The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

June 2020

Editors

Phil Corman | Jim Price

Contributors

Bruce Jaeger | Bob Kromer | Tom Rouch | Brian Lloyd | Linda Corman
Ron Blum

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Features

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From the Editor

Phil Corman

Thank You

We would like to thank our new contributors to The Mooney Flyer.

Bob Weber of WebAir Consulting (https://webairconsulting.com/) contributed an article on the challenges of maintaining aged aircraft. This is a great read for many of us Vintage Mooney Mooniacs!

Richard Brown recently installed a new transponder and had interference issues. His great article explains his troubleshooting experience. Richard also blogs on his Mooney travels, with his lovely wife Kathy.

And a wonderful article on how to enjoy your next Mooney flight more than usual by new contributor **Jerry Proctor.**

Mooniac Imagination

The Covid19 Quarantine did not slow down two Mooniacs who decided to get another FAA Certificate. We love Kelly and Jana's spirit. Bravos and Balloons… PRICELESS

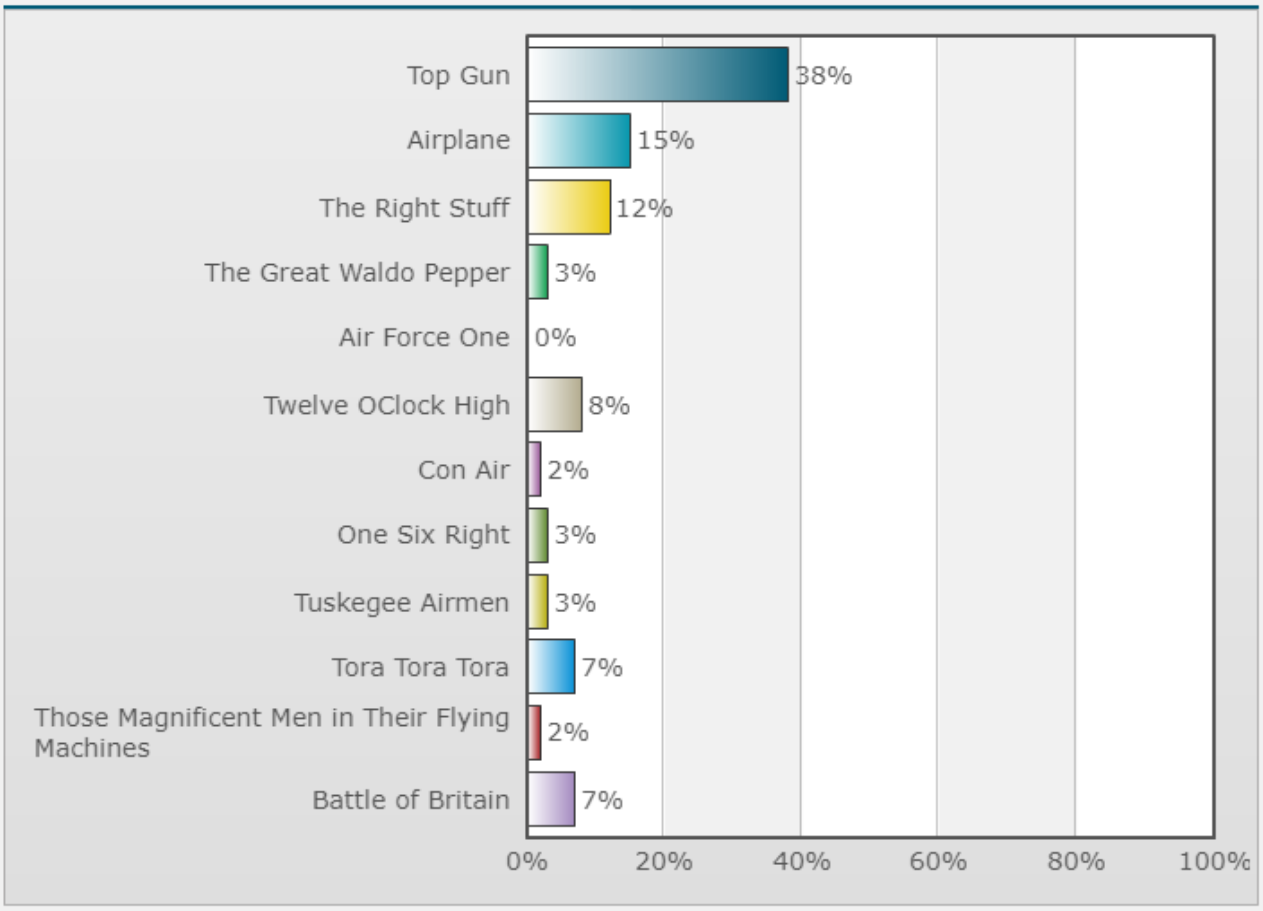
More on Costly Accidents

1. **Gear Up Landings** are usually not caused by a mechanical malfunction, but by the PIC. Gear Ups are the costliest accident, typically averaging $70,000. The bill usually includes an engine teardown and inspection, a new propeller and belly skins.
2. The next most costly is loss of **Directional Control on the Ground.** And no, this is not limited to ground looping taildraggers. It happens more than you think in conventional gear.
3. **Hard Landings** is next. Prop strikes can end up costing $30,000 or more. We are particularly susceptible in Mooneys, since porpoising in a Mooney is less forgiving. The third touch will almost always end in a prop strike. Can you spell "Go Around"?

What is Your AllTime Favorite Aviation Movie?

Poll created by Phil Corman on 03/09/2020

Poll Results



Next month's poll: "Regarding Touch and Go's" **CLICK HERE** to vote.

Letters to the EDITOR

Editor@themooneyflyer.com

RE: Ron Blum's Article on AirFoils - Thanks for the [May 2020] article. As you mentioned, Mooney pilots are drag obsessed. I have a question about a specific drag. Which VOR antenna type has the least drag: whisker, towel bar, or blade? And is the difference significant?
Thanks,
Bob P

Ron's Response**:** *Great question! Could be the subject for another article!*

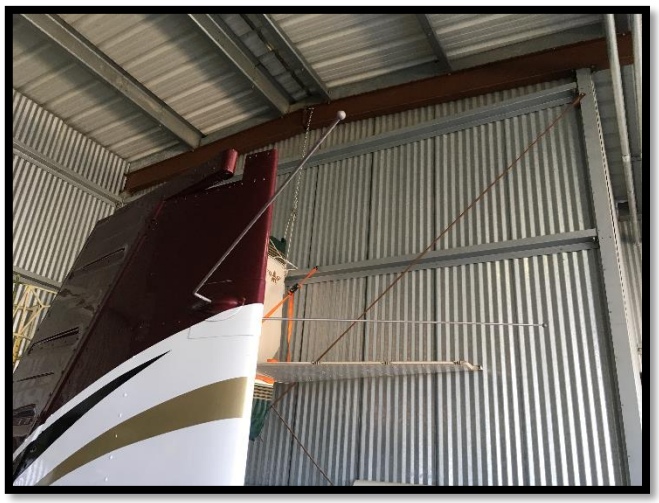
The really quick, bad, answer that you don't want me to say is, "it depends" … but it does. The straight answer is, in the largest variety of flight conditions, the whiskers are the lowest drag because their drag is almost independent of local angle of attack and they have little surface area. The coefficient of drag of a cylinder is high, though … especially that small of a diameter. Big cylinders have a lower Cd (higher total drag though, because the larger cylinder has a larger reference area). Let's go on to the other two configurations.

One would think that blade VOR/localizer antennas would have the lowest drag, but they don't. In this case, local angle of attack is critical. Blades have a tendency to separate at small angles of attack (both positive and negative). OEMs spend a lot of time/effort looking at cruise airflow patterns to put these antennas, (all antennas, actually), at the lowest drag angle of incidence. Blades have a lot of surface area drag and intersection drag (relatively large intersections, (top and bottom on both right and left side antennas).

Towel bar VOR/localizer antennas have some bad and good attributes. They have lower intersection drag, but they have two intersections per antenna. They have two lateral cylinders per antenna, which are draggy, but they are larger in diameter, but shorter in span. The long, longitudinal cylinder is good … unless it has a local angle of attack. Although the airflow will see an elongated oval in this case, the airflow will separate on the backside.

Bottom Line: *In the largest variety of flight conditions, whiskers are the lowest drag … we CFD-analyzed the different antennas on the M10. Seal the intersection as on Scott Sellmeyer's 1977 M20J, (shown here).*

Please let me know if this was helpful, too much or too little.
Blue on Top,
Ron B

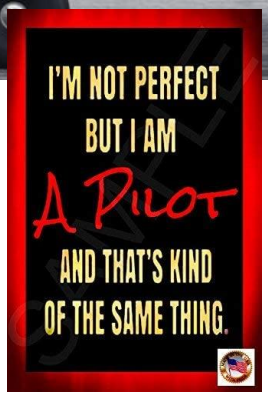


Hello from New Zealand. What you guys are doing here is next level. Thank you so much.

Be well, **Jason W**

What Can I Learn From Harrison Ford

Jim Price
Co-Editor



We all make a mistake occasionally. I made a mistake back in 1971, before graduating from USAF Pilot Training. However, after graduation, I have been a perfect pilot. 😇

When we make an aviation related mistake, it's usually not something the news media broadcasts all over the internet. But, when Harrison Ford makes a flying boo-boo, everybody gets to hear and read about it. His most recent aviation error was on April 24, 2020, at Southern California's Hawthorne Airport (KHHR). There, while taxiing his Aviat Husky, N89HU, he found himself involved in a Runway Incursion.

It seems that Mr. Ford crossed the airport's only runway after he misunderstood a radio instruction from ATC, telling him to "hold short".

In the audio recording, it begins with Harrison Ford reporting that, "Hotel Uniform is holding short [of runway 25] at Hotel".

The Hawthorne controller replies, "Hotel Uniform, continue to hold short of runway 25, traffic on the runway."

Harrison incorrectly acknowledges, "Crossing 25, 89 Hotel Uniform." Then the fun begins.

The controller, in a rather unhappy and scolding voice says, "Niner Hotel Uniform, get across that runway now! I told you to hold short! You need to listen up."

Harrison replies, "Excuse me, sir, I thought exactly the opposite. I'm terribly sorry."

No one was injured and another plane was reportedly 3,600 feet from Ford's aircraft.

What's Your Hurry?

Harrison may have been reading back the instructions while he was moving forward in N89HU. If so, the lesson here is to take your time. Don't' be in a hurry, no matter how fast the controller is talking. Pilots and controllers are not perfect, so you need to give the controller a chance to correct your incorrect readback or correct his or her original clearance. **Don't move!** Readback the controller's instructions, then wait a few seconds. If you don't hear the controller correcting his or her clearance or your readback, then proceed with caution.

Expectation Bias

Expectation Bias occurs when a pilot hears or sees something that he or she expects to hear or see, rather than what actually may be occurring. Harrison told the controller, "I thought the exact opposite". He may have been expecting a crossing clearance and read back and proceeded accordingly. When you get into your airplane, bring your A-Game and never let expectation bias take over.

My Engine is Better than Your Engine

My first Mooney was a 1965 M20C which had a Lycoming O360 and I thought it was the most reliable engine in any Mooney. When I traded up to an M20S with a Continental IO550, I wasn't sure it was as reliable as my Lycoming. So, I thought I would research why engines fail, and if a failure can be avoided. I needed some data to determine the truth.

Mooney Specific Engine Failures

It is interesting to note that of all the aircraft engine failures, only 10-15% involve general aviation light aircraft. However, a whopping 24% of those GA light aircraft are Mooneys! When I researched the Mooney IO-360 engine failure events, I found that the NTSB reports concluded that 15% of those failures either could not be determined, or that no mechanical defects were noted. That's a distinctly unsatisfying conclusion. In all Mooney engines, a little more than 15% of the engine failures have been attributed to *fuel contamination*.

Catastrophic engine failures happen relatively infrequently. About 9% appear to be due to connecting rod failures, while crankshaft failures are all but unheard of. If the detail in the accident report is accurate, rod failures are not often spontaneous bearing or materials failures, but are the result of lubrication faults.

Considering injected Lycomings, one suspicious engine component is the Bendix RSA fuel injection servo. Although engine manufacturers say this unit is simple, reliable and unlikely to cause a complete engine stoppage, it was implicated in at least nine of the accidents (13% of the Lycoming IO-360s).

Most J-model Mooneys are equipped with the much-maligned Bendix D-mag, which has a single shaft that drives a pair of mags in the same housing through a gear arrangement. Although this single-shaft design doesn't seem to provide much redundancy, there was only one failure attributed to the D-mag. Magnetos, as a failure point, occurred in seven accidents, but no patterns are worth noting and a few of these appeared to be due to degraded ignition leads.

General Background

There are approximately 96,000 Lycoming and 88,000 Continental engines. Of those engines, Lycoming has the majority of smaller and mid-displacement engines, while Continental has the majority of the larger bore engines. Interestingly, Continental has 1.15 failures per 1,000 engines, while Lycoming clocks

in at .91 per 1,000 engines. However, we really need to analyze if that is due to the manufacturer or if larger displacement engines are failing at a different rate than smaller displacement engines. Forty-six percent of Continental engines are larger displacement and these represent 60% of the Continental failures, while Lycoming has only 15% of its engines categorized as larger displacement, and they account for 25% of Lycoming failures. So, the data suggests that larger displacement engines fail more frequently.

More Interesting Data

Approximately 1/3 of engine failures occur during, or soon after takeoff. This seems to be the worst phase of flight to lose power since your recovery options are slim. Slightly more failures occur during the Cruise Phase of flight, but that makes sense since cruise is typically the longest segment of the phases of flight. Did you know that "single engine" failures are more survivable than "twin engine" failures? Who knew? Yup, for both Lycoming and Continental equipped aircraft, twin engine failures are twice as likely to be fatal. Ouch.

Why Do Engines Fail?

We tend to think that an NTSB investigation will ultimately determine the cause of an engine failure, but this is not always true. In fact, the NTSB has not been able to determine the cause of 30% of those engine failure crashes.

Water contamination is the easiest to avoid. Sump your tanks before EVERY flight. Rain is one way for water to enter your tanks, but condensation is equally destructive. Replace your O-Rings every annual whether they need it or not. And as for water in the fuel dispenser, let it sit for at least 10-15 minutes in order for any water to sink to the bottom of the tank and be shown on your sumped sample.

Fuel Issues

More than a quarter of engine failure crashes are caused by fuel issues that frankly, are mostly avoidable. These include fuel exhaustion (Ugh!), mismanagement, or contamination, such as water or other foreign object debris. Mis-fueling, though a scary concern, is very rare.

Remember that water can enter your tanks in 3 ways: 1) Water in the fuel dispensed, 2) Water entry via fuel cover leaks, and 3) Condensation in the tank.

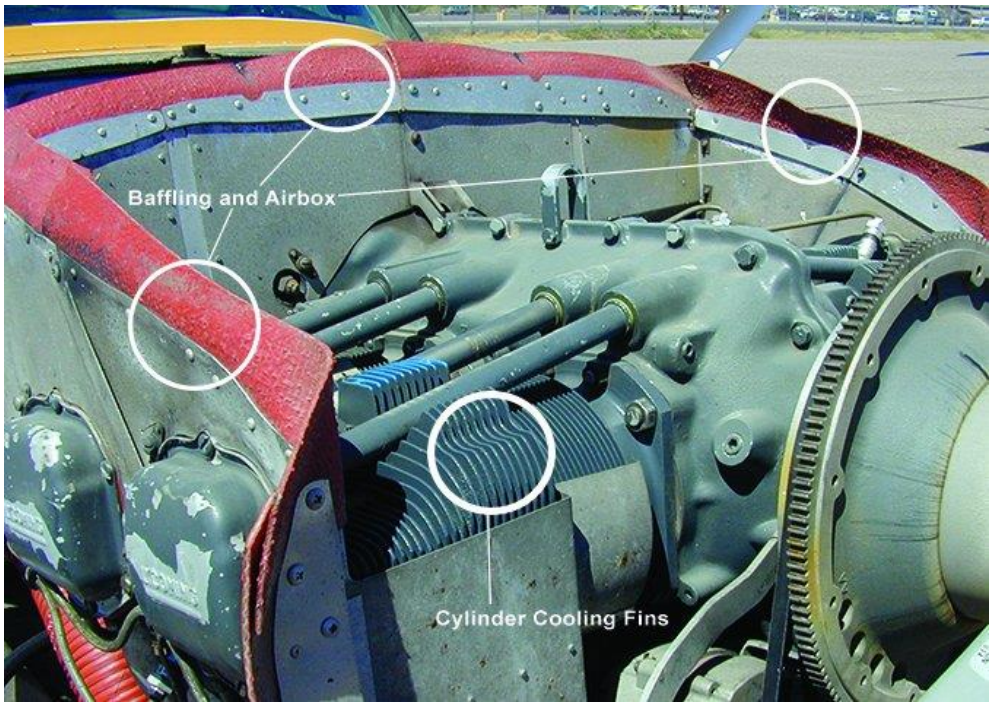
Mechanical Issues

These account for less than 1/5 of engine failure crashes. Again, more seem to occur in Continentals than Lycomings, but a little over 1 in 10 are caused by maintainer issues. Under torqueing of fasteners, cylinder through bolts, rod nuts, fuel pumps, and accessory case hardware are just a few examples.

Catastrophic failures include spun main bearings that damaged crankshafts or connecting rods due to improper torqueing.

Easy Things Pilots Can Do to Avoid Engine Failures

Fuel mismanagement is so easy to avoid. Always check your tanks for water or dirt before departing. Always carry adequate fuel plus healthy reserves. Depending on your destination and alternatives, the FAA reserves for VFR or IFR may be inadequate for your flight's specific situation. Remember to manage fuel in each of your tanks. Have a system and stick to it. Here's another simple step: If you have a carbureted engine, in the event of engine roughness, remember to apply the Carb Heat. Carb Ice is actually a cause of too many crashes and easily avoidable. If your engine is fuel injected, remember where the Alternate Air is located, and if you suspect a blockage, pull the Alternate Air and see if things clear up. Again, this is an avoidable engine failure issue.



It is more difficult to avoid maintenance related issues. If your A&P makes a mistake, you probably won't know until the failure happens. Deferred maintenance is an issue, and something that you have control over. It's not wise to defer issues related to your engine. Preventative maintenance, such as regular oil and filter changes, cutting and looking at the filter, and oil analysis are simple ways that you can look inside the health of your engine. You can also Bore Scope your cylinders and check compressions; cheap and easy to do. A frequently flown engine is much happier than a seldom flown engine. You should fly at cruise for at least an hour to burn off water in the crankcase.

Since Mooneys don't give you a thorough look at your engine, you can pull your cowling and look for oil leaks, cracked hoses, loose nuts & bolts.

If you don't have a multi-probe engine monitor, get one soon. They can tell you an awful lot about your engine's health before many problems occur in flight.

Our engines are air cooled, so we need to ensure that the air filter is clean and useful. It's a cheap and easy thing to replace. Check your engine baffling. It only takes a faulty or missing baffle to cause hot areas in your engine. Excess heat is not good for your engine.

Use Your Senses

It's amazing how much our engines communicate to us. Use your senses.

Your nose can easily smell hot oil, burning fuel from a leaking line, or electrical burning. Don't ignore your nose. Engine issues are not an everyday occurrence, so psychologically, it's easy to dismiss a slight odor. DON'T! Make a precautionary landing have it checked.

Your sense of touch can feel an abnormal vibration, however slight, that might indicate an engine issue.

Vibrations or rough engines can be the result of:

- A magneto beginning to fail
- A bad or fouled spark plug
- A clogged injector
- A stuck valve
- A propeller issue

Address these issues before your next flight.

Finally, your sense of hearing is valuable. If the engine doesn't "sound right", then it might not be right. Slight variations in the sound could be an early warning of an impending problem. It might just be that you are running a little too rich or too lean. You can test that easily, but if the noise persists, then something is out of the ordinary. Heed the warning.

Summary

Larger displacement engines tend to have more issues and failures than midsize or smaller displacement engines. Lycomings tend to fail less often, probably because they sell more mid and small size engines. Many failures have warnings that can be found/detected by your mechanic, by your engine monitor and by your senses. Use everything at your disposal and you can mitigate the risk of getting caught in the air with a failing engine. Remember, the riskiest time for an engine failure is in the first few hundred hours after an overhaul or Factory REMAN, So be alert. And be safe out there.

What is your Angle of Attack (AOA)? Installment #2

The hottest topic in aviation safety over the past several years – decades actually – has been loss of control. Even the words "loss of control" need to be defined, as each of us think of those words slightly differently. To a competition aerobatic pilot, an inverted spin is not an "out of control" maneuver. As pilots, we have been taught over and over concerning the definition of angle of attack or AOA. It is simply **the acute (small) angle between the chord line and the opposite of the direction of flight.** But, is it really that simple?

We only need two lines (vectors) to define AOA. How hard can this be? Most everyone has read "Stick and Rudder" by Wolfgang Langewiesche. In his book, he states angle of attack is the angle between the chord line and the opposite of the direction of flight. This works in the theoretical world, but not in the real world. Wolfgang's good friend, Leighton Collins wrote, "Takeoffs and Landings", which states that AOA is the angle between the chord line and the relative wind. Can you see the difference? He goes on to say that the relative wind in the real world is not equal and opposite the direction of travel of the aircraft. What? As a side note, Langewiesche wrote the "Forward" for Leighton Collins' book.

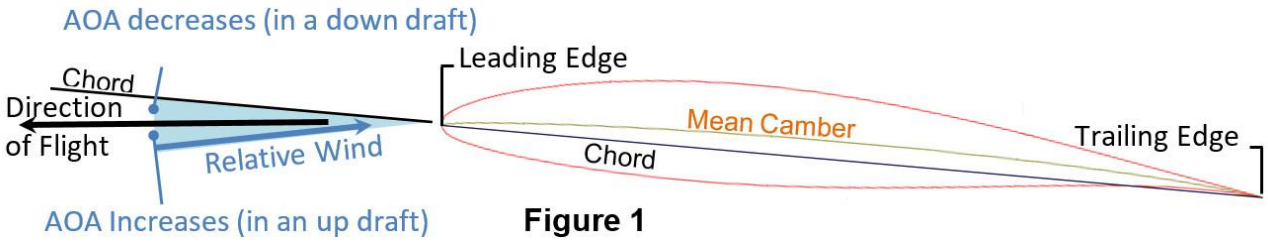


Figure 1

How can relative wind differ from opposite the direction of travel? It is simple. The air we fly through is not without its own movement. In other words, the air we fly through has up and down drafts, horizontal gusts, etc. The relative wind includes these conditions. See Figure 1.

The next question I normally get asked is, "How much can that air movement really matter or change AOA?" Do you ever feel turbulence or bumps? Turbulence is changing your AOA and, as a direct result, the load factor on you and your airplane. In fact, with today's airplane designs, gust loading typically defines the wing maximum strength requirements, as vertical gusts can put more load on the wing than maneuver loading, which is the 3.8 Gs that we use for normal category airplanes.

We have now defined the easier of the two legs of AOA, relative wind. How difficult can the chord line be? It is fixed, right? The chord line is simply a line drawn between the physical leading edge and trailing edge (see Figure 1). But what if either the leading edge and/or trailing edge move? What if a spanwise portion of either moves? Think about slats, icing, flaps, ailerons, etc. Everything just got a lot more complicated.

Let's start with the easy part, the airfoils themselves. M20s use a NACA 632-215 (root) and a NACA 64-412 (tip). Although these airfoils are from the same family, the mean camber lines are different, and therefore, the lift characteristics (lift vs. AOA) and stall AOAs are different. To make the spanwise lift distribution of the wing as close to elliptical as possible (think WWII Spitfire), we also geometrically twist the wing (washout). Twist also helps the stall pattern progress from inboard to outboard. Now which "chord" should we use? The chord angle varies from root to tip. It is getting more difficult to define the "chord". See Figure 2.

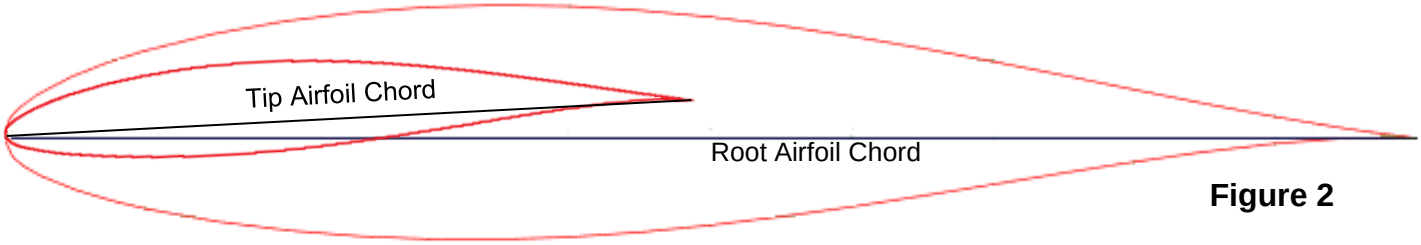


Figure 2

Now let us move an aileron (Figure 3) or flap (Figure 4), and chord definition gets really ugly. Regretfully, changing the chord method seems to be the current training fad in the pilot community. But looking at only chord angle changes ignores that the chord may have also changed length, the camber of the airfoil has changed, a slot may have opened, the wing area increased, etc. This method is only looking at the tip of an iceberg. So how does an aerodynamicist look at chord line and AOA?

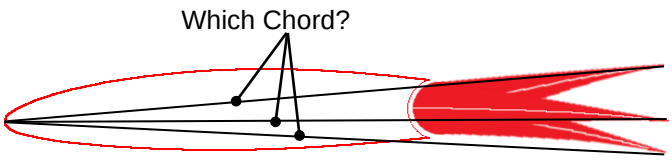


Figure 3

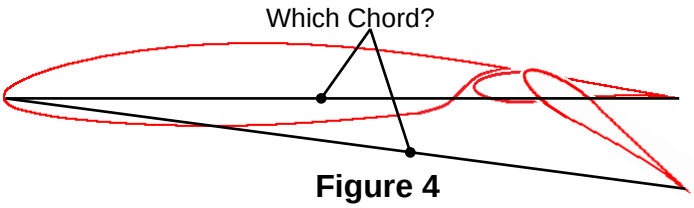


Figure 4

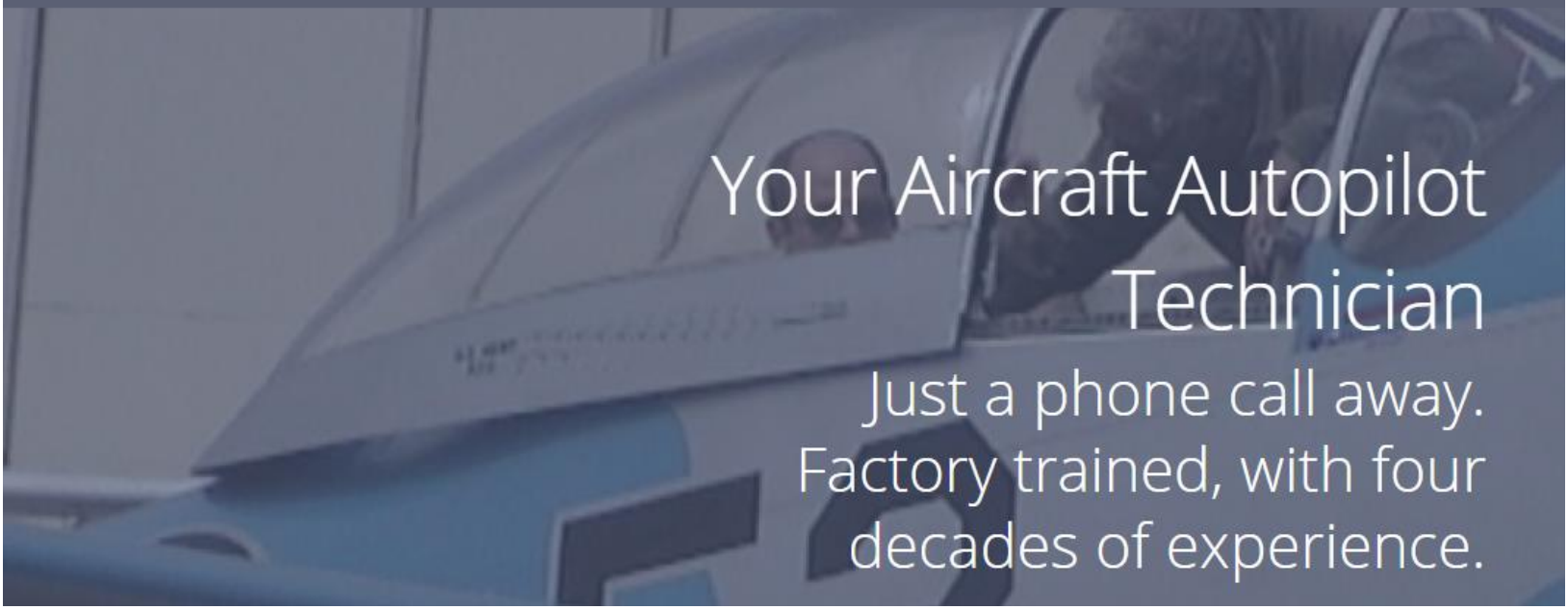
Aerodynamicists look at both from the other side. Remember how we discussed micro and macro viewpoints on aerodynamics last month? Aerodynamicists look at the wing chord and AOA from a macro viewpoint. In other words, we typically define the wing chord as the longitudinal axis of the airplane. It's an easy to define reference. And, after all, it is just a reference line. We're halfway there.

A wing doesn't lift, lift, lift and then suddenly stall (go to zero lift). Remember how I mentioned stall progression earlier? An aerodynamicist calculates at what AIRCRAFT AOA each spanwise section of the wing will reach its stall angle of attack. In other words, near the fuselage the wing might start separating at 10^{o} (aircraft) AOA, but the wing tip (remember the wing is twisted (washout) and is a different airfoil) may not stall until 19^{o} AOA. As the stall (separation) moves outboard, the wing will eventually not produce enough lift to support the weight of the airplane … and the airplane stalls. This last paragraph is foreshadowing for next month's article … defining stall.

Here's the answer to last month's question: Reference the photo to the left, is the flow laminar, turbulent, or separated? The answer is: "**turbulent**". It is not separated as all the tufts are firmly down on the surface. It is not laminar because all the tufts act like little vortex generators and make the flow turbulent. It must be a turbulent boundary layer.

I would still like your suggestions on where to take these articles. Email me at solutions@blueontop.com. The next article will be on how we define stall. What? There is more than one way? Until then, I hope your attitude is always Blue on Top.

Blue on Top



The Challenges and Responsibilities of Maintaining Aged Aircraft

by Bob Weber, https://webairconsulting.com/

From a very young age, I've loved old things. Airplanes are very high on this list of old things. One of my favorite memories is being part of a small team that built a 1967 UH-1 Huey from a pile of parts that was collected from all points of the globe, and we did it in 6 weeks.

Pilots that I work with beam when showing pictures of their wonderfully maintained, or nicely restored vintage aircraft. I will always have a soft spot in my heart for these proud pilots.

Those experienced with maintaining and restoring these aircraft, often find the need to look deeper than the published service information.

Whether there is an AD, service bulletin, service letter, etc., invariably there is something else we need to share with others who are tasked with the same problem. Good, sound, experienced advice is both a time and money saver. However, for today's aging fleet, it is harder to find a voice of experience.

New and Improved Problems, the Fun we Have with Old Things.

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.

Aircraft, by their very nature, must balance a varying number of sometimes complicated and sensitive systems with Mother Nature.
As time goes on, to maintain this balance, the normal wear of parts and timely inspections become more critical. This is exemplified by a "new and improved" issue that a colleague dealt with and “chased” for a while, before he finally found an aileron with a loose rod end.

The rigging was right, the roll servo checked fine, the bridle cable was tight, yet the roll oscillation persisted. Resetting gains led nowhere. Once the offending rod end was replaced and the gain settings restored to where they belonged, the aircraft was back on the rails. I always tell the client, "When I figure out where the problem is, this thing is going to fly sweet!"

The Most Neglected Component – Wiring Harness

The most critical "component" of an aging aircraft is the wiring harness. It acts as the central nervous system of your aircraft. There are multiple fronts of battle in the areas of maintaining and troubleshooting the harness.

Out with the old

Vintage aircraft are complicated enough to troubleshoot and maintain, without dealing with old wiring and equipment. The best advice I can give, is to remove all the unused / inoperative equipment and wiring. Your laser focus should be eliminating all unnecessary "obstacles", not to mention weight and drag.
With some preplanning and little extra work, much of this can be accomplished in steps, during upgrades and maintenance operations.

Breakers Get Old and Connections Become Loose

During my troubleshooting projects, a great many of the suspect breakers I found were surgically disassembled for inspection. Most of them had evidence of arc and heat damage. Several things can contribute to the failures, but one of the most common cause is one or more loose connections. These are easy to detect and correct.

An Item that is not on the Inspection Form

Early in my experience, I was building up and installing entire breaker assemblies for complete packages that we were installing in aircraft that had been brought directly from the manufacturer using handheld radios. Thankfully, I was trained to lace the harnesses in such a manner that it would minimize any stress on the individual connections. Over the years, I honed my skills by learning from the various techniques that I observed in the different manufacturer’s assembly practices. At times, what I found in a "sea" of forty or fifty breakers was the prevalence of loose connections. Ever since then, I have double checked the torque on each breaker connection.

How Tight is Tight

The torque of those breaker connection screws is nearly as important as that of many engine bolts. Honestly, I will have to get back to you on the specifications here, as I have never seen them. However, many times I have broken screws or stripped the tab threads. I now know the feel of the balance of T.I.T. tight.

Never use the supplied screws for multiple terminals on one breaker. I was taught to use a button head screw and split washer for multiple terminals. Although I try my best to avoid this practice, it happens. This was also where my "research on just how tight before stripping the breaker tab" was conducted. I found the practice of connecting the buss supply line with a dedicated hole and a lock nut, was far superior to adding it to a breaker on the buss bar.

Head on a swivel

When discussing an errant trim issue on an aircraft, I was going through a ground check procedure when my client said, "Oh hang on a minute. It does this every so often. The avionics would only intermittently come alive when the switch was turned on. It had been doing this for a while."

I told him we were done with the ground check until we find the cause of the intermittent avionics buss. This was what we found within an hour of that first call.

It's the Little Things that Speak the Loudest, so Listen to Them. The gravity of my Point

After multiple calls with my client, and several emailed pictures, I was able to spot the problem and direct him to a screw that had backed out completely at the supply side of the avionics master breaker switch. It had rested among things that don't react very well with screws rattling around them. The ring terminal of that supply line was contacting the threaded tab of the breaker. This was by virtue of the tension offered from the 10-gauge wire that it was crimped to, prior to the annealing process. He said it was, “Getting worse.”

Multiple times, the terminal had welded itself to the tab. My theory is that he was able to get the avionics to power up while cycling the switch.

Once we discovered the cause of the intermittent avionics buss, the aircraft was grounded, and he needed his engineer to take over. The damage to the wiring was the most telling. The wire involved with the offending screw was discolored, requiring replacement of at least 5", (12.7 centimeters).

The discolored *Tefzel* insulation was the farthest I have ever seen from the connection, indicating that it was exposed to a great deal of heat for a long period of time. This condition progressed over many hours of flight, while he was transporting his family through several hours of sometimes heavy IFR flying in the bumpy soup. After the situation was corrected, during the client’s follow up call, he said, “This is the best I have ever seen the autopilot function in this aircraft."

When You See a Bug, Stomp on it

After troubleshooting auto flight systems for so long, I found that when there is more than one problem, it is far more difficult to recognize the cause of the issue. Quite often I would come across numerous things while chasing an elusive, unrelated issue.

Some of the most common offenders are loose connections, control cables, clutches, and connector sockets. Basically, things that are not tight enough.

Another lurking culprit is the slightly tight bearing, bushing, control cable, and yes, even the former owner that skimped on maintenance!

Any of these things can contribute to problems. While troubleshooting an issue, I always correct the problems I see with the belief that if this doesn't fix my issue, it will no doubt, prevent a future one.

The Technicians that persevere and look at problems as a challenge, and never as a burden, are the people you want on the job!

The Day the Music Died

Richie Valens (17)

Buddy Holly (22)

The Big Bopper (28)

The 1971 Don McLean song, "American Pie" recalls the tragic events of the night of February 3, 1959. That's when Buddy Holly, Ritchie Vallens, J.P. Richardson (The Big Bopper) and their young pilot, Roger Peterson, died in a tragic aviation accident near Mason City, Iowa.

McLean said, "I still remember this light going off in my head as I was sitting up in my little room writing my songs and thinking about Buddy Holly and just how sad that was and how much I loved that guy, and how much I loved his music and how much I felt for him. I started to write this 'A long, long time ago', about how it felt when I was a paperboy [in 1959] and I opened up these papers… and this whole fantasy came out and [American Pie] was written".


THE DAILY TRIBUNE
YOUNG TEXAS SINGER DIES IN PLANE CRASH

"But February made me shiver
With every paper I'd deliver
Bad news on the doorstep
I couldn't take one more step

I can't remember if I cried
When I read about his widowed bride
Something touched me deep inside
The day the music died"

Don McLean grew up in New York, and he would listen to music and party at "**The Levee**" in New Rochelle, NY. Sometimes, when The Levee would close (i.e. when the levee was dry), McLean and his friends would drive across the river and scout for places to drink and have fun in Rye, NY.

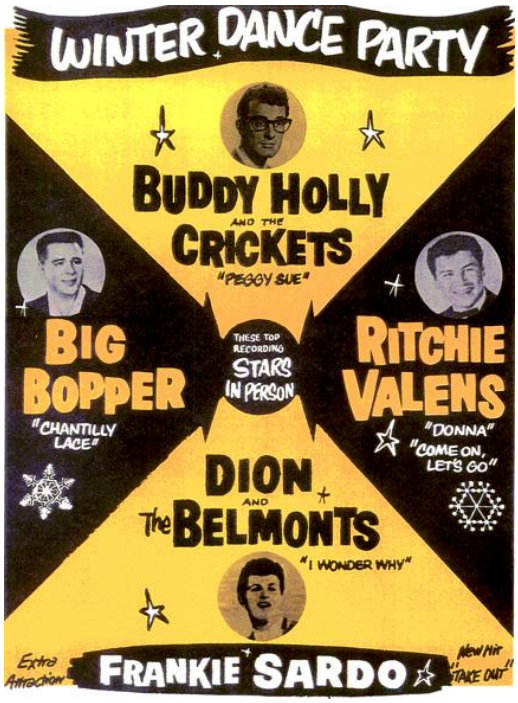

Don McLean

Numerous times, Don McLean has been asked about the meaning of the whole song. His famous and unhelpful answer was simply, “It means I don't ever have to work again if I don't want to.” While McLean is evasive about the elements, he describes it as “recalling a simpler time”.

It was a simpler time when The Winter Dance Party tour began in Milwaukee, Wisconsin, on January 23, 1959. By February 2nd, they were playing in Clear Lake, Iowa’s Surf Ballroom. Morning temperatures in Iowa ranged from -10° F (-23° C) with highs of 20° F (-7° C). Adding to the problem, their unheated tour buses broke down twice in freezing weather, leading to Buddy Holly’s drummer, Carl Bunch, being hospitalized for frostbite on his toes.


Carl Bunch

Facing a seven-hour bus ride to their next gig in Moorehead, Minnesota, (East of Fargo, North Dakota), Buddy Holly turned to aviation. He chartered a four-seat 1947 Beechcraft Bonanza 35 from Dwyer Flying Service in nearby Mason City, Iowa (KMCW). This Charter was originally intended for Buddy, Waylon Jennings (his bass player), and Tommy Allsup (his lead guitar player).



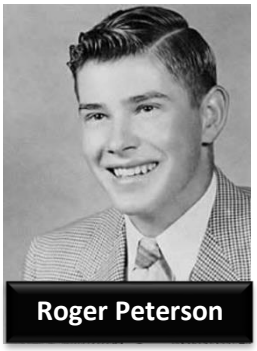

Buddy Holly & Tommy Allsup

When the Clear Lake show ended around midnight, Tommy Allsup “lost” a coin toss and gave up his seat in the Bonanza to Ritchie Valens. J. P. Richardson had the flu and was complaining that for a man of his size, the tour bus was cold and uncomfortable. Waylon Jennings voluntarily gave up his seat, so that J. P. could fly.

When Holly learned that his bandmates, Allsup and Jennings had given up their seats in the aircraft, Buddy said to Waylon with a smile, "Well, I hope your ol' bus freezes up again!"

Waylon replied, "Well, I hope your ol' plane crashes!" This innocent jab between good friends would haunt Jennings for decades.


21-year old Waylon Jennings Lubbock, Texas


Roger Peterson

Charter owner and KMCW Manager Jerry Dwyer assigned his 21-year old pilot Roger Peterson to the flight. Peterson was planning a career in flying, and he had 711 hours total time. He had had about 52 hours of dual instrument training, had passed the instrument written examination, but he was not yet an instrument rated pilot, having failed an instrument flight check in March 1958.
Peterson and the charter company he worked for were only authorized to fly in Visual Flight Rule (VFR) conditions. Although Peterson was young, Dwyer had a high opinion of him and stated he relied entirely on Peterson's judgement.

While the Winter Dance Party show was rocking in Clear Lake, Roger Peterson was at the Mason City Municipal Airport (KMCW), reviewing the weather. Visual Meteorological Conditions (VMC) prevailed in Iowa. However, the primary concern was Fargo, North Dakota (KFAR), where conditions were expected to deteriorate because of an approaching front.
Peterson checked on Fargo throughout the evening, and the front looked like it was going to arrive sooner than forecast.

As midnight passed, the ceiling at KMCW had lowered to 5,000 feet and light snow had begun to fall. The winds had increased in velocity and were reported as 20015KT to 18025G32KT.

The passengers arrived at KMCW at about 0040 CST and Peterson prepared the aircraft for takeoff. During the taxi to the runway, Peterson made one more weather check via radio. He was advised that the en route weather had not changed substantially, but the local weather had deteriorated. The KMCW ceilings had lowered to 3,000 feet, sky obscured with a visibility of six miles. Light snow had begun to fall, with 20 knot winds that were gusting to 30 knots.

At 0055, Bonanza N3794N, departed Mason City's Runway 17 and made a gradual turn to 315 degrees. Jerry Dwyer watched the aircraft from a catwalk outside the Mason City tower and saw the Bonanza's lights gradually descend several miles away.

At approximately 0100, people were worried. The pilot had not filed his flight plan by radio and tower personnel made repeated, unsuccessful attempts to contact N3794N. As the night went on, Fargo personnel reported that the airplane did not arrive.

In the morning, Jerry Dwyer hopped in an aircraft and conducted his own search. At 0935, he found the wreckage four miles Northwest of the Mason City Municipal airport.

The aircraft had impacted the ground in a snow-covered field. With no houses nearby, no one heard the crash. There was no fire and all aircraft parts were accounted for.

Civil Aeronautics Board (CAB)
Their investigation found that the plane hit in a 90-degree right bank and nose-down. The damaged vertical speed indicator (VSI) showed a 3,000 FPM descent. The tachometer was at 2200 RPM, and the airspeed indicator was stuck at about 168 knots. The propeller was broken at the hub, indicating that the engine was producing power.

So, what went wrong?

The CAB report indicated that Peterson's weather briefing, '. . . was seriously inadequate, in that it failed to mention adverse flying conditions, which should have been highlighted.' The weather briefers somehow failed to tell Peterson about flash weather advisories, which described deteriorating conditions en route, visibility below two miles, freezing drizzle, and moderate to heavy icing below 10,000 feet.
A second flash advisory issued at 0015 CST identified freezing drizzle within cloud layers in eastern Kansas that were producing moderate to heavy icing.

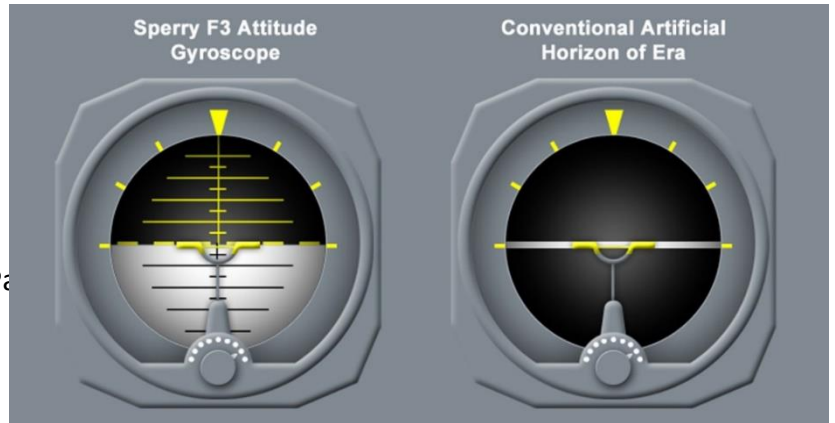
VFR Flight not Recommended

Investigators speculated that if the pilot had been aware of these flash advisories, and of the rate at which local conditions were deteriorating, he might have elected to cancel or delay the flight.

The Sperry F3

Bad weather and snow are often associated with the crash, and at first glance, weather seems to have been the cause. However, the accident investigators found that the Bonanza was equipped with a Sperry F3 artificial horizon. This is a design in which the ball is kept fixed with respect to the ground. The upper half of the F3's display was black, and the lower half was white, unlike modern displays that use blue to represent the sky and brown to represent Mother Earth. Also, the F3 indicated pitch in the opposite direction to conventional and modern indicators.

Experts concluded that this unusual presentation, along with the pilot's young age and the fact he had only been trained in aircraft that used a conventional artificial horizon, pointed to spatial disorientation as the cause of the accident. Investigators surmised that Peterson began referencing the Sperry attitude indicator shortly after takeoff.
As the lights of Clear Lake moved behind the



plane and the plane entered the cloud base, Peterson would have lost all his remaining visual references.
The CAB concluded that Peterson could have "become confused and thought that he was making a climbing turn when in reality he was making a descending turn."

Adding to the pilot's confusion, the directional gyro (DG) was caged; not operating and locked at a fixed heading. The Bonanza had recently been fitted with an autopilot, but it was not engaged.

Jerry Dwyer **(October 11, 1930 - January 16, 2016)**

At first, the crash was a scourge on Jerry Dwyer and his wife Barb. Ritchie Valen's mother filed a $1.5 million lawsuit and Dwyer's insurance company settled for $75,000. Still, the aftermath of the crash lingered. In 2009, Dwyer said, "It was the worst thing that ever happened in my life until I lost my oldest son."

Gradually, the Dwyers were befriended by the relatives of the musicians, and others. Today, the annual Winter Dance Party at the Surf, (begun in 1979), is a cherished family reunion. To leverage the attention to the tragedy for good, Jerry and Barb Dwyer helped establish college scholarships for music students.

"I've told so many people that if you're going to have a problem," Dwyer once said, nearly in tears, "the best place to have a problem is in Iowa, because the people in Iowa give a damn."

Never Forgotten

In Lincoln, Iowa, at the intersection of Gull Avenue and 315th Street, is a giant pair of glasses marking the nearest roadside location in the Buddy Holly plane crash site.
Following the fence about a 1/2 mile down a dirt path into a cornfield is the crash site, where you'll find memorials to Valens, Richardson, Holly and their pilot, Roger Peterson.

In our era, we are blessed to have Electronic Flight Bags like ForeFlight. Through WiFi, ADS-B, and FIS-B, we have access to wonderful weather displays, PIREPs, METARs, TAFs, Icing forecasts, cloud coverage, etc.

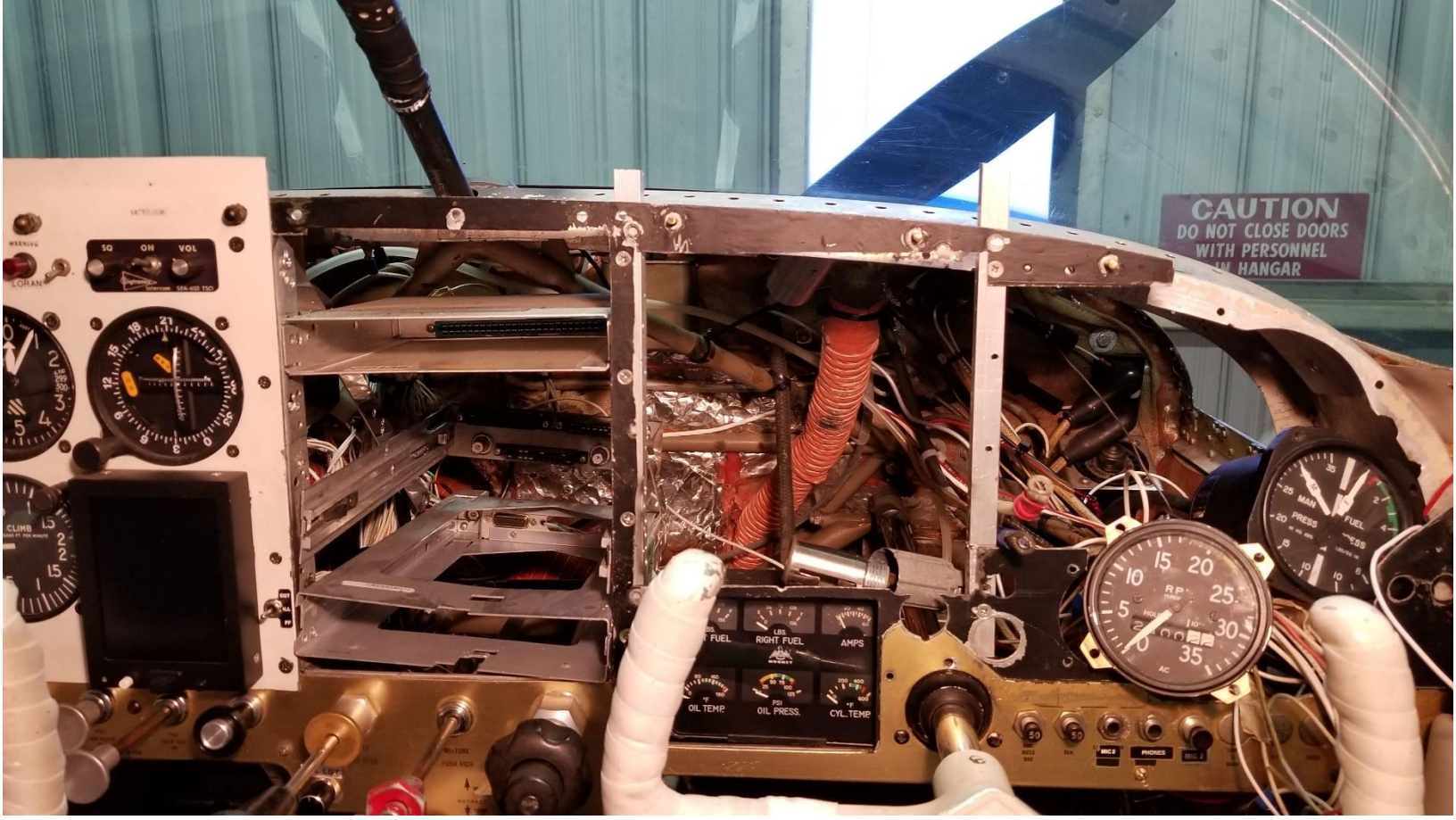
After examining all this marvelous weather information, before committing to a flight, pilots must be careful about where and when they fly. Just because it's VMC doesn't mean that it's acceptable.

At night, it's so difficult to see clouds. Before you know it, you're IMC and in the clouds, when the temperatures are 0° C or below, ice may start to adhere to the wings and tail. As the negatives start piling on, we need to step back and remember all the pilots who have challenged the weather and lost. Remember the many monuments that have been erected to memorialize their lives and remind us of their unfortunate errors.

Live to fly another day, so . . .

Fly Safe,

Jim



New Transponder? Crackling/Popping in Your Headset?

by Richard Brown

Are you one of the many who had to upgrade their transponder to be ADS-B compliant? Do you hear a crackling/popping sound in your headset now? It just might be the location of your transponder antenna.

I was flying with an old Narco AT-150 transponder. It had served me well for almost three years after buying N78878. I was one of the holdouts, hoping for something less expensive that would get me compliant. As time was winding down, I was leaning towards the SkyBeacon, to work in conjunction with my dinosaur transponder.

Then it happened, as I was approaching my home field at KFUL, I called up the tower, and after tower responded “November 78878, make straight in runway two-four”, he continued with, “I’m not getting your Mode-C, recycle your transponder.” I turned it off and then back on, but still no joy.

After landing, and before the next flight, my AP and I checked everything we could, yet nothing seemed amiss. Several successful flights were made after that, and I was beginning to think I was in the clear. That is, until I was flying a couple of friends to a breakfast run. We took off and as we were turning downwind, I heard “Mooney 878, recycle your transponder, I’m not getting anything from you.” I asked if it was just my Mode-C and he said there was nothing.

Oh boy…

I looked over and noticed the breaker had popped. I pushed it back in and it popped again. I informed the tower of the situation and that we would be coming around to land.

Facing a dying/dead Narco, I decided to just pull the trigger on a GTX 335. Under the direction of my AP/IA, I installed it and it passed the transponder check with flying colors (no pun intended).

Sometime afterwards, I started to realize there was a crackling or popping sound in my headset. I wasn't really sure when it had started, and after taking off and flying, I didn't really notice it much. It was just there every now and then in the background, just enough to be annoying. I knew it wasn't engine related because the noise was there even if the engine wasn't running.

After checking multiple things, I stumbled across the possible culprit. I read that the new transponder puts out more power than the old dinosaur, and if your transponder antenna was too close to the radios, the result could be causing the noise I was experiencing. My transponder antenna was in the same location as many other Mooneys; a few feet behind the exhaust, almost under the co-pilots feet. The way to check was simple. Power up your avionics and have your transponder on and transmitting, while listening for the sound. Switch your transponder over to Standby and see if the sound stops. I thought, "That's easy enough to check."

I headed to the hangar, got in the plane, put my headset on, turned on the avionics, and listened. Sure enough, there was the crackling/popping sound. I reached up, pushed the standby button, and… silence. Could it be? I pressed the ALT button so that it would start transmitting again and there it was, that annoying crackling/popping sound. I pushed standby and again, glorious silence.

A few months later, during the annual inspection, with all the inspection panels off and the interior pulled, I ran new RG-400 cable and moved the transponder antenna back on the fuselage to the belly, a little aft of the avionics bay. With everything hooked up, I put on my headset, powered up the avionics, listened, and heard… nothing. I couldn't believe it was so simple, but it was. The location of the antenna made all the difference.

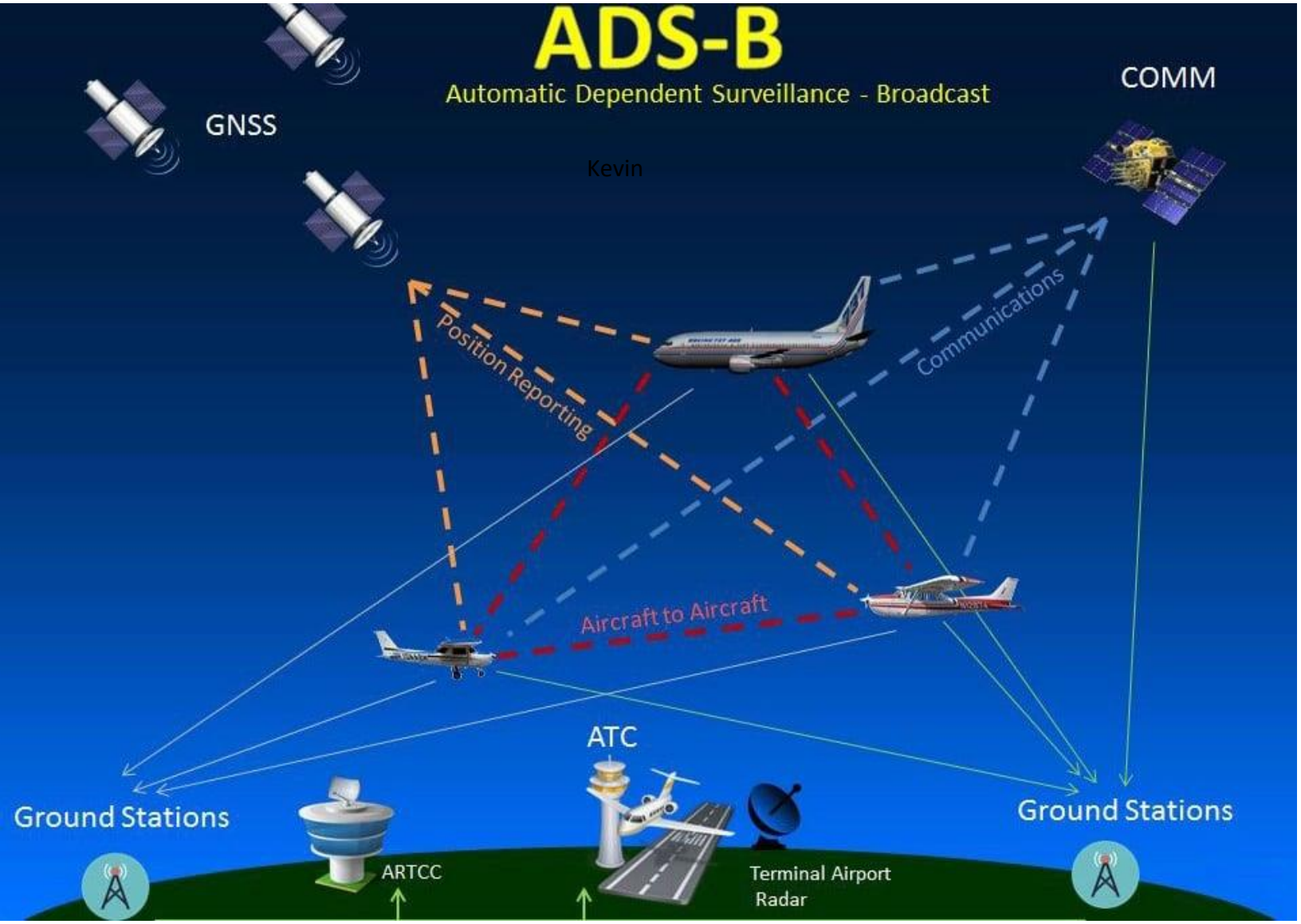
If you recently upgraded your transponder and are hearing a crackling/popping in your headset, take a minute to put your transponder in standby mode and see if it goes away. If it does, and your antenna is located where most of them are, the next time you have your interior pulled, run some new wire and move the antenna back. That is, unless you like the sound of bacon frying in your ears while you fly.

Mayday and Pan-pan

The phrase Mayday is generally considered to have originated in 1923 by Frederick Stanley Mockford, the senior radio operator at Croydon Airport in London. Mockford was asked to think of a word that would indicate distress and would easily be understood by all pilots and ground staff in an emergency. Since much of the traffic at the time was between Croydon and Le Bourget Airport in Paris, he proposed the expression "mayday" from the French *m'aider* ('help me'), a shortened form of *venez m'aider* ('come and help me').

Mayday is generally only used for a significant emergency. Minor problems and failures are handled by calling "Pan-pan", which comes from the French: *panne*, (‘a breakdown’). When used in aviation, it means that for the time being, the situation does not pose an immediate danger to anyone’s life or to the aircraft.

Example: On 13 April 2010, Cathay Pacific Airways A-330, flight CPA780 from Surabaya, Indonesia to Hong Kong issued a “pan-pan” when one of their engines failed 100 miles from Hong Kong. Shortly thereafter, just 45 miles southeast of the Chek Lap Kok airport, the second engine quit, and the pilots upgraded the situation to a “mayday”.



Better Late than Never ADS-B

by Kevin Knight

If medals were awarded for procrastination, my wife says mine would be solid gold. I'm busy, I tell her----not lazy----but she still wonders why I didn't install the uAvionix's tailBeacon ADS-B on my 1967 M20F until mid-March of this year.

In our first month of using this small device, it has already paid big dividends in improved safety and weather data. The irony of my foot dragging is I'm one of the first GA pilots to know about this technology, because I arranged the 2003 "Free Flight" article in **Forbes** Magazine.

When I met the engineers at UPSAT in Oregon nearly 20 years ago (you might remember that avionics company as "Apollo"), it was clear that ADS-B would offer numerous safety and situation awareness benefits to pilots. The inbound signal would provide pilots with dynamic traffic and weather information for free. The outbound signal would let other pilots and controllers know the position, heading, speed, altitude and N-number of other planes. (CLICK HERE for answers to every question on this subject).

In 2017, I started hearing lots of noise that the FAA was dead set on having every plane equipped with ADS-B Out by January 1, 2020. Three things kept me from jumping in with both feet.

First, ADS-B Out products available then were expensive, particularly compared with the ADS-B In system I cobbled together. It consisted of my iPad, some cheap but powerful software from Seattle Avionics, and a Merlin receiver they sold for $250.

Second, inexpensive, portable computer technology was migrating into cockpits and the agency was becoming more receptive to affordable innovations that improved safety. Many pilots felt the agency would approve a mobile ADS-B Out technology that didn't require expensive installation costs from an avionics shop, or extensive airplane downtime.

Finally, the FAA was notorious for changing schedules and equipment requirements. You might recall the microwave landing system. That costly experiment was supposed to supply precision radio guidance at large airports. It never got much traction despite inhaling many millions of dollars. (CLICK HERE for more information on MLS).

Fast forward to December 2019, when I was cycling across Vietnam and Laos with my best friend. I had already missed the FAA's ADS-B Out $500 rebate program, but the last half of the year had been jammed with other priorities. Since my plane was winterized and wouldn't be pulled from the hangar until February, I finally started drilling down on options.

The classic choices included panel mount transponders with ADS-B In *and* Out. They were digital, self-contained and started at $2,600 plus installation. Google searches indicated transponder installation, certification and set up would take around 10 hours and cost at least $1,000. Past experience indicated that I should add at least another $500 for surprises. Also, the avionics shops were backed up for months. No thanks.

As an **Aviation Consumer News** subscriber, I became intrigued with a unique product from uAvionix called skyBeacon. It replaces a wingtip light and has an integrated WAAS GPS and antenna, providing a position source for the ADS-B Out. That was ideal, since my plane doesn't have a panel mount GPS.

The engineering seemed well thought out and installation would take roughly 30 minutes. The unbiased reviews were strong, and the device cost $1,849. Plus, as someone whose professional life revolved around cutting edge tech, I have a strong bias for innovators who keep big companies honest and competitive. (CLICK HERE for more info).

When I told my A&P I was leaning towards the skyBeacon, he suggested I look at the company's newer ADS-B product, tailBeacon. It cost $150 more at $1,999, but he thought it would look nice on the rear of my Executive, and there was less chance of it getting dinged back there. I agreed.

After reading comments from other pilots on Mooneyspace.com, my only concern was whether it would successfully communicate with my ancient, Narco AT-150 transponder. The company's website said "tailBeacon works with any existing transponder…" and its "… patented power transcoder technology communicates … over your aircraft's electrical system."

That sounded definitive. However, I'm a big believer in research, so I sent queries to some of the Mooney pilots who posted comments online.

"Kerry" emailed me, "I installed the skybeacon on my 1959 Mooney M20A. The installation of the hardware went great without any issues. I did have issues with the configuration when trying to use the Apple iOS app. I couldn't make the configuration work on either my iPhone 5 or my wife's iPhone 7. I finally gave up on iOS and tried my Android Samsung tablet. The Android tablet configured the skybeacon correctly and the test flight went great without any hiccups."

I got a more detailed response from "skydvrboy." He wrote, "I installed the wingtip mounted skyBeacon with my IA's approval. Here were the challenges I encountered.

- I couldn't find my Whelen strobe power supply for a while. It was in the battery compartment and runs both wingtips (and belly strobe if installed).
- The kit shipped with 6-32 screws, but my backing nuts were 8-32. I had a hard time locating 8-32 screws with a small enough head to fit inside the plastic recesses. Once found, they were slightly too big to fit through the metal grounding plate. I had to drill the holes in the skyBeacon slightly larger and then, all fit properly.
- The only 8-32 screws I was able to find were bare metal steel screws, so they have since begun to rust. I'll pull them out and blue them by heating them red hot and quenching in oil. That should help slow the rusting process.
- I didn't know the skyBeacon Wi-Fi turns off after 5 minutes if you don't connect to it. So, the first time I tried to connect, I couldn't and had to call uAvionix. Everything connected perfectly when I tried within the 5-minute limit.
- Once the nav light was removed, I found some insulation type material in the tip of the wing which needed to be cleaned out. To do that, I had to tape a garden hose to the end of a vacuum hose because the nav light hole is the only access point to that compartment. Once removed, I sprayed with a corrosion inhibitor. Of course, none of that was directly related to the skyBeacon.

"Other than that, the install was super easy. If you don't count the time dealing with the issues above, which were specific to my plane, it took less than 15 minutes to install and about 5 minutes to configure. Everything passed with flying colors on my first attempt and I have had no issues with it since. It sure was a flying game changer to have weather and traffic info on my iPad after the install."

Installation was a breeze….

When the tailBeacon arrived in a small box, I was surprised how small and attractive the 3-ounce device was. Nearly everything I needed was included except for some simple tools and an A&P with Inspection Authorization. Fortunately, I knew one on my field who could sign off a 337 form.

It took less than 30 minutes to remove my original taillight, attach the provided bracket and connect two wires before using a cigarette lighter to shrink a pair of transparent sleeves so the connections would be waterproof. The bracket is a twist-and-lock style. The entire process couldn't have been easier. (CLICK HERE for a video with more info).

After downloading the free app from uAvionix's website to my iPad and following the provided instructions, configuration took less than 15 minutes. I just followed the prompts to add the ICAO address, emitter type, aircraft dimensions and GPS offsets.

To power my tailBeacon, the navigation lights switch stays in the "ON" position. With that activated, my next-to-final step was a 30-minute flight around 3,000 feet near Seattle. An icon of my plane and its tail number were displayed on the iPad's navigation software, along with other planes in the vicinity.

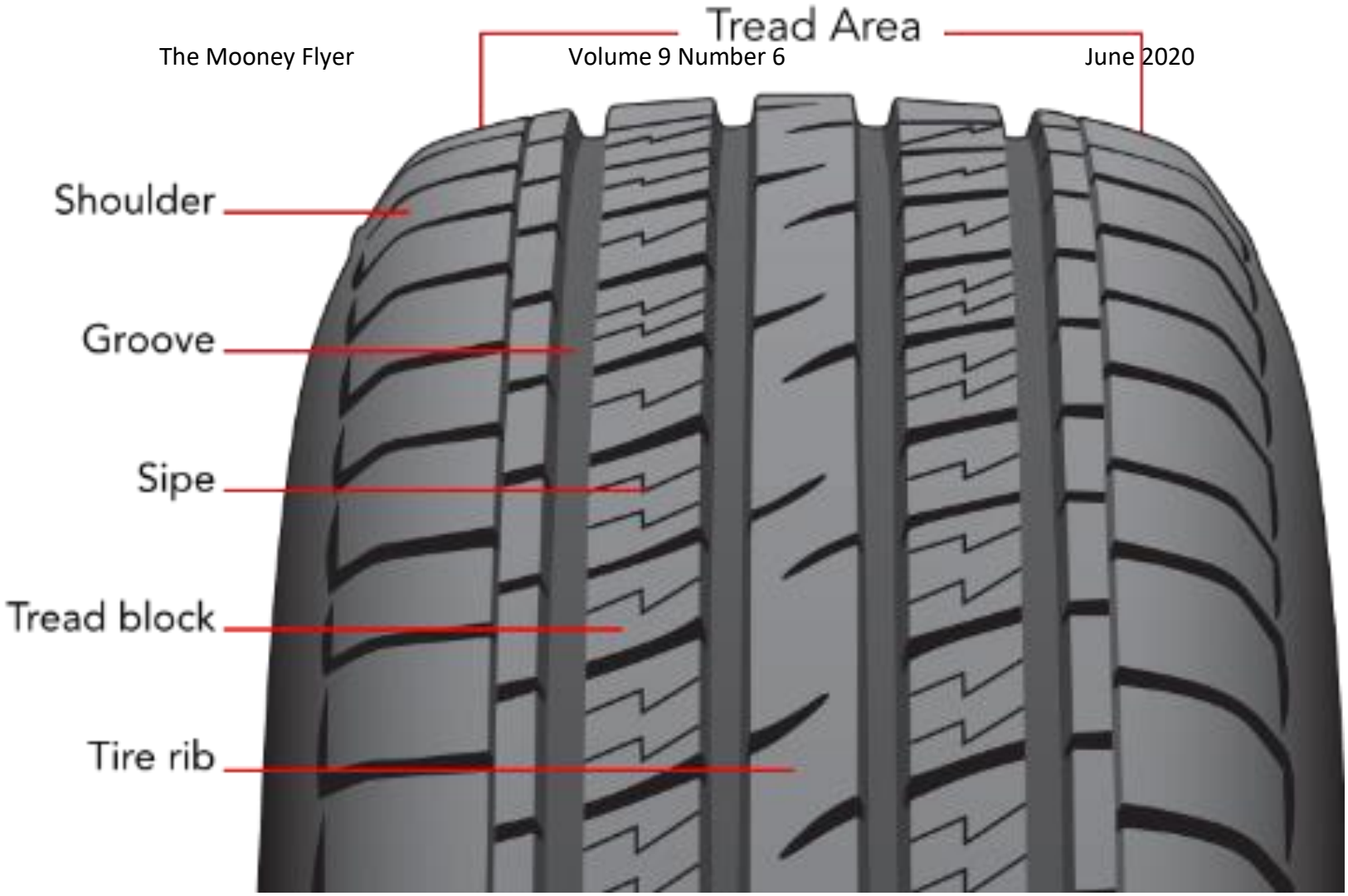
After landing, I visited FAA.gov for an FAA Public ADS-B Public Performance Report (PAPR). Passing results were emailed to me in a few minutes. If there had been red sections on the report, I would have had to address the problem areas and go up for another flight.

I've since flown several hours with the tailBeacon and am getting used to tracking other planes and seeing the weather. Everything's worked flawlessly, but I'm still using Flight Following since an extra pair of eyes is always good. That came in handy during my latest flight over the San Juan Islands. The controller reported a plane heading in my direction, but said its transponder wasn't on so the altitude was unknown.

Less than two minutes later, a red and white Cessna 172 zipped about 400 yards past my left wing. The Texas native in me was tempted to do a 180-degree turn, call in the idiot's tail number, then follow him to his landing. The pilot would then be given the option of a robust discussion or both barrels of nuclear whup ass.

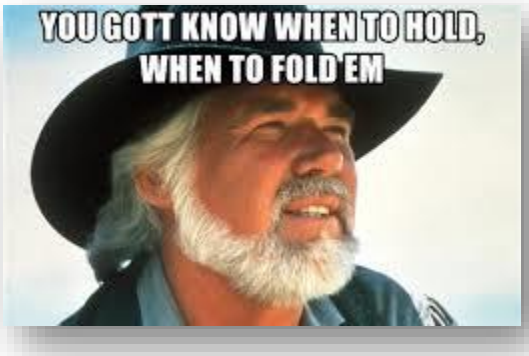
Reason – and my wife prevailed, so I told the controller what that pilot did was clearly illegal. He agreed. I assume that scofflaw didn't have his or her transponder on because he or she didn't want to be identified as someone who was flying without ADS-B.

As someone who works in health care, that experience reminded me of the concept of "herd immunity." If everyone gets immunized, or flies with ADS-B, everyone is far safer. Installing a tiny tailBeacon to keep my own tail out of trouble is something I would never procrastinate on again.



Tires… Tires… Tires. Why you need to Love them

Tires are often overlooked, except, of course, when you notice that one or more tires are underinflated during your pre-flight inspection. Tires really deserve more of your attention.



There are only three things you should do regularly:

- Ensure proper inflation
- Move your Mooney to Inspect the entire tire
- Know when to "Fold 'em"

Inflating

Know your target tire pressures. The two mains will be the same and usually lower than the nose tire. To allow for some pressure loss, you should add a few extra PSI to the target pressure.

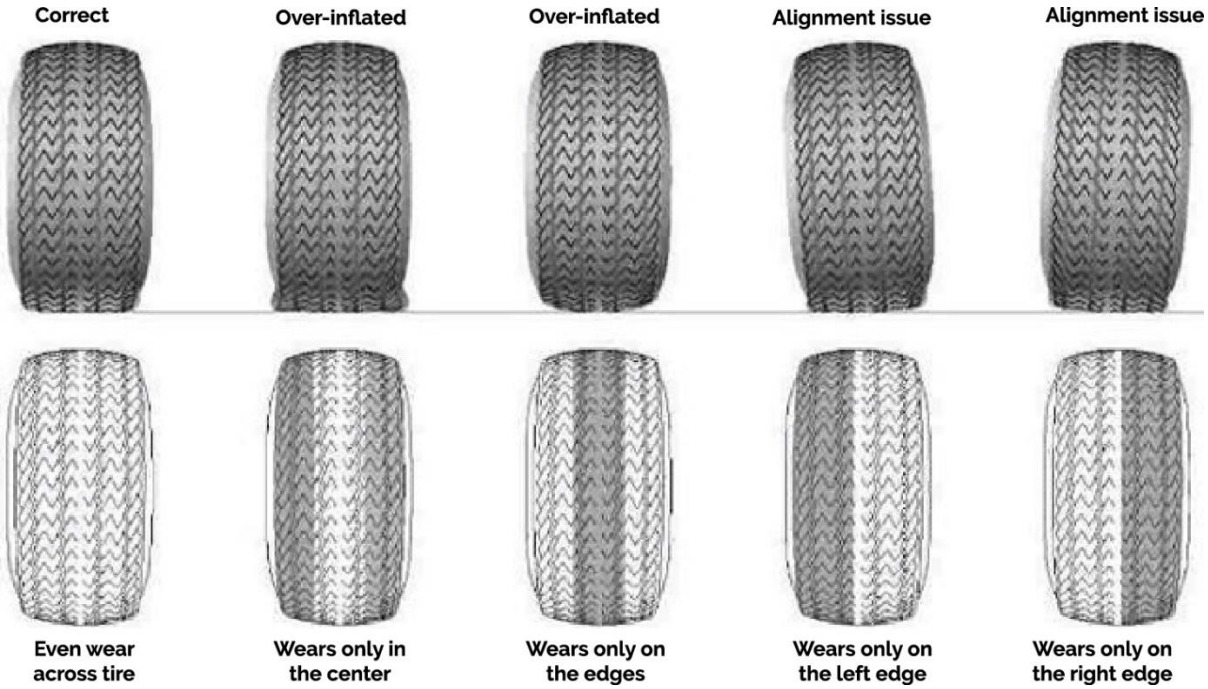
Inspection

Here is a systematic approach to inspection:

- Check the wear first. Is the wear mostly even? Is there more wear on the inside or outside shoulder of the tire? If there is uneven wear, a simple solution is to rotate the tires. But

regardless, you should check for the cause. Gear misalignment, although rare, should be addressed quickly.

- Next, check the amount of **tread wear**. A good rule of thumb is to replace a tire before there is no tread, i.e., the tread has worn to the bottom of a groove. ***NOTE**: If there is any fabric showing anywhere on a tire, your Mooney is no longer airworthy.*
- **Flat spots** – Too heavy on the braking after landing? If, however, the tread wear is ok and no fabric is showing, then keep a close eye on the flat spot(s) before each flight.
- The **Bead** – Inspect the bead. The most common damage is due to heat, sometimes from frequent or excess braking.
- **The Surface** – Pay attention to uneven wear on the surface. If there is more wear in the center of the tire, you have been running excess tire pressure. If there's more wear on the edges, then the tire(s) are or have been used while underinflated. Both conditions are easily fixed.
- **Tread Cuts** – If you find any cut that extends more than ½ of the tire rib or ½ of the depth of your grooves, you should replace the tire.
-



Mooney owners have an additional concern which is the diameter of the tire. The last thing you want is for your tire to rub into the wheel well during retraction or extension. Ensure that your tire does not encounter these conditions during operation. Be especially observant if you are using retreads.

Summary

Know your tire pressures and maintain them. Avoid using your brakes while taxiing. No matter how badly you need to visit the restroom, roll to the next taxiway. Remember, you are not in a short landing contest. Give your tires a thorough pre-flight and be safe out there.

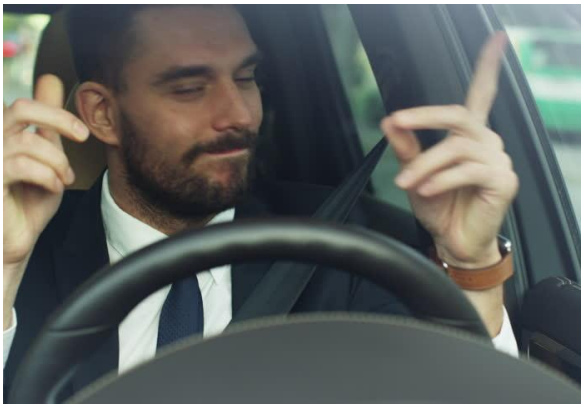
Turn the Radio Off – for a Better Flight

by Jerry Proctor

Greetings to Mooney Flyer readers. I have been a fan of the Mooney Flyer for years and I know Phil and Jim well, so I thought I might try to add to their fine publication by writing an article or three. I am a CFII for another Mooney safety related organization and I have written articles for MAPA Log before. I confess, I will not be as refined as Phil, Jim or other quality contributors, but I hope to entertain and have a safety lesson somewhere in the middle. Safe Flying all!

My first topic is, turn your radio off and have a better and safer flight, huh?

I am in my beautiful machine, cruising along and just like every time I fly, I want it quiet, so I turn my radio off. Yes, I really do! It is more peaceful. I can think much better, and I am sure that I operate the machine very well. I think about where I am going, what maneuvers I am going to perform, what the objective of the flight is and that my plan makes sense. I really do turn the radio off. Oh, I guess I should let you know, it is the radio in my Ford truck that is off, as I am driving my 20 minutes to the airport.



Well, I am not sure my attention getter worked, but to emphasize again, I really do drive to the airport without XM radio bopping in the background. Is this when I do my flight planning? No, not at all. When I plan, I am methodical. For a local flight, I look at the weather and NOTAMS five to seven days ahead of time. For a cross country, I am look out as far as Weather.com allows, which is 15 days. I use a quality flight planning website and I also use the new 1800wxbrief website. In fact, as the safety officer for our local aviation association, I presented a two-hour education and demonstration class on all aspects of 1800wx.brief. So, as I drive to the airport, believe me when I tell you that I have planned well.

When I plan for a flight in my study, it is still hours before takeoff and that is why I use the quiet drive time to get my head in the aviation game. Silly as it sounds, I look at the four American flags which are on my path to the airport. These are great windsocks. I look at the mountains, clouds and how clear the air is – or not. I go over my flight plan, not so much the IFR or VFR flight plan, but the steps to prepare for the flight and then when we are airborne. If I have a student, I go over again the objective(s) of the flight and the points I should emphasize.

In short, I prepare mentally for the transition from ground life and transportation, to a life in flight. It will be much more complex and potentially riskier if I'm not well prepared.

I also have been turning the radio off, even when I am not flying. We are all are bombarded with a huge excess of electrical stimuli such as cellphones, TV, radio and who knows what else. Quiet is something we probably don't enjoy enough. I grew up working on my friend's family farm. I remember driving the tractors in solo mode with no other stimulus. I am certain many great ideas were conceived in the environment that was absent the external electronic input. I am also betting that I am not the only one that seeks limited stimuli when preparing to fly. If you are one, share the idea with others. If you are not, give it a try. I bet you will like it, and I bet you will be better prepared when you push that throttle up for takeoff.

So, enjoy and take advantage of the opportunity for quiet thought. I hope it isn't a lost art.

Fly safe, be safe!

Jerry Proctor, CFII, jprocmooney@gmail.com

Installment #9

by Brian Lloyd, CSEL/CMEL, CFIA/CFII

When it comes to Lean of Peak, opinions are all over the map. Let's kill this sacred cow and jump to the barbecue.

In my opinion, Lean-of-Peak (LOP) operation is better for your engine than Rich-of-Peak (ROP).

Markus Villinger, one of our Mooney brethren from Austria, owns and operates an M20K "231", N231MV. He wrote, *"In the last Mooney Flyer issue I read about Brian Lloyd flying around the world in a M20K. In his article he mentions that most of the time he flies LOP (Lean of Peak).*

"I also have a M20K for over 15 years also with intercooler, Merlin wastegate and Gami injectors - however I always fly it ROP because I hear so many stories about damaging the engine when flying

LOP. Therefore, I would like to talk or write to somebody who really has the experience – like Brian – about him flying LOP on the TSIO 360 - and his experience, and which power settings, temperatures he is using."

First, let me talk about the difference between rich-of-peak (ROP) and lean-of-peak (LOP) operation. The important instruments for power setting are different for the two modes. When you are ROP, it is the amount of air entering the engine that determines power. Once all the oxygen molecules have combined with fuel molecules to produce heat, the fuel that is unburned, goes out the exhaust. So, the primary instrument for power setting is our measure of air going into the engine – manifold absolute pressure (MAP). This also explains why, even with differing amounts of fuel flowing to each cylinder, the cylinders produce the same amount of power and the engine runs smoothly.

When running LOP the opposite is true. Now we have an excess of oxygen molecules and all the fuel molecules get burned. The amount of air coming in has much less effect on the power output. Our primary indication of power output is how much fuel is going into the engine – the fuel flow. If you do not have the same amount of fuel going to each cylinder, the power output of each cylinder is different. Instead of "bang, bang, bang, bang, bang" you get "bang, BANG, Bang, BANG, bang", and the engine runs rough. Therefore, balanced fuel flow and something like GAMInjectors™ are necessary for smooth LOP engine operation.

We can measure Fuel to Air ratio in automobiles, but we don't have any direct way to measure the ratio in airplanes. So, we use a secondary indication, Exhaust Gas Temperature (EGT). Peak EGT occurs very close to best stoichiometric mixture – where we have exactly the same number of oxygen and fuel molecules to get complete combustion. We can use the point of maximum EGT to separate rich from lean and hence the terms rich-of-peak and lean-of-peak

Most modern engine monitors have a mode to help you set your mixture using EGT. In the case of ROP operation, the engine monitor tells you the first cylinder to reach peak EGT. At that point you enrich the mixture until you get to a good, safe (for your engine) EGT drop. At cruise, that should be around 100˚-150˚ Fahrenheit. For takeoff and climb, it should be about 200˚-250˚F ROP.

When operating LOP, place your engine monitor in the LOP leaning mode. Now the monitor watches for the last cylinder to peak (richest cylinder) and indicates how far the EGT on that cylinder has dropped. Once the monitor alerts you to the last cylinder to peak, you continue leaning until it shows a drop between 25˚F and 40˚F, depending on the desired power setting. Higher power settings require more EGT drop. At 65% power, lean the mixture to run at 25˚F LOP. At 75% power you want to run at 50˚F LOP or leaner. If your engine is running smoothly and CHTs are normal, you are being nice to your engine. Maximum continuous safe cruise Cylinder Head Temperature (CHT) should be no more than about 380˚F with the cowl flaps set normally.

When speaking of CHT, it is important to discuss the cowl-flap system. The F, J, and early K (231) models have the same cowl-flap system. It is a push-pull control with Open, Trail, and Closed positions. Use "Open" for take-off and climb. "Trail" or closed is for cruise. "Closed" is for descent and landing. With my 231 K model, I wish I had a setting between trail and closed because "Trail" is

too cold (less than 350˚F on the hottest cylinder) and “Closed” is too hot (over 400˚F) for cruise above 60% power. Apparently, Mooney, noticed this and when they produced the 252, they switched to a continuously adjustable cowl flap. The important thing is to notice what your normal CHT is for a given power setting and cowl flap position. If CHTs are higher than normal for a given power and cowl flap setting, (which includes IAS value), you will need to adjust your mixture. If ROP, enrich the mixture. If LOP, lean the mixture more.

This brings up a key point about mistreating your engine. The instrument that best indicates engine stress is CHT. If your CHTs are running higher than normal, your engine is under greater stress. You need to either reduce power or change the mixture. If running ROP, make it richer. If running LOP, make it leaner. Either way will reduce engine stress and increase the life of your cylinders. Just opening the cowl flaps more does not make things better. It just hides the problem with more cooling air and lower airspeed.

It is easier to damage your engine running ROP than at LOP. Once the power setting is below 65% your engine is safe from damage due to mixture mismanagement at any mixture setting. On the other hand, if you like to go fast, running at 75% power, you must be VERY careful not to lean too much while on the rich side of peak EGT. The area where your engine is most stressed by mixture is the range from 25˚F to 100˚F ROP, which is right where most POHs tell you to set your mixture. If you are running ROP in cruise, try not to ever get leaner than about 125˚F ROP. For 75%, you need to run 150˚F to 175˚F ROP to be safe.

Running LOP in the 231 means you can go 15%-20% farther on the same amount of fuel. If Low Lead costs $6/gallon, then think of running LOP as a reduction in the cost of fuel by $1/gallon. I am more of a "go far" than a "go fast" kind of guy. I am willing to slow down and save fuel. If I can skip a fuel stop by flying slower and more efficiently, then I save time too. Fuel stops kill your average speed, and it is the average speed that determines how long it takes to get to your destination. I fly at Carson's speed, which, at max gross weight in my 231, this typically happens at around 125 KIAS and 65% power. This means I almost always use the same power setting for cruise flight.

When running LOP, you need excess air for a given power setting. This means you need to increase MAP to force more air into the cylinder for a given fuel flow. My 65% power setting is usually 32" MAP, 2400 RPM, 40˚LOP on the engine monitor or the turbine inlet temperature (TIT) gauge. If I have done it right, fuel flow will be 9.8-10.0 gph. At that point, I watch fuel flow and TIT to tell me if the engine is drifting off from my desired power setting. These are more sensitive to changes and will alert you to the need to make small adjustments.

Since changing power settings changes mixture too, I try not to make MAP or RPM changes after I have adjusted the mixture. I start by setting MAP and RPM at my final desired values, lean the engine to a TIT of about 1500˚F (on the rich side), enable the lean-find function of the engine monitor, and then lean rapidly to about 11 gph. That will be close to peak EGT. Since this is the point where you can cause your engine the most harm, you do not want to stay here for a long time. If you happen to look at CHT, you will see that it is rising rapidly. Now, I use the Vernier to lean the mixture at about one whole knob rotation about every 5 seconds. EGTs and TIT will rise rapidly toward peak. (In my aircraft that will be a TIT of about 1650˚F.) The engine monitor will alert you of the first cylinder to peak. Continue to lean the mixture but do it more slowly. EGT and TIT are rapidly changing, and you do not want to miss the last cylinder to peak. When the engine monitor tells you of the last cylinder

to peak, adjust that cylinder for a 25˚F - 40˚F drop in EGT. Fuel flow should settle at 10 GPH and CHTs should be perfectly normal.

What kind of performance should you expect? In my 231, airspeed normally settles at about 125 KIAS down low and about 118 KIAS up high. The lower IAS up high has to do with loss of propeller efficiency, even though the engine is producing the same amount of power. At half-fuel, 65% power, and FL210, I expect to see just about 170 KTAS. That works out to about 17 nm/gallon.

I talked about bootstrapping in Killing Sacred Cows last month and you will see bootstrapping occurring here. TIT, fuel-flow, and MAP are going to drift. If TIT, fuel flow, and MAP drift downward, the fix is most likely a small mixture change. Turn the mixture just slightly toward rich and monitor TIT. Fuel flow should come back up, along with TIT. Shortly thereafter, MAP will come along. Do not try to chase the MAP with throttle or mixture changes. You will only end up going back and forth across your desired power setting. Make a small change in mixture and wait to see what happens. Patience is your friend.

These procedures are applicable to other Mooney injected engines as well. Different engine types will have different numbers for fuel flow and MAP, but the concepts and techniques remain the same. If you have a normally aspirated, injected engine (E, F, J, R, or U) things are easy. There is no bootstrapping. If you are flying an E, F, or J, you will most likely be flying wide-open throttle. Lean to LOP and accept whatever power you get. In the Ovation (R or U), reduce MAP and RPM to get about 50% power. Then, lean to LOP and increase the MAP by about 2". Temperatures should not vary by much.

With the other turbocharged Mooney engines, such as the 252/Encore (K), TLS/Bravo (M), or Acclaim (TN/V), set the power as I have indicated above. Because of the density-type waste gate controller in the later turbocharged engines, you won't have to fiddle with the mixture and throttle once you get the throttle set.

Markus Villinger *later wrote, "Flying my Mooney LOP would be beneficial for me – not only because of Avgas price savings (Avgas prices are indeed very high here in Europe), but also to get more range out of the airplane – because Avgas is not available at several European airports."*

The dwindling supply of Avgas is a big problem in the world. If you are flying in North or South America, Australia, or New Zealand, they have ample supplies of Avgas. If one is in Europe or the rest of the world, Avgas is becoming scarcer. One must plan.
On my flight around the world, ensuring I would have fuel was a big challenge. Having long range tanks let me fly until I could find a place where I could get fuel. Getting Avgas when crossing Africa was my biggest problem. We tried for a year to get even one drum of Avgas placed in N'Djmena, Chad, and could not. I had to resort to carefully mixing Avgas with Mogas, (premium auto fuel), to give me a safe reserve for the leg from N'Djmena to Khartoum. I was successful at doing that, but it was a big concern. Lower power settings provide greater detonation margins, so I used my Avgas/Mogas mix only once and I had reduced power to 60%. It worked and I made it to Khartoum with acceptable reserves. I do not recommend this mode of operation, but it was the only way to complete the flight.

Markus wrote, *"Thank you for tuning me up on LOP flying and especially for the M20K engine the TSIO 360. Actually, it is the first time after all these years that I understand the concept and it makes sense to me! I will go try this on my next flight - here are just a few additional questions:*

"You wrote, 'My 65% power setting is usually 32" MF, 2400 RPM.' Are these values with or without an aftermarket intercooler? My M20K has an intercooler and often I fly using 2400 RPM and 28-29 MF. According to the Intercooler-table, this should be 65-70% power.

"I have the Merlyn waste-gate controller and the TurboPlus intercooler so yes, my power settings assume a reduction in MAP at a given power setting due to the cooler induction air temperature due to the intercooler. That means I can get 100% power from the engine up to about FL210. (And my Mooney goes really fast when I try it!)"

You are correct Markus. When running ROP, you need less MAP for the same percent-power than when running LOP. Remember, when running LOP, it is fuel flow that determines percent-of-power. However, you need more air than fuel, which means more MAP for the same horsepower. Just remember, you are not paying for the air, only the fuel.

Because we usually think in terms of running ROP, power output seems to be a function of MAP. Increase MAP power increases. Power setting tables in the POH are all based on ROP operation. If you increase MAP too much, your engine makes too much power and breaks. Therefore, we have a redline MAP for take-off power.

Once we are on the lean side of peak EGT, it is now the fuel flow that determines the power. No matter how much you increase the boost, the engine will not produce any more power. So now the extra MAP has no effect on increasing the chance of damaging your engine. Extra MAP does not hurt. The only problem with increasing MAP too much, is that power decreases rapidly with an over-lean mixture and you will notice rough running. This will remind you to set the mixture properly.

So, how do you know if you have the same percent-of-power, rich or lean? The answer is IAS. If your airplane has the same IAS when running LOP as it did when running ROP, then the engine is producing the same horsepower. Of course, this assumes same pressure altitude and density altitude.

If your values are with installed intercooler, this means that LOP requires around 3 inches more MF flying LOP, over ROP, for the same power setting. With the intercooler and the Merlyn waste-gate controller that is not a problem to achieve.

Marcus wrote, "I think you wrote you have around 4,000 hours flying LOP with the 231. How many overhauls or new cylinders did you need in that time period?"

The 4,000 hours is with many different engines running LOP. With Lycoming engines equipped with Lycoming cylinders, I saw no tendency for shortened cylinder life. Compressions and wear metals were completely normal over the run-time of the engines. When I had problems, it was with aftermarket cylinders from other manufacturers, but the problems didn't seem to be mixture related.

I have over 1000 hours running LOP on my 231. I have had no LOP or temperature-related problems. Instead, I had a spate of problems with exhaust valves leaking. That has nothing to do with ROP or

LOP, but rather it is because Continental did not install the head valve guides properly, which resulted in improper exhaust valve seatings and valve burning.

Last year I pinned the Continental engineers down at AirVenture for a long discussion of exhaust valve problems. Once they realized I was discussing actual in-the-field failures and what they looked like, complete with Borescope photos, they admitted they had a quality-control problem and that the only solution was to lap the exhaust valves in-place. Apparently, many of the engine overhaul shops now do that as a matter of course, but not all shops are aware of the technique. If you must replace a cylinder in the field, it is good to know how to do this.

To tell if this needs to be done, you need to Borescope the cylinders. With the plugs out, rotate the prop until the exhaust valve is all-the-way open. Now, use the Borescope to look at the edges of the exhaust valve. You should see a black line on the edge of the valve where it contacts the valve seat. This line should appear relatively wide and uniform. If it gets thin or disappears, you have a problem. The solution is to lap the valve to make it fit the seat better.

To lap the exhaust valves in place, you remove the rockers and the valve springs, attach a piece of stiff rubber tubing to the exhaust valve stem, and then attach the other end of the tubing to a drill motor so you can spin the exhaust valve. Push the valve down into the cylinder so you can paint lapping compound onto the edge of the valve through the spark-plug hole. Now, you pull the valve back up against the valve seat and spin the valve using the drill. The lapping compound grinds a smooth, wide contact line between the valve and the seat, which stops leaking and increases heat transfer area. That has solved my cylinder problems.

So, if your Continental compressions suddenly go bad after about 400 hours, with leaking past the exhaust valve, this is likely the problem. Running LOP will not make this problem worse. On the other hand, running ROP with the mixture set in the danger zone, usually between 125˚ rich-of-peak and peak EGT, will increase the likelihood of valve-burning.

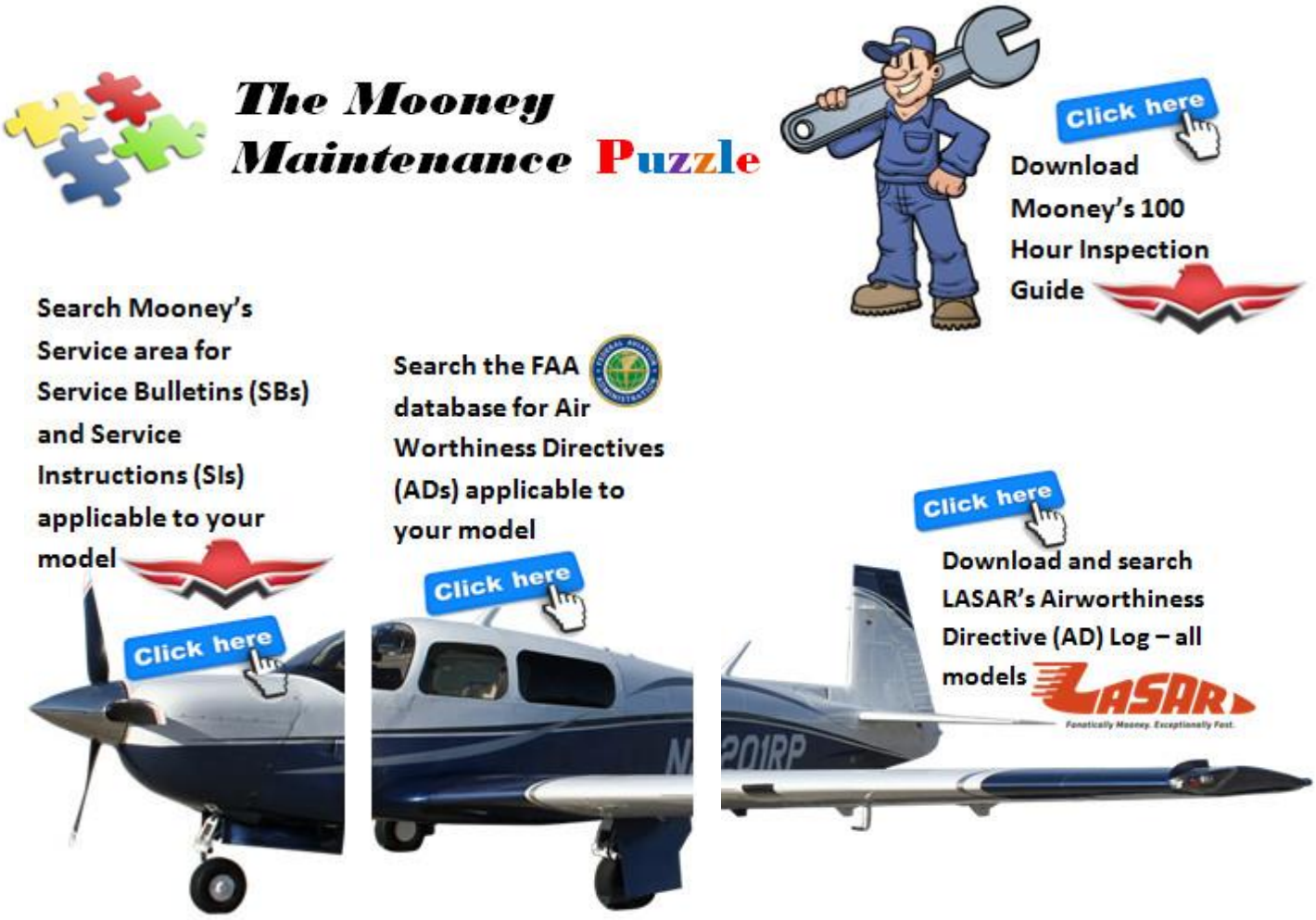
As a result of all this, every 100 hours or during your annual inspection, there should be a Borescope inspection of the exhaust valves. I now consider that to be more important than the differential compression test.

There is no better way to practice social distancing than going flying! So, until next month …

Fly safely. Fly better. Have fun!

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



Ask the Top Gun

TG

Tom Rouch

Founder of Top Gun Aviation, Stockton, California

Send your questions for Tom to TheMooneyFlyer@gmail.com

Question: Continental Starter Adaptors seem to fail a lot. What is the expected life? Do they typically fail before the starter itself? Are there warning signs of failure? Any preventative maintenance suggested? Finally, what does the solenoid do?

Answer: TCM starter adapters have been a problem for a long time. The design is a shaft that runs through a coil spring. As the shaft turns, the spring gets tighter on the shaft. It is attached through a gear to the engine, and that is what starts the engine. The spring is designed to "slip" on the shaft, so as the engine gains speed, it does not, in turn, drive the starter, which would make it a generator. It is not easy to explain, but *Google* TCM starter adapter problems and you will get a detailed description.

That being said, there is an "old" style adapter and a "new" style. When they started using newer starters, which were small compared with the old style, the motors didn't turn backwards easily, and we started having broken springs. At the minimum, this required a new shaft and spring, but also could result in metal shavings getting into the engine. There are service bulletins on the subject with a variety of fixes. To keep the costs lower, we usually changed the shaft and spring. They also had an oversized spring, which helped compensate for the shaft wear. It is an interesting design with many problems, but it has been improved through the years. You can look at Lycoming's starter system, which is far more reliable and is basically what you find in most autos. It just engages a gear on the front of the crankshaft to turn the engine. It is mounted just behind the propeller.

A solenoid is a relay designed to connect a power source to a motor. It has a high amperage draw, rather than just a switch, which is not designed for high draw. Solenoids are sometimes called "Contactors". Solenoids have many uses in all machinery.

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Large-screen GPS with WiFi, AHRS, and full instrument approaches

This is the GPS pilots have been waiting for. The rugged aera 760 is made just for the cockpit, with a vivid touchscreen, digital charts, panel avionics connectivity, a built-in AHRS, and even WiFi for preflight weather briefings. It's like having an iPad and a GTN 750 in one.

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Complete digital charts. No need for paper charts or an iPad. You can view sectionals and IFR high/low enroute charts for the US, Canada, and Europe. Use it to plan your trip or navigate in flight.

READ MORE at Sporty's

Medicals, flight reviews and more extended through June 30

The FAA issued a special federal aviation regulation (SFAR) April 29, 2020, that extends the validity of expired or soon-to-expire medical certificates, flight reviews, currency requirements for instrument pilots, and flight instructor certificates — in most cases — until June 30, 2020. READ MORE HERE

GARMIN ending GNS 400/500 WAAS Upgrades

Orders accepted until May 29, 2020

Garmin International will be ending Wide Area Augmentation System upgrades for the GPS receivers in its popular GNS 430/530 GPS/com navigators and similar products in the GNS 400/500 product line. Aircraft owners with units that have not been upgraded still have an opportunity to do so if they wish. Units must be received by Garmin by June 30, 2020," READ MORE

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New Dual USB Charger

Both USB plugs put out 3 amps, ideal for iPads and iPhones alike. The Flight Gear Dual USB Charger is a compact cigarette lighter plug, shaped like many other charging plugs. There are three key differences, though, that make this our new favorite charging accessory.
It's universal, accommodating a wide range of plug voltages.

Dual 3 amp plugs. While iPhones are happy to charge off a 1 amp plug, iPads and ADS-B receivers all need 2.1 or 2.4 amps to charge properly. Both USB ports on the Flight Gear USB Charger are 3 amps, so you can easily charge an iPad and a Stratus at the same time. Even the latest iPad Pro models can charge off this plug at full speed.

Built-in screen. This shows real time system status and features a pivoting arm that allows the screen to be tilted 45 degrees, which is helpful in tight cockpits. When you plug in the charger and the airplane's electrical system is on, you'll see the current voltage being put out by your cigarette lighter. This is a good way to monitor the status of your battery, or at least your plug.

You'll see the screen blink if it drops below 12V (for 12-14V airplanes) or is between 18 and 24 volts (for 24-28V systems).

The screen alternates between showing amps (2.6 here) and volts.

Once you plug into the USB ports, the screen also cycles through the amps being drawn by your devices as well. This is a great way to confirm that your iPad is getting its 2+ amps, and you'll notice it automatically charges an iPhone at the lower rate of about 1.3 to 1.5 amps.

Sporty's has tested it and there has been no avionics interference, a common problem with cheap chargers. The charger even has some handy aviation reference information printed on top, including suggested IFR and VFR cruising altitudes.

The Flight Gear Dual USB Charger is now shipping, and is available for $18.95.

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320-444-3042

The Mooney Safety Foundation, a nonprofit organization, was chartered in 1990 to improve aviation safety for Mooney pilots and their airplanes. It is comprised of a diverse group of Mooney instructors that all share a deep commitment to, and passion for Mooney aircraft and aviation safety.

The Mooney Safety Foundation provides:

- Structured pilot proficiency training in locations across the USA.
- Aviation safety through articles, lectures, and scholarships.
- Central locations for pilots to share Mooney operational and safety information.

After attending the MAPA Mooney Safety Foundation Pilot Proficiency Program, Mooney pilots can expect:

- Improved piloting skills.
- Improved decision-making skills.
- Improved awareness to avoid emergencies.
- Improved access to maintenance sources to enhance airplane safety.

Santa Fe

The first Mooney Safety Foundation program in the state of New Mexico will be held on August 21-23, 2020 in Santa Fe. In 1610, it was founded on the site of old Pueblo villages at the foot of the Sangre de Christo Mountains. Situated at 7,000 feet, it is the highest and oldest state capital in the U.S., America's second oldest city.

The program will be held at the Santa Fe Municipal Airport (KSAF). New Mexico in August is renowned for its lively desert cacti and has proven to be one of the most popular venues for tourists from around the world. Daytime temperatures are indeed pleasant for flying. Look at your schedules and try to be with us in Santa Fe. To register for the program, call Lela Hughes at 210-289-6939 or send her an email at **lelahughes49@gmail.com** You can also register at https://www.mooneysafety.com/ppp-registration/ Please plan on arriving on Thursday, August 20, 2020 and departing on Sunday, August 23, 2020.

DoubleTree by Hilton Santa Fe

We booked a block of rooms early and secured an excellent "high season" room rate, which includes an All-American Breakfast Buffet. The hotel has a cutoff date for the reduced group rate. So, if it looks like there is a possibility that you can be with us, please call the hotel now at 505-4734646, and make your reservation. Inform the registration clerk that you are part of the **Mooney Safety Foundation group** and **request the group rate**. If your schedule changes at a later date, the hotel will allow you to cancel your reservation (within reason) without any penalty. Your early registration also helps us to firm up our instructor corps for the event.

The FBO is Jet Center Santa Fe. It is managed by Troy Padilla, and he is assisted by Lorena. The telephone is 505-780-4455.

NIGHT TRAINING. Thursday and or Friday, starting at sundown, we will be offering optional night recurrent training. Send me an email if you are interested so that we can have sufficient night training flight instructors.

FAA APPROVAL. This Mooney pilot proficiency program has been approved by the FAA. At the completion of the program, each eligible pilot will be endorsed for a Flight Review, Instrument Proficiency Check (IPC), and FAA WINGS credits. Pilots will also receive an FAA recognized Certificate of Successful Completion of a Mooney specific recurrent training program. Many insurance companies are now requiring confirmation that you have completed a recurrent training program prior to quoting you an insurance premium rate or offering you a renewal policy. Many companies are providing pilots a 10% discount on the annual premium upon proof of the successful completion of our program. Here is what the late John Allen of Falcon Insurance Agency wrote in an article published in the *MAPA Log*:

"MAPA members know the importance that the aviation insurance industry places on Recurrent Training for pilots. This is based on the fact that both actual experience and statistics have shown that pilots who are current and well trained are better equipped to handle in-flight emergencies. Further, actual training is intended to prevent bad habits from forming which create hazardous situations. However, the fact of the matter is that the quality of the training pilots get is no better than the course of instructions that they are receiving and the proficiency of the CFI that is providing it. Therefore, it is important to make sure that the training is of good value.

"The Pilot Proficiency program offered to MAPA members through the MAPA Safety Foundation is an excellent source of training and proficient Certified Flight Instructors."

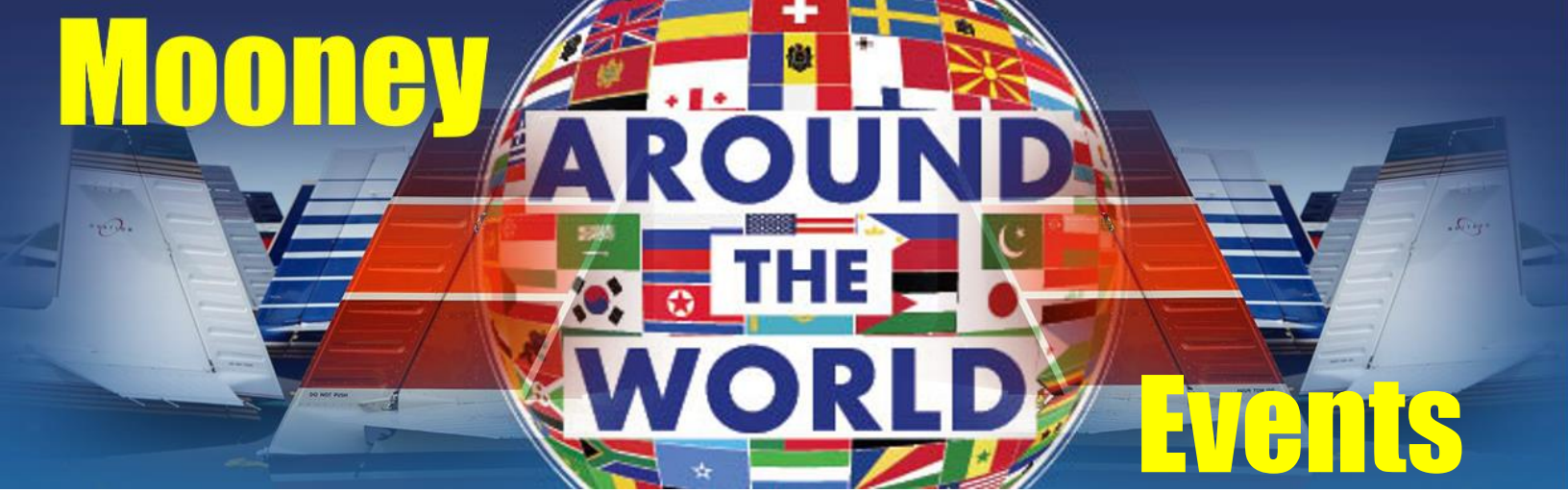
John Allen
Falcon Insurance

Come Join Us

Knock off the "rust" and make it a Santa Fe mini vacation, where world class scenery and activities abound. Family members are always welcome. It will be a time to relax and enjoy yourself while you learn more about your Mooney airplane, and hone your Mooney flying skills with a weekend of recurrent training with other Mooney pilots and friends and our skilled Mooney instructors. Please check our website for more information about our organization at ***Mooney Safety Foundation***.

My best regards to each of you. Always remember . . . .

Ted Corsones, ATP, MCFI-I,
Executive Director
MAPA Safety Foundation, Inc.

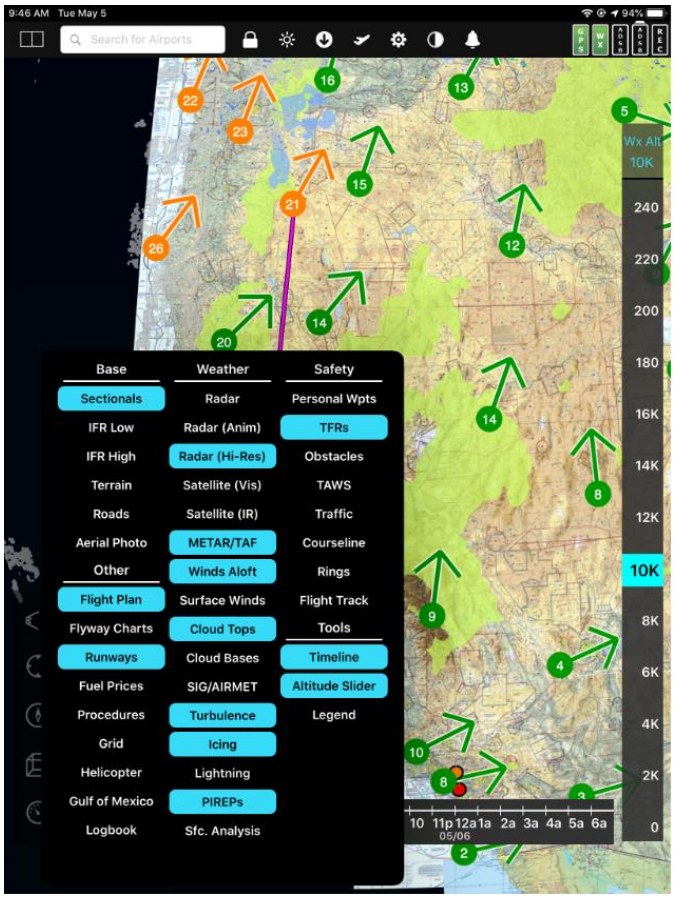


Florida Mooney Lunch Group	*Contact Dave at daveanruth@aol.com or (352) 343-3196, before coming to the restaurant, to have an accurate count. Events begin at 11:30* ~~June 13: New Smyrna Beach (**EVB**)~~ CANCELLED
Mooney Caravan	~~Sep 10-13: Advanced Formation Clinic (PDT)~~ CANCELLED
MooneySafety.com MAPA Safety Foundation Pilot Proficiency Programs	~~Jun 12-14, 2020: Ft Worth, TX~~ CANCELLED (May be rescheduled) Aug 21-23, 2020: Santa Fe, NM Sep 11-13, 2020: Springfield/Chicopee, MA Oct 2-4: Wichita, KS **Sign Up at** https://www.mooneysafety.com/ppp-registration/
MOONEYSUMMIT	October 16-18: Tampa O'Knight (KTPF) CLICK HERE for details
Australian Mooney Pilots Association	
EMPOA	CLICK HERE for details
WEST COAST MOONEY CLUB FAST FLYING · FUN TIMES	August 20-23: West Coast Mooney Club Summer Fly-In, Sunriver (S21) CLICK HERE for details
Other Mooney Events	

TMF PRODUCT REVIEW

SEATTLE AVIONICS SOFTWARE FlyQ™ efb

I took the time this past month to review Seattle Avionics FlyQ EFB. I have been a ForeFlight user since their beginnings, but with their prices skyrocketing, I thought I would look at the competition. They are currently offering a FREE, 30-day trial, and then I was offered the VFR package for $49 for the first year, a discount from $79. As with any different EFB, the user interface is different and takes a while to get it, especially after more than a decade of using ForeFlight.



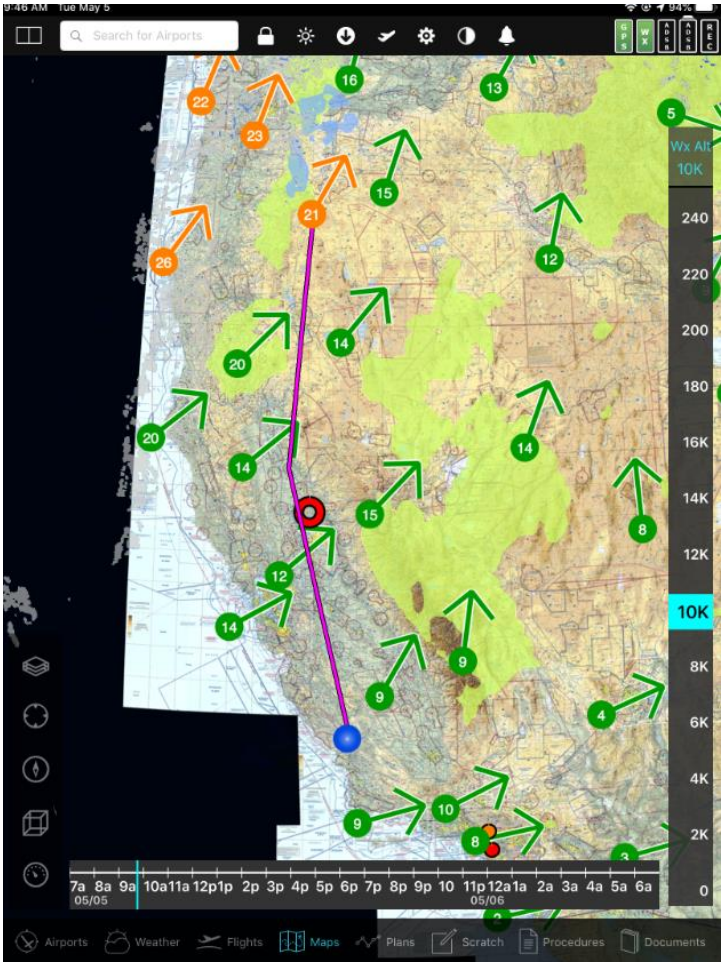
Things I really liked included a graphical representation of Cloud Tops or Cloud Bases. In both cases, the tops and bases are color coded and if you forget what the colors mean, the legend is only a click away. You can slide an Altitude Slider to show if you are in the clouds, under them, or over them. This is especially useful for pre-flight planning and enroute information. FlyQ supports several ADS-B receivers.

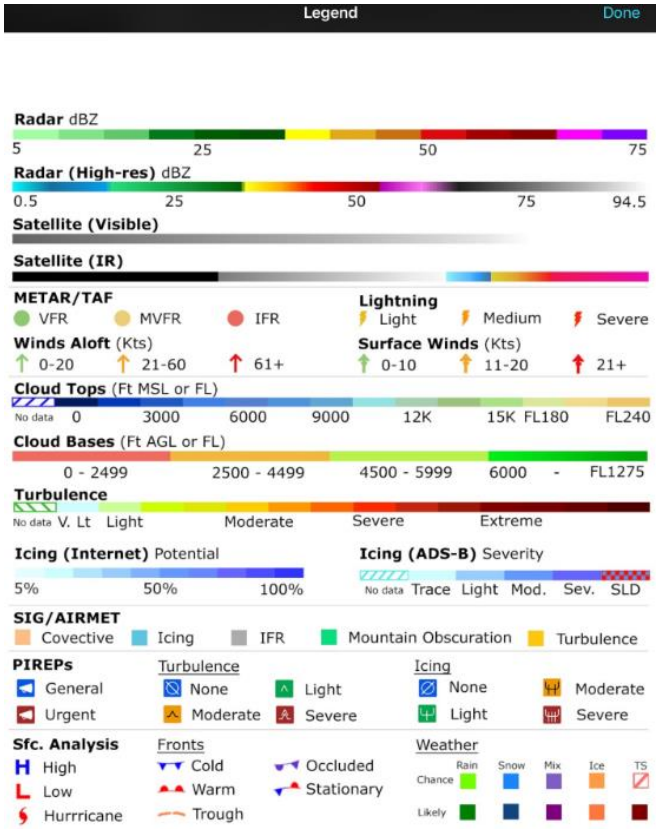
Another feature is FlyQ's support of 16 weather products, depicted to the right.

During pre-flight planning, or while enroute, you can select a course deviation (see below) and it shows you a lateral terrain map with color encoding to show you what to expect at your selected altitude. Pretty good stuff.

At any time, you can pull up a Legend to remind you of the meanings of all the color encodings.

Below is a depiction of Cloud Tops and Winds Aloft at my selected altitude.





I particularly like the Winds Aloft depiction, as it is easy to see the direction and intensity, (both are color coded), and actual velocity. You can slide the altitude selector to find altitudes where you are under or over the cloud tops or cloud bases.

Another feature I like is the ability to slide the "time bar". This allows me to dynamically see how the weather changes before, during, and even after my planned flight. This makes it a lot easier to pick an optimum time for departure. This is incredibly useful during a flight as you only need to slide the time bar to see how the weather is behaving.

This review is just a glimpse into Seattle Avionics FlyQ product. But remember the VFR product will only cost you $49 the first year, after a free trial; $99 for the IFR model.

For all the details, CLICK HERE to get it from the horse's mouth at Seattle Avionics.

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.

NEW Hangar For Sale (Camarillo KCMA) - $99,000

42'x36' in Great Condition

$218 a month covers electricity, etc.

Contact: Julie Ryan, 360.281.3488, Julierryan@comcast.net

1979 M20K For Sale

TTAF: 5155

SMOH on TSIO-360 LB Engine with 1800 TBO: 662
SMOH – engine was completely rebuilt again, but was not zero timed. Brand new cylinders were installed. 119 hours

Garmin G500 MFD
Garmin GTN750 GPS
Garmin GTN430W GPS
Garmin GDL 69 XM Weather displayed on G500, GTN750, and GTN430
Garmin GTX330 transponder with ES
Garmin GI 106A CDI
TIS traffic displayed on G500, GTN750, and GTN430
406Mhz ELT
Garmin GMA340 audio panel
EI MVP50 engine monitor with %engine power and vacuum options

Backup AI – last vacuum gage
Backup altimeter
Backup airspeed indicator
Garmin 106 glide slope gage
Century 41 3 axis AP. G500 linked to provide GPSS
Precise speed brakes
LASAR smooth one piece belly mod
Merlyn automatic wastegate
GAMI injectors
Fine wire sparkplugs
Intercooler
Brand new 115 ^{ft3} oxygen tank for 4 place
Whalen strobes
LED landing light
MT 3 bladed prop, Recently overhauled
New paint in 2003
Leather Interior – new 02-10
Panel mounted digital clock/timer
February 2020 Annual
Both Magnetos overhauled, new prop governor, overhauled fuel pump installed at annual.
Tanis Engine pre heater installed last year

Damage history: Off airport landing 1985 and off airport landing 2003. Right wing damaged. The plane was repaired by Crown Air in San Diego with a factory new wing

$149,000

Kevin@ 909-790-9359


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
J D PRICE
N257KW
JDPriceCFI.com