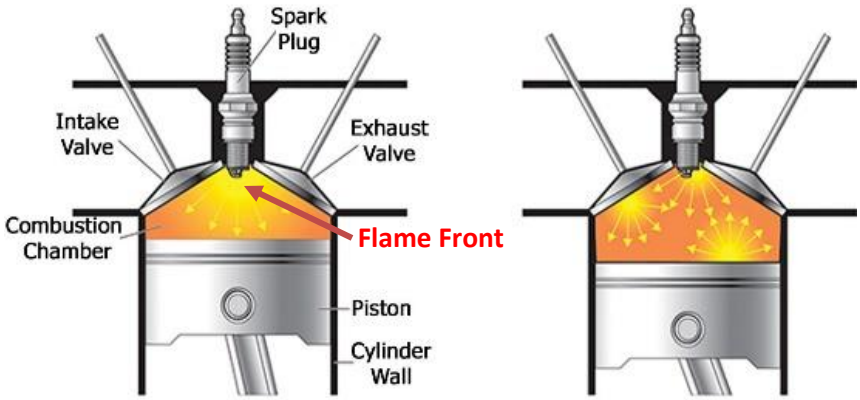
## Phil Corman

### Pre-Ignition vs Detonation

Anyone who has ever observed how settled fuel vapors ignite has seen how the flame front progresses smoothly from the source of ignition to the outer edges, where flammable vapors reach a point of dilution which stops the burn. This is exactly how fuel must burn within a piston engine to develop power without doing damage. Detonation refers to the condition where remote pockets within the fuel air mixture explode violently due to rising pressure following regular ignition. Pre-Ignition refers to the condition where either a mistimed spark or another source of ignition exists within the combustion chamber, allowing the burn to start well in advance of the normally timed spark. Pre-Ignition and Detonation can often overlap each other, usually from detonation damage causing pre-ignition.

With the hot summer months upon us, this can become a more important item to monitor as our CHTs may climb in the hot summer heat, especially during departure climbs.

**Detonation**

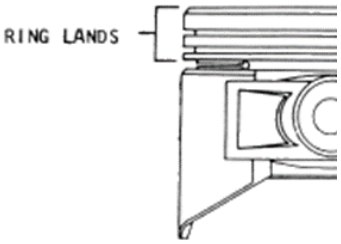


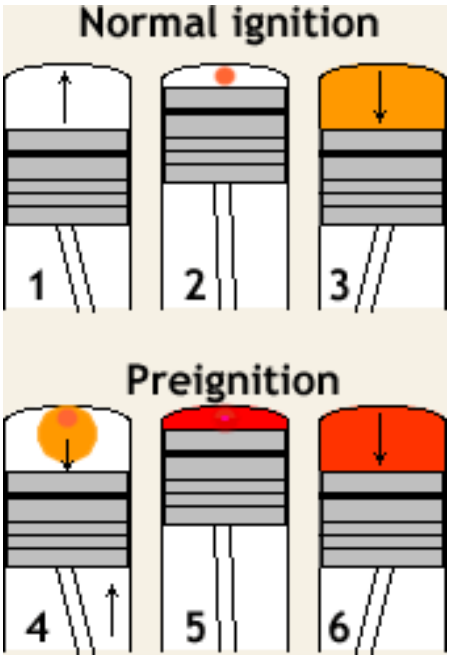

Detonation is uniquely distinguished by the fact that it cannot occur before the spark plug fires. When the spark initiates burning within the cylinder, the flame front is expected to progress through the cylinder evenly, creating heat and even pressure to push the piston down. As the burn starts, cylinder pressure quickly rises. If combustion chamber parts are hotter than usual, this can cause remote pockets within the cylinder to spontaneously detonate. This can also occur when fuel octane is below the requirements of the engine.

Causes of detonation are limited to excessive heat and low octane. Excessive heat can come from improper cooling, high compression from excessive combustion chamber deposits, lean mixture, advanced timing and more. When it is limited to one cylinder the likely culprit is a partially clogged fuel injector, which allows one cylinder to operate much leaner than the others. Intake leaks can also lean the mixture, but are usually noticed during low manifold pressure operation where the symptoms of a leak become much more obvious.

Detonation caused by low octane fuel is more likely to affect several cylinders since the contributing factor is present in all cylinders. Detonation can be difficult if not impossible for a pilot to detect from within the cockpit.

Detonation can occur for some time before severe damage occurs or it can very quickly progress to severe failure, depending on how bad it is. Minor detonation can cause damage that in time will likely progress to an increasingly severe condition. It occurs at the far reaches of the combustion chamber and as a result, usually causes the most damage at the piston edges. It causes rapidly rising temperatures at the piston edges, which can allow subsequent detonation to damage ring lands. It can also trigger pre-ignition due to the hot spots. Once this occurs, the damaged piston edge is exposed to severe heat and pressure, which can cause a hole to be burned through the corner of the piston. Leaking combustion gasses pushing through broken ring lands can also cause torching at the piston edge, which quickly progress to failure of the seal between the combustion chamber and the crankcase.




**Pre-Ignition**

Pre-Ignition is defined as combustion that begins before the regular timed spark. Pre-Ignition can occur alone or as a result of detonation. Hot spots from detonation, improper heat range spark plugs and glowing carbon deposits from lean mixtures are common causes of pre-ignition. Carbon deposits do not usually accumulate when the lean mixture is chronic. However, normal deposits can be quickly heated to glowing temperature when a fuel injector suddenly becomes partially clogged. Carbon tracks within a magneto that allows a cylinder to get the spark from another cylinder can also be a cause.

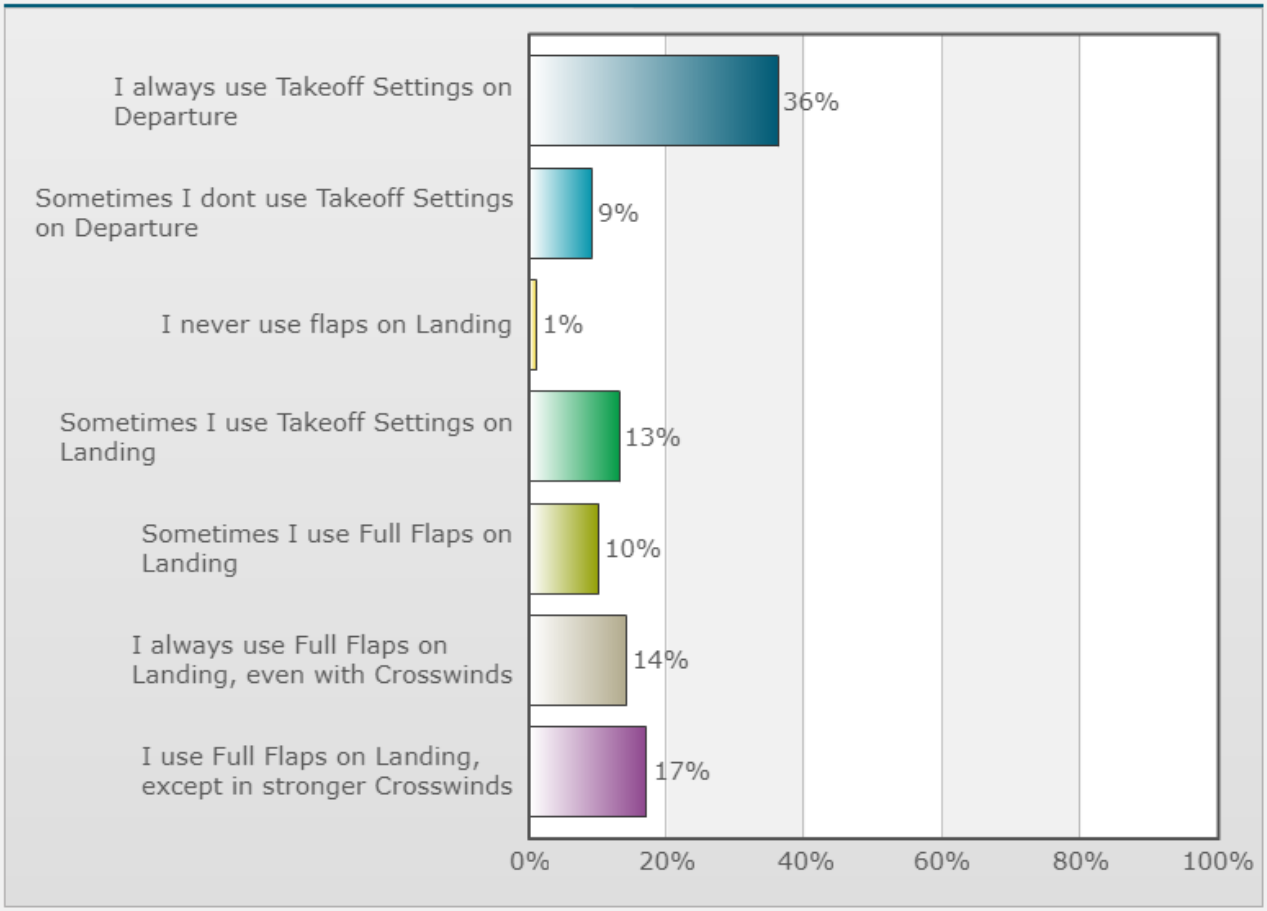
Most cases of pre-ignition will start at or near the beginning of the compression stroke since a combustible mixture becomes more difficult to ignite as pressure rises. This causes severe stress on the engine and can quickly burn a hole in the piston, most often in the middle. Pre-ignition will cause a sudden loss of power as the affected cylinder is working against the normal rotation of the engine. Severe heat results from compressing a burning mixture. No power is extracted from the burn, resulting in the cylinder parts absorbing all heat the energy.

Damage from either detonation or pre-ignition is severe. Once the seal between the piston and the crankcase is breached, pressurization of the crankcase can push crankcase oil overboard causing possible oil starvation and additional damage. Engine contamination and the severe stress imposed will require the engine to be completely disassembled. All parts must be assessed for contamination issues and all stressed parts must undergo the appropriate nondestructive testing (NDT) for integrity.

# Regarding Flap Settings

Poll created by Phil Corman on 05/04/2019

## Poll Results




Next month's poll: "Do you own a Mooney?": **CLICK HERE** to vote.


**Send your comments to editor@themooneyflyer.com**

**RE: Flaps** - The poll doesn't let you separate your take-off from landing flap usage, so you are going to lose some information there.

Regardless, as a CFI who specializes in Mooney training, I can certainly say that your poll doesn't really get to the heart of flap usage in the Mooney.

We pilots tend to be creatures of habit rather than analytic thinkers. That means most of us just do what we were taught a long time ago without any real analysis of whether or not it produces the best results for the particular flight operations planned. This is why, during transition training, I make the new Mooney pilot do takeoffs with zero and 10 degrees of flaps, and landings with zero, 10 degrees, and 40 degrees of flaps. We also go out and do a full stall series with the gear and flaps extended and retracted to see how they affect acceleration, deceleration, and stall speed. With that information under their belt, we then approach the issue of proper landing speeds.

One of the things that surprises me (or maybe not) is that the landing performance charts for the Mooney include the adjustment for the gross weight. As the aircraft is lighter, approach speeds go down (by the square root of the ratio of the landing weight to max gross weight, if you must know). Of the light GA airplanes, the Mooney performance charts are the only ones I can recall that include this information. The fact that they did certainly suggests that the factory felt it was necessary for the pilot to be aware and adjust accordingly. I teach awareness of and adjustment for approach speed for landing weight as part of Mooney transition training.

So why might this be critical? I believe it has to do with the tendency of the Mooney to land nosewheel-first if the flaps are extended and the approach speed is too high. We have all seen the "Mooney Bounce" and have possibly experienced it for ourselves. It can almost always be attributed to trying to force the airplane on the runway while the airplane is flying too fast. If you are fast, you have no choice but to hold the airplane off until almost at the stall. This is going to eat up a LOT of runway as you float ... and float ... and float. If you don't, a bounce is likely.

So this where we might change our use of flaps. I normally adjust my approach speed to 1.3 Vs0 at my landing weight (which is the weight-adjusted speed published in the landing performance charts) and land with full flaps, even with a crosswind. The flaps don't change the approach speeds

all that much so landing in a crosswind with full flaps doesn't really make much difference. The big difference comes when landing with no flaps. Approach speeds don't change that much, but the deck angle sure does. If you must land fast for any reason, e.g. ATC has asked you to keep the speed up on final or you are doing a formation landing, the no-flap landing is your friend. It keeps the nose-wheel off the ground, even if you are fast and virtually eliminates the likelihood of a bounce. You can use your brakes a lot sooner so landing distance isn't increased by much.

So, flaps are a tool to use to change the characteristics of the approach and landing. Don't get locked into only using flaps one way. Flaps are your friend. Use them to change the landing characteristics of the airplane to meet your immediate needs. **Brian L (**51 years and 12,000+ hours)

**RE: iPad Overheating** - As a confirmed Mooney "cheap bastard", I found a way to keep my iPad cool. I use a Ram mount on the centre post, with an iPad Air. Before my mod, the iPad would shut down any time the sun could heat the mount. Now, it never shuts down. The only thing I did was spray paint the back of the mount a shiny white. Problem solved the correct Mooney way, for under $5.
**Chris S**

**RE: Overheating iPads** - Here's my Ram iPad mount, painted white on the back. It now reflects heat, instead of absorbing it. My iPad has never overheated since I did the paint, even flying into the sun. I have it mounted high on the center post, so it gets all the sun.


**RE: Mooney Control Locks** - This is what I made last week. The only part I glued together were the parts that slid over the front seat backs and that might not even be necessary.

I used a larger tube on one side of the H. It helped keep the H in position so it would wedge tighter between the bottom of the passenger rear seat and seat frame. This might only apply to my airplane, however (it's an old rat).

**Aileron Lock**

The two Tee's are large enough to slide over each control wheel (vintage Mooney). I then made a cardboard template so I would know how much angle I needed to put into the crossmember as I heated it with a heat gun. I then cut the crossmember to the proper length, keeping it just a bit tight as I fitted the two Tee's into the crossmember. Too long and you won't be able to join the yokes. Too short and it will fall apart. DO NOT GLUE THESE PARTS. You want to be able to move them around when assembling/disassembling. The third Tee will slide over the co-pilot yoke Tee and keep everything locked. This locks the ailerons. The high point of the bend will always be up, so the two control wheel angles align with the Tees.

The locking Tee will also pivot to allow alignment with the pipe that joins the aileron lock to the H, which will tie everything together.

**Elevator Lock**

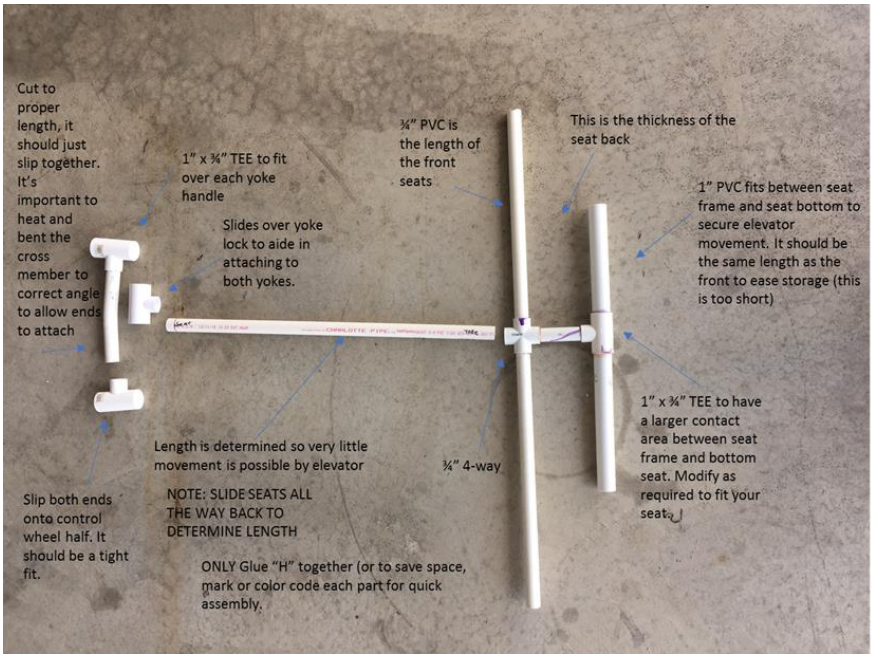
Sliding the seats all the way back will help hold the H in place. The H should be a snug fit with the seat backs which then becomes secure when placed just under the passenger bottom seat cushion. I made the length long enough to go all the way across the seat. The foam from each side will add a slight pressure and keep the H straight.

You then measure the length from the yoke to the H. I set my trim tab to about my TAKE OFF position and then pushed the yoke forward for some added pressure. I think I left about 1.5" of yoke travel from the stop. You need this so you can connect/disconnect the H (elevator lock) and the aileron lock. You will note that the Tee at the aileron can pivot to match the angle of the H.

I found that the pipe that connects the aileron lock and elevator H aligns against the co-pilots seat (note photo).

So, that's it. It securely locks the ailerons and elevator. I used an old bag chair bag to hold everything.

A short video showing the assembly/disassembly might be something worthy of doing to clear up any confusion.



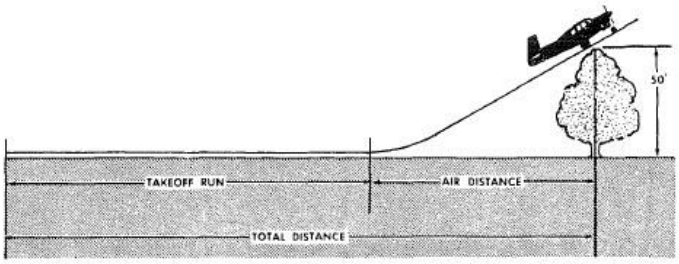

# Whew! That was tight! Koch

# "Climb baby, climb!"

Jim Price
Co-Editor

*Compared to modern day Takeoff Performance Charts, those developed for earlier model Mooneys are . . .lacking.*

**TAKEOFF DISTANCE (OVER-50 FOOT OBSTACLE)**




| ALTITUDE IN FEET (MSL) | TEMP IN °F | TAKEOFF WEIGHT OF 2200 LBS: TAKEOFF RUN (FEET) | AIR DISTANCE (FEET) | TOTAL DISTANCE (FEET) | TAKEOFF WEIGHT OF 2575 LBS: TAKEOFF RUN (FEET) | AIR DISTANCE (FEET) | TOTAL DISTANCE (FEET) |
|---|---|---|---|---|---|---|---|
| SEA LEVEL | 100° | 745 | 545 | 1290 | 1030 | 730 | 1760 |
| | 59° | 620 | 455 | 1075 | 815 | 580 | 1395 |
| | 20° | 520 | 380 | 900 | 660 | 470 | 1130 |
| 2500 | 90° | 900 | 660 | 1560 | 1345 | 960 | 2305 |
| | 50° | 745 | 545 | 1290 | 1030 | 730 | 1760 |
| | 10° | 615 | 450 | 1065 | 805 | 575 | 1380 |
| 5000 | 80° | 1125 | 830 | 1955 | 1910 | 1365 | 3275 |
| | 41° | 900 | 660 | 1560 | 1340 | 960 | 2300 |
| | 0° | 740 | 540 | 1280 | 1000 | 715 | 1715 |

TAKEOFF CONDITIONS:

WING FLAPS -- TAKEOFF POSITION — HARD SURFACE RUNWAY

POWER -- 2700 RPM, MAX MANIFOLD PRESSURE — ZERO WIND

Shown here is a takeoff performance chart for the 1974 M20C. It offers three temperatures and three altitudes. What if you're taking off from Flagstaff, Arizona, which has an elevation of 7,015 MSL? That's a little over 2,000 higher than the 5,000 MSL considered by the Mooney engineers when they developed these charts in the 60's and 70's.

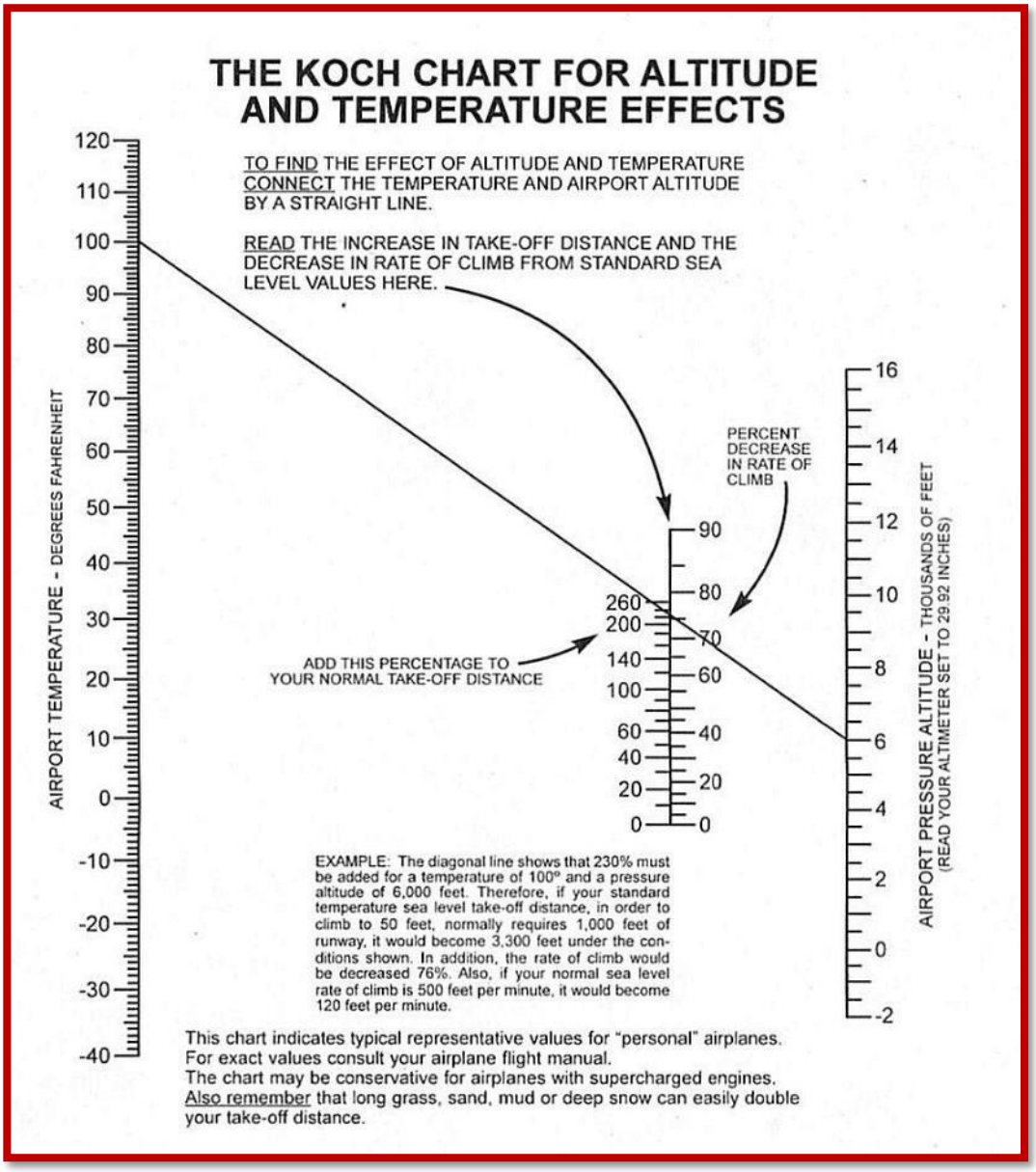
Summer mornings in Flagstaff can develop Density Altitudes of 8,400' and higher. In the afternoon, when the temperature is over 80°F (26°C), the Density Altitude can exceed 9,600'.

Leadville, Colorado's Lake County airport (KLXV), is nestled in the Rockies at 9,934 MSL and has cool morning Density Altitudes of 11,498' or higher.

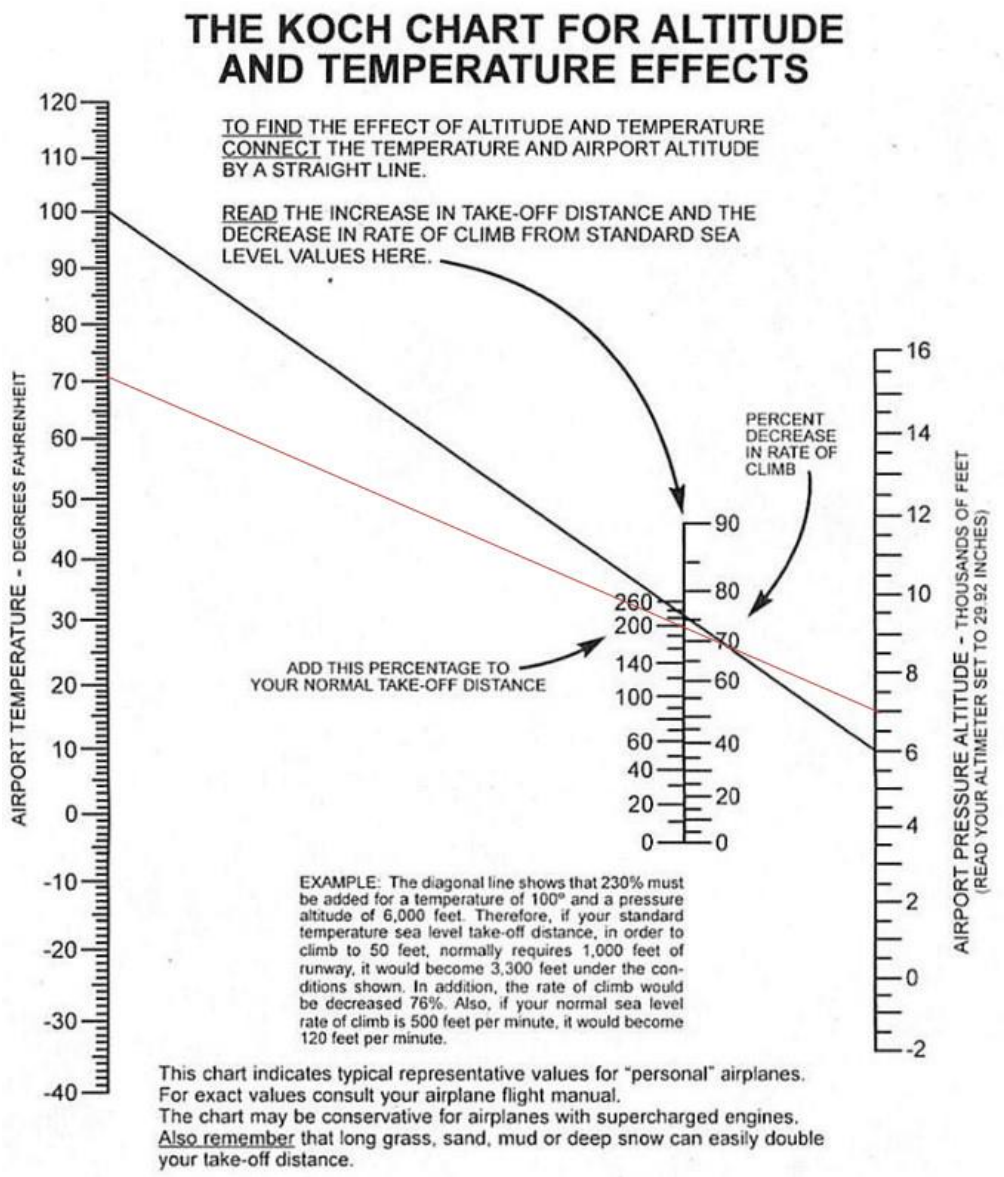
Einstein would have a difficult time interpolating these high altitudes using the M20C chart.

*For those with normally aspirated engines, the Koch Chart offers a simple way to determine the effect of a higher temperature and pressure altitude. It supplements the simple Takeoff Performance charts that were engineered earlier.*

**From a sea level, standard day, the Koch chart determines the percentage increase in takeoff roll & the percentage decrease in climb rate.**




**NOTE for Turbocharged aircraft: Koch Chart indications "may be conservative for airplanes with supercharged engines".**




| ALTITUDE IN FEET (MSL) | TEMP IN °F | TAKEOFF WEIGHT OF 2200 LBS: TAKEOFF RUN (FEET) | TAKEOFF WEIGHT OF 2200 LBS: AIR DISTANCE (FEET) | TAKEOFF WEIGHT OF 2200 LBS: TOTAL DISTANCE (FEET) | TAKEOFF WEIGHT OF 2575 LBS: TAKEOFF RUN (FEET) | TAKEOFF WEIGHT OF 2575 LBS: AIR DISTANCE (FEET) | TAKEOFF WEIGHT OF 2575 LBS: TOTAL DISTANCE (FEET) |
|---|---|---|---|---|---|---|---|
| SEA LEVEL | 100° | 745 | 545 | 1290 | 1030 | 730 | 1760 |
| | 59° | 620 | 455 | 1075 | 815 | 580 | 1395 |
| | 20° | 520 | 380 | 900 | 660 | 470 | 1130 |

## A standard day is defined as:

Sea Level
15 °C (**59 °F**)
Altimeter is 29.92 (in/Hg)

## *Let's plan a takeoff from Flagstaff, Arizona in an M20C.*

### *Elevation: 7,015' MSL*

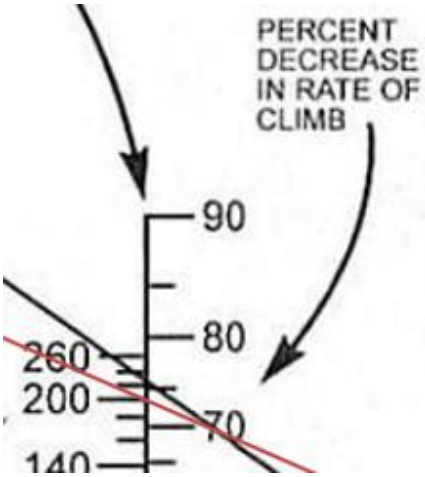
It's **72°F (22°C)**. Both ATIS and (ForeFlight declare that the Density Altitude (DA) is **9,057'**). The Altimeter setting is 29.29. (To check the Pressure Altitude, you would set the altimeter to 29.92).

You apply the pressure altitude (7,015) and the temp (72°F) to the Koch Chart.

**The M20C POH** indicates that the normal, **Sea Level**, **15 °C** (**59 °F**) takeoff roll is 1,395. We'll add **200%** more to the charted total takeoff distance. If your Mooney weighs 2,575, your SL Standard day takeoff run plus air distance, would be 1,395. Add 200% (2,790') to 1,395' and that indicates the total takeoff distance would be **4,185 feet**. Flagstaff's runway length is 8,800', so no problem, right? Well, let's look at your climb rate after takeoff.

# Climb Performance

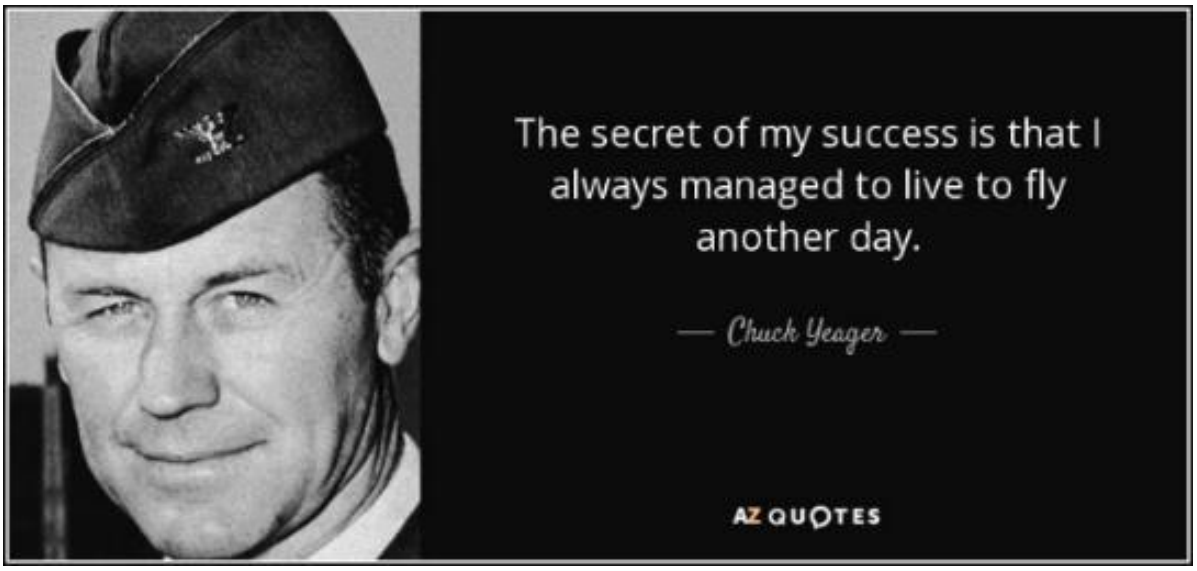
That giant sucking sound you hear is your climb rate going South. For this Flagstaff departure, you're going to take an **73%** hit in climb performance. (You'll be climbing at 27% of the SL climb rate).



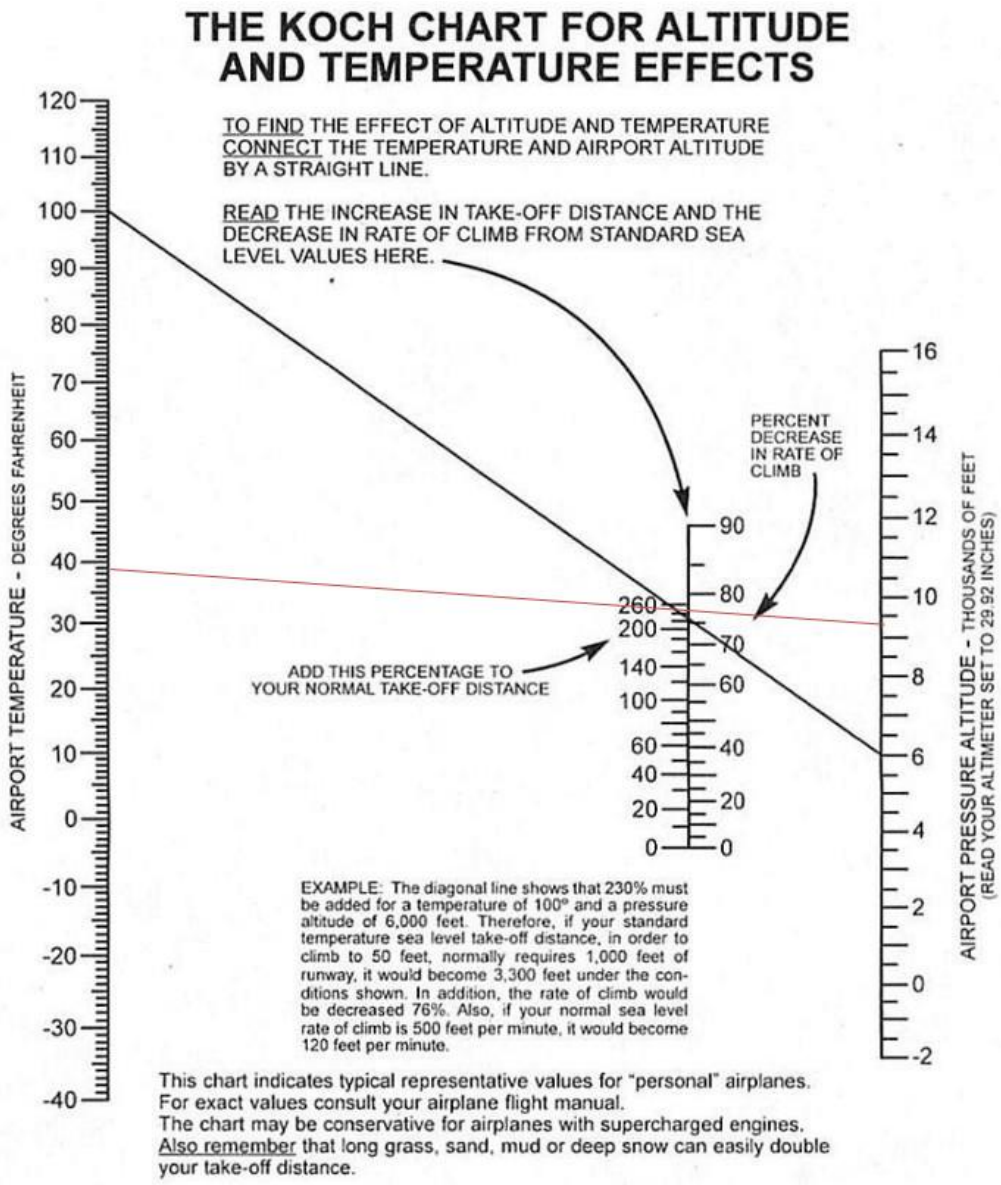

| SL | 800 | 1000 | 100/87 |
|---|---|---|---|
| | RATE OF CLIMB (FPM AT 2575 LBS) | RATE OF CLIMB (FPM AT 2200 LBS) | BEST RATE OF CLIMB SPEED (MPH/KTS)CAS |

If you're heavy, (2,575 lbs), the POH charted Sea Level climb rate is **800** FPM. **27%** of 800 equals **216 FPM**. (One minute after takeoff, you'll have attained an altitude of 7,231. Two minutes after takeoff, and you'll be at 7,447'. I love nature, but I don't like becoming close to the trees which surround the Flagstaff airport. If you're not comfortable with a climb of 216 FPM, you might re-think this takeoff.

You might be trapped in Flagstaff for a while, but at least you'll live to fly another day. Your family and Chuck Yeager will be so proud of you.



## *Let's try a takeoff from Leadville, Colorado (KLXV) in an M20C, Elevation: 9,934'.*

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| | 59° | 620 | 455 | 1075 | 815 | 580 | 1395 |
| | 20° | 520 | 380 | 900 | 660 | 470 | 1130 |

The runway length is **6,400'** and this morning it's a cool **4°C (39°F)**. The altimeter setting is **30.56** so, according to FltPlan.com's calculator, the **P**ressure **A**ltitude is 9,349'. (ForeFlight indicates that the DA is **11,815').**

Leadville's runway is **6,400 feet long.**

Do you think you could make it in an M20C? Add 260% of 1,395 (3,626) to 1,395 and the takeoff roll is **5,022** feet.

You could takeoffwith 1,378 feet to spare.

How about your climb rate after takeoff? With a 77% decrease in climb rate, you'll only climb at **23%** of what you'd expect at Sea Level.

(800 x .23 = **184 FPM**)


I recommend that you download, print and USE your own Koch Chart. They're available on the web. Just Google "Koch Chart". It will eliminate the "wonder" about your takeoff runs and climb performance.

# Oshkosh And Back


by Charles McKenna

My Oshkosh preparation started in an unconventional way for a Mooney pilot. I missed all the Mooney formation clinics and was lucky enough to know Mike Radomsky. Not only is he my IR instructor, but he's a great guy!!! He invited me to the Cirrus clinic in Spokane, Washington on May 31st to June 2nd. He worked his magic and next thing I knew, I had three other Mooneys there to help me get qualified for the caravan. Formation flying was a great experience. It's true that you either like it or you don't, and if you do, it infects you! "Sausage", "Buzz", "Bolter" and "Velcro" made the training experience comfortable, but I knew that I had high expectations to meet.

After being cleared for the Caravan, I had to start on the logistics of getting there, where I would stay for five or six days, and getting all that gear to fit in my 77' J. Along with the planning, I picked up a copilot, Bubs Wark. He is a newly minted instrument rated pilot and when he said he was interested in going with me, I jumped at the chance to have a solid backup. This would be the first time at Oshkosh for both of us.

We bought two tents, sleeping pads and everything we thought we would need. Our departure date would be July 17th, which would give us plenty of time to work around the weather and still arrive in Madison by the 19th.

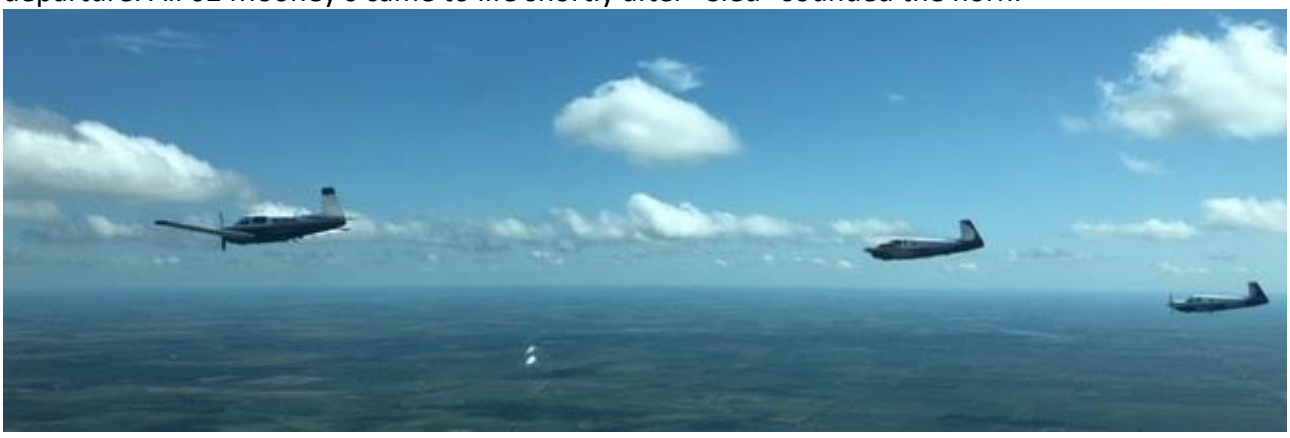
Leaving from John Day, Oregon (KGCD), we would have to cross the Rockies and I wanted to get an early start. We packed the plane the night before, and it would have been much easier if all we had to pack was the 15-year-old Scotch, but we would have needed more than one bottle to keep us warm at night.

We arose early Wednesday morning and after our preflight, we received our IFR clearance, and we were wheels up by 6am. As we climbed to 13,000' MSL, we lost the GPS signal. Luckily, we had VMC weather and I set up the VOR's for some old school flying. After 10 to 15 minutes the GPS signal returned. At altitude, we had a great tail wind and started eating up the many, many miles ahead of us.

Our first stop was Billings, Montana (KBIL), where we planned to meet up with three other Mooneys and fly formation to the next fuel stop. After we arrived, we filled up and assessed the weather for our next stop, Aberdeen, South Dakota (KABR). We briefed the formation and off we went as a four ship. As we were getting closer and closer to Aberdeen, the ground started to fall out beneath us as the mountains got further and further away. We landed at Aberdeen after about three hours. We checked the weather and realized we would be able to make it to Madison, Wisconsin (KMSN), the meet up point for the caravan. We went single ship from there, with N201NU bringing up the rear.

While we were in Madison, I was able to ride right seat with "Buzz" in a Mooney 8-ship formation for photos. Hopefully next year, I can have my plane in it that formation.

We were scheduled to depart Madison Saturday morning for the 40-minute flight to Oshkosh (KOSH). However, anyone that knows the weather in that area knows that there can be a great chance of thunderstorms. Sure enough, Friday night and early morning Saturday thunderstorms brought a lot of rain, so the Caravan weather crew made the perfect decision to wait an extra day. The weather gods stopped all the thunderstorms and we had perfect weather for a Sunday departure. All 62 Mooney's came to life shortly after "Sled" sounded the horn.



In no time, we had tower clearance to line up on runway 03 and we started our takeoff. I had to pinch myself to realize I was really flying in the Mooney mass arrival. As a wing man, I only had a few rules I had to worry about, and one of them was to never take my eyes off the lead. Five

seconds after my lead took off, I was on the roll. I had my eyes locked on lead so tight, I didn't even know there were 60 other aircraft near me. Being a newbie to the caravan, I had to land on 36R. Lead kissed me off with his own loving gesture. I finally looked forward and there was Oshkosh!!!!! After a long taxi we were at our campsite. We quickly exited the planes and began to help each other.

Going with the caravan really helps with logistics. It's wonderful how we all help each other, and this proves that many hands make light work!

Bubs and I spent four days at Oshkosh. It was wonderful. I saw planes I never knew existed and made friendships that will last a lifetime. I truly look forward to next year.

We planned for an early morning departure on Thursday and it quickly turned into a five-ship departure briefing. We had arrived in class with 62 planes and I departed in style with four other beautiful Mooneys.

Our first stop was at Taylor County, Medford, Wisconsin (KMDZ) to fuel up with $3.89 a gallon fuel. After fueling and checking the weather we planned to stop at Frank Wiley Field, Miles City, Montana (KMLS). Due to weather, we diverted to Rapid City, South Dakota (KRAP).

It was a quick fuel stop and we departed VFR with Flight Following to Billings, Montana (KBIL), where we spent the night. The hotel bed was like heaven after sleeping in a tent on a two-inch air mattress for the last few days.

The trip to Oshkosh was great with a 20+ knot tail wind most of the way, but we had to "pay the piper" as we traveled West. At one point my, Avidyne IFD440 showed a 43kt headwind. Maybe that saying, "pay the piper", came from those who fly at Piper speeds. Crossing the Rockies there wasn't much of an option for going low, so we slugged out the last leg in just over four hours.

I told Bubs that his last job was to make sure I put the gear down because we were not ending this great trip by skidding to a short stop. After he verified that we were green and green, I checked a few times myself, and I made a perfect landing, befitting an end to our first trip to Oshkosh!!!

Closing Notes: The Mooney proved its design by making those 2,700+ miles go by faster than most other planes. The many hands of the caravan lessened the work and made the trip a breeze.

We packed more stuff than we needed and could have easily left 70 pounds of gear at home, all because we had the caravan. I hope everyone that flew with me this year wants me back next year!

I personally want to thank "Velcro" for the weeks leading up to Oshkosh, as he answered my endless questions. "Buzz" for being the best Element Lead ever and making sure we made it to Oshkosh. "Sled" for being the GREATEST Mooney caravan lead. "Sausage" for taking the time to get me Caravan qualified. "Gadget" for letting me class up his wonderful Spokane clinic with a few Mooneys.

And most importantly, my better half Shareena, for letting me take the time away from home to do something she knew I would enjoy (and I did!). She had a busy time watching our little baby bug Emmalyn for all those days I was away and I love her very much for it! I'm the luckiest Mooney owner out there!


By Brian Lloyd, CSEL/CMEL, CFI/CFII

How do I get myself into these things? Probably because I can't keep my mouth shut. I read the articles here in the Mooney Flyer and I feel compelled to comment. Eventually Phil Corman said, “Would you please write an article?” Me and my big mouth.
On the other hand, I thought about it and I realized I do have something to say. Seems I have learned something in my 51 years and over 12,000 hours of flying GA airplanes. I thought maybe some of my insights might be useful to others.

I learned to fly in the late 1960's. My father was a retired Navy fighter pilot and instructor. After his retirement in 1963, it probably comes as no surprise that he gravitated to general aviation. As a result of his participation in creating Cable Commuter Airline in SoCal he ended up with a Cessna 182. Shortly after the arrival of the C182, I found myself in the left seat at age 14. My father, the US Navy Instructor Pilot informed me, “If you are going to fly with me, you are damned well going to learn how to fly this thing.” So began my personal relationship with flying.

Like most of us, my expectations and standards were set by my earliest instructors. My father’s career was in aviation and he learned how to fly airplanes by getting in them and flying them.

When you fly single-seat fighters, there is very little transition training, especially back in the '40s and '50s. Mostly it involved being handed a couple of sheets stapled together, reading them, climbing in, and going flying. It didn't matter if it was an SBD Dauntless, an F6F, an F8F, an F9F Panther, or an F11F Tiger. Down the road, it was lots of different GA airplanes. So, he learned early on how to stay far away from the edges of the envelope and then expand his own envelope a little at a time until he found the limits of the airplane. Flying with and listening to him formed my earliest flying background and set the stage for my flying for the next 50 years.

In my early years, after we sold the C182, my dad and I would beg, borrow, or steal pretty much anything we could get our hands on. (I use the term 'airplane whores' to describe our behavior.) I remember “checking out” in a C310, an Aero Commander 680, a C172, an M20C, a Grumman Tiger, a C207, and who knows what else, with nothing more than the keys in our hands. I became very adept at dragging out the POH, scanning through it, getting the numbers, going through the checklist, finding all the switches and levers, and then taxiing out and taking off. We'd head out to the practice area and do stalls, slow flight, steep turns, and generally get familiar with the airplane before returning to the airport to do some landings. There were no CFIs and no “specialists”. We just studied, briefed, and flew. That is probably why there are over 80 different aircraft in my logbooks and why I don't really find new airplanes daunting.

So, the first rule of “No Sacred Cows” comes from my father and it reads:

***All airplanes fly based on the same aerodynamic principles, but have very unique characteristics.***

If you know how to fly, you can get into an airplane and fly it safely, but it takes time to fully understand the nuances of each individual airplane. The key point is to be safe and conservative while learning the characteristics of the airplane. This means that you are always being a “learning” pilot. Sure, someone else has been there before you and they have collected data that eventually ended up as part of the POH you are reading. It also means that nothing prevents you from using the POH as a starting point and then finding out new things about the airplane. So, here is the second rule of “No Sacred Cows”:

***The POH isn't always right.***

Yup. It can be wrong. And the way it is wrong is probably NOT in your favor! So, how do you know it is wrong? Be a learning pilot and find out. What is YOUR airplane’s 1G stall speed? Do you know? Did you carefully perform multiple stalls to nail that stall speed down at different gross weights? Well, once you have done that, you can figure out what your approach speed SHOULD be. (More on this another time.)

Ok, before someone blows a gasket, I am going to make my disclaimer here: Don't be stupid! If you are doing stalls to find out stall speed, or generally trying to find out what your airplane will do, you must first accomplish two very important things:

1. Do it at altitude first. If things don't work out the way you expect, you will have time to recover.
2. Be conservative. Give yourself a huge margin just-in-case. Gradually work your way up (or down) to the best case. Keep the edges of the envelope very much in mind.

(This is how I know that some airplanes can safely do the “impossible turn”).

*I promised to kill a sacred cow. We have reached that point. So, without further ado, here it is:*

***Stall speed does not increase with bank angle***

"But wait," you say. "There is a table in my Mooney POH that shows how the stall speed increases with bank angle! It is right there in the POH! My CFI says so too. How can it be wrong?"

I know you have been to an Airshow. I know you have watched someone doing aerobatics. Ever seen a roll? That airplane passed through a 90-degree bank without stalling, perhaps even at a relatively slow speed. Hmm …

The thing about stall speed increasing with bank angle has to do with a level turn, but the real cause is something other than bank angle. The real answer is:

***Stall speed increases with the load factor on the wing***

The reason you think that stall speed increases with bank angle is that you try to maintain level flight and at steeper bank angles, you increase the load factor (G) on the wing to remain in level flight. So, here is another question for you:

***What makes an airplane stall?***

Did you say something about exceeding the critical angle of attack? The critical AoA is WHEN the airplane stalls, not what MAKES the airplane stall.

OK, perhaps in hindsight, that seems a bit obvious, but it is very true. The important point here is that stall speed increases as the square root of the load factor (G), not the angle of bank. If you are in a level 60-degree banked turn, you will be pulling 2G. That means that the stall speed will increase by the square-root of 2 or 1.4. If your level stall speed was 60 knots, it is now 84 knots. You have to reach that 2G by pulling on the stick. If you maintain that 60-degree bank and relax the back pressure until you are only pulling 1G again, the stall speed will be back to 60 knots, even though the bank angle is still 60 degrees. Of course, your flight path is going to seriously bend downward, but … *stall speed does not vary with bank angle.*

Fly safely. Fly better. Have fun.

# ATLANTIC CITY – SURF, SUN & MOONEY TRAINING

By Ted Corsones, Mooney Safety Foundation


The Mooney Safety Foundation will return to Atlantic City with its acclaimed Mooney Pilot Proficiency Program **on the weekend of September 6-8, 2019**. We will be using the Atlantic City International Airport (KACY) and our FBO host will be Signature Flight Support.

Atlantic City has a long and varied history. Although much has been written about the post 1977 casino years, and the heyday years of the 30's and 40's when the Atlantic City Boardwalk was the "in place" to be seen, there is a wealth of rich history which dates back over 200 years before the first dice were thrown. It is located in South Jersey hugging the Atlantic Ocean between the marshlands and islands.

The original inhabitants of Absecon Island, on which Atlantic City rests, were the Lenni-Lenape Native Americans. They made it their summertime haven. Then, through the following decades, its growth was nourished by the tourists who came to bask themselves in the sand and sun during the summer solstice and the autumnal equinox.

The first boardwalk was built in 1870, along a portion of the beach to help hotel owners keep sand out of their lobbies. It worked for the hoteliers and then it was adopted by the tourists for walking, sunning and biking. It eventually reached 7 miles in length. Postcards from Atlantic City are likely to feature this unique treasure - which billed itself as the "Showplace of the Nation" and it is cited as one the greatest boardwalks in the country.

In an effort to revitalize an aging city, New Jersey voters, in 1976, approved casino gambling for Atlantic City. Modern hotels were erected and the tourists came in ever increasing numbers.


The community that inspired the board game *Monopoly* and hosted *The Miss America Pageant* for many years continues to offer inducements and attractions from New Jersey's tallest lighthouse to deep sea fishing; from free concerts and bicycle rides on the boardwalk; to fireworks and airshows; and from golf and beaches to gaming and nightly shows. Atlantic City excels as a world class resort.

Atlantic City enjoys 205 days of sunshine annually, while the daytime temperature in September is in the mid-70s.

The Mooney pilot proficiency program features eight hours of informative lectures on Friday, which include ATC procedures, Weight & Balance, flying a Mooney By the Numbers, Landing a Mooney, High Performance Engine Management, Emergency Procedures and Aviation

Physiology. Then, on Saturday and Sunday we have a minimum of four hours of flight recurrent training with Mooney specific instructors. This involves Normal Takeoffs, Crosswind Takeoffs, Slow Flight, Spiral Demonstrations, VFR Go-Arounds, Approach to Landing Stalls, Takeoff and Departure Stalls, Steep Turns, Forward Slips, Shortfield Takeoffs and Landings, Softfield Takeoffs and Landings, Emergency Procedures, Partial Panel Navigation, Recovery from Unusual Attitudes, Instrument Approaches (GPS, VOR, ILS, Localizer Back Course, autopilot coupled approaches, Circle to Land, Missed Approaches and Holding Patterns). In between your training flights, you will have an opportunity to attend seminars on Mooney Accident Reviews, Mooney Aircraft Systems, Mooney Aircraft Maintenance and Mooney Owners Inspections.

During the program you will hear lectures, and receive flight training, by Mooney specific instructors. Then, at the completion of the program, eligible pilot will be endorsed for a flight review, instrument proficiency check, and will receive earned FAA WINGS credits. They will also receive a Certificate of Successful Completion of a Mooney specific recurrent training program.

We are all aware that most insurance carriers are now asking pilots whether they have received recurrent training during the previous year. These same carriers recognize MAPA Safety Foundation as a pre-eminent source for such training. So, be prepared to give a positive response when the question is presented to you. The certificate that you receive at the completion of the weekend will be of considerable value to you. As the late John Allen of Falcon Insurance Agency stated: "The Pilot Proficiency Program offered to MAPA members through the MAPA Safety Foundation is an excellent source of training by proficient Certificated Flight Instructors"

Come join us and have some fun while you hone your flying skills during a weekend of Mooney immersion and the friendship of other Mooney pilots and aviation comrades; and, remember, that family members are always welcome to attend our programs. There is so much for them to see and do during the event.

As we always do on your behalf, we have successfully negotiated favorable hotel rates and FBO prices. So that you will not be disappointed, I encourage you to make your reservations without delay. Complete the registration form and make your check payable to MAPA Safety Foundation, Inc. Then mail them to MAPA Safety Foundation, Lela Hughes, PO Box 455, Mountain Home, TX 78058. Further, you may contact Lela Hughes by telephone at 210-289-6939 or by email at lelahughes49 @gmail.com

# Safety Is No Accident

# Pilot Certificate
# A License to Learn


LEARNING TO FLY

## *It all begins with your Pilot Certificate*

The day I got my Private Pilot Certificate, my CFI told me that it was a License to Learn. I understood what he was saying, but I did not internalize it. He immediately said, "Let's go fly for an hour or more so I can show you some things that weren't required in your training, but every pilot should know." He then went through a series of things that I still remember to this day.

Flying is about ongoing and continuous learning. To put a spin on a Bob Dylan song, ***"If you aren't busy learning, you're busy dying".*** That's a harsh statement to make, but it's true. Most of us know a pilot or two that push the limits of an FAR, only to repeat that experience again when the opportunity presents itself. There is no learning loop there.

We'll cover two topics related to learning in this article; 1) The stages of learning, and 2) How good, serious and competent pilots learn at each stage.

# The Four Stages of Learning


## *Stage 1. Unconscious Incompetence: We don't know what we don't know.*

We don't understand how to do something and don't recognize the deficit. We may deny the usefulness of the skill. The individual must recognize their own incompetence, and the value of the new skill, before moving on to the next stage. The length of time an individual spends in this stage depends on the strength of the stimulus and desire to learn. More importantly, it's critical to understand that we are at the first stage of learning. The result should be that our minds are open to CFIs and books that might illustrate our lack of knowledge.

We usually need to be taught by a CFI, take a course, and or read a book, as we study to earn a new pilot certificate or add a new rating. Immediately after getting a certificate or rating, we are probably unconsciously incompetent. The best example is when you are flying under a hood while working towards an Instrument rating. It's easy to fly under the hood, but to fly in actual weather is a different beast. Some students get very little "actual: experience, especially in sunny climates such as California and Arizona.

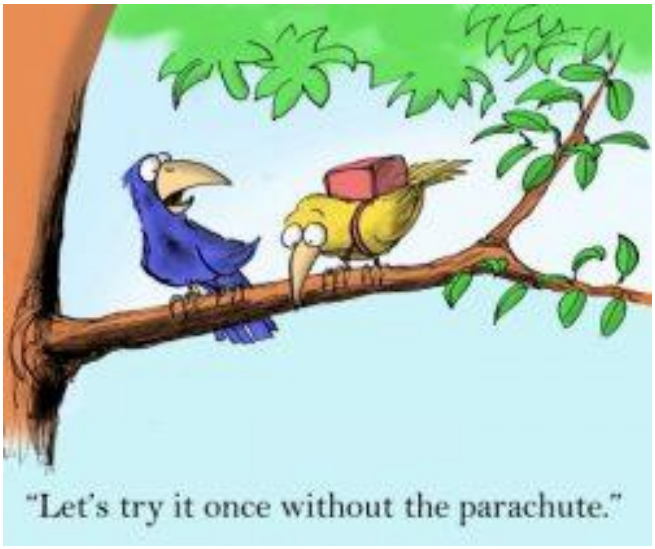
## Stage 2. Conscious Incompetence: W*e begin to know what we don't know.*

Though the individual does not understand or know how to do something, they recognize the deficit, as well as the value of a new skill that will address the deficit. At this stage, making of mistakes can be integral to the learning process and we are much better and much safer pilots because we are somewhat humbled that we survived stage 1 (Ha Ha). It's around this time that Learning Pilots begin

to hit the books again, or practice procedures that haven't been exercised for a while, such as engine out, short field, and soft field landings; approach and departure stalls and more.
Learning pilots might also set personal minimums, which are often more stringent than those set by the FARs. They might also attend FAA Safety Seminars, take AOPA Safety Foundation online courses, read more books, etc. They may, whenever possible, take part in Hangar Flying discussion. It's amazing how much you can pick up from experienced pilots. You can also learn by sharing some risky situations that you may have experienced.

## *Stage 3. Conscious Competence: You have learned how to do something, however, demonstrating the skill or knowledge requires concentration.*

To execute the new skill, you may need to break it down into steps, and it requires heavy conscious involvement.
To illustrate this, I will share a common sentiment among the "New to a Mooney" pilots. I often hear a new Mooney pilot indicate that he or she was not comfortable flying their Mooney until they had 30-50 hours in the aircraft. Recently, I met two "New to a Mooney" pilots, with thousands of hours flying Air Force planes of all types. They were still in the stage where it took more focus and concentration than they would like. This was probably true for most, if not all of us, as we began our journey to be competent Mooney pilots.




How do you get out of this conscious competence stage? It's simple: Practice.. Practice.. Practice. Go do some pattern work for an hour or more, shoot more varying approaches at different airports, etc. You are striving to put your skill into "muscle memory", a place where your brain doesn't have to work so hard. That's part of what makes you feel "comfortable" with your Mooney in different situations.

Another attribute of *Conscious Competence is to have Checklists for both Normal and Emergency* situations. Checklists are always valuable, but they are also a point of focus in an emergency that can mitigate your adrenaline and anxious state, and thereby ***increase*** your skill level.

## *4. Unconscious Competence: This is when you practice a skill so much, that it becomes "second nature" because it's etched into your muscle memory.*

You perform these skills so easily, that you can perform them when executing other tasks. Also, depending upon how and when it was learned, you might be able to teach it to others.

Most of the time, you get to this stage with practice. This level of understanding is REQUIRED in some emergency situations. For instance, in a Mooney, if you experience an engine failure on takeoff, your nose will be high; probably at $V_x$ (best angle of climb speed). Unless you want stall and spin to your death, you must aggressively and assertively push the nose down. ***Mooney Muscle Memory*** is required because if you wait 2-3 seconds, it might be too late to recover from the situation.

Sometimes, even though you've reached the Unconscious Competence level, you may slip back into Conscious Competence because you didn't exercise a skill for some time. Your two choices to get it back to muscle memory are to fly with a CFI or to practice it until you're comfortable again. The "learning pilot" recognizes when he's in a "backslide", and immediately seeks to correct it.

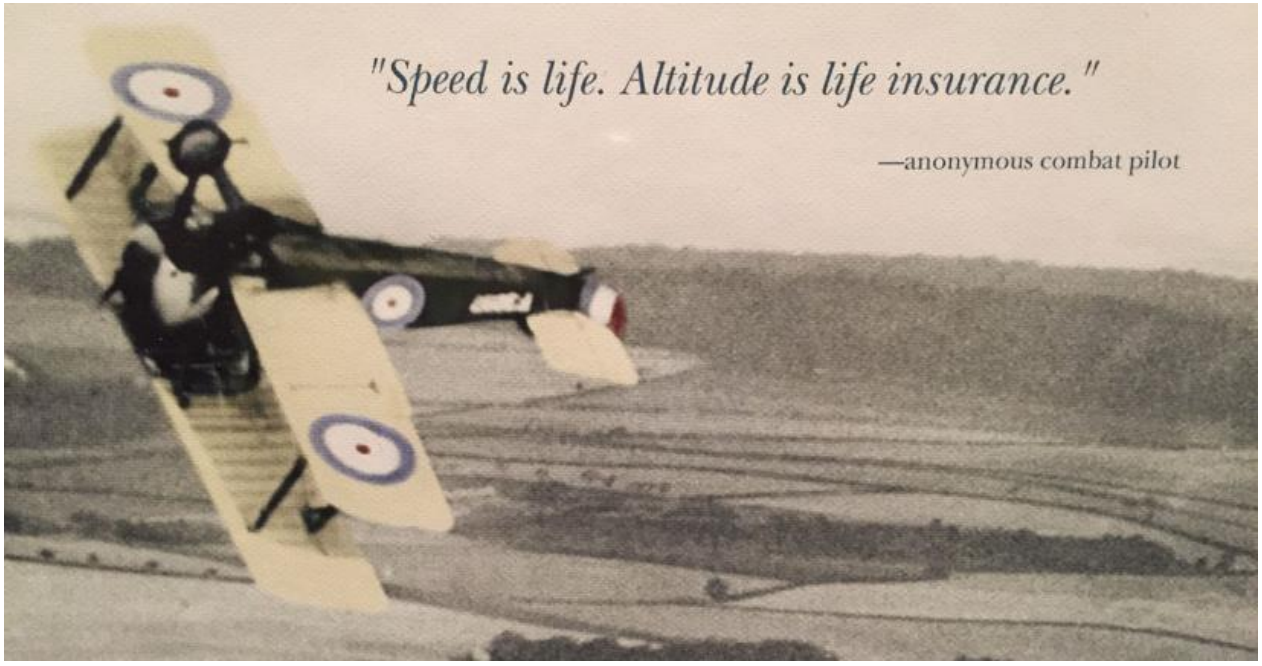
## Summary

Being a Learning Pilot for Life is not hard and it's really a choice. The one thing I see in the best Mooney pilots is that they are committed to learning and sharing learning experiences with other pilots. Flying is not a forgiving endeavor, such as tennis or bowling and when we learn about the mistakes of others, those lessons can save your life.

You can learn in the hangar with other pilots, learn with a CFI, or simply when you are flying with another pilot. When bringing my plane home from Top Gun, I told the pilot I was ferrying back to give me some cool new things to do. I learned three or four new techniques which made me a better pilot and made the ferrying experience extremely interesting.

You cannot lose weight by going on a diet and then, after you hit your target weight, go back to your old ways of eating too much. Similarly, a learning Pilot can't learn and then slack off. He or she must keep at it for life and be dedicated to always learning and becoming better.

I want to thank Brian Lloyd, a Mooney Flyer reader. He inspired this article during a phone call. Brian knew a phenomenal amount of interesting flying information. I learned that he's been flying for 51 years and has over 12,000 hours in more than 48 aircraft types. ***Phil***





There is a big inventory of serviceable airframe parts, including wings for M20C, E, F, G, J, K & R models, empennage assemblies, fuselages, rebuilt controls, rudders, elevators, ailerons, flaps, cowls, engine mounts, landing gear and small parts.

Paul Loewen is offering them online, or by phone. The website is www.LoewensMooneySalvage.com, and he can be contacted in Lakeport, California at **707 263-0462** or by cell at **707 272-8638.** Email is PaulLoewen98@gmail.com. The used inventory is also still available through LASAR Parts at 707. 263-0581

# The Mooney Maintenance Puzzle

Click here

Download Mooney's 100 Hour Inspection Guide

Search Mooney's Service area for Service Bulletins (SBs) and Service Instructions (SIs) applicable to your model

Click here

Search the FAA database for Air Worthiness Directives (ADs) applicable to your model

Click here

Click here

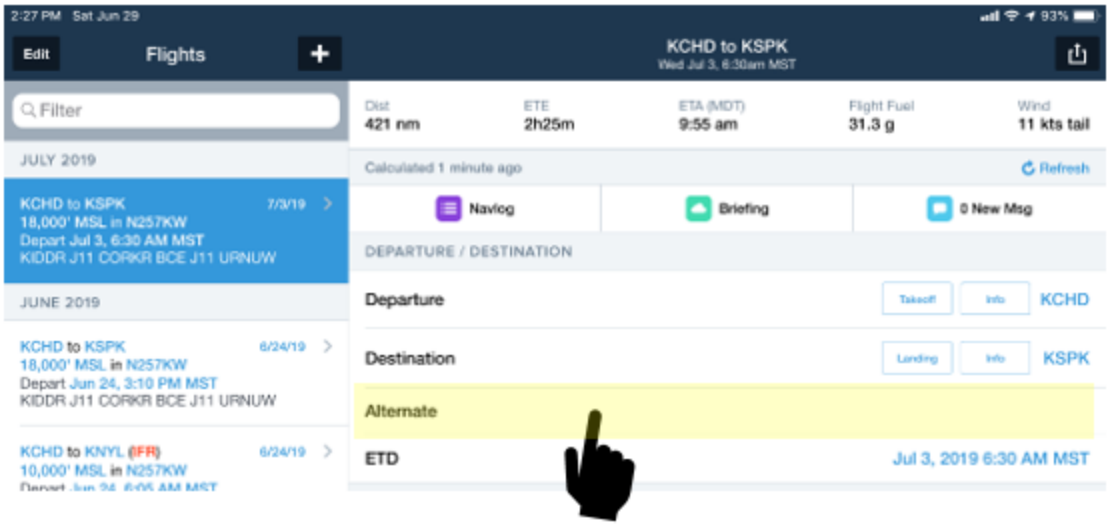
Download and search LASAR's Airworthiness Directive (AD) Log – all models


# ALTERNATE ADVISOR

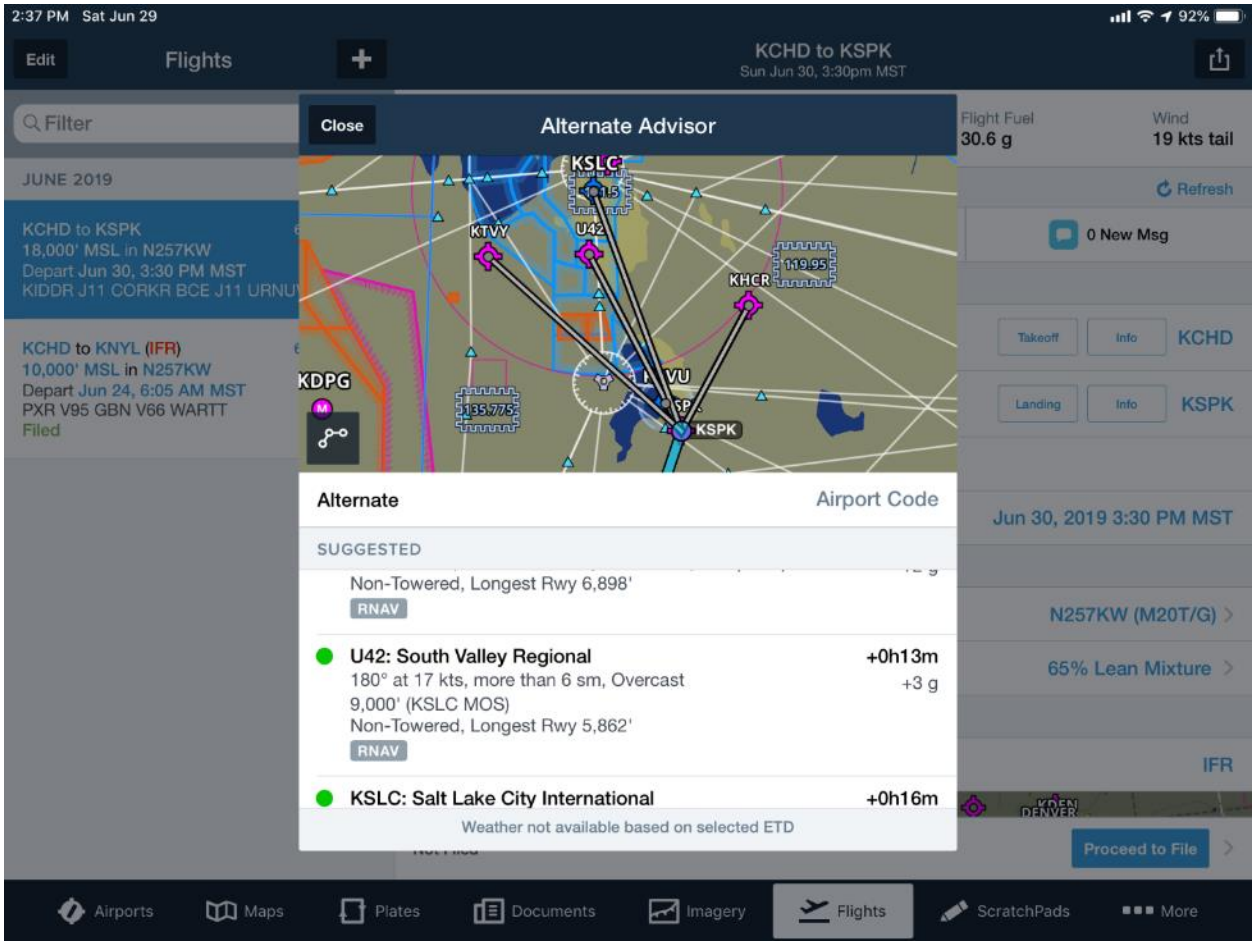
It's important to always have an alternate airport in mind when flying outside the vicinity of your departure airport, and it's a legal requirement for IFR pilots when the destination weather is less than 2,000 & 3, plus or minus 1 hour of the planned arrival time. To help you make a decision, ForeFlight has added a new Alternate Airport Advisor feature to the Flights section of the app.

1) **Send your flight plan to "Flights"**

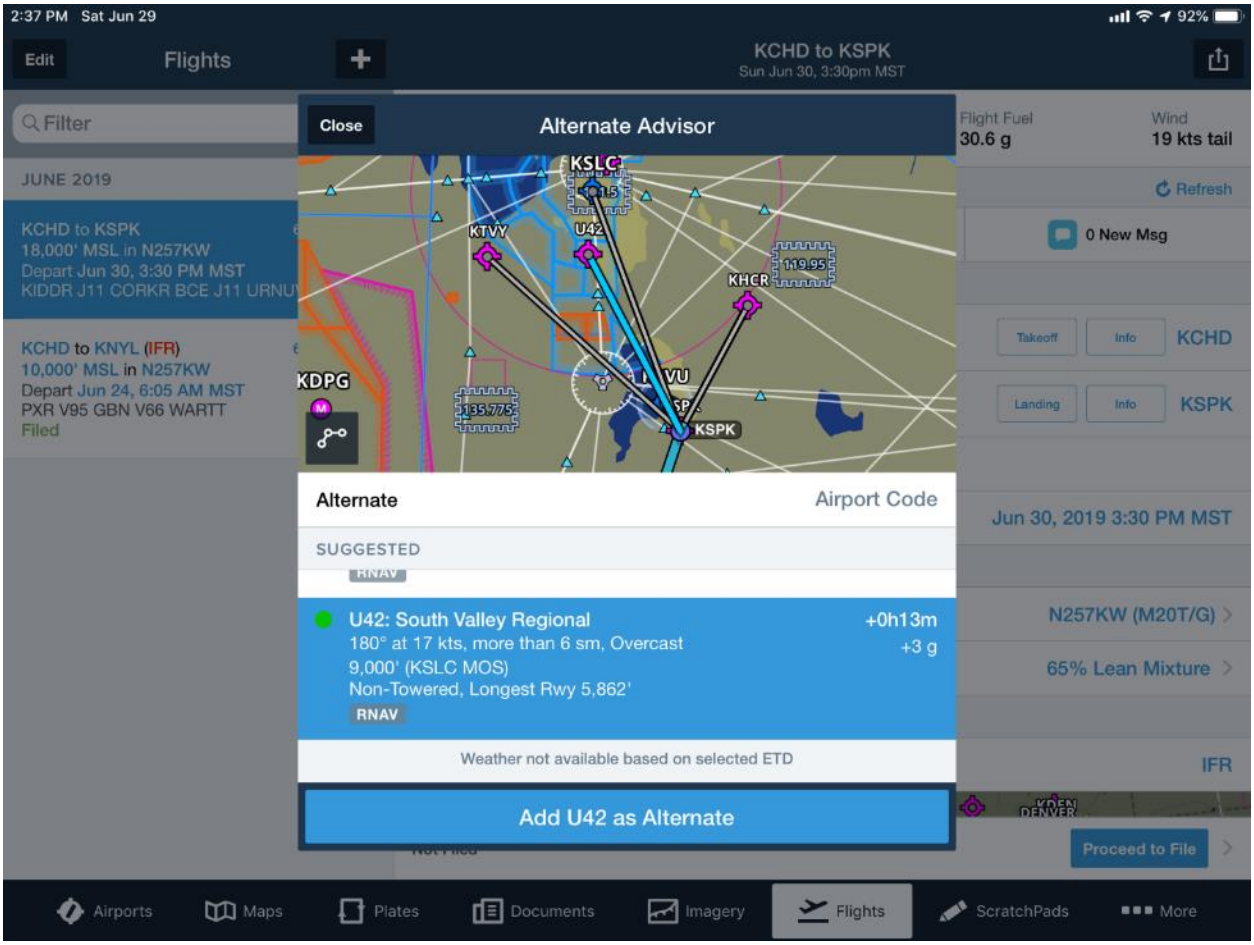
**2) Tap the Alternate Airport field**




**3) A new pop-up window will appear showing a list of alternate airport suggestions and a map showing their location.**



4) **Select the desired alternate and then click on the "Add [name of airport] as Alternate"**

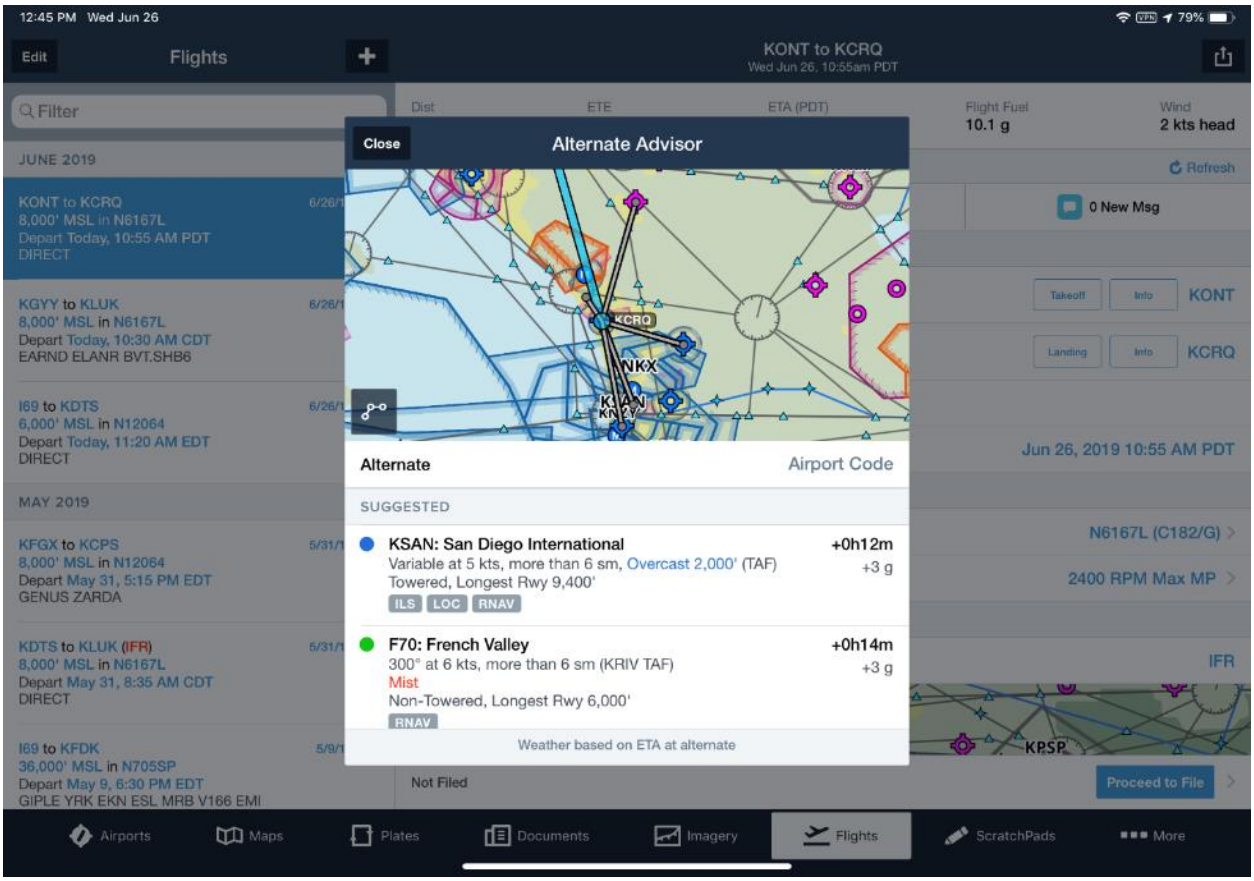



ForeFlight uses several criteria to narrow the list of suggested alternatives, including:

- Distance and fuel range considerations,
- Whether the airport is closed by NOTAM,
- The presence of available instrument approaches, &
- Forecast weather conditions.

Additionally, ForeFlight will prioritize any airport that you've previously used as an alternate on flights with the same destination.

You'll see only the important details with each airport listing: weather conditions forecast at your ETA, longest runway, instrument approaches available, and the fuel/time required to fly from the destination airport to the alternate.



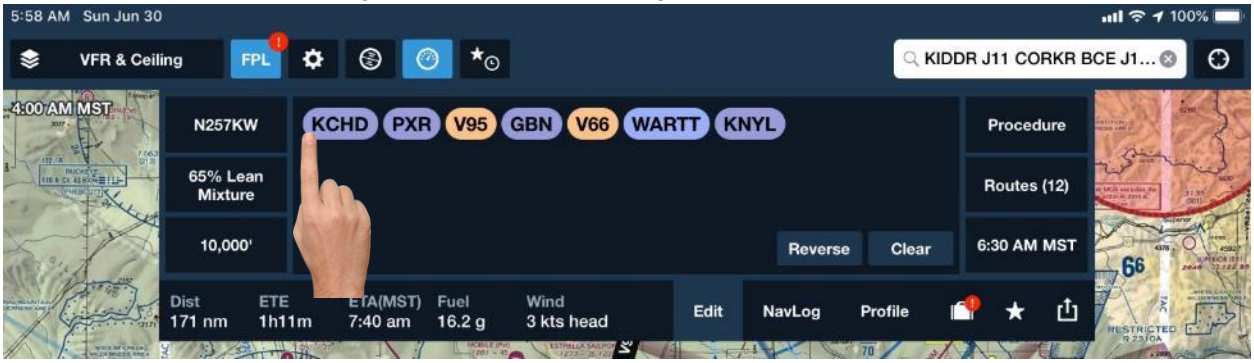

You can also manually enter a different alternate airport ID directly on the right side of the advisor window. Just tap on **"Airport Code"** and enter your favorite alternate.

# RUNWAY SELECTOR

Pilots flying larger aircraft with sophisticated avionics systems make it a habit to enter both the departure and destination runways into the system to assist with performance and navigation planning. ForeFlight now allows you to do this as well, providing similar benefits.

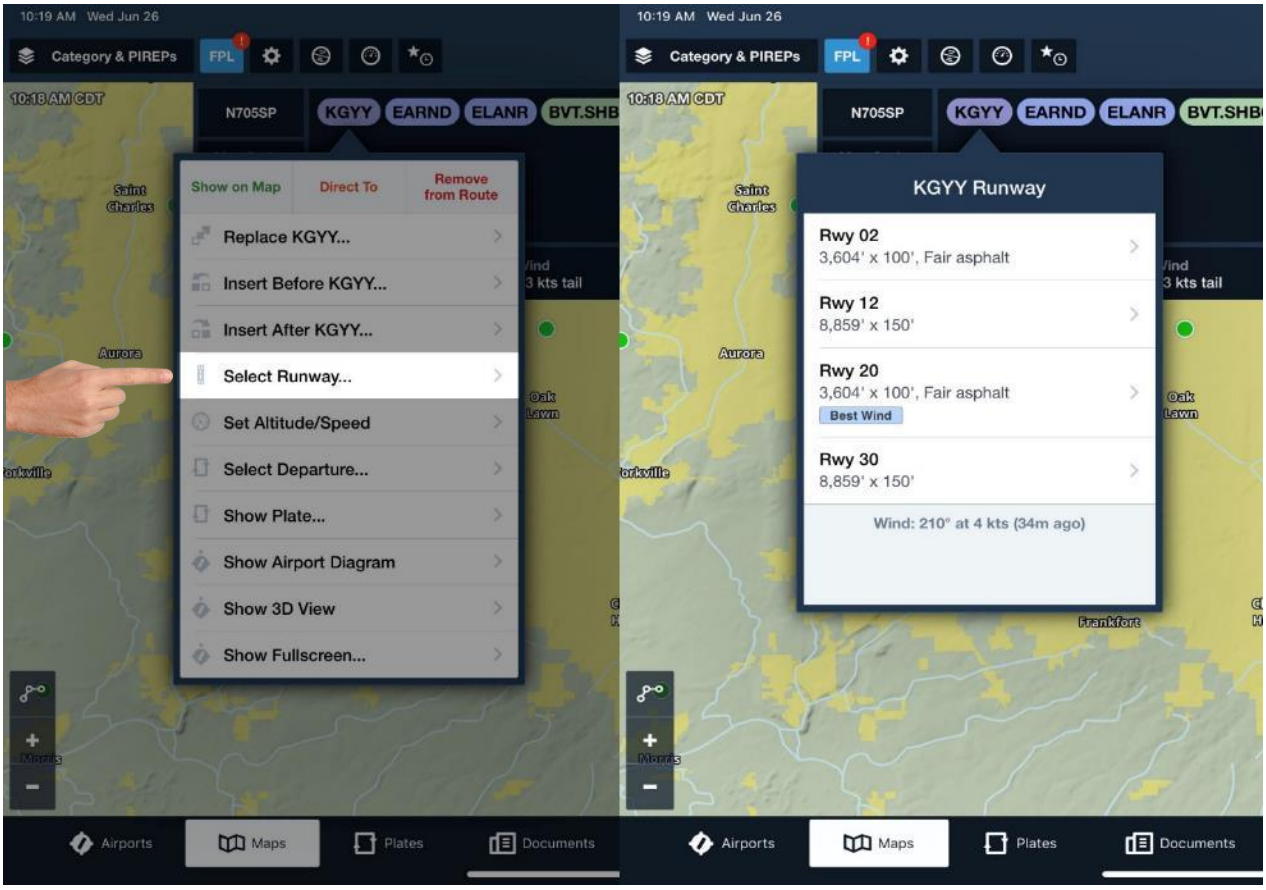
## BEFORE TAKEOFF

1) **After entering your route and filing the flight plan, tap the airport ID bubble in the route editor (in the "Edit" mode).**

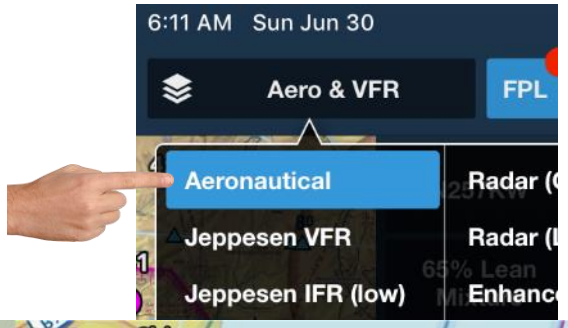



This will display a listing of all the runways. The blue "Best Wind" indicator will appear on the runway with the highest headwind component.

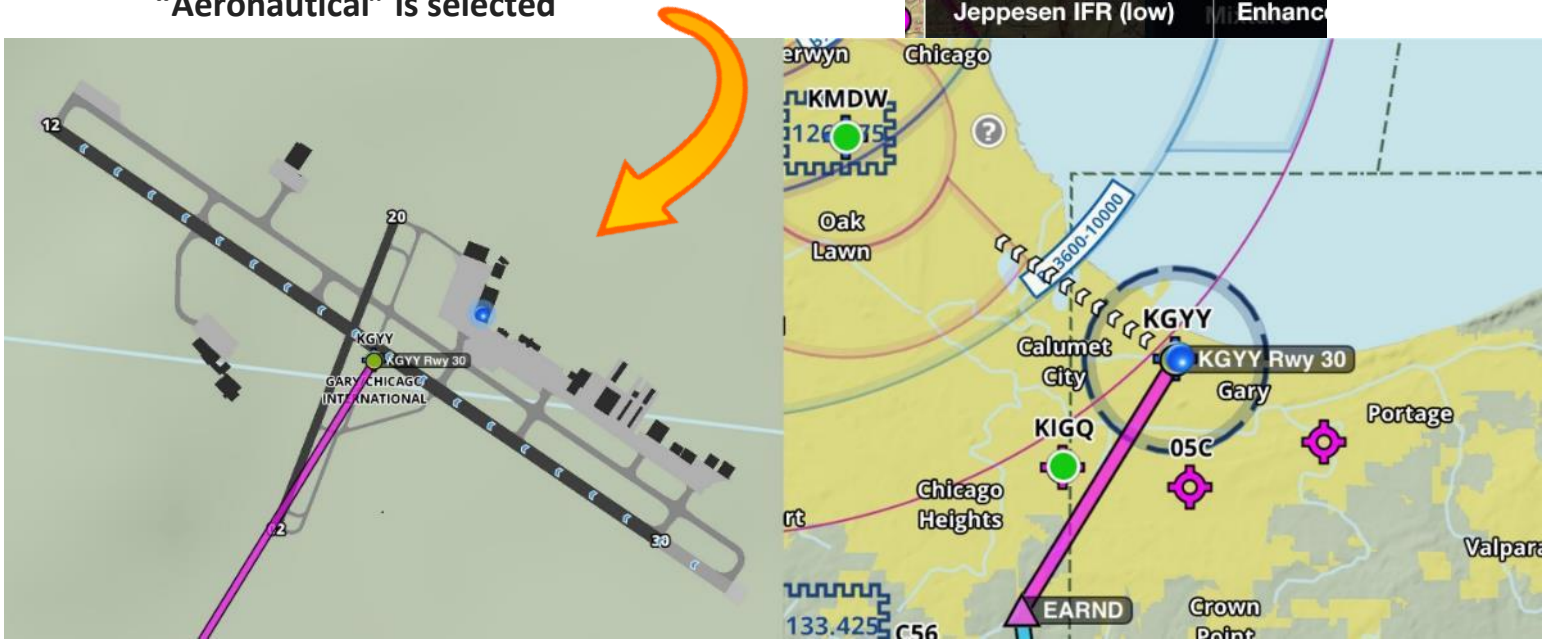

2) **Tap the Select Runway field**



3) **After selecting a runway,** ForeFlight will display various indicators on the moving map based on your zoom level. When zoomed in close, you'll see blue chevrons on the selected runway, serving as visual verification when viewing your airplane's position on the map. Zoom out a little further and you'll see white chevrons along the extended centerline.



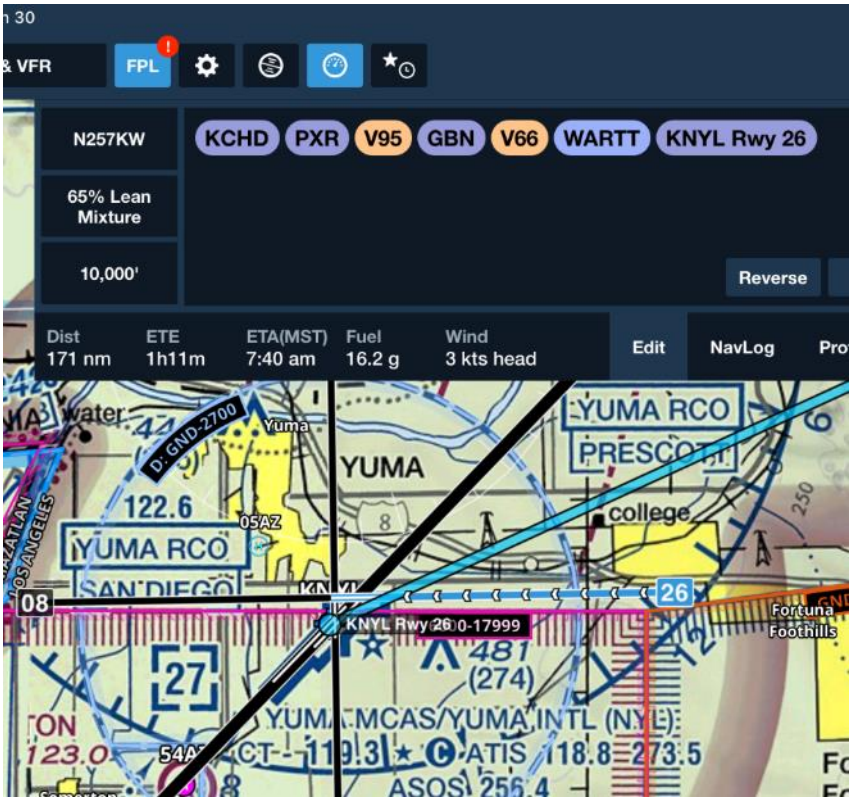

**This zoomed view is displayed when "Aeronautical" is selected**




For Performance Plus users, ForeFlight will also enter the selected runway in the Takeoff Performance Planning section of the app.

## Select a runway for the arrival (in flight)

Repeat this process by selecting the destination airport bubble in the Route Editor and again tap Select Runway to specify the landing runway. This will display chevrons and a blue line along the final approach path, and chevrons on the runway when zoomed in closer.




For Performance Plus users, the runway will also be set as the landing runway in the Flights Performance planning section.

## ForeFlight's 2019 Releases

- 11.5 - June 2019: ***Included Track Log Review, Alternate Advisor, runway selection on Maps, Organized Track System filtering, and more.***
- 11.4 - May 2019: ***Included Takeoff & Landing Performance for piston and single-engine turboprop aircraft, Flight Sharing, Smart Logbook Photos, night vision goggle currency tracking in Logbook, enhancements to the Flight's view Navlog, and more.***
- 11.3 - April 2019: ***Included major Documents enhancements, documents on iPhone and document syncing, as well as custom Geospatial PDF support, Military Training Routes in ForeFlight MFB, and more.***
- 11.2 - March 2019: ***Included support for Passenger companion app, route line in Profile view, airspace hiding by altitude, and more.***
- 11.1 - Februrary 2019: ***Included flight planning enhancements, Logbook entries from filed flight plans, MFB DD-1801 Filing.***
- 11.0 - January 2019: ***Included Airport 3D View, Breadcrumbs, and G-AIRMETs via ADS-B.***

# Ramp Checks


For some pilots, FAA Ramp checks are a serious concern. However, they should not be if:

1) You and your Mooney are "ship shape",

2) When you flew into the airport, you didn't bust any FARs, and

3) You're prepared for a ramp check, knowing what you should and should not do.

Ramp checks are rare and usually occur because you allegedly performed in a stupid or unsafe manner and managed to displease one or more controllers. Occasionally, it may simply be a routine check.


## Here's what you should do:

- **Be polite and respectful.** My wife was a lifelong cop and she always told people that being polite to the officer was the best policy. It's also true for a ramp check.
- **Be wary.** To ensure the Inspector is legit, you should first have him or her show their credentials.
- **Be ready.** Have your documents handy, but DO NOT hand them to the FAA Inspector! Just show the documents to him or her. A few years ago, in Southern California, a fellow Mooney pilot gave his docs to the Inspector and didn't get them back for months.
- **Be on the safe side.** File a NASA Aviation Safety Report within 10 days.

**Which documents will you need to "show"? Just remember A R R O W**

*A – Airworthiness Certificate*
*R – Registration*
*R – Radio Station License* (not required in the U.S.)
*O – Pilot Operating Handbook (specifically the Operating Limitations)*
*W – Weight and Balance*


## Here's what you should NOT do:

- **Do NOT carry Logbooks in your Mooney.** Keep them safe at home.
- **Do NOT let the FAA inside your Mooney.** They can observe the interior from the outside.
- **Do NOT offer any additional documentation** or access to your Electron Flight Bag (EFB) software.

If you have taxied up to the ramp and see the FAA, let not your heart be troubled. Continue as you normally would and complete your shutdown procedure. It would be embarrassing to have them spot a hot mag, or another forgotten checklist item. If you don't have a checklist, we recommend that you get one.


# Ask the Top Gun

## Tom Rouch

TG

Founder of Top Gun Aviation, Stockton, CA

Send your questions for Tom to TheMooneyFlyer@gmail.com

**Question**: First, let me say that I love your answers to our questions each month.

I read the entire magazine, but I start with your article. My question is this: I love my Mooney and most everything about it EXCEPT for those LEAKING FUEL TANKS. Can you tell me why they leak so much, and things I can do to reduce the chances of a tank leaking?

**Answer**: The question this month is more of a statement that LEAKING FUEL TANKS are probably the number one disliked problem on a Mooney.

The problem exists even on the newest of models, although it is most prevalent as the planes age.

First, why a wet wing instead of bladders? The easy answer is weight saved and when you are building a plane for speed, reducing weight is a big factor. If you go through the history of the Mooney, the company's goal through the years, has been to increase size, and speed. Bigger engines required more fuel on board to keep the range more constant. You can see the results when a bladder kit was developed and the F model lost about 10 gallons of fuel to compensate for the bladder weight. That is the "why", but the question is, why the leaks and what you can do to reduce leaks?

Mooney has used the same procedure for sealing since day one and the only real problem has been persistent problems in the wing walk area with leaks around the tank access panel under the wing walk. Constant weight in and out of the cabin has flexed the metal, screws, and nut plates until there have been many leaks that show up as a wet ring just outside the door. This is an engineering problem that has persisted many years and may be solved on newer models. The main complaint tanks leaking mainly into the spars and then "downhill" and dripping out the belly. So, what can you do?

Ideally, you would always keep your Mooney hangered at a cool 70 degrees. The wings can heat up like an oven, and over the years, this bakes the sealant dry. The best thing you can do is to keep a good quantity of fuel in the tanks, but not necessarily full of fuel. Heat will cause an expansion of the fuel and if the tanks are full, the heat can put pressure on the fuel, and this causes leaks.

One other help is to make sure the shock discs are changed when they become hard and don't pass inspection. Hard disks and a hard landing will send shocks to the wings. Of course, the easiest thing to do is always make soft landing landings "soft", as I know you all do.

There is not much else you can do. Just realize that even fuel tanks have a have limited life and will cost you in the long run.

**Repairing limited leaks versus complete resealing**

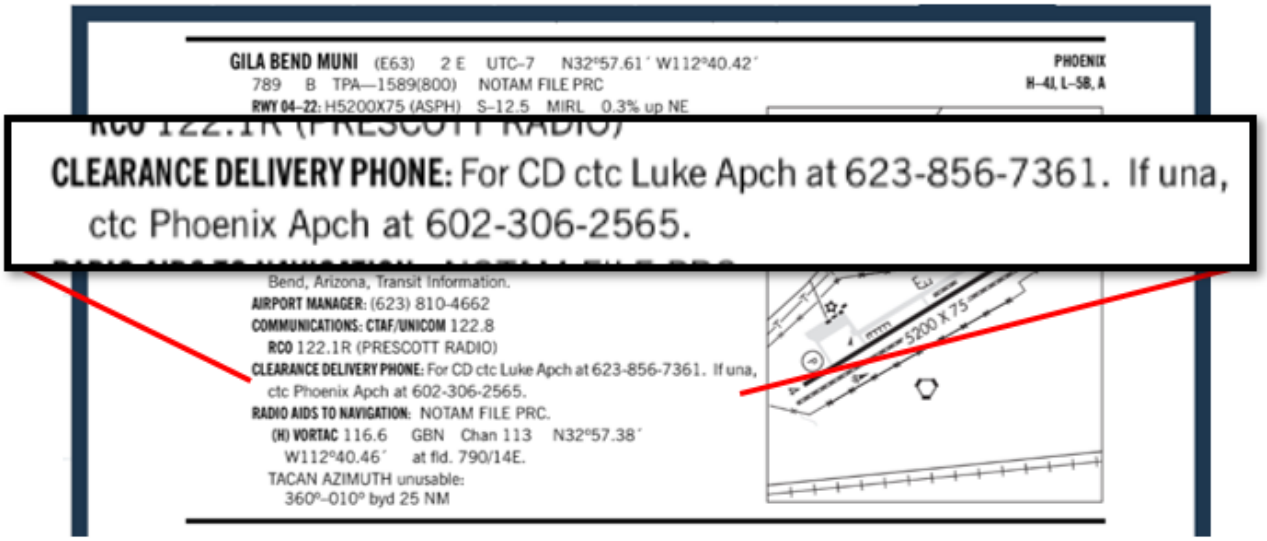
This is the most difficult repair for any shop because it's hard and time consuming to get inside the tanks. There are a couple of shops that do a complete resealing, which is the best option. There are allowable seeps, weeps, etc. These can extend the tank life.

What I always wished someone would develop is a "stop-leak", that we could just pour into the tank. This would have made my life a lot easier as fuel leaks have probably cost me more money trying to fix than any other Mooney repairs.


***The June 20 issue of the chart supplement included a new batch of air traffic control facility phone numbers that pilots can call to receive or cancel IFR clearances as the FAA ends the practice of flight service "relaying" clearances to pilots from ATC.***


***If you're at an airport without a tower or if a part time tower is closed, you can obtain or cancel an IFR clearance, by simply calling the closest FAA facility.***

The phone numbers are listed in the communications section of the ***Chart Supplement, US***, formerly known as the Airport/Facility Directory or A/FD.




In addition, Leidos, the FAA's flight service contractor, can provide pilots with the name and phone number of the facility to contact to obtain or cancel an IFR clearance.

"Pilots may continue to request clearances via radio from air traffic control or Flight Service.

## *Sorry Alaska*

This initiative, a component of the Flight Service NAS Efficient Streamlined Services (FSNESS program), does not affect pilots operating in Alaska.

A thunderstorm is never as bad on the inside as it appears on the outside.

It's worse.


*March 21, 1944, in the cold of winter, the residents of Miles City, Montana found that their quaint little town was being overrun and submerged by the rising frozen waters of the Yellowstone river.*

Ice jams were building quickly, raising the subzero river water levels over 16 feet. As the blocks of ice, slush and freezing waters flooded into the city, residents were forced to flee their homes for safer grounds.

Miles City Mayor L.S. Keye knew that immediate action had to be taken, and explosive experts were brought in from a nearby town. Two local pilots took off in small aircraft, flew over the river and attempted to drop and detonate 50-pound homemade bombs on the Yellowstone's ice jam. Unfortunately, it had little effect.

*His request was short and to the point: "Send in the bombers."*

Mayor Keye then decided to place an urgent request to the Governor's office. His request was short, and to the point: "Send in the Bombers!"

At Rapid City Army Air Base, Rapid City, South Dakota, (now Ellsworth AFB), the crew of an Army Air Force B-17 were quick to accept the unusual mission, and preparations to bomb an American city began. The crew hastily began fusing and loading 250-pound bombs into the bomb bay of their Boeing B-17 Flying Fortress.

Shortly thereafter, Major Richard Ezzard and nine other crewmembers, took to the skies in a harsh blizzard and low ceilings.

The plan was to deliver the bombs to Miles City where the load would be transferred to a waiting Dive-Bomber to execute the bomb delivery. As the lone B-17 was nearing Miles City, low clouds forced the plans to be changed. Under a blanket of 1,000-foot overcast skies, the B-17 was then ordered to handle the bombing run themselves.

They planned to release the load at 10,000 feet, but the low overcast forced the B-17 crew to take their ship lower. At 1930 hours, in heavy snow, winds and cold, the Flying Fortress appeared over the river and executed two dummy bombing runs as crowds of locals watched in amazement. On the third pass, they released a test bomb that exploded precisely on target. Unsure of the effect, the crew brought their bomber around again.

They made two more passes and released all six of the 250 lb. bombs. Hundreds of residents watched, knowing that their entire town, their homes and their future hung in the balance. Seconds later the bombs fell, a huge plume swirled upward, carrying mud, water and ice 150 feet into the air.
The ice jam quickly broke apart, and the frozen waters slowly receded, saving the small town. The next morning, Miles City residents were thrilled because the water levels had dropped a full 10 feet from the day before.

That night, Major Ezzard and his crew were welcomed by the thankful and relieved residents of Miles City Montana. The entire crew were put up at the local hotel, and each received a well-deserved steak dinner.

The next morning, the crew departed, and the B-17 made a final victory pass over the town at 50 feet, rocking their wings as they flew back home to Rapid City, South Dakota.

*The only time the Continental United States has been bombed, was to save a community.*


# Aspen Receives STC For Evolution MAX

Aspen Avionics has received STC approval for its Evolution MAX displays. The MAX name denotes a “bolder and brighter display with higher reliability and several customer-requested functions such as font and window enlargement and increased processing speeds.”

**Read More**

# New FAA regulations require towers under 200 feet to be marked

New FAA regulations require landowners to mark any towers between 50’ and 200’ on their property, as well as include the towers in a new database the FAA is developing. It will be functional by October 2019.

Previously, towers under 200’ were not subject to any federal marking requirements, according to officials with the National Agricultural Aviation Association.

**Read More**

# Dynon's SkyView HDX Avionics Approved for Mooney

Dynon Certified, a division of Dynon Avionics based in Woodinville, Washington, today announced a significant expansion of the Approved Model List STC for its SkyView HDX line of products that will allow the products to be installed in nearly nearly 600 type-certified single-engine aircraft, including Mooney M22, M20, M20A, M20B, M20C, M20D, M20E, M20F, M20G, M20J, M20K, M20L, M20M, M20R, and M20S.

**Read More**

# Garmin introduces the GSB 15

The GSB 15 is a small, lightweight USB charger designed for a wide range of aircraft.

Designed specifically for aircraft installations, the GSB 15 includes two 18W (up to 3A) USB Type-A charging ports that allow pilots and passengers to charge tablets and mobile devices in the cockpit and throughout the cabin. A single GSB 15 is capable of charging two full-size tablets while using them at full backlight.

Priced at $349, the GSB 15 will begin shipping the week of July 22, 2019.

**Read More**

# Garmin Adds IFR-Approved GPS/COMM


The GNC 355, which combines an approach-capable GPS with a COMM radio for $6,995.

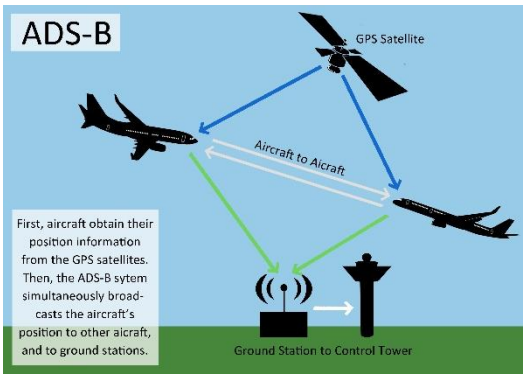
**Read More**

# Garmin Updates G5


For the G5, Garmin has added outside-air temp, true airspeed and wind data to the display; these features will be available with the addition of the OAT probe as part of a $495 upgrade package. These new features are available whether the G5 is configured as an attitude indicator or DG/HSI. The certified versions of the G5 will soon be able to select from two navigation sources. The G5 is designed to fit into a 3 1/8-inch (or similar) instrument hole.

**Read More**

# If You're Caught in a GPS Outage after Jan 1, 2020, you won't be Considered ADS-B Out Noncompliant




The FAA released a policy statement (PDF) last week assuring operators that "the FAA will not consider aircraft non-compliant with the ADS-B Out rule during periods of GPS performance degradation that are outside the operator's control. The circumstances are identified in the policy and are valid provided the operator has exercised appropriate due diligence prior to conducting an operation."

**Read More**

# FAA Clarifies ADS-B Preflight Requirements: GA Is Exempt (17 July 2019)

The Notam reads: “It is not necessary for operators of aircraft equipped with the Wide Area Augmentation System (WAAS) (TSO−C145 or TSO−C146) receivers to conduct a preflight availability prediction.”
Garmin spokesman Bill Stone said the preflight requirement to check WAAS outages at https://sapt.faa.gov/outages.php?outageType=129001250&outageResolution=0.5 was always intended for airliners, most of which have early-generation GPS systems that are not as reliably precise as those with WAAS. To report position, all ADS-B units certified for GA aircraft use a WAAS GPS receiver.

**Read More**

## Sporty’s new & smaller Flight Gear Battery Pack

Last year at Oshkosh, Sporty's introduced a handy battery pack that is specifically made for pilots. Now there's a new option with the same great features but in a more compact size and at a lower price.

The overall case measures 5.75” x 3 x 0.5” and weighs about half a pound. It’s almost exactly the same size as an iPhone X.

The Small Flight Gear Backup Battery is available for $39.95, and includes a short charging cable. The Large Flight Gear Backup battery is available for $79.95.

**Read More**

# uAvionix SkyBeacon receives STC for Mooney

**Included Models are** M-18C, M-18C55, M-18L, M-18LA
M20, M20A, M20B, M20C, M20D, M20E, M20F, M20G
Price is $1849.

### *What if my aircraft does not appear in the AML?*

Under the FAA Memo titled "Installation Approval for ADS-B OUT Systems," the FAA explains that after an STC is achieved for ADS-B OUT equipment, additional installations can be accomplished on aircraft not listed under the AML STC by an A&P with Inspection Authorization (IA) so long as the installation does not require airframe modification. This process requires completion of a two-page FAA form known as a 337. uAvionix provides a mostly complete sample skyBeacon Form 337 here. Once the form is completed, your installer will mail it into the FAA office in Oklahoma City. The process is normal for many ADS-B installations and your installer is likely familiar with the process. If your installer has questions, please ask them to contact avionics.

# uAvionix's TailBeacon


The TailBeacon is undergoing STC approval for the Cessna 172 and the Piper PA28. These high and low-wing installations will satisfy the FAA requirements and will enable subsequent tailBeacon installations to be performed on any "suitable aircraft" **without STC** as a minor alteration.

Once the STCs are complete for the low wing PA28, the TailBeacon installation is considered a minor alteration and can be approved by the installer for most aircraft. At this time a form 337 should be completed and submitted along with the proper logbook entries. Please note, the installer must determine if the conditions are appropriate for installation on a specific aircraft. Additional guidance for ADS-B installation, performance verification, logbook entries and 337 instructions have been provided in the FAA policy memo titled "Installation Approval for ADS-B OUT Systems"

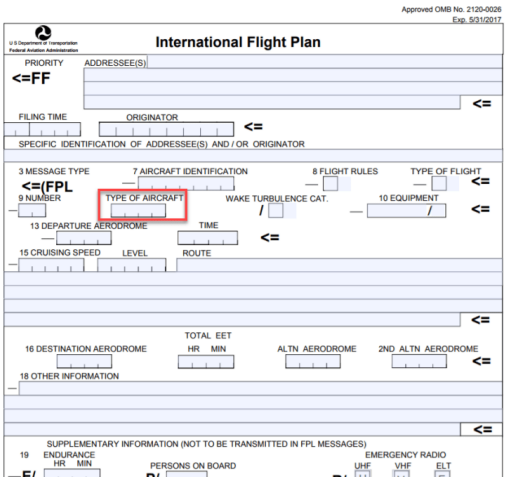
# Another ADS-B Transponder hits the market

On opening day of EAA AirVenture Oshkosh 2019, German avionics company TQ Aircraft Electronics introduced itself to the general aviation community.


TQ Aircraft Electronics has the KTX2 ADS-B transponder, (shown here) for which the FAA certification process is complete, with an AML STC expected in early August on more than 500 aircraft models. $1,759

**Read More**

# International Flight Plan (ICAO) format will be Mandatory as of August 27, 2019




The FAA has successfully completed system testing and will transition to mandatory use of the international flight plan format for all IFR and VFR domestic and international civil flights on **August 27, 2019**. The change is part of an effort to modernize and streamline flight planning and supports the FAA's NextGen initiatives.

Several improvements to the international form make it easier and more intuitive for pilots to use and will increase safety.

**Please use the international format now.** Simplified guidance on how to complete an international flight plan is available at bit.ly/2JiUkQN.

Please contact Flight Service by email 9-AWA-ATO-SYSOPS-FS@faa.gov if you have any questions.


## More International Flight Plan Help

**ForeFlight video to help you set it up**

**Garmin Pilot video to help you set it up**

**Leidos video to help you set it up**

**FltPlan.com video to help you set it up**

**iPad News video focuses on ForeFlight, Garmin Pilot and FltPlan.com**

You can also find all these links and more at The Mooney Flyer website. Just click on Links (on the home page)

Learn from the mistakes of others. You won't live long enough to make all of them yourself.

# 13 More Cubic Feet

# of Space and Comfort in Mooney's Big-New Executive 21

13 cubic feet of extra space and comfort have been added inside the cabin of Mooney's new EXECUTIVE 21. There is stretch-out leg room even for the tall set and all seats, front and back, individually recline for relaxing or a quick nap enroute.

There is extra space in the baggage area too! Ample room for 4 passenger's luggage. How about golf clubs? Take 'em along — they'll fit in the EXECUTIVE 21.

A convenient recessed shelf area is ideal for brief cases, cameras, hats and other light articles.

The all new EXECUTIVE 21 is long on performance too! It carries up to 7 hours of fuel . . . a lot of range for long cross country hops. You can cruise at 180 mph; faster, farther, and at less cost than in any other business aircraft.

The EXECUTIVE 21 offers comfort, speed, and the safety of PC at a practical price. If you haven't seen it — Do it! — today! Dollar for dollar, pound for pound you get more for your money in a Mooney. For free full color brochure write:

**MOONEY**

fly modern — fly Mooney with PC

Mooney Aircraft, Inc. • Kerrville, Texas

Mooney's 1967 Fly & Win Prize-O-Rama! See Your Dealer

CIRCLE NO. 55 ON READER SERVICE PAGE

# *Spatial Interior for your vintage Mooney*

**Simple, quick and effective repair methods add new life to cracked and discolored plastics. Optional STC approved lower side panels add space and elegance. Installed without screws will please any mechanic.**

***For details, visit:***

***www.jaegeraviation.com***

**Jaeger Aviation**

**Email: bruce@jaegeraviation.com**

**320-444-3042**


| | |
|---|---|
| Florida Mooney Lunch Group | ***Contact Dave at daveanruth@aol.com or (352) 343-3196, before coming to the restaurant, so we can have an accurate count. Events begin at 11:30***<br>August 10: Williston (X60)<br>September 14: Winter Haven (GIF)<br>October 12: Flagler (FIN) |
| Mooney Caravan | |
| MAPA Safety Foundation Mooney Pilot Proficiency Program | September 6-8: Atlantic City, NJ<br>October 4-6: Ogden, UT |
| **Mooney Summit** | September 27-29, 2019: Mooney Summit VII, Panama City<br>www.mooneysummit.com |
| Australian Mooney Pilots Association | September 6-9: Spring Fly-In to Mt. Hotham<br>Go to https://www.mooney.org.au/ for details<br>October 2019: Pilot Safety Program in Perth<br>March 2020: Annual General Meeting at Coffs Harbour |
| EMPOA | |
| **Other Mooney Fly-Ins** | |

# Sentry Mini ADS-B Receiver

## *Compact, affordable weather receiver for ForeFlight*

Free-flights new Sentry Mini weighs less than 2ounces, butt still delivers all the essential features for cross country flying. You'll see complete FIS-B weather data in ForeFlight, from radar and lightning to METARs and TFRs. Dual-band traffic helps you track nearby aircraft, and the built-in GPS drives moving map navigation with terrain alerts. Available at an incredible price, Sentry Mini can be plugged into a cigarette lighter charger or a portable battery pack for all-day performance.

**Features:**

- Subscription-free weather in flight
- Dual band ADS-B traffic
- Built-in GPS
- Weather replay

**Sentry Mini measures just 2.25"w x 3.25"h x 0.25"d and weighs only 1.5 oz.**

- Connect to ForeFlight via WiFi (up to 5)
- Easy firmware updates with ForeFlight

**Integrated Weather Replay**

With onboard memory supporting up to 30 minutes of FIS-B data, Sentry and Sentry Mini save animated radar and other weather so data is available as soon as you connect. Turn off your iPad screen and save battery when not in use; when you turn it back on, you'll receive a burst of weather data so you're up to date.

**Fast and Reliable Mounting with Quick Release**

Sentry's quick-release mechanism means you can attach and remove it in under a second. The popular RAM® suction cup mount ensures a long-lasting seal and high heat tolerance, so you can leave it in the plane between flights.

**Easy Firmware Updates Through ForeFlight**

Updating Sentry's firmware is a non-issue thanks to fast over-the-air updates through ForeFlight. When an update is available, ForeFlight provides one-tap installation that finishes in seconds.

# You might not like:

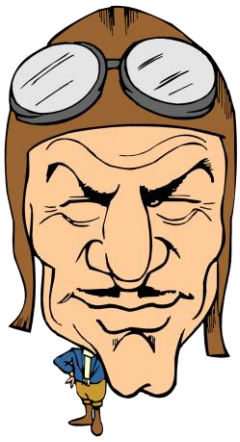
Con: Sentry Mini does not have a battery (one reason it's so small), so you'll need to power it with either a cigarette lighter plug, a panel-installed USB plug, or a portable battery pack, like Sporty's Flight Gear Battery Pack.

+ Fortunately, a sturdy, braided USB-C charging cable is included with Sentry Mini and it's long enough to reach across the cockpit in most airplanes.
The included suction cup mount is the same as the one included with the full-size Sentry, and it works well. Just twist the Sentry Mini onto the RAM suction cup and mount it on a side window.

Con: Because there is no AHRS in Sentry Mini, ForeFlight's synthetic Vision won't display the attitude indicator. Instead, you'll have GPS-derived ground speed, altitude, vertical speed, track, and an HSI display that includes a course deviation indicator.


**The Pilot Pocket XL and the Flight Gear Backup Battery are great accessories for Sentry Mini.**

+ Because there's no AHRS, it's less particular about where it's mounted in the airplane.



Flying is the second greatest thrill known to man.... Landing is the first!

FOR SALE Mooney Stuff

## 1979 M20K For Sale ($88,000)

Call Tom at: 925-595-8969

| | |
|---|---|
| Engine 1262 TSIO360 LB1B<br>McCauley prop 152 hours<br>Airframe 3215<br>Turboplus intercooler<br>Merlyn automatic wastegate (deck pressure controller)<br>GAMI fuel injectors<br>Insight Graphic engine monitor<br>**TKS inadvertent icing protection**<br>Precise Flight Speed Brakes<br>Precise flight Pulselite<br>KFC200 autopilot slaved with altitude hold<br>Electric standby vacuum<br>King Attitude indicator with flight director | King HSI<br>3M WX10A Stormscope<br>Hoskins Fuel computer<br>All King radios (KNS80 KY197)<br>Built in SKY-OX oxygen system<br>Mods by Lake Aero Styling and Repair<br>Including fiberglass belly panel and fiberglass gear doors with brake rotation<br>Inflatable Door Seals<br>Rosen Sunvisors<br>Exterior paint is good<br>Interior leather worn but presentable<br>**Annual: 5/31/2019** |

## Parts for Sale

This Cowling was removed from a M20E and replaced with a M20J (201) cowling. The cowling is located at Fullerton Airport (KFUL) and is in excellent condition. Offers accepted

Contact: Bernard Lee – leebern@msn.com (562-865-2547)

P/N 310309-501
P/N 310309-502

These fairings are new and priced @ $280.00 each or $525.00 for both. Priced elsewhere @ $362.69 each.

Contact: Bernard Lee – leebern@msn.com (562-865-2547)


Bushing P/N 914007-003 - 2- Bushings in the original package @ $35.00 each. Priced elsewhere @ $45.00 each.

Bushing P/N 914007-005
1-Bushing in the original package @ $59.00
1-Bushing loose @ $50.00
Priced elsewhere @ $69.00 each

Contact: Bernard Lee – leebern@msn.com (562-865-2547)


Access Covers P/N 3000-901 (2-available) - 1-without nuts attached.
Make offer

Contact: Bernard Lee – leebern@msn.com (562-865-2547)

## Parts for Sale

**I have several Mooney parts for sale from a 1969 G model.** Brand new voltage regulator (never used). Instrument light rheostat controller, cowling plugs and like new fuselage/cockpit and tail feather covers. G model POH. Contact me at Wilson Brown, located in Georgia, 678-469-6182

## Wanted

**Time on your Mooney. Hangar available.** I only need 20-30 hours yearly. I have an empty hangar in Cartersville, GA for your Mooney or Cirrus @KVPC. 3500 hours, 3000 Mooney INST CML no accidents. Please email to: mooney201@gmail.com


Whether you're a Rusty pilot, dreaming of becoming active again . . .
. . . or you're a proficient, veteran
Master of
The Flight Review
J D PRICE
Prepare online
Free!
Master of
The Instrument Proficiency Check
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