The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

January 2022

Editors

Phil Corman | Jim Price

Contributors

Bruce Jaeger | Tom Rouch | Ron Blum | Richard Brown | Linda Cormar

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The views expressed in each author's article are their own.
The Mooney Flyer's goal is to educate, inform, and entertain Mooniacs.

From the Editor

FTE

Phil Corman

GTN750 Data Base Verification Failure

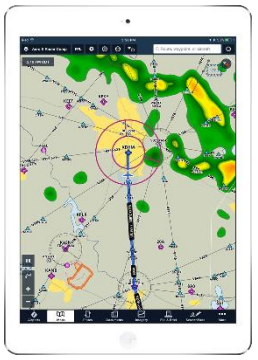
I update my Garmin devices using Garmin Pilot. The feature called Database Concierge is amazingly useful. You can download the database "updates", (Navigation, FliteCharts, SafeTaxi, Basemap, Obstacle and Terrain), onto your iPhone/Smartphone. No matter where you are, if connected to the internet, you can download the latest. When you arrive at your Mooney, (assuming you have the Garmin Flight Stream 510 option), the databases are then transferred from your iPhone/Smartphone to your GTN 650 or 750.

But, if you receive a failure to update message, such as "Database verification fault", you cannot use that database until you find a remedy. Without the Navigation database, you have no Flight Plans, no Approaches, no Airport info, etc. So, it extensively cripples your GTN 650/750.

Should you ever encounter this problem, here is an easy solution. Power down your 650 or 750. Then, power up again, while holding the "Home" key. This puts you in Configuration Mode. Select "Updates" and then check the database that failed.

This will force a refreshed download of the bad database, and unless something else is wrong, you are good to go.

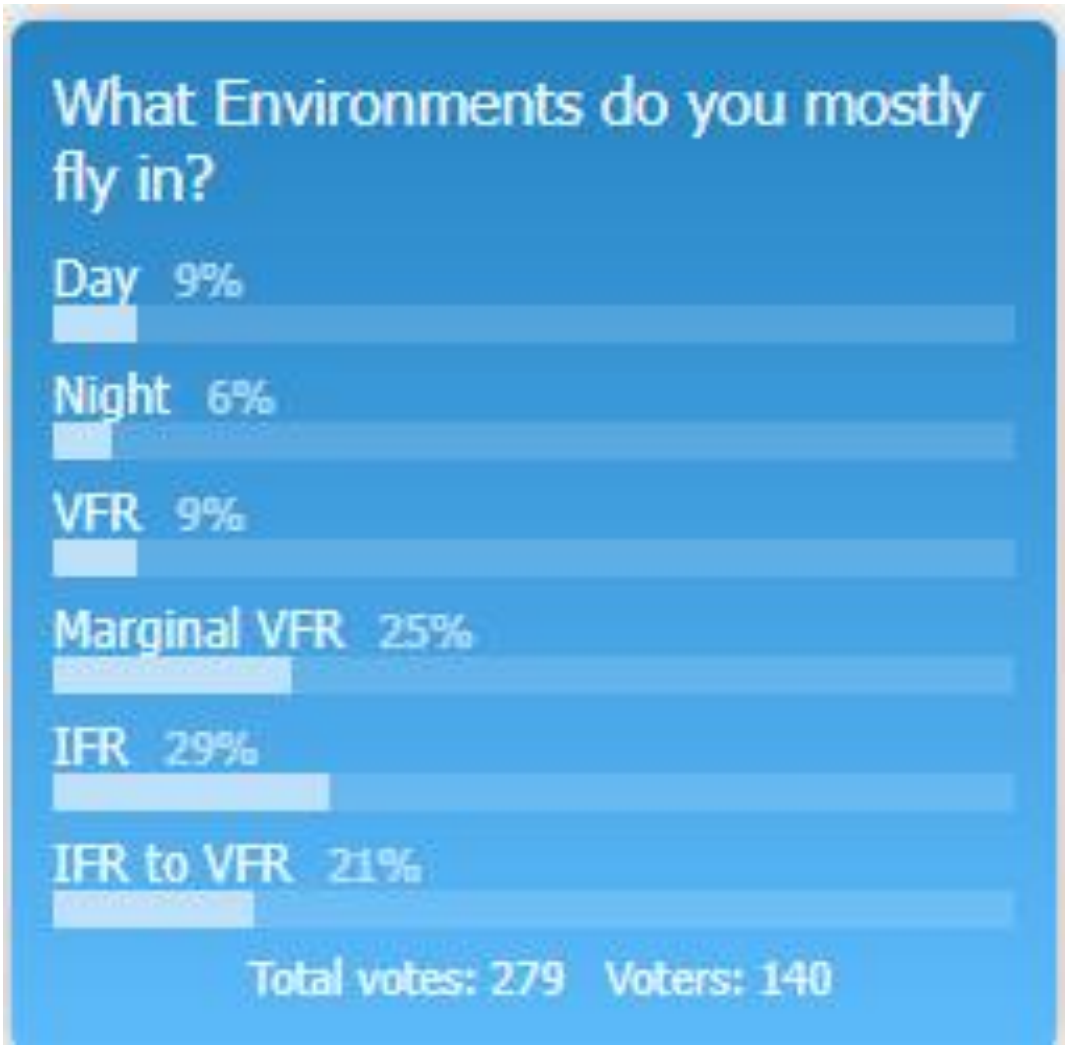
This is just one more reason you should have software redundancy. I also have a Garmin 496 which serves as a second GPS, should my GTN750 fail. And, of course, there is ForeFlight, which is extremely useful as a primary or backup navigation tool.



FSS Yada, Yada, Yada

While flying, sometimes I want to talk to FSS, but I tend to dread it since most of the time, they seem to be hard to raise. But what irks me a little more is when I call, wanting something simple like the latest METAR at a specific airfield, I receive a litany of AIRMETs – more information than needed or wanted.

So, an expected one-minute exchange turns into 2 – 3 minutes. End of my complaining.



Next month's poll: "My Biggest Challenge Transitioning to Mooneys was?"
CLICK HERE to vote.

Letters to the EDITOR

TheMooneyFlyer@gmail.com

The Mooney Flyer! What an outstanding source for Aviation Knowledge especially for the planes of our passion.

I had just the first look at the December issue and am (like always) impressed of your excellent Journalism for Aviation!

Great articles like: How We would Restart Mooney; Icing & Mooney …. Phil and Jim, please keep this going on. Thank you so much!

So, a donation is on the way to support your important, great work.

Merry Christmas and a Happy New Year

Bernd Z

Regarding Rejuvenation of Mooney - I'd be in. If this ever becomes reality, i.e., a complete revamp including a new business plan, financing, M20J/K upgrades, (i.e., Mk. II), etc. Let me know.

I've been in global aviation and aerospace for over 20 years; corporate and entrepreneur.

I believe Mooney to be a strong product.

Cheers, **Philipp M**

First, I'd like to thank you for The Mooney Flyer which is a great magazine to read every month, even if I sold my beautiful Bravo last year.

Second, I'd like to add my 2 cents to your article. I don't believe in the turbine option. I don't see how Mooney would be able to do any better than the TBM. To me, the future of aviation is electric (hybrid-electric to start with). This is the way I would go in the « run » phase. A unique design that would allow for a 4-seater or a 2-seater with extra batteries. Such a program would probably require $100 to $200 million...

Best regards from France, **Jérôme**

It is just enlightened self-interest. The Mooney Flyer is by far the most useful magazine for those of us that own Mooney aircraft, so I'd like to see it continue.

Maybe your next trick should be "crowd funding" the money to buy the type certificate so that Mooney operates in future, more effectively satisfy the needs of the current owners. I'm sure that I could rustle up a few contributors here!

Best, **John**

3° Glide Slopes

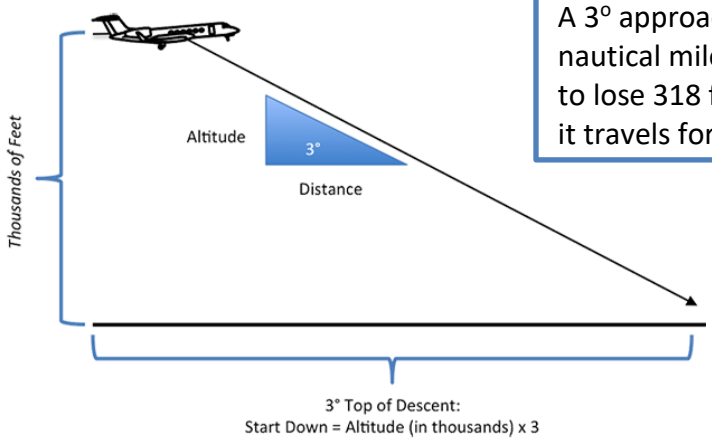
Phil Corman
Co-Editor

A few years ago, I took a refresher day with Master Mooney CFI Don Kaye. It was the most useful training I have received in years. I swear that in five minutes, Don forgets more about how to fly a Mooney safely and effectively than I will ever know.

One of the best things he stresses is a 3° stabilized final approach. At first, it sounded a little too preachy, but after flying several approaches, I was amazed that when I fly a 3° stabilized approach, my M20S Eagle practically lands itself. This is useful if you are VFR and perhaps following a PAPI or VASI. It is also extremely useful for IFR pilots when chasing an ILS glidepath.

Why is this useful? Mooneys are easy to land if you do it correctly and a stabilized approach on the correct airspeed is essential for success.

After a short time, you will get a visual sight picture of a 3° approach. However, until then, here a few methods to calculate a 3° glide slope.



A 3° approach is equivalent to 318 feet per nautical mile. This means an aircraft needs to lose 318 feet for every nautical mile that it travels forward.

Multiply Your Groundspeed by 5

As an example, let's say your groundspeed is 100kts. Multiply that by 5 and you'll get 500. Your descent rate should be 500fpm. That'll put you on the proverbial 3° slope.

Another Formula: Divide Groundspeed in Half and add a "0"

Using 100kts groundspeed again, divide it in half and you have 50. Now, add a "0" to get 500fpm. This is too easy.

Headwinds and Tailwinds can Drive you crazy

If your GPS is providing you with an accurate groundspeed, the above methods automatically compensate for headwinds or tailwinds. But if you use "indicated airspeed", here's how to compute.

Say you are indicating 100kts, with a 15kt headwind. Your groundspeed is 85kts. Multiply that by 5 and you get a 425fpm descent for 3°.

Correspondingly, let's say you are still indicating 100kts but now have a 15kt tailwind. Your groundspeed is therefore 115kts. Multiply that by 5 and you need a 575fpm descent for a 3° slope.

Summary

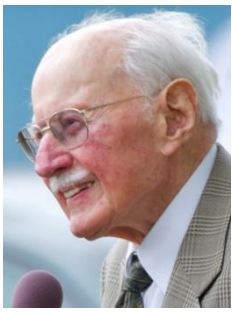
3° approach angles are recommended for many reasons, but the main reason is that it provides an ideal descent rate that will give you a smooth transition to the round out and flair. It requires less effort and, at least in my Mooney, it almost lands itself.

Although not related to a stabilized approach, Co-Editor Jim Price wrote about how your perception of the runway indicates the time to begin your flair. As you enter the runway environment while landing, there will be a point at which the runway width suddenly expands. That indicates you should begin your round out/flare. It's another quick method, especially if you are flaring too high or too low. CLICK HERE to watch a short video of this.

What if . . . ?

In the early seventies, I was a young Air Force pilot, flying KC-135s. The Colonels in senior leadership were always asking, "What if . . . ?" I thought they were old coots with an agenda to keep me busy addressing their improbable concerns. After all, as far as I knew, their "What if" fears never seemed to materialize. Twenty-four years later, I was a Colonel in the Air Force Reserves and the Vice Commander of an Air Refueling Wing. Quite frequently, I found myself asking, "What if . . . ?"

Flight education has improved since I soloed in 1969. Flight Instructors are teaching pilots to ask and answer questions that begin with "What if…?" Today, the airman certification standards indicate that a new pilot's takeoff planning should focus on "satisfactory knowledge, risk management and skills associated with a normal takeoff, climb operations and rejected takeoff procedures." Pilots should know how the environment affects these procedures.



What if the engine quits when you're 500 feet in the air? Will you land straight ahead, turn back to the airport, or land on the road just off the end of the runway? First, we need to fly the airplane. Fighter pilot, test pilot, flight instructor, and record-setting air show aviator Bob Hoover said, **"If you're faced with a forced landing, fly the thing as far into the crash as possible."**

Takeoff Accidents

In 2018, approximately 26 percent of the aircraft fatalities occurred during takeoff.

What is an Engine Failure?

For many years, flight instructors defined an engine failure as a complete powerplant failure. However, the Australian Transport Safety Bureau writes in its article, *Avoidable Accidents No. 3*, that "During and after takeoff, **a partial power loss is three times more likely** in today's light single-engine aircraft than a complete engine failure."

Mike Busch, founder and CEO of Savvy Aviation says, “It’s a lot more common to lose power in one cylinder than to lose all engine power. When you lose power in one cylinder — either because a head separates, or a fuel injector clogs up — the engine continues to run and produce power. But it runs very rough, and it’s very scary.”

Chances of Fuel Exhaustion

According to the FAA, about 90 percent of all NTSB reportable engine failures are because of fuel exhaustion or starvation. If pilots thoroughly review the before-takeoff checklist and correctly manage / monitor their fuel flow, the chances of an engine failure are extraordinarily low.

If the engine manifold pressure drops 4 inches just a few seconds after setting takeoff power, most pilots wouldn’t notice because they are now focusing on the runway centerline. This makes me wonder, what else could we miss?

Airline and business jet pilots generally have a great safety record when it comes to takeoffs. Why is that?

1. **Training!** Depending on the airline, they train once or twice a year in full-motion simulators so they can realistically and safely deal with life-threatening scenarios.
2. **Experience.** These pilots usually have a great deal of it.
3. **Engine Type.** Turbine engines are generally more reliable than piston engines.

An Airline Takeoff Briefing

Trying to think clearly when an emergency strikes at a low altitude is tough. That is why the PIC of a transport-category jet often begins the takeoff briefing while the aircraft is still sitting at the gate. This helps the other pilot understand the plan if something goes wrong.

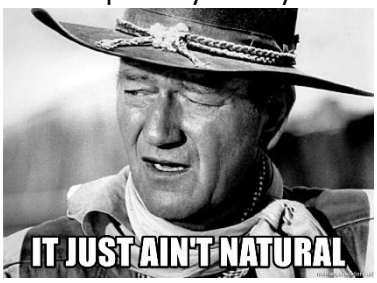
A Single Engine Aircraft Example

A Beech Sierra pilot recalled that his airplane began to sink shortly after takeoff. He retracted the flaps at 200 feet and began a turn back toward the runway as the aircraft began to vibrate and lose power. The pilot leveled the wings just before the aircraft struck the roof of a nearby factory building, then fell to the ground, hitting five parked cars. The post-accident fire consumed most of the aircraft. The pilot was seriously injured, and his passenger died. The NTSB determined that a mechanical issue caused the power failure but focused on the pilot’s decision to turn around at an altitude insufficient to complete the turn, as well as his failure to maintain control of the aircraft.

Effective takeoff planning demands more than calculating weight and balance, the required runway length and considering the prevailing winds. What if you lose power?

- Should you land on the remaining runway, if there is any, or simply accept that the airplane is landing straight ahead?
- Should you safely turn 180-degrees and try to land on the runway? Under certain conditions, you might make it back to the runway without harm.

Flight Instructor Refresher Clinics (FIRCs) teach that if you lose power after takeoff, the best move is to land straight ahead. Too many pilots lose control of the airplane trying to execute a steep 180° turn, especially if they've never tried it before.



Thinking about how or where to land an airplane following a loss of power does not come naturally. The checklists in the pilot's operating handbook assume that you have lots of time to check magnetos, the fuel selector and adjust the mixture. As you know, time is precious, especially when you are at 200 – 300 feet AGL.

A new acronym, "TENE" – Pre-Takeoff Briefing

TENE. The T represents '**Threats.**' Perhaps you are facing a slushy runway today. Perhaps the winds are gusty or there is a low IFR ceiling. **How will you prepare for events that may affect the takeoff?**

T**E**NE represents '**Expectations.**' How many feet of runway will you use for takeoff under the current conditions? After advancing the throttle, what should you expect to see on the manifold pressure, RPM and fuel flow indicators?

The Rule of 70% by 50% - Speed Expectation

Use this takeoff rule of thumb before beginning each takeoff: "The airplane should achieve 70 percent of its liftoff speed by 50 percent of the ground-roll distance."

TE**N**E is for '**Normal'.** In a VFR pattern, which way do I turn? If you are flying a SID, does it require climbing to a certain altitude before making any turns? If the climb is at VX, what is that speed?

TEN**E** is for "**Emergencies.**" If you have a power loss, you should know how quickly the airspeed will drop if you don't immediately pitch down to maintain flying speed. Failure to pitch down often results in a terrible loss of control accident.

Mitigating Loss of Power after Takeoff – Getting High

The Mooney Safety Foundation recommends that after takeoff, the first power reduction should take place no lower than 1,000' AGL. Some CFIs feel that each climb to 1,000' AGL should be flown at Best Angle (Vx). Each second that you climb full power at Vx places you in a better position should you lose power. If you lose power in the climb at Vx, you will need to aggressively lower the nose to a safe speed, such as Best Glide. For instance, in a M20K, Vx is 71 knots, and that's just 10 knots faster than stall speed. Maintaining climb pitch angle will stall the aircraft in three to four seconds, and it won't be pretty.

What if today is the Day?

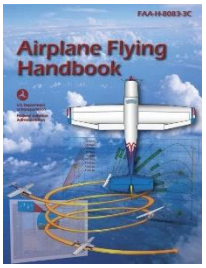
So, what are your chances if a takeoff emergency demands extraordinary skills? If the chance of a 180-degree turn has never crossed your mind, you should realize that successfully performing this turn is about skill and understanding your airplane's capabilities. You might want to conduct some airplane-specific research at a safe altitude. Learn what your airplane is capable of before you're faced with an actual engine failure.

Think You Can Make a 180 Turn Back?

During an EAA 2020 Webinar, "So You Think You Can Make a 180 Back on Takeoff?", a panel of experts emphasized the FAA's perspective that landing straight ahead is usually best. They asked the big question: "Is my aircraft capable of making a 180 back after a power failure today, and if so, how would I successfully perform the maneuver?"

Don't Panic!

The only way to deal with the potential for panic [during a takeoff emergency] is to train, train, train. When an engine loses power during takeoff, some pilots realize they have a few seconds to solve the problem and become paralyzed.



The FAA's Airplane Flying Handbook says that while "fear during a takeoff emergency is understandable, uncontrolled fear can lead to a disaster. The success of an emergency landing is as much a matter of the mind as of skills. Survival records favor pilots who maintain their composure and know how to apply the general concepts and procedures they've learned through the years. An unconscious desire to delay the dreaded moment may lead to a failure to lower the nose to maintain flying speed, delay in the selection of the most suitable landing area within reach, or indecision in general. Desperate attempts to correct whatever went wrong at the expense of airplane control fall into the same category."

Practice, Practice, Practice

In a 1994, at a US Naval Academy training session, David F. Rogers, a Ph.D. in aeronautical and astronautical engineering said, "Although the turn-back maneuver is a high-performance, edge of the envelope maneuver, there is good evidence that a well-trained pilot is capable of successfully performing it." However, "a pilot should NOT attempt to turn back to the airfield unless the procedure has been practiced at a safe altitude and the minimum turn-back altitude for the combination of their ability and skill is known."

Avoid Takeoff Emergencies

Before you advance the throttle:

- Do not simply read the before-takeoff checklist. Make sure you have accomplished the required tasks.
- Do you have sufficient fuel in the selected tank?
- If the POH requires that the fuel boost pump be ON for takeoff, make sure it is ON.
- Recheck takeoff flaps and takeoff trim are properly set.
- What are the expected inches of manifold pressure and RPM?
- Do not accept an intersection departure. It leaves valuable runway behind you.
- Where is the 50% point for checking 70% takeoff speed?
- Note the distance (in feet) of your upcoming ground roll. Where should you break ground?
    - If not airborne by the highlighted spot, will you have enough remaining runway to stop?
- Have you surveyed the area beyond the departure end of the runway for potential landing spots?
- If you lose power and you have never practiced making a 180-degree turn back, do not expect miraculous skills today.
- If you are proficient at the 180-degree turn back maneuver, brief your limitations.
- If faced with an off-airport landing, your job is to protect the people on board. Remember, the airplane is insured.

Two Thought Provoking Videos

At 400 – 500 feet AGL, Dave Keller safely and skillfully accomplished the "Impossible Turn" in his Mooney M20C. Click here to watch the video (8 min 40 sec).

Do you think you're ready? Watch this video about the Defined Minimum Maneuvering Speed (DMMS).

Normalization of Deviance

By Richard Brown

I can remember exactly where I was on January 28th, 1986. I was sitting in my 8th Grade Science classroom when the Space Shuttle Challenger was lost 73 seconds after lift-off. All of us kids in the class were having a hard time processing that the accident had happened. It seemed impossible. I also remember a class trip to Washington, D.C. where we saw the Challenger Memorial, which was still in the process of completion.

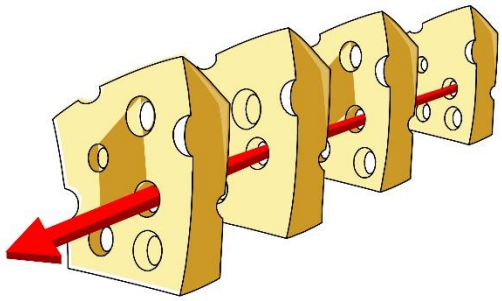
During the subsequent investigation into the cause of the Challenger disaster, Diane Vaughan, a Professor of Sociology at Columbia University, coined the term "normalization of deviance." Vaughan stated, "Social normalization of deviance means that people within the organization become so much accustomed to a deviation that they don't consider it as deviant, despite the fact that they far exceed their own rules for the elementary safety."

The O-rings in the Shuttle had a dangerous design flaw. NASA engineers were aware of the flaw, but repeatedly made the decision to fly the space shuttle, despite flaws in the O-rings. There were two O-rings, so there was redundancy. There were instances of blow-by past the primary O-ring and in 1984, damage to the primary O-ring was increasing. However, engineers decided the risk was acceptable. During one launch, there was complete burn through of the primary O-ring and damage to the secondary O-ring. In response, engineers increased the amount of acceptable damage and continued flights, finally waiving the requirement that the O-rings must be redundant. Tragically, on January 28th, 1986, with the outside temperature at 36° F, which was well below the 53°F to which the O-rings were rated, all the holes in the Swiss-Cheese lined up with devastating results.

What can we, as pilots learn from this tragic chain of events? While collectively, as Mooney owners and pilots, we could be called an "organization," it doesn't really fit in the same way that NASA is an organization. When it comes to maintaining and flying our planes, we do have, or should have, Standard Operating Procedures (SOP). Do we skip steps in our checklists? Somewhere along the way, after hundreds of hours flying the same plane, do we still use our checklists?

The airlines have a much better safety record than those who fly General Aviation aircraft. Why? They have the benefit of a two-man crew, more reliable equipment, (you can't argue the reliability of a jet

engine compared to a piston single-engine), and higher maintenance standards, just to name a few reasons. But there are some things that we can do to improve our safety record.



Use a Checklist and Follow it Religiously

Do you cut corners? You may get away with it for a long time, maybe even for your entire time flying. However, one day, the holes in the Swiss-Cheese may line up. When you are going through your pre-takeoff checklist, do you check your flight controls to ensure that they are free and correct?

Preflight Failures and Tragedies

On May 31, 2014, a Gulfstream IV attempted to take off from Hanscom Field in Bedford, Massachusetts without removing the gust lock. The professional pilots skipped checklists. They did not perform a flight control check, and a review of flight data from 175 takeoffs revealed that they did not perform a flight control check in 98% of those takeoffs. After beginning the takeoff roll, they realized there was a problem. The plane overran the runway, went through the airport perimeter fence, and came to a stop in a shallow ravine, immediately catching fire and killing all seven people on board. They had skipped checklists and specifically skipped a control check 171 times out of the previous 175 flights, but this time the holes in the Swiss Cheese lined up.

On April 18, 2019, I went to the airport after work for a short evening flight. After landing and putting the plane in the hangar, I was driving to the gate when I saw a Beechcraft Duke lining up on the runway. It was a beautiful plane, and I stopped the car and rolled the window down to watch him take off. He stood on the brakes as the engines and turbos spooled up. He released the brakes and began the takeoff roll. As he rotated, I started to drive away, but as I turned the corner at the end of the hangars, something out of the corner of my eye caught my attention. I hit the brakes, looked out the window to my right and saw the giant fireball in the taxiway. It took a few seconds for my brain to process that the fireball I was looking at, was the Duke I had watched lift off a few seconds earlier.

The NTSB report showed that the pilot had put something in the elevator to keep it in the full up position so it would not hit the prop of another plane in the hangar. The device had not been removed. Videos from the airport showed that he did not pre-flight the aircraft. The elevator was full up during taxi and run-up, and no control check was performed. Two seconds after rotation, the plane began to roll to the left. Three seconds later he was about 80 ft above ground level and in a 90° left bank. When he released the brakes, the flight was doomed. I don't know if he regularly performed a control check, but this time he didn't, and it was fatal.

Resolutions

As we enter the New Year and everyone is making resolutions, let's all look at our Standard Operating Procedures. Are there things that we did before we became "more experienced", that we don't do anymore? Maybe we made a change to our SOP's, and we have been flying for years and hundreds of hours without incident. Everything is great, until it isn't.

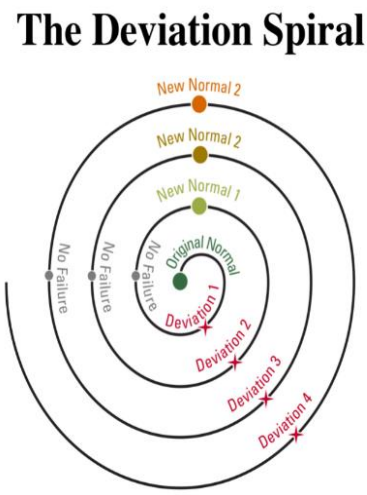
When I perform my Before Takeoff Checklist, I verbalize the airport elevation, traffic pattern altitude, my abort point on the runway, my option for an off airport landing immediately after takeoff, and the altitude at which I can turn back if necessary. My confession is that I probably only do that about 90% of the time. One of my resolutions is to follow that SOP 100% of the time. Hopefully with proper maintenance and pre-flight checks, I won't ever need those abort plans. However, if I do, my survival odds are better if I briefed it right before takeoff, so that is what I am going to do.

While I'm making confessions, here's another one. FAR 91.103 requires that we "become familiar with *all available information* concerning the flight." FAR 91.103 does not specifically include NOTAMS, but I think those would fall in the "all available information" category. Well, when just making a short local flight to an airport I frequently fly to, I confess I have not always checked the NOTAMS. In fact, a few months back when I was working on my Instrument Rating, I was going up to shoot approaches with a safety pilot in VFR conditions. Knowing I wasn't landing (or planning to land) at any of the airports, I just checked the weather and off we went. After shooting the first approach, we were enroute to the next airport, Oxnard (KOXR). Approach handed us off to the next sector who said, "Mooney 78878, are you aware that Oxnard is closed? State intentions." This wasn't some temporary closure. The airport had been closed for weeks and would be for a total of 91 days so the runway could be completely replaced. There was no excuse for me not to have known. Somewhat embarrassed, I requested a change to Camarillo, a few miles northeast of Oxnard and shot the approach there, before heading back to Fullerton.

With all the technology at our fingertips, it is simple to file a VFR flight plan and get a briefing right on your phone. It is said that if you make a resolution and don't tell anyone, the chances of keeping it are slim. So, I'm going to tell all of you that in the New Year, I resolve that if I am not filing and flying IFR, that I will still file a VFR flight plan and get a briefing before every flight. That includes the short 15-minute flights to a neighboring airport for the cheaper fuel.

Take a deep dive into your flying habits. Are there things that you have been "skipping" which haven't been a big deal so far, but could be if all the holes in the proverbial Swiss-Cheese line up? Make a New Year's resolution to get back to the basics. Just like your personal minimums, establish your SOP's and don't cut corners on them. After all, it works, until it doesn't.

As always, thanks for reading, and if there are things you would like me to write about (or not write about), or if you just want to say hello, drop me an email at richard@intothesky.com.



Wisconsin Aviation Expands Aircraft Interiors Service with the Acquisition of Jaeger Aviation & Its Spatial Interior

Wisconsin Aviation, Inc., announces the expansion of its aircraft interiors department with the acquisition of Jaeger Aviation, based in Willmar, Minnesota.

With its roots stemming back to 1945, Jaeger Aviation's sixty-four years of specializing in Mooney Aircraft sales and service made a new interior design for the vintage Mooney a natural. The "Spatial Interior," as this new design was labeled, allows for a simpler and better way to increase cabin space and expedite service while giving the Mooney a look it deserves. The Spatial Interior, now 15 years in the making, is recognized worldwide.

For more details, visit:

www.WisconsinAviation.com or www.JaegerAviation.com

Wisconsin Aviation's aircraft interiors department, located in Watertown, Wisconsin (RYV), accommodates all types of general aviation aircraft. Its services include minor repairs to complete customized interior replacements. The Jaeger Aviation products and experience will help continue to grow this department.

Wisconsin Aviation offers a complete line of general aviation services including air charter, aircraft maintenance, avionics repair and installation, flight training and aircraft rental, aircraft management, aircraft brokerage, and fueling services. The corporation has locations in Madison, Watertown, and Juneau, Wisconsin.

For more information about Wisconsin Aviation, send email to Interiors@WisAv.com or call 920-261-4567.

EGT -- Old Wive's Tale Dispelled

Many pilots place too much stock in Exhaust Gas Temperatures (EGTs). They simply are not nearly as important as Cylinder Head Temperatures (CHTs). Absolute EGT temperatures are not very relevant. EGTs are valuable as a diagnostic tool, such as telling you when a sparkplug or magneto is failing. With an oscillation of about one minute in temperature, it can tell you that an exhaust valve is failing, and more.

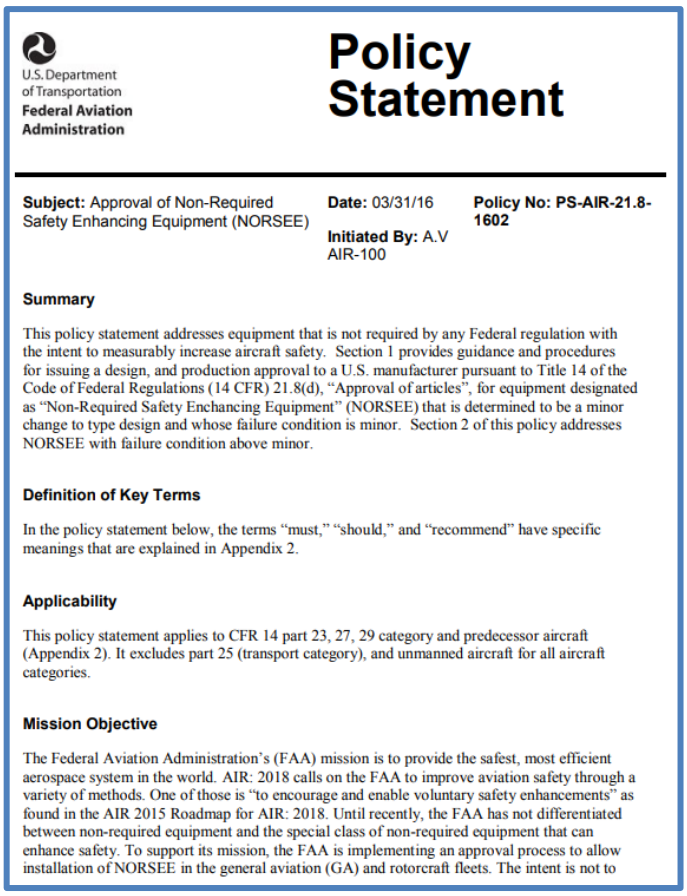
The absolute temperature is bogus. Think about it. You have an EGT probe that is on the exhaust manifold. It's chasing a wild, changing temperature. During the exhaust stroke of your engine, the EGT is hottest when the exhaust valve opens and cools rapidly as the hot gas expands and departs the manifold. All this is happening at 2400 – 2700 RPM.

The main value in monitoring EGTs is to monitor changes from flight to flight and during a flight. A valuable setting on your engine monitor is to normalize the EGT temperatures after setting up cruise settings. This makes all EGTs "flat" on the monitor, thereby highlighting any changes during cruise.

What is NORSEE?

Nineteenth in the series
by Ron Blum

At this point, as you read the title of this article, you're probably saying, "What is NORSEE? I have never heard of it before." I'm guessing that pilots are familiar with the results of the FAA NORSEE policy but have not heard of the NORSEE acronym before. NORSEE policy is FAA talk for an easier process to get safety-related items installed on certificated airplanes. In that process, the FAA came up with this idea! Wow, the FAA is trying to make certification, or the installation of safety equipment easier! Let's take advantage of this while we can!



U.S. Department of Transportation
Federal Aviation Administration

Policy Statement

Subject: Approval of Non-Required Safety Enhancing Equipment (NORSEE)

Date: 03/31/16

Policy No: PS-AIR-21.8-1602

Initiated By: A.V AIR-100

Summary

This policy statement addresses equipment that is not required by any Federal regulation with the intent to measurably increase aircraft safety. Section 1 provides guidance and procedures for issuing a design, and production approval to a U.S. manufacturer pursuant to Title 14 of the Code of Federal Regulations (14 CFR) 21.8(d), "Approval of articles", for equipment designated as "Non-Required Safety Enchancing Equipment" (NORSEE) that is determined to be a minor change to type design and whose failure condition is minor. Section 2 of this policy addresses NORSEE with failure condition above minor.

Definition of Key Terms

In the policy statement below, the terms "must," "should," and "recommend" have specific meanings that are explained in Appendix 2.

Applicability

This policy statement applies to CFR 14 part 23, 27, 29 category and predecessor aircraft (Appendix 2). It excludes part 25 (transport category), and unmanned aircraft for all aircraft categories.

Mission Objective

The Federal Aviation Administration's (FAA) mission is to provide the safest, most efficient aerospace system in the world. AIR: 2018 calls on the FAA to improve aviation safety through a variety of methods. One of those is "to encourage and enable voluntary safety enhancements" as found in the AIR 2015 Roadmap for AIR: 2018. Until recently, the FAA has not differentiated between non-required equipment and the special class of non-required equipment that can enhance safety. To support its mission, the FAA is implementing an approval process to allow installation of NORSEE in the general aviation (GA) and rotorcraft fleets. The intent is not to

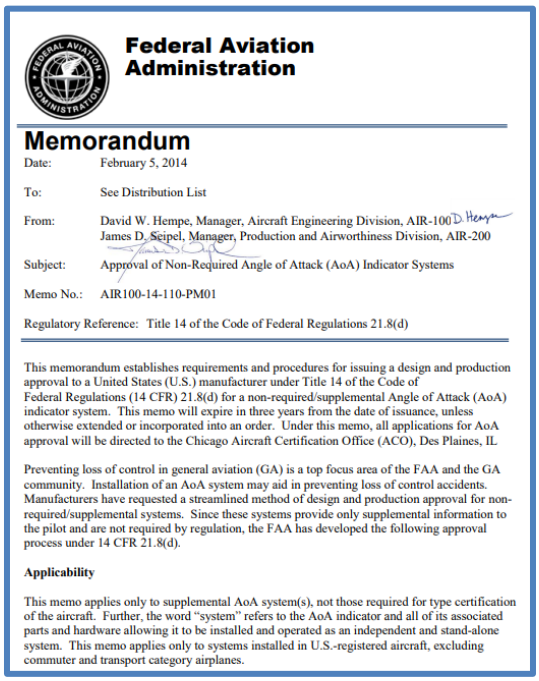
NORSEE is an acronym for **NO**n-**R**equired **S**afety-**E**nhancing **E**quipment. Let's take a moment to look at what that really means. "**NO**n-**R**equired" is a shortened statement for "not required to show compliance to FAA certification regulations (laws)." In other words, if this equipment were not installed in the airplane, the airplane will still meet all the FAA-required regulations for safety. This sounds black and white, but there is actually a LOT of grey with more than 50 shades. We'll get to a few examples shortly.

"Safety-**E**nhancing" and "**E**quipment" are both self-explanatory. BUT both are very broadly interpreted. A broad interpretation is good in this case as it allows more types of equipment to be installed. Can a USB port enhance safety? Sure! Through a USB port, an iPad (or other device) can be connected to power and add GPS moving-map capabilities, weight and balance calculations, radio frequencies, etc. All these items add to safety. Adding GPS to airplanes greatly reduced the number of fatal CFIT (Controlled Flight Into Terrain) accidents, which in years past was very high on the fatality list.

The FAA NORSEE policy number is PS-AIR-21.8-1602 and the cover is illustrated above. This policy statement is 14 pages long and describes how to get equipment approval and which FAA office to contact for approval. Currently, we would contact the Chicago Aircraft Certification Office (ACO). But we're not done yet. Although the equipment has been FAA-approved for installation, it must also be approved to be installed on a specific airplane. For example, an Angle of Attack (AOA) system may be FAA-approved, but installation approval might require an A&P/IA signature, a Form 337, Engineering justification and ACO or Manufacturing Inspection District Office (MIDO) approval. That is needed if **structural** (hole in pressure vessel) or **electrical** (draws many amperes) modifications are required for the installation. Let's look at another simple example. Pilot Pete is sitting in his airplane one night. He's looking at his dimly lit instrument panel. Long ago, half of his post lights had burned out, and he thinks, "I can

do a much better job with LEDs." Pete designs and installs nice, dimmable, LED strip lighting up underneath the glareshield. They look and work great, so Pete removes all the post lights. Is Pete legal? He was until he removed the post lights. Adding LEDs is adding non-required, safety-enhancing equipment. Removing the post lights or having them inoperative is not legal because those lights are required to be working to show compliance to a regulation. Bummer.

If you're interested in finding a list of approved NORSEE items, Google "list of FAA-approved NORSEE items." Ironically, the list doesn't include most AOA systems. This is simply because AOA happened prior to NORSEE and was the main driver for the new policy. The memo for AOA, AIR-100-14-110-PM01, is only 5-pages long. The cover is illustrated on the right.



Federal Aviation Administration

Memorandum

Date: February 5, 2014

To: See Distribution List

From: David W. Hempe, Manager, Aircraft Engineering Division, AIR-100
James D. Seipel, Manager, Production and Airworthiness Division, AIR-200

Subject: Approval of Non-Required Angle of Attack (AoA) Indicator Systems

Memo No.: AIR100-14-110-PM01

Regulatory Reference: Title 14 of the Code of Federal Regulations 21.8(d)

This memorandum establishes requirements and procedures for issuing a design and production approval to a United States (U.S.) manufacturer under Title 14 of the Code of Federal Regulations (14 CFR) 21.8(d) for a non-required/supplemental Angle of Attack (AoA) indicator system. This memo will expire in three years from the date of issuance, unless otherwise extended or incorporated into an order. Under this memo, all applications for AoA approval will be directed to the Chicago Aircraft Certification Office (ACO), Des Plaines, IL

Preventing loss of control in general aviation (GA) is a top focus area of the FAA and the GA community. Installation of an AoA system may aid in preventing loss of control accidents. Manufacturers have requested a streamlined method of design and production approval for non-required/supplemental systems. Since these systems provide only supplemental information to the pilot and are not required by regulation, the FAA has developed the following approval process under 14 CFR 21.8(d).

Applicability

This memo applies only to supplemental AoA system(s), not those required for type certification of the aircraft. Further, the word "system" refers to the AoA indicator and all of its associated parts and hardware allowing it to be installed and operated as an independent and stand-alone system. This memo applies only to systems installed in U.S.-registered aircraft, excluding commuter and transport category airplanes.

Let's look at one last example from the list of FAA-approved NORSEE items, the AeroVonics, (now uAvionix), AV-20-S. One can see the long list of all the items the unit can provide. Now, take a closer look at the "Note" at the bottom right of illustration below.

Safety-enhancing? Yes! If one loses the vacuum system, this unit will still display attitude. Can it be used as a primary instrument? No, because it hasn't been proven to meet all the certification requirements. We now see the tip of the iceberg …

Manufacturer	Approval Date	Equipment	Model/Type	Description
AeroVonics LLC.	10/22/2018	Multifunction display	AV-20-S U-1002-0 (PDF)	Display of • AoA w/Voice Alerting & Peaks, • G-Meter w/Voice Alerting & Peaks, • Attitude (Roll / Pitch), • Slip/skid, • Clock (GMT / Local), • Outside Air Temperature (C / F), • Bus Voltage, • Dual User Timers (Count Up / Down), • Engine Run Timer, • Flight Timer, • Density Altitude, • True Airspeed (Kts / Mph), • Internal Battery Operation NOTE: this is for advisory and Situational awareness purposes only.

Got a topic? Email me at solutions@blueontop.com. Until next time keep the blue on top.

Phil Corman

Co-Editor

So, There's No Pavement

Mooneys on Ice, Snow, Gravel and Grass

Ron Blum is an aeronautical/astronautical engineer with a 35+ year career managing general aviation Flight Test and Aerodynamics departments from shore to shore and border to border. He was Chief Engineer of the Mooney M-10 in Chino, CA. He founded Blue on Top LLC, providing engineering and management consulting, Flight Analyst DER services and keynote speaking.

Let's face it, Mooneys are not bush airplanes. They were designed to go fast on a minimal amount of fuel. Because our propeller clearance is at a premium, landing on anything but pavement seems like a bad idea. But that is not always true if you know the airfield, the current conditions, and your skills.

Can you land on snow, ice, gravel or grass? Yup, but there is some risk and items that you must be aware of.

Ice

Before my Mooney days, I lived in New Hampshire. I flew Cessna 172s and 182s out of Manchester, NH (KMHT). Not far north of there was Lake Winnepesauke, the largest lake in NH. Almost every year, the town of Alton Bay would clear the snow from the lake and create a fun landing strip.

Landing a 172 on the ice was considerably more direct than in a Mooney since 172s are docile and can land at a slower airspeed. But the technique is almost identical when doing so in a Mooney.

The name of the game is to know the conditions of the ice and the wind. If there is a crosswind component, you've got to remember that your ability to keep the nose going straight is reduced. You may have little or no breaking and minimal nose wheel steering. But, if the ice has a little texture and the wind is down the runway, you should simply target a short field landing, so as to land as slow as safely possible with minimal roll.

Snow is a different animal altogether. First, you need to know:

- The depth of snow
- The type of snow

How much snow are you willing to deal with? I you think there is more than a few inches, you may have your hands full. The type of snow is also a factor. A light powdery snow is more manageable than a thick slushy snow or snow with a crusty top layer. The slushy snow will accumulate in your gear wells and if not dealt with, can make your next gear retraction very interesting or unsuccessful.

Secondly, you want to consider a snow landing as a soft field landing, thereby coming in slower than a normal asphalt landing. Also, remember to keep you nose off the snow until you run out of elevator. You can be blown off the runway to the left or right, so be prepared for that.

Believe it or not, there are too many incidents where the pilot turns off the runway onto a non-existent taxiway and noses down off the runway into an infield. Be careful of this situation.

Gravel

I personally do not like gravel and won't take my Mooney there. I remember we had organized a Mooney fly-in to Monument Valley airport (UT25) for a night at Gouldings Lodge. The runway was paved, but the tiedown area was gravel. Always being concerned with the Mooneys, I suggested that the pilots apply power on the asphalt and when they got to the gravel tiedown area, retard the throttle to idle and coast to their tiedown area. One Mooney pilot did not heed this advice and dinged his propeller. Granted this was not a gravel strip, but it illustrates a key concern. Our Mooneys are low to the ground with minimal prop clearance, and we are more likely to pick up come stones and mess with our prop or lower fuselage.

Know the condition of the gravel. Is it large stones or small gravel? Are they embedded or loose? Is the surface groomed? Are there potholes? Are there wet/muddy sections that you must avoid? Kicking up gravel on landing is not as significant as it is on departure when your prop will be at full RPM. If you do not have recent local knowledge, it might be wise to make a low pass to check out the

conditions. Be mindful when you do your runup check because this is when you are likely to kick up stones. Do a short field takeoff with the yoke pulled back to lift your nose at an early opportunity.

Grass

Can you land your Money on grass? Sure, but once again, you should arm yourself with some pre-knowledge.
You should know the type of grass strip you are targeting. Is the grass cut short and regularly cared for? You can call or you can perform a low pass to see for yourself. Another consideration on grass is gophers and mole holes. These would not be friendly to your nose gear.

The clearance to your landing gear doors might be a factor. Many Mooney owners remove the lowest hanging doors so they won't catch on the grass and cause damage.

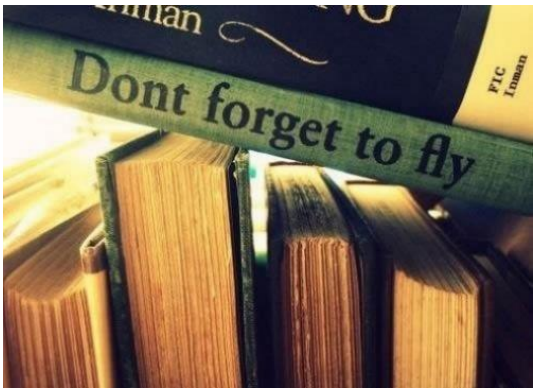
Also, remember to keep moving if the grass is high so you won't get stopped. When you leave the groomed grass for a tiedown spot, the grass tends to be longer and less tended. Be ultra-careful about possible holes and rocks.

It is a ton of fun to land your Mooney on a well-groomed grass airfield. It might be a fun place to camp, hike or fish.

Summary

Mooneys are primarily intended to take off and land on asphalt or concrete, but other operations are suitable if you are:

- Completely aware of the landing environment and current conditions. "Current conditions" are key here. A runway may be completely fine in the summer, but wet and muddy in other seasons. Investigate the current conditions before attempting operations there.
- Completely aware of your skills and how current you are with those skills, (including, but not limited to "short field" and "soft field" landings).
- Completely aware that in almost all non-hard surface landings, you should land at the slowest safe airspeed.



Yes? No?

by Jerry Proctor, CFII

I have BS and MA degrees in Psychology. (The BS degree was very appropriately named). As such, I recently conducted a highly scientific and broad-based study of hangars and the personalities of their owners. Yes, I now have you on the edge of your seat.

Having walked by many hangars, and keenly observed their residents, I have concluded that there is definitely a relationship between how the hangar looks and the owner's personality and habits. Note, psychologists are seldom definitive. The names are fictitious.

Nice Bryce the Neat Freak

Let us start with Bryce, my hangar neighbor to my left. His hangar, which shelters his home-built RV-7, is as neat as a pin. He has several big toolboxes, and each tool is carefully organized, resting in Styrofoam organizers that have been carved to fit each tool. He has reference books which are neatly displayed, gently used, and of course nicely shelved. He is a neat nut. His clothes are meticulously pressed. He is gentle, and soft spoken. I find him hard to neighbor with.
My wife keeps asking, "Jerry, why can't you keep our hangar like Bryce's hangar?"

When I visit Bruce's hangar, I try to mess things up when he isn't looking. He, of course, calmly straightens things up. Sigh!

Bob the Slob

Bob is a few hangars away. I think he is a mechanic with a flying problem. Actually, he is just a wannabe airplane mechanic. In the years he has been there, I have never seen him start his Cardinal start, let alone fly it. However, he could qualify to be a star on the TV show Hoarders. He has parts and bins piled to the roof and I may have seen a vacuum tube radio. He also drives a mess of a truck, which fits his oily, disheveled clothes, and lack of shaving. His hair looks like he has survived an Oklahoma tornado. Do not ask me how his dusty Cardinal got there. It's a mystery.

Dr. Bert, the Shy Guy Mole

Now, let us look at a special pilot and Radiologist. Bert's hangar is across the way. He is very quiet and seems to like his hangar dark. Upon arrival at his hangar, he drives his car under the wing of his Cessna 182 and pulls the plane out with hardly a word. He flies his Cessna, then pushes it back in the hangar and spends the rest of the day in the dark hangar. I would say that he has a good life for a mega introvert physician.

How About You?

What does your hangar look like, and does it match your personality? I have studied several unnamed pilots.

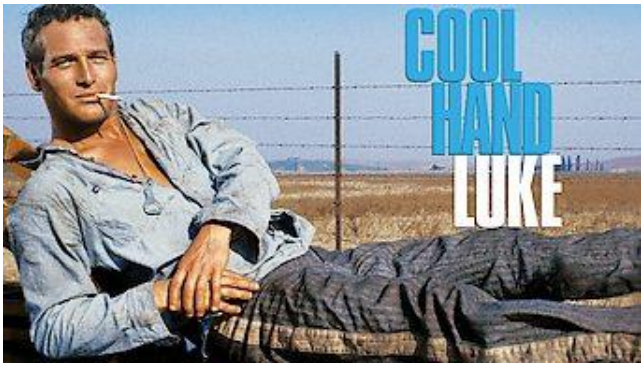
Jim Bob – Split Personality

He is a very experienced pilot, has had several other planes and is a long time Mooney owner. He managed to stuff two planes and parts of another into one very cramped hangar.

Peter Perfect

Peter has developed what all Mooneys deserve. He has a beautiful and meticulously maintained hangar, with a coated floor, bright lights, A/C – heat, running water and a head, (Navy for toilet). Mooneys are beautiful airplanes, and they deserve such treatment. Peter is also well dressed, flies well and is a dream to instruct. I am still deciding if I like him or not. Nevertheless, I am certainly jealous.

Musty Dusty



On the other end of the scale is an M20J, that resides in a creaky old hangar. (I am not going to hold that against anyone). I have no idea how Dusty can move his hangar door over all the dirt. Inside is Dusty's Mooney. I noticed that his plane was dirty and had several hundred bugs plastered on it.
I came out of my Cool Hand Luke persona and scolded him about his plane. He was not personally as bad as his plane, but when he cleaned up his plane, his act also improved.

Honor your Mooney

I could go on, but I think you understand. Please make sure your hangar honors the amazing plane that resides within. Also, check yourself and ensure that your flying skills and personal presentation are worthy of the title, "Mooney Owner." The world of aviation looks up to us, as we go whizzing by every other GA airplane.

So, when your Mooney is not blowing the doors off every other single engine and many twins, make sure the home of that beautiful bird reflects this class act. Now, look in the mirror and smile. Analysis complete. Hangar = Personality. Yes!
Next month, Close that #$&! Door!

Jprocmooney@gmail.com

Below are photos of my Hangar. It might be considered bland, with a little sparkle. However, it is okay, just like the owner. ☹

WINTER WARNING!

By Ray Reher

Winter is fast approaching, and Frosty the Snow Person has already shown his/her face in a few parts of the country. Your engine doesn't like it. Your battery doesn't like it. And flying in it can be hazardous to your health. Rather than continued violence against the dead horse we beat each year around this time, I offer a few items off the beaten path and not often discussed, but which could be just as hazardous in extreme weather. What follows is geared toward a pretty tough winter day, especially extreme temperatures that occur in some parts of the country, are routine in the northern tier, and are very common at altitude.

ENGINE

It's no secret that starting a cold engine can cause damage. How cold? A common recommendation from engine manufacturers and POH's is to preheat the engine at anything below 25°F and in some manuals 20°F. That seems awful cold, and of course generates the usual hangar arguments about oil viscosity. Although ultra conservative, I tend to preheat at any temperature that even approaches freezing. But just as important is HOW to preheat. Two methods are (1) internal/attached engine heat (i.e., Tanis), and (2) warm air. Tanis, the more expensive and labor intense installation option, works well using heating pads glued to the case and a heater probe in each cylinder. Warm air in the engine compartment is another effective method, with a number of options. But CAUTION(s)! One of the problems with changing temperature is that different metals expand and contract at different rates, elevating wear when parts rub against each other. If you only heat parts of the engine, it exacerbates this issue during start. So, always preheat the engine thoroughly. It's a big chunk of metal that just can't be thoroughly heated in a short period of time. Most heater manufacturers recommend a minimum of six hours. Another caution is to not use innovative preheat systems such as ducting corn poppers, floor heaters, hair dryers, light bulbs etc. It's scary to put something like that in or under an engine compartment where fuel fumes may be present.

There are several heaters on the market certified to be used in combustible areas. I've had experience with a Tanis system, and a relatively inexpensive AircraftHeaters.com Hornet 22. Both heaters work well. Add a moving blanket or two over the cowling at colder temps. In addition to the engine, at extreme temperatures oil can congeal in the prop. So whatever method you use, for those with constant speed props, the heat should also be vented toward the hub.

BATTERY

People tend to get sick in the winter, and so do batteries. A fully charged battery has a freezing point around -80°F, while a fully discharged battery freezes at around 20°F. Below these points and others in between, the electrolyte can freeze and expand, ruining the battery, or even worse, crack the case. This can make a mess or cause damage in whatever part of the plane it's installed. Allowing a battery to discharge to a low capacity, regardless of temperature, will reduce its useful life ($$$). Depending on your system voltage, if you see 12.0v or 24.0v on the meter, or almost that before start, you may feel comfortable, BUT… If your battery is charged to 100% capacity (rarely the case), you should see 12.9v or 25.8v respectively. If you see 12.0v/24.0v, your battery has a 25% charge, and of course any less than that, it's on life support. To the battery, the start process is a punch in the gut, and may take at least an hour of flying time to recharge, (perhaps more time, depending on its original condition and charge status). The bottom line is that in very cold or hot environments, a fully charged battery is a happy battery, and is less likely to call in sick.

If after sufficient time flying or charging your battery, a low voltage persists, the battery is probably a goner. The voltage meter can be meaningless, and the only real way to check the health of a battery is by a capacity test. The equipment for this is expensive, and probably not worth buying for the few times in your life that you may need to take a suspicious battery to the FBO for testing.

AIRFRAME

My intuitive grasp of the obvious, tells me that flying with ice/snow/frost on the airframe is not good. **Here are some uncommonly addressed, but dangerous issues in extreme winter conditions:**

Let us begin with a preflight item that most pilots check around 0.0008 percent of the time. If you landed on or pulled into a ramp with snow or slush, before the next flight, you should check that the engine breather tube didn't get frozen shut, with the potential to over pressurize the crank case. This vulnerability may depend on where your breather is situated, and where the pin-hole vent is located on the tube.

Another item not often considered, is ice in the fuel. We all know how water gets into your fuel; either from the truck, pumps, a less than perfect fuel cap, or condensation in the tank by moisture/humidity

entering through the tank vent. Water settles to the lowest point, and we check the sumps, blah, blah, blah. This is called "Free Water," but it may not be all the H_2O in your tanks. Water can be suspended/dissolved in fuel. Its settling rate depends on several factors, including temperature, droplet size, and how still the fuel sits in the tank. Suspended droplets are normally so small that they are invisible to the naked eye unless saturated to the point where the fuel appears slightly hazy. If the moisture has not settled out as "Free Water," it begins to crystalize as the fuel approaches 32°F. At 15°F the crystals begin to adhere to their surroundings, and at 0°F, depending on the level of agitation (vibration/turbulence), the crystals in suspension grow larger, threatening to clog filters and small openings. These referenced temperatures are pretty extreme, but if not on the ground, can easily be encountered at altitude on one of those clear cold days. If the environment generates concern for fuel ice, you can add Prist or Iso-Propyl alcohol to the fuel. However, another CAUTION! FIRST CHECK with your POH, Aircraft Manufacturer,

or Manufacturer bulletins, before adding ANYTHING to your fuel. My M20K POH allows adding Iso-Propyl alcohol up to 3% of total fuel volume.

THE OTHER PERSONAL MINIMUM

Most everyone has drawn their personal red line when it comes to crosswinds, ceiling, and visibility. But have you set personal minimums for field conditions? Depending on your proficiency, are you willing to accept a FICON (Field Condition NOTAM) of 3/3/3 or maybe 4/2/3? And if so, what becomes your new personal crosswind limit? At what point will you decide to sleep-in and NO-GO? It's smart to become knowledgeable of the Field Condition reporting system (FICON NOTAM). Know your red line before you're confronted with a G0-NO-GO decision, or even a nasty surprise upon arrival.

Assessment Criteria		Downgrade Assessment Criteria		
Runway Condition Description	Code	Mu (μ) [1]	Vehicle Deceleration or Directional Control Observation	Pilot Reported Braking Action
• Dry	6		---	---
• Frost • Wet (Includes Damp and 1/8 inch depth or less of water) ***1/8 inch (3mm) depth or less of:*** • Slush • Dry Snow • Wet Snow	5	40 or Higher	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
5° F (-15°C) and Colder outside air temperature: • Compacted Snow	4	39 to 30	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
• Slippery When Wet (wet runway) • Dry Snow or Wet Snow (Any depth) over Compacted Snow ***Greater than 1/8 inch (3mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than 5° F (-15°C) outside air temperature:*** • Compacted Snow	3		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2	29 to 21	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	0	20 or Lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

Note: A **FICON Runway Condition Code (RCC)** consists of three numbers, each from 0 to 6 separated by a slash (/), each number representing 1/3 of the runway (Touchdown/Midpoint/Rollout segments). A 0 = Absolutely NO TRACTION (You're along for the ride), and 6 = COMPLETELY DRY. If all three runway segments are dry, no FICON RCC will be reported. On Federally funded airports, a Runway Breaking Action of NIL will never be reported. Instead, the runway will be closed. On APRONs, TWYs, and Non-Paved RWYs (movement areas), with a NIL report, the airport will close that surface. The matrix published in FAA Order 7930.2S Ch2 (page 5-1-10) is pretty self-explanatory and can be reproduced for reference in the cockpit or flight planning.

Finally, everyone knows that any kind of frozen precipitation on the wing is bad juju. But a reminder: Frost with just the consistency of medium grit sandpaper can sap 30% of your wing's lift and increase drag by as much as 40%. Snow and ice are obviously worse. Unless your plane has an afterburner, that's a scary thought.

Sedona Mooney Fly-In 2021

by Trevor Jones

It started off as a general thought in my head, but I quickly begun brainstorming and turned my thoughts into a reality. Back in September, I flew the GoldFinger down to Phoenix from my home in Kelowna, B.C., Canada. Along the way we stopped in Reno for the Air Races, but as the trip progressed, I noticed my oil temperature seemed to be getting hotter and hotter. When we finally reached our home base of Falcon Field in Mesa, Arizona (KFFZ), I brought the airplane to a shop to rectify the problem. What I thought might be a quick fix, evolved into me, stuck in Phoenix for three weeks longer than I planned.

In that time, I was thinking “man it would be cool to organize a Mooney Fly-In to Sedona sometime.” So, I began planning and posting a bunch of ideas I had for the Sedona Fly-in, and we settled for December 18th, which is a week before Christmas. Thirteen Mooneys arrived in Sedona on that windy and gusty Saturday morning. The thing about Sedona is the airport sits overlooking the city on a plateau at about 4,800 feet elevation. If there is any sort of a wind, you can expect a tricky approach for landing. I believe there were two people who overshot the runway that morning because on short final to Runway 03, just before the threshold of the runway, there was wind shear and downdrafts.

After landing, a group of us met and proceeded to the famous Mesa Grill for a delicious breakfast, good conversation, and of course nothing but Mooney talk. One couple had flown in from Colorado that morning, leaving fairly early to make the three-hour flight to Sedona. Three people came from California, and the rest were from all parts of Arizona. It was short and sweet, but I’m happy to say I met some new fellow Mooniac friends and I’m sure others felt the same way. My Ovation 2 was the only long body, but there were numerous M20J’s, a couple M20K’s and the rest were M20C’s and E’s. I am so glad that we put that together.

Everyone returned home either that day or early the next morning. When I left, there was a group of seven Mooneys departing for their home bases. Patrick in 693MM, Preston in 971V and me in the GoldFinger, left for Falcon Field. When we arrived, we taxied right up to the Steak and Stone restaurant and enjoyed a late lunch. If you are looking for an excellent restaurant you can taxi right up to, the Steak and Stone in Mesa offers a very unique dining experience. They heat a rock to 500 degrees and serve you a raw steak of your choice that you can cook to your liking. I enjoyed an 8 oz Sirloin, which to my surprise was only $13. It was a fun weekend and I believe Patrick is going to try and organize a March 2022 Mooney fly-in event, so stay tuned for that. Fly safe Mooniacs!! -Trevor "GoldFinger" C-GGLL.

Required Instruments/Equipment

1. Which of the following is NOT required for VFR or IFR flight?


A Tachometer & Manifold Pressure

B Magnetic Compass 

C Vertical Speed Indicator 

D Oil Temperature and Pressure Gauges 

E Fuel Gauges

Answer: C. Vertical Speed Indicator

2. Do you need a working radio to fly VFR?

A Yes

B No

Answer B. VFR flight does not require a radio unless the pilot is operating in controlled airspace. It is needed so the pilot can communicate with and get the appropriate clearances from Air Traffic Control (ATC).

3. For a personal (not for hire) night flight, which equipment is NOT required?

A Landing light

B Position lights

C Anti-Collision Lights (if certified after March 11, 1996)

Answer A. Landing Light

4. For an IFR flight, what equipment/instrument is required (in addition to those required for VFR)?

A Directional Gyro 

B Rate of Turn Indicator or an additional Attitude Indicator 

C Attitude Indicator 

D Skid/Slip Indicator 

E Clock installed in the aircraft 

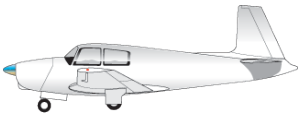
F All the above

Answer: F. All the above

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

Mooney Maintenance



Search Mooney's new website for Service Bulletins (SBs) and Service Instructions applicable to your Mooney

Click here

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

Click here

LASAR
Fanatically Mooney. Exceptionally Fast.

Ask the Top Gun

Tom Rouch

Founder of Top Gun Aviation, Stockton, California

Send your questions for Tom to TheMooneyFlyer@gmail.com

The POH for my M20R says that the maximum turn on the nose wheel is 11 degrees to the left and 13 degrees to the right. Caution must be exercised when using a tow bar not to exceed those limits or the nose assembly could be damaged.

>> My question is: What if I use single-wheel braking to tighten my turn, say in a tight spot on the ramp? Am I risking damage?

Tom's Answer

While taxing the plane, internal stops limit the turn radius. Using braking to help reduce the turn radius still honors the turn radius limits. But, when using a tow bar, there are no restraints and that's when you can damage the nose gear.

P C RETROFIT

is available at authorized Mooney Service Centers

Owners of previous model Mooneys may now enjoy the pleasures, added safety-and the auto-pilot "add-on" features of Mooney P C. Retrofit P C installations can be made on retractable gear models, 1962 through 1964, and on converted Mooney Masters. See your nearby Mooney dealer for complete information.

FOR YOUR 1965 MARK 21 OR SUPER 21

	Factory Installed Price Standard Equipment
POSITIVE CONTROL	
Group I Auto Pilot (with heading, capture, track and localizer modes and drift correction)	$1365.00
Group III Auto Pilot (Group I plus pitch control and altitude hold)	$2290.00

RETROFIT YOUR '62 THRU '65 MARK 21 OR SUPER 21

	Suggested Price (1)
Positive Control – '62-'64 Mark 21/Super 21	$ 966.00
Group I Auto Pilot – 1965 Mark 21/Super 21	$1253.00 (2)
'62-'64 Mark 21/Super 21	$1305.00 (2)
Group III Auto Pilot – 1965 Mark 21/Super 21	$2143.00 (2)
'62-'64 Mark 21/Super 21	$2195.00 (2)
Group I conversion to Group III Auto Pilot (addition of pitch control and altitude hold)	$ 900.00

(1) Installation not included (2) Includes aluminum control tubes in tail cone area (standard on '65 production)

MOONEY AIRCRAFT, INC. • KERRVILLE, TEXAS • TELEPHONE CL 7-4043

NOTAMs are now 'Notices To Air Missions'

A NOTAM is still a NOTAM, but the words represented by the acronym now represent the FAA's foray into modernizing and gender-neutralizing aviation terms. On December 2, 2021, the acronym NOTAM was changed to mean Notice to Air Missions, which the FAA feels is "more applicable" to the role of the notices and is "inclusive of all aviators and missions." The agency has purged all the relevant guidance and regulatory documents of the former long-form term Notice to Airmen. Although the acronym part is getting the most attention, the revisions also contain changes that bring FAA terminology in line with that of the International Civil Aviation Organization (ICAO).

Other changes

The term "good" as a criterion for braking action has been removed and the agency has added more detail to describe the operation of runway alignment lights to replace the single term "unserviceable" because it "did not accurately describe the reduced condition of the ALS."

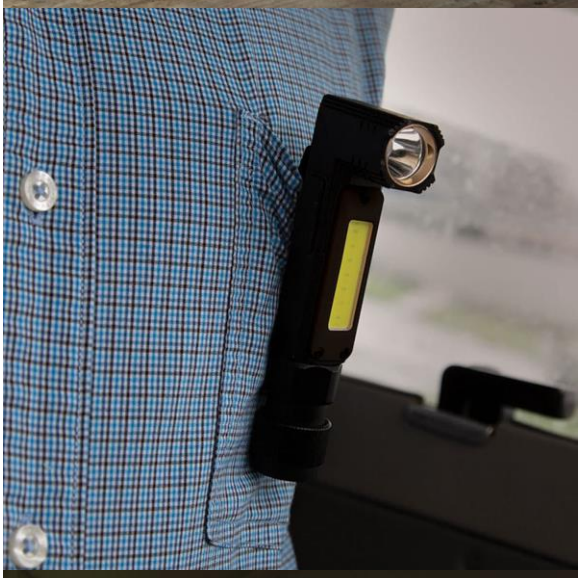
ASOS and AWOS automated weather stations are now treated the same in NOTAMs.

Las Vegas International Name Change

The Las Vegas airport is now named after Harry Reid instead of McCarran. There have been long-standing calls to rename the airport. Las Vegas' previous namesake, Democrat Patrick McCarran, served as a U.S. senator from 1933 until his death in 1954. He was known for his contributions to aviation along with his anti-immigrant and anti-Semitic views.

Jeppesen Mobile FliteDeck transitioning to ForeFlight

The Jeppesen Mobile FliteDeck app (also known as JeppFD) will no longer be supported for U.S. customers by year-end 2021, and for customers outside of the U.S., by the second half of 2022. There is no change to customers' Jeppesen digital chart coverage, but they will be required to subscribe to a mobile EFB app to display Jeppesen digital charts. To encourage Jeppesen customers in their transition to ForeFlight Mobile, Jeppesen is providing a free 30-day full feature trial.



A new Flashlight – the 3-in-1

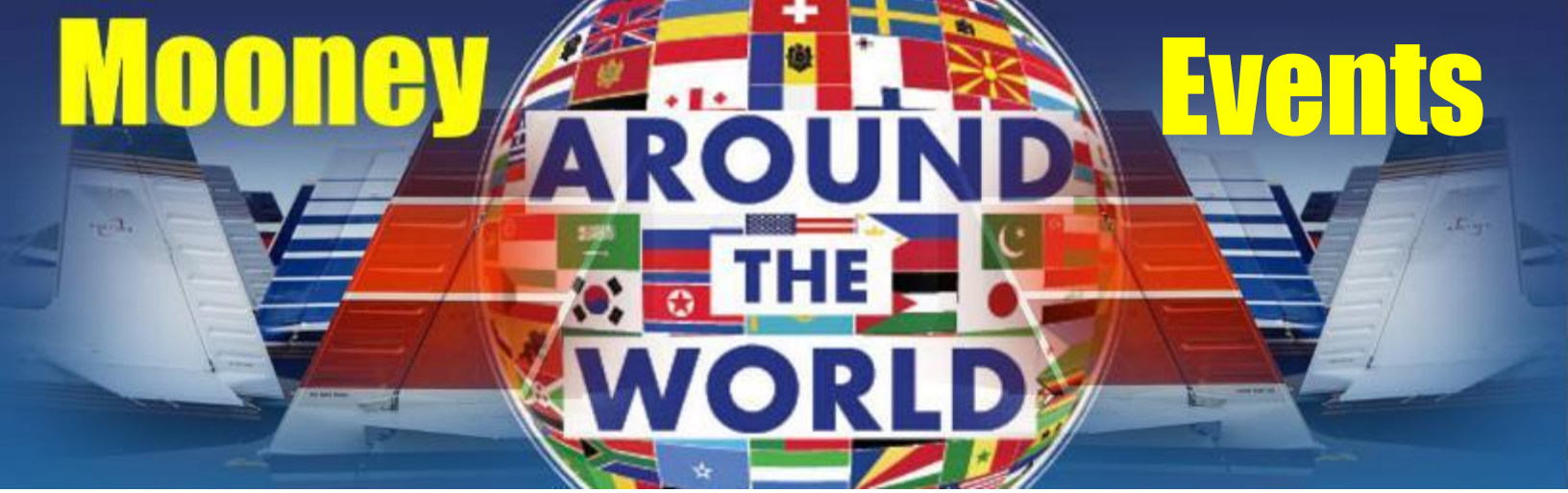
FlightOutfitters has introduced its new 3-in-1 Flashlight. It includes a flashlight, cliplight, and headlamp in one device.

It is made of aluminum and includes long-lasting LEDs.

Features include:

- Two levels of white light from the pivoting flashlight head.
- One level of red light from the task light on the side.
- Smart button sequence — never have two colors on simultaneously.
- Pivoting magnetic base instantly attaches to toolboxes.
- The rechargeable battery plugs into any standard USB port and lasts up to five hours.

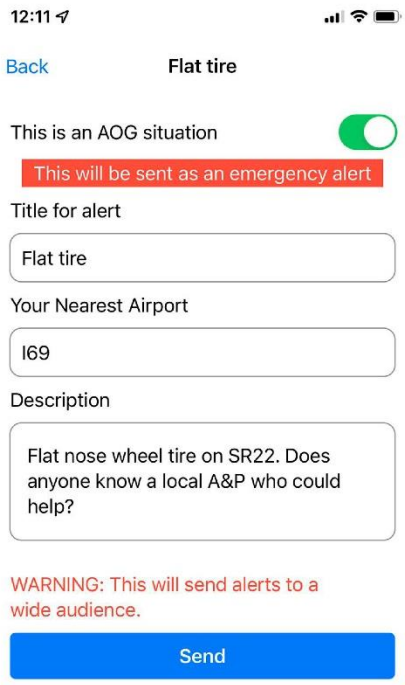
Price: $39.95



Florida Mooney Lunch Group	*Contact Dave at daveanruth@aol.com or (352) 343-3196, before coming to the restaurant, to have an accurate count. Events begin at 11:30* January 8: Leesburg (LEE) February 12: Fort Pierce (FPR) March 12: Vero Beach (VRB)
MOONEY SAFETY.COM	**2022 Events** Jan 28-30: Lakeland, FL (LAL) Apr 22-24: Santa Maria, CA (SMX) Jun 3-5: Denver, CO Sep 16-18: Oshkosh, WI (OSH) Oct 21-23: Redding, PA Sign Up at https://www.mooneysafety.com/ppp-registration/
MOONEYSUMMIT	**Learn more at** https://www.mooneysummit.com/
Australian Mooney Pilots Association	March 17-21, 2022: Annual Gathering of Mooneys - You will be able to visit the Coonawarra wine region (where life is a cabernet), Princess Margaret Rose caves, Dingley Dell (former home of Adam Lindsay Gordon), Piccaninnie Ponds, the Nelson Aeroplane Company and lots more. September 9-12: Spring Fly-In to Merimbula – More details later **Learn more at** https://www.mooney.org.au/
EMPOA	**Learn more at** https://www.empoa.eu/index.php/en/
Other Mooney Events	January 27-30: Yuma formation clinic June 3-5: Walla Walla Fly-In by Henry Hochberg. Wine, Food and Fun. Hotel room block at Whitman, 866-826-9422. Contact Henry if you need any additional info at aeroncadoc@comcast.net. **CLICK HERE** to register for free

AOG Alerts App

AOG Alerts app helps stranded pilots get help



It's a nightmare that many pilots face every year: after landing at an airport far from your home base, your airplane develops a mechanical problem, and you find yourself AOG (airplane on ground). Maybe it's a flat tire, maybe it's a bad alternator, but whatever the issue, you need help before you can fly home. However, A&P mechanics can be hard to find, especially if it's after hours or on a weekend, and Uber isn't always an option at quiet GA airports. Who do you call for help?

This is a simple app, but it's a brilliant concept and it's easy to use. Simply create a profile in the app and you'll have the option to either ask for help or receive notifications when other pilots need help. Best of all, there is no fee to participate.

From the home screen, tapping the AOG button allows you to create an alert that will be sent to all AOG Alerts users in your area. Note: you can choose your alert range when you create your profile. You can fill out any details on your situation, and your profile information helps potential helpers identify you. Since each account is verified, you know you are helping a real pilot when you receive an alert.

Sometimes you might just need a ride to a hotel while you wait for a part to arrive; sometimes you might need the name of a local mechanic. All of these options are available, since you're connecting with fellow pilots, not maintenance shops.

The app doesn't have to be just for emergencies. The Social button can be used to meet other pilots in your area or organize a fly-out. Tap on the green button to send a non-AOG message to pilots nearby.

AOG Alerts is free to download, and is available for both iOS devices and Android devices.

FOR SALE Mooney Stuff

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)

Items for Sale

Call Tom 303-332-9822

New Hartzell Propeller Hub HC-C2Y (K, R)-1 Serial CH41782B

This hub will comply with AD2006-18-15 and superseded by AD2009-22-03
This AD affects many IO-360 aircraft.
Current Hartzell price is $4,275.

Price $3,999

Brand new, never used, two-person portable oxygen system

Bottle, carry case, two masks, two nasal cannulas, and all associated tubing, flow indicators, and regulators

Price is $400

New never used aircraft wheel stand

Used when tire and rim assembly is removed. This stand slides onto the bare axle to hold up the aircraft for safety and to avoid damage to bare axle. This stand is adjustable for different heights.

Price $75

1/3 SHARE FOR SALE

Two partners are offering the final 1/3 co-ownership share in this excellent, incredibly unique and well-equipped aircraft. Over $50,000 spent over the last two years, upgrading and sorting it out. The share price is $45,000.
TTAF is about 3160, engine SMOH About 1320 (Mattituck Red/Gold). We have Calculated that 1/3 of the fixed expenses will be around $5,250 per year. Reserves TBD. Photos and all records can be provided. The plane is hangered at KCCR Concord, CA.

- Garmin GNS 430 WAAS
- King KX 155 N/C/LOC/GS
- Castleberry electric back AI
- King KFC 150 FD/AP alt hold, climb/descend, simulated GPSS
- King KCS 55A HIS
- Garmin GTX 330 ES TXP with traffic, ADS-B out
- Newly Overhauled KX 256 AI ($1,730)
- King KN 64 DME
- New Garmin GMA 345 Audio Panel
- New JPI 830 with *all* options
- ADS-B in including traffic, weather, Sirius XM, etc. via a new certified Garmin GDL 52R hard wired to a panel mounted Garmin Aera 660. A new yoke mounted Aera 760 will be hard wired to provide IFR charts and Additional features. More Bluetooth connections for portables and iPad available from GDL 52R
- Newly Overhauled BFG WX 1000+ Stormscope, display and processor ($1,890)
- 28-volt electrical system
- Astrotech LC-2 clock
- Electric trim with CWS
- Yoke mounted AP disconnect and ident.
- Electric Back-up vacuum
- New STC'd gear and stall audio alarm ($1,100)
- Built-in CO2 detector
- Speed brakes completely overhauled January 2020 ($2,800)
- Four place intercom
- 2900 GW STC
- Two built-in David Clark 20-10X ANR headset jacks with headsets
- CYA 100 AOA with custom housing, (not yet wired) ($1,690)
- Useful load 992 lbs.
- Air/Oil Separator
- Reiff Preheater, 2 sides
- Removable back seats
- Articulating seats
- Inflatable lumbar support
- Indirect interior lighting
- Kool scoop
- Wing mounted fuel gauges
- Two place Sky Ox oxygen tank with custom rack
- Sidewinder electric power tug
- B-Cool ice cooler with remote switch
- Annual completed February 2020 by Top Gun Stockton MSC.
- Tan leather interior redone 2012, good condition, front sheepskins coming soon
- Custom black front floor mats, custom cover, cowl plugs
- Original paint. Pleasing colors. Looks very good at 8'.
- The plane starts right up hot or cold, good compressions, does not use much oil, good oil analysis, runs very smoothly, flies great.
- Recent avionics fan, fuel pump, starter, battery, airstop tubes on mains
- New shock discs 2 1/2 years
- No back clutch spring was installed 2 1/2 years ago

Give me a call anytime at 510 377 0129 or email bradinc@astound.net. Thanks! Steve


Rusty Pilot or Old Pro
INSTRUMENT PROFICIENCY CHECK
Study Guide
J D Price, CFII, MEI, ATP
FLIGHT REVIEW
Study Guide
J D Price, CFII, MEI, ATP
Prepare online
FREE
JDPriceCFI.com