The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

October 2022

Editors

Phil Corman | Jim Price

Contributors

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

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

From the Editor

Phil Corman FTE

Mid Airs & Gear Ups

Just this past month there have been two midair collisions. These did not involve Mooneys, but they are still very distressing. The first took place in Watsonville, CA and the second in Colorado's Boulder County. In this edition, Jim Price writes about the Watsonville midair, wherein the bottom line is that this midair was immanently avoidable if only one or both pilots took defensive and conservative actions. The weather was clear and both airplanes were communicating on radio, but not taking safe actions.

It is still too early to know what happened in the second midair in Boulder County, but the weather was VFR, so "See and Avoid" failed on both sides.

In most cases, but clearly not all, if only one pilot was aware of a potential conflict and acted, a midair could have been avoided. Never turn Base if an airplane is on final unless 1) You have the plane on final in sight, and 2) You have both communicated about the actions each is going to take. The airplane with the "right of way" doesn't really matter if a midair results. If the situation is not clear, then the airplane on downwind can easily extend the downwind leg until the plane on final passes his wing. The plane on final can break it off if there is not a clear communication and set of actions to be taken by each.

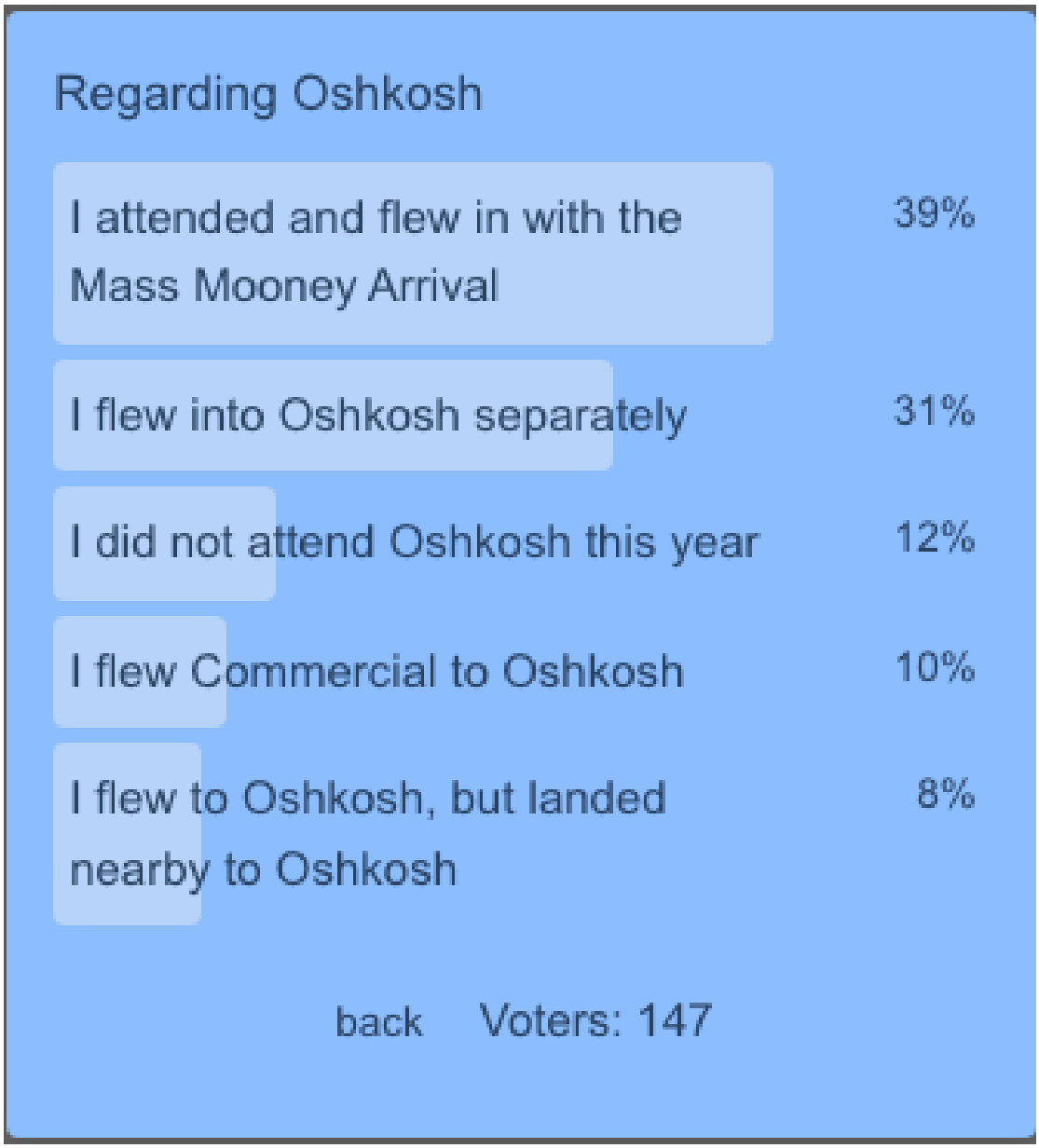
Gear Ups

Gear up incidents continue to happen with increased frequency. The vast majority are the result of a forgetful PIC. Interestingly, two of our close Mooney friends had mechanical gear failures. In the first failure, during an otherwise normal landing, a M20E experienced the collapse of the nose and both main landing gear. We thought this was odd in a Mooney but were informed by a Mooney expert that in some rare instances, if the nose gear fails, it will take the two mains with it. We don't know the cause, but we will report on it once we know more.

The second failure was the left main gear on a Bravo. Again, we wonder what caused it, but they were extremely fortunate in that there was no prop strike and therefore saved the expense of a new prop and engine tear down.

We are also concerned about the number of gear ups. We have written many times about what causes these and they are very avoidable. The main cause is when "The pilot is distracted in the pattern," gets out of his routine checks and lands with the gear retracted.

Our solution is simple. Put the gear down approximately at the same place each time. When you confirm the gear is deployed, say aloud "Gear Down & Locked." When you turn Base, confirm the gear is deployed and again say aloud, "Gear Down & Locked." When on short Final, confirm the gear is deployed and say aloud, "Gear Down & Locked." After doing this for a while, you will cognitively realize that the gear is deployed, or not, if you do NOT hear the voice. It's just human psychology. This technique is FREE and easy to adopt. Give it a try. It is something you can do to avoid a gear up.



Next month's poll: "I Prefer Mooney Mods That:" **CLICK HERE** to vote.

Letters to the EDITOR

TheMooneyFlyer@gmail.com

Can you help me on how to ask a question in the magazine? I am looking for an electric step retraction to replace the vacuum for a 1982 K model
Al H

I enjoyed Richard Brown's article, "Take Someone Flying". But I'd like to add something. If your circle of friends does not include a young man such as in the article, there are other opportunities. I fly with Wright Flight in Tucson. They take 10-year-olds flying; many for the first airplane ride ever. I'm not involved, but there is also the EAA's "Young Eagles" program. There must be other volunteer opportunities for pilots if one looks for them.
Rod C

We love receiving your comments TheMooneyFlyer@gmail.com

Volume 11 Number 10 October 2022

Methods for Fuel-Efficient Flying

Phil Corman
Co-Editor

With the current cost of 100LL, and an even more pricey 100UL on the horizon, we thought we would spend some time looking at ways to be more fuel efficient. There is no magic bullet here, but over the course of a year of flying, you can save a significant amount of money.

Mixture to Increase Efficiency

This one is easy to do. You are striving for "Best Economy" which is usually in your POH, but not always in the early Owners Manuals. To get it, do the following:

At cruise power, after the engine has settled in from the climb,
Lean the mixture until the onset of engine roughness
Then, enrichen the mixture until the engine is running smooth.
This puts you very close to Best Economy.

In addition to optimizing fuel efficient, operating Lean of Peak (LOP) has other benefits. The engine runs cooler and cleaner. The stress on critical engine components is reduced, as is the buildup of harmful exhaust deposits on valves and other combustion chamber components. LOP is a kinder, gentler way to operate the engine, and pays dividends in engine longevity. For years, pilots thought only fuel-injected engines could run LOP, but that's not true. Most carbureted Lycoming engines will run quite well at LOP because the symmetrical design of their induction system provides an even mixture distribution to the cylinders. LOP will cost you 4 – 7 knots, when compared with ROP.

Throttle Settings

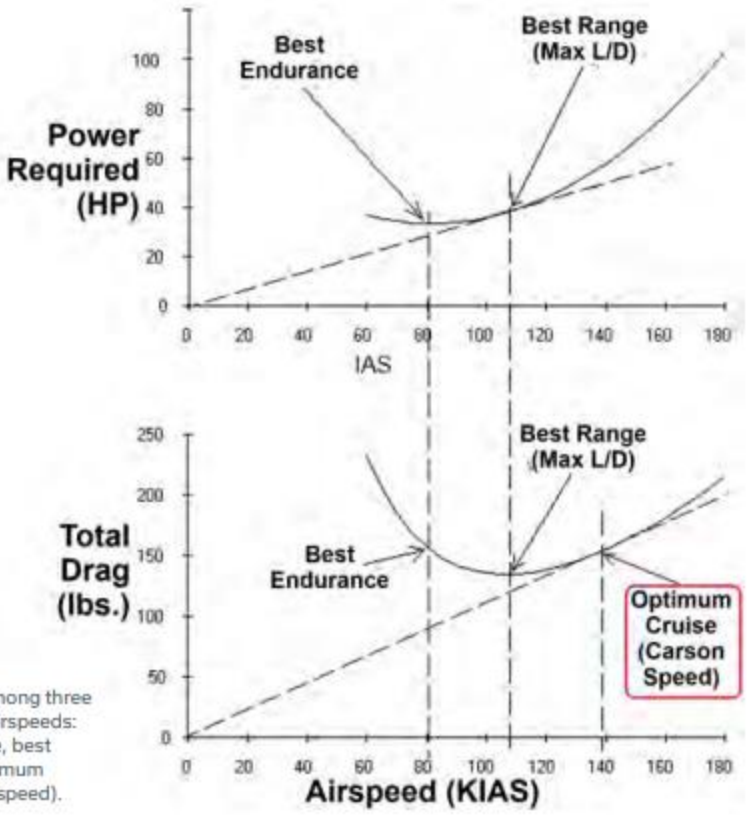
Our engines were designed to be operated WOT (Wide Open Throttle). Pulling the throttle back reduces the air supply to the engine and reduces the volumetric efficiency. So, from the beginning of our departure until we descend into the pattern, it's most efficient and healthiest for you to run WOT. For turbocharged engines, this may not be true, and you will need to reduce the throttle to remain within normal operating ranges.

The next thing to do is to reduce the RPM on the propeller. Forget what your CFI told you about operating your engine in the so called "Over Square" (when the Manifold Pressure (MP) is higher than the RPM setting). This is an OWT (Old Wives Tale). If the airplane has a constant-speed propeller, best efficiency is achieved by pulling the prop control back to the lowest RPM that the book allows. Low RPM dramatically reduces friction losses, improves volumetric efficiency by reducing pumping losses, and usually improves propeller efficiency. Low RPM also gives the engine more time to convert the heat and

pressure of each combustion event into mechanical energy before the exhaust valve opens and discards what is left.

Altitude is Your Friend

True Airspeed (TAS) will usually increase with altitude. This is not only true for turbocharged Mooneys, but it is also true for normally aspirated Mooneys, but only up to a certain altitude because in normally aspirated engines, you will lose MP as you ascend. Up to a limit, that's OK until it falls off too much.



Relationship among three key indicated airspeeds: best endurance, best range, and optimum cruise (Carson speed).

Lift Vs Drag (L/D)

The most fuel-efficient speed here is "**Best L/D speed.**" Unfortunately, most of us are not interested in this airspeed since you are going too slow, and the efficiency tradeoff is not beneficial. This speed is usually used after an engine failure, as it will enable you to glide the farthest – hopefully to an airport.

Another useful speed is "**Best Endurance,**" which will keep you aloft the longest, with a minimum sink speed. Again, you probably don't want to cruise at this airspeed since it is about 1/3 slower than Best L/D. If you are in a search and rescue operation or photographic expedition, this may be the best fuel-efficient airspeed.

Carson Speed – The least wasteful way of wasting fuel

Is there an optimum balance between these "too slow for cruise" fuel-efficient airspeeds? Perhaps it is the Carson Speed. This can be found in a seminal research paper written in 1980 by renowned professor Bernard H. "Bud" Carson, Ph.D., of the U.S. Naval Academy. In his paper, Carson examined this question: How much does it cost (in extra fuel) to fly faster than the most fuel-efficient airspeed (best L/D)? When he looked at the ratio of excess airspeed to excess fuel consumption, he found that it reaches a maximum at an airspeed of about **32 percent greater than best L/D**. Carson referred to this airspeed as "the least wasteful way of wasting fuel." The rest of the aviation world calls it "Carson speed."

Summary

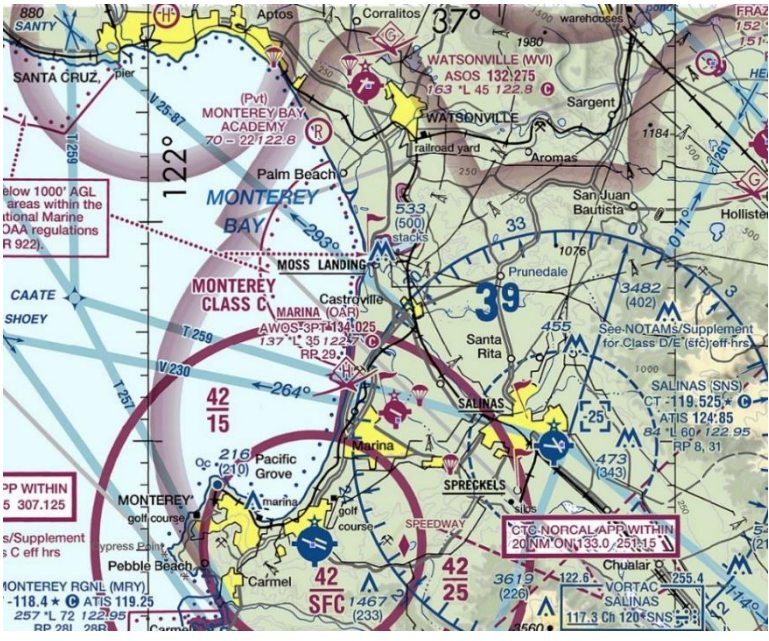
Nearly all of these ideas have an impact on your airspeed by reducing your typical cruise speed and we own our Mooneys because we want to fly fast. After all, they are pretty darn efficient already, so maybe the correct answer is to run WOT at higher altitudes. Right?

The Watsonville (KWVI) California Midair Accident – Avoiding Conflict in the Traffic Pattern

On Aug. 18, 2022, a twin-engine Cessna 340A with two persons on board and a single-engine Cessna 152 with one person on board, collided on final approach to runway 20 at the Watsonville Municipal Airport (KWVI), California. All three occupants were killed in the tragic collision. The weather was VFR, with clear skies and 10 miles visibility.

Watsonville Muni is a remarkably busy, non-towered airport in the Monterey and Santa Cruz area. Aircraft land on runway 20 because of the ocean breeze.

The Cessna 152 pilot was established in the runway 20 pattern, flying touch and go landings. As the Cessna 340 pilot approached the airport, he called on CTAF that he was 10 miles northeast at 3,400 feet MSL, and that he was planning a straight-in approach to runway 20. He indicated that he would descend after the last ridge, which is 8 miles northeast of the airport at 2,000 feet. At 5 miles, the pilot of the C-340 made another call on CTAF, indicating he would be landing on runway 20. When the C-340 pilot reported at 3 miles, the Cessna 152 reported that he was turning left base for runway 20. Then, when the 340 pilot transmitted his one mile call, the C-152 pilot was turning from base to final and he transmitted, “Yeah, I see you, you’re uh, you’re behind me. I’m gonna go-around then, cause you’re coming at me pretty quick, man.”

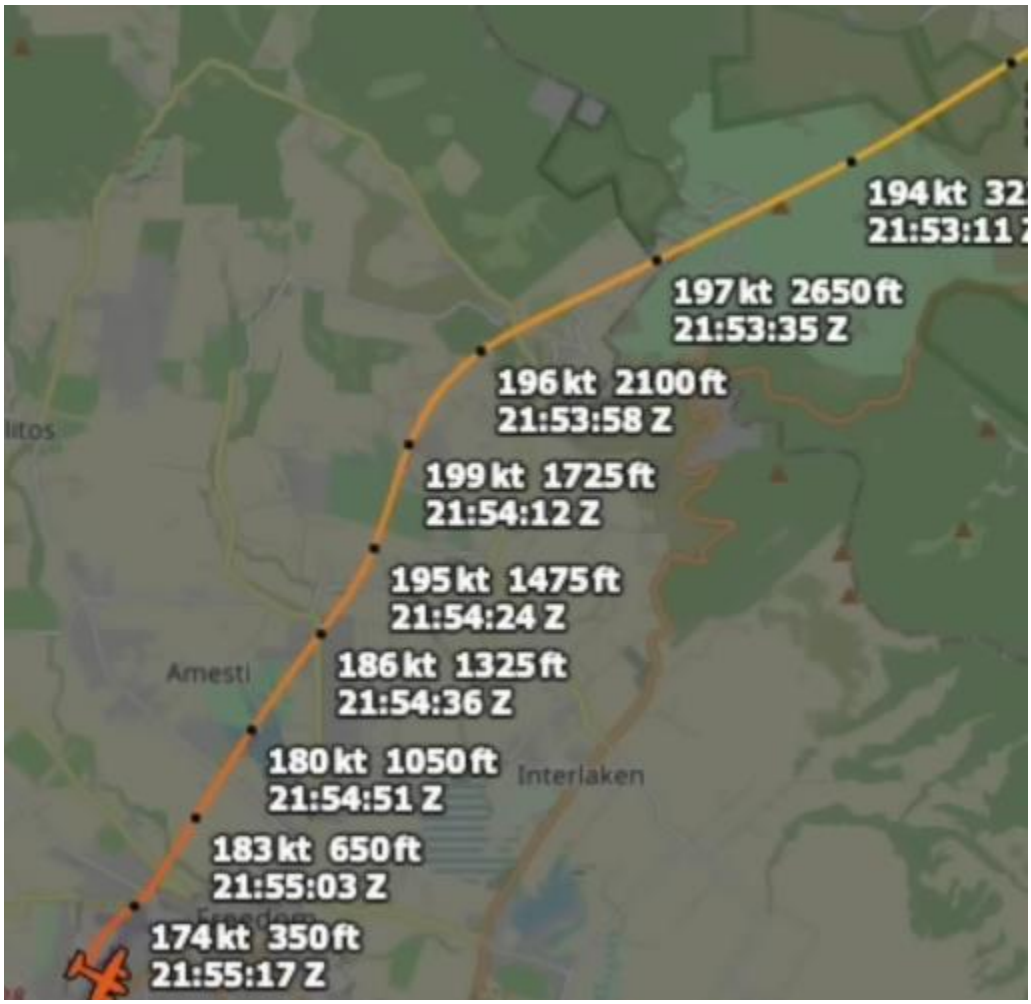


That was the last transmission from either aircraft as both pilots continued to converge. Neither pilot altered course nor took evasive action until it was too late. When the C-152 pilot attempted to go-around, turning to the right of runway 20, he collided with the C-340 at about 200 feet.

The Cessna 152 crashed in a grassy area near the runway, bursting into flames. The Cessna 340 crashed on the runway, veered off, and crashed into a hangar.

The Cessna 340's Unusually Fast Final Approach

This C-340 regularly flew into Watsonville and ADS-B historical data shows that it consistently flew a final approach speed of 100 knots (115 MPH). A typical POH recommended approach speed would be around 90 to 95 knots. Assuming the ADS-B data is correct, on the day of the midair, at 350 feet, when most pilots are configured and stabilized at approach speed, for an unknown reason, the 340 indicating a ground speed of 174 knots (200 MPH).
I do not know why the C-340 pilot was in such a hurry, but 80 knots above approach speed at one mile from the runway suggests that something was not right.



Note that the C-340 landing gear extension speed is a number that Mooney pilots can relate to, because it is 140 knots (161 MPH). The maximum landing gear extended speed is also 140 knots. Conversely, the Cessna 152 approach speed is only 55 – 60 knots (63 – 69 MPH).

What can you do?

Maintain Situational Awareness

Regardless of priority reasoning, any time traffic is at or inside a 5 mile final, pilots should be on alert and never turn inside traffic that is at or inside a 3 mile final.

Fly a Stabilized Approach

At 3 miles from the runway, your approach should be stabilized. That is:

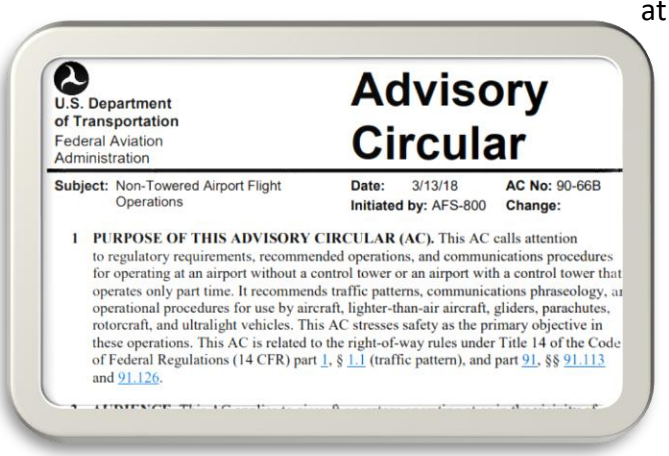
- Configured for landing (landing gear and landing flaps down)
- Perfectly established at indicated approach airspeed
- Comfortably on a 3 degree glidepath

Traffic Pattern Entry and Traffic Pattern Priority

The only real guidance for preference and priority is, that when two aircraft are approaching the runway, the lower aircraft has priority. In this case, the 152 was lower than the twin Cessna, but as we know, that did not give him priority over the 340.
Other guidance indicates that traffic on final has priority. But what do we define as the final? Is it 1 mile, 3 miles, 5 miles, or 10 miles? This is a General Aviation gray area.

Make the appropriate pattern radio calls and listen intently to maintain situation awareness. If we do that, we can deconflict early!

Both pilots could see a developing conflict. Sadly, it appears that neither took action to avoid a collision at an appropriate time.



U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Non-Towered Airport Flight Operations
Date: 3/13/18 **AC No:** 90-66B
Initiated by: AFS-800 **Change:**

1 **PURPOSE OF THIS ADVISORY CIRCULAR (AC).** This AC calls attention to regulatory requirements, recommended operations, and communications procedures for operating at an airport without a control tower or an airport with a control tower that operates only part time. It recommends traffic patterns, communications phraseology, ar operational procedures for use by aircraft, lighter-than-air aircraft, gliders, parachutes, rotorcraft, and ultralight vehicles. This AC stresses safety as the primary objective in these operations. This AC is related to the right-of-way rules under Title 14 of the Code of Federal Regulations (14 CFR) part 1, § 1.1 (traffic pattern), and part 91, §§ 91.113 and 91.126.

AC 90-66B

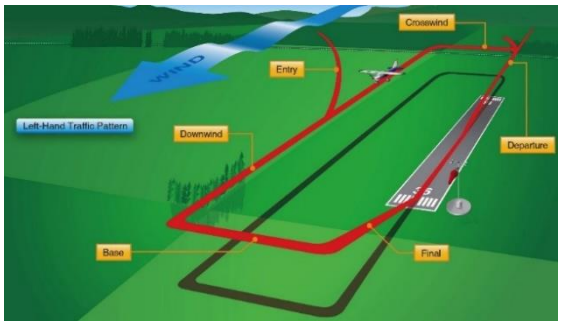
The FAA encourages pilots to use the standard traffic pattern when arriving or departing a non-towered airport or a part-time-towered airport when the control tower is not operating, particularly when other traffic is observed or when operating from an unfamiliar airport.

Reference Advisory Circular 90-66B, paragraph 9.5, ". . . there are occasions where a pilot can choose to execute a straight-in approach for landing when not intending to enter the traffic pattern, such as a visual approach executed as part of the termination of a 4 3/13/18 AC 90-66B instrument approach. Pilots should clearly communicate on the CTAF and coordinate maneuvering for and execution of the landing with other traffic so as not to disrupt the flow of other aircraft."

Think of the Pattern as a School Zone

You have been cruising at amazingly fast speeds and now it is time to land. That means it is time to slow down and mingle with your slower brothers and sisters. (At a controlled airport, the controller might ask you to "keep your speed up"). Think of an uncontrolled pattern as a School Zone and as you near pattern entry, configure for landing and slow down to something closer to approach speed plus 15 knots. That's 90 knots in some Mooneys. If you see a conflict developing, take evasive action early.

The FAA recommends that VFR traffic enter the pattern in a standard pattern entry. That is 45 degrees to downwind. The FAA allows straight in approaches when making an IFR approach, so there are exceptions.



Midair Statistics

The importance of following the FAA recommendations is reinforced by the midair statistics. On average in General Aviation, we have about 6 midair collisions per year, and 4 of those are fatal. They happen during the day, in VMC, and within 5 miles of an airport. 50% of all these midairs occur in the traffic pattern and 80% of those are on final approach.

So, Who was Right?

The lower aircraft has the right of way, but if you think you are lower, is it worth it to steadfastly assert your right of way privileges, even if it might kill you?

If you were in the Cessna 340, on a 3 mile straight-in final and an airplane were turning base, would you proceed further?

An unhappy join up is inevitable! I hope you would depart from the straight-in approach and enter the pattern on a 45 to the downwind and follow any traffic that may be ahead of you.

If you were in the Cessna 152, on downwind with an aircraft on a 3 mile final, would you make a base turn to final?

I hope you would realize that you are about a mile and ½ from the runway and the straight-in is a mile and ½ from you. He or she will be even closer as you begin your base to final turn. There will never be enough space to make your turn to base and final, without interfering with the aircraft on a straight-in approach. No matter how much you may hate "straight-in pilots," the smart option would be to swallow your pride, give up your right of way privileges and continue on downwind until you can safely follow the straight-in.

All Eyes and Ears

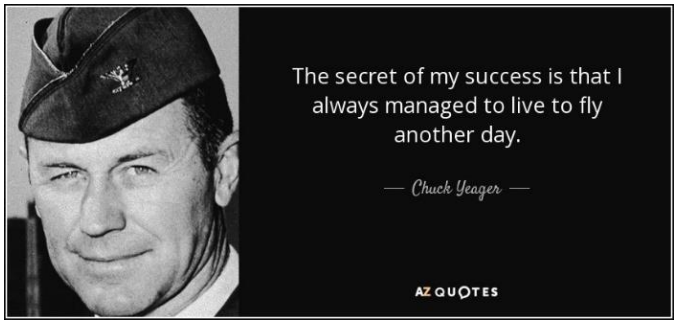
Pilots operating in the traffic pattern should always be on HIGH alert, especially during the base leg and prior to the turn to final.

A Belly Check

I know, it is going to take a long time to unsee the picture at the left, but that is my intention. I never want you to forget it!

When on base and about to turn final, please make a "belly check." That is, take a good look to see if there might be a conflict on final. Once in the turn to final, you will be "belly up" and unable to see a potential pattern conflict. Let us be the safest and most proficient pilots in the world. When people think of Mooney pilots, they will say, "Oh yeah, those Mooniacs are the best and most considerate pilots. They are never, never involved in accidents or incidents."

Fly Safe, Jim



A Birthday Week Palooza

by Richard Brown

Last month I entered my fifth decade here on this rock, hurtling around the sun and through the cosmos. I'm not one to make a big deal about birthdays and in fact, I would rather people don't know about mine. I made it through over a decade at work without them knowing, until my new wife showed up at work on my first post-wedding birthday with a cake. It's been a disaster ever since.

My wife feels the opposite. She believes in "birth week." It's not enough to celebrate a day, you need to celebrate the week. With that in mind, and my 50th coming up, we planned a weeklong trip in the Mooney. We flew to our place in Colorado, my family in Arizona, and on the way home to California, we stopped in Utah to see my youngest son at college and my wife's dad.

We wanted to get through the desert before noon when the air was smoother and before the thunderstorms were building, so we got up at 4:30 am and headed for the airport. The forecast the day

before showed a likelihood of an IFR departure, so the previous evening, I filed IFR from Fullerton (KFUL) to Clark Memorial field at Williams, AZ (KCMR) to get out of SoCal. One benefit of doing that beforehand is that I can check FlightAware. It will show the cleared route, and I can change my filed route on 1800wxbrief.com to match the cleared route. Generally, when calling ATC for an IFR clearance, I often hear, “as filed.”

It was early, just after 6:00 am and the KFUL tower was closed, so I called ATC on my cell phone and with our clearance, we were on our way. Typically, ATC vectors us all over the place due to incoming traffic to John Wayne and Long Beach. However, at that time of the morning, we had the sky almost all to ourselves and hadn’t climbed to 2,000’ before I heard, “November 78878, climb and maintain one-one thousand.”

The views were glorious. There was a high broken layer of clouds, and the rising sun was sending shafts of light which lit up the clouds beneath us. Just east of Hemet, we flew into a cloud bank and 20 minutes later when we came out the other side, we were just on top and surfing along. I love cloud surfing where you can actually get a feel of the speed you are traveling.

Click the picture for the YouTube Video

The flight was smooth, even in the clouds. Eventually after numerous hand offs, we checked in with Albuquerque Center.

Me: “Albuquerque Center, Mooney 78878, one-one thousand, direct Clark Memorial Field.”

After giving us the altimeter setting, Center followed with, “Be advised, there is an area of light to moderate precipitation from 10 miles west to 20 miles east of the field.”

I knew from the forecast and briefing there was a chance of rain at KCMR, so I had filed Winslow (KINW) as our alternate. KINW has an instrument approach, and it was also forecast to be clear.

Me: “Center, Mooney 78878, we’d like to change our destination to our alternate, Winslow, India November Whiskey.”
Center: “November 78878, stand by for clearance.”

A few minutes later Center came back.

Center: “November 78878, you are cleared to the Winslow Airport via Direct, readback clearance and state reason for change.”
Me: “Cleared to Winslow Direct, and because of weather; there are no approaches at Clark.”
Center: “November 878, readback correct.”

We proceeded on, flew through a patch of light precipitation, and uneventfully landed at Winslow for a restroom break and refueling. The second leg of the flight from KINW to Pagosa Springs, CO (KPSO) was also uneventful. That is my favorite kind of flight.

After four days at our place in Colorado, it was time for the second part of the “birth week” celebration. (Can you see my eyes rolling as I type that sentence, along with the smile on my wife’s face?)

I had decided I would spend my actual birthday with my parents and sisters in Arizona, which without a Mooney, would have been a long drive. With our time machine, it was a short flight. KPSO's field elevation is 7,663', so it didn't take long to get to our cruising altitude of 8,500' (it's all downhill to Phoenix-Mesa Gateway (KIWA), although it did take a bit of runway to get off the ground in our NA M20D because Pagosa Spring's density altitude was 8,700'.

In anticipation of a bumpy flight in the clouds, my wife took a couple of Dramamine before our flight and missed, (slept through), most of that gorgeous flight out of California. For this flight to KIWA, she had asked me if I thought it would be bumpy. Well… we were leaving in the morning, the winds were forecast to be light, and there were no AIRMETs for turbulence, so I told her, "I don't think so."

A long story short, it wasn't *really* bumpy, but it was constantly *slightly* bumpy. We skirted around building thunderstorms and 2 ½ hours later we were touching down at Phoenix-Mesa-Gateway. There are often fun planes to be seen on the ramp, and this day was no exception. While I have seen pictures of it before, this was the first time I had actually seen NASA's Super Guppy. There it was in all its weird, (how in the world does that thing fly), glory as we taxied to the FBO.

The next morning, I had my first birthday treat when I took two of my sisters for a flight along the Salt River Lakes. One sister had flown with me in a rented Cherokee just after I got my PPL and had probably less than 60 hours in my logbook. However, this was the first time she had been in the Mooney, and she loved it. My other sister had been in the Mooney before but was happy to go flying again.

Over Roosevelt Lake I asked my sister in the front seat, “Do you want to fly?” She enthusiastically replied, “Sure!”

We flew along the lake westbound for a bit before I told her to take us in a right turn back the other direction.

“How right turn can I do, can I do like a,” she said as she cocked her head to the side, implying a steeper bank.

“Sure,” I said, and she rolled into about a 30-to-35-degree bank. It was a nice turn, and she held the altitude fairly well. It should be noted that her husband was not particularly excited about her going flying, so in the turn she said, “You have to take a picture of this while I’m doing it so I can freak Greg out.” My sister from the back seat said, “I’m videoing you,” which got an, “Oh, yay!” from the one flying, along with a, “This is so fun!”

She flew for the next 25 minutes as I gave her directions to get us back to the airport. I took the controls when I called the tower inbound. It was a great start to the day!

The following morning it was time to FINALLY wrap up “birth week.” If all you have is a car, or maybe a Cessna 172 or Cherokee, which fly about as fast as a car drives, you would be heading straight back to SoCal. Fortunately, we are blessed to be flying a Mooney, so we decided to go from Phoenix to St George, UT, and then to California.

My youngest son moved out in August to start college in St George, so why not take the detour and have breakfast? After all, we do own a time machine. It was another beautiful flight. We flew over Prescott, AZ, where there were half a dozen Embry-Riddle planes beating up the pattern. We were able to climb above a cloud layer and crossed over the western end of the Grand Canyon.

We had a great breakfast with my son and then spent some time visiting my wife’s dad and his wife before heading back to the airport. After goodbye hugs, we got in the air as soon as possible and climbed to cooler temperatures. I was worried it would be warm, but it was a pleasant 56° F at 10,500’, which was perfect. The air was fairly smooth, considering it was mid-day over the desert.

I'm still amazed at what can be done when you have a Mooney. I was telling a friend about our week of flying and his response was, "Man, you fly the heck out of that plane!"

I told him that was the reason we bought it. We covered 1,857 miles in 13.7 hours, saw incredible views, and most importantly, built amazing memories that will last a lifetime.

As always, thank you for taking the time to read. If there are things you would like me to write about (or not write about), or if you just want to say hello, drop me an email at richard@intothesky.com. If you're ever in Southern California and want to meet up, let me know.

Situational Awareness

A student became lost during a solo cross-country flight and contacted ATC for help.

While attempting to locate the aircraft on radar, the controller asked, "What was your last known position?"

The student replied, "Ah . . . when I was number one for takeoff."

Talking About Tail at Oshkosh

Twenty-sixth in the series

Two of my Oshkosh forum presentations this year were “Mooney (General Aviation) Aerodynamics.” The first was on Monday afternoon and the last was on Saturday morning. I was trying to get the serious aviators on Monday through Wednesday and the ‘weekend warriors’ on Saturday. Happily, both were well attended and well received, with lots of great questions. Audience participation was highly encouraged, and it’s required for a presentation that doesn’t cure insomnia. After all, it’s aerodynamics.

Often, I am asked, “Why is the Mooney tail shaped the way it is?” Is it that way for a reason, or is it just a marketing gimmick?”

Al Mooney

The simple answer is, it’s there for a reason … actually, two reasons: Al Mooney and Art Mooney (not the singer but rather Al’s brother). As we all know, Al was the engineer and was fanatic about aerodynamic efficiency. He wanted to go fast on as little horsepower as possible. Art was all about keeping the airplane simple to build.

Similar to the evolution of the Mooney wing design (starting back in the Culver days with the elliptical planform), the vertical surface (stabilizer and rudder) is also the collaboration of Al, the aerodynamicist, and Art, the manufacturer. They worked well together and after leaving Mooney, both finished their careers at Lockheed.

Let’s start by looking at a couple of other tails first (Figure 1). These are from earlier Cessna 150s (left) and later 152s (right). As aerodynamicists, we are mainly concerned with what we call the quarter chord line (1/4th or 25% aft of the leading edge, (the blue, long-dashed, line on these illustrations). This line determines the sweep angle of the surface.

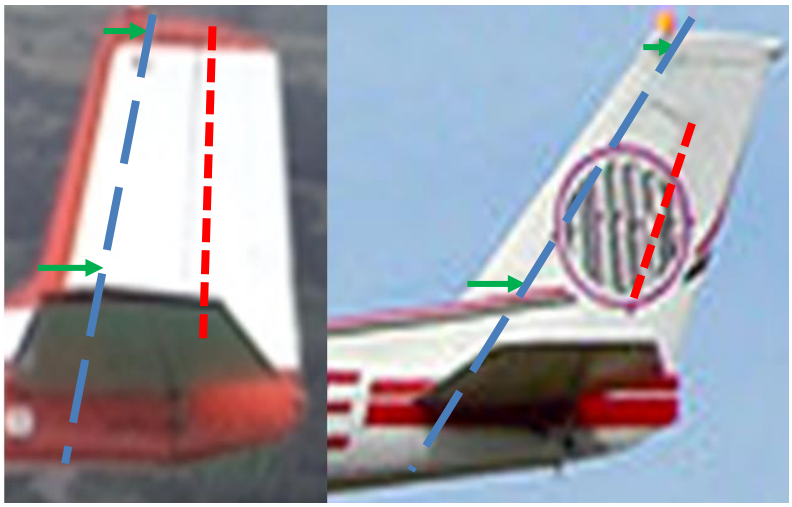


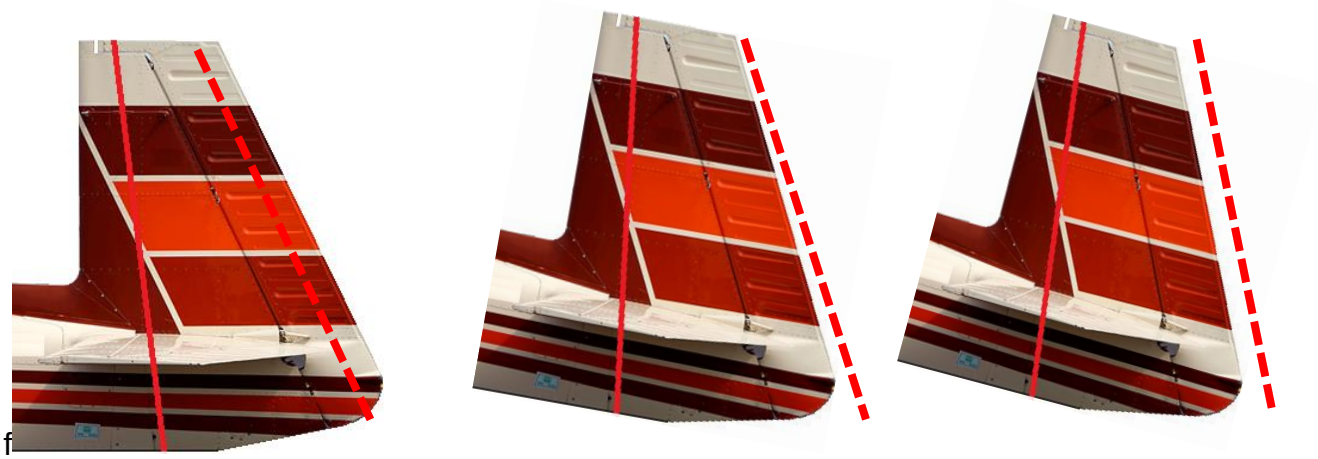
Figure 1 – Plain Flap

As can be seen, the earlier Cessna tails were almost vertical and hence were nicknamed “straight tails”. The later ones were more swept and hence were nicknamed “swept tails”. The straight tails are more effective (smaller and lighter). In addition, looking at the hinge lines (the red, short- dashed lines), when the rudder is deflected to the left (toward one in this picture), more air is forced around the rudder and less goes vertically up the tail. On the other hand, with the swept tail, everything is pushing the air up the hinge line and off the tip of the tail.

As the angle of attack increases, (or pitch attitude increases in level flight), the sweep angles of the quarter chord line and the hinge lines get further and further from being perpendicular to the airflow, making it less effective. Why would Cessna do this? Simply because of looks. Looks faster; looks like a jet. The Piper “Tomahawk” and Beechcraft “Skipper”, shown at lelft, have T-tails for similar reasons.

Now let's talk about the Mooney tail in Figure 2. It's forward swept! Yes, both the quarter chord and the rudder hinge line are forward swept. In other words, the quarter chord line moves forward as one gets further from the aircraft centerline. Actually, all the Mooney flying surfaces, (wings, horizontal stabilizer and vertical stabilizer), are forward swept.

As with all design considerations, everything is a tradeoff. With an aft sweep, the tail center of pressure is more aft. With a T-tail, like those used in business jets and airliners, the vertical can be more swept because the horizontal stabilizer end-plates are the top of the vertical stabilizer, making it more efficient.



f

3 degrees **13 degrees** **18 degrees**

Figure 2 – Mooney Tail at Various AOA

Now you have heard Al's part of the reason for the Mooney tail, but Art had a voice, too. Although all the flying surfaces are forward swept, the leading edges are all straight. In other words, all the leading edges are perpendicular to the centerline of the airplane. What does this do for manufacturing? It allows the skin material (wood or aluminum) to be simply wrapped around the leading edge to form both the upper and lower surfaces. In the case of the vertical stabilizer, it's the right and left sides.

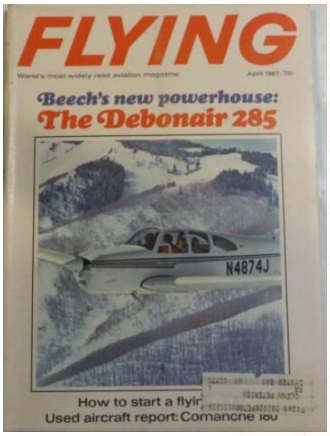
In addition, the all-moving empennage allows fewer gaps between the horizontal stabilizer and the fuselage, further reducing drag. The two upper pivot points of the empennage, (left and right sides, co-axial), with the trim jackscrew at the bottom, (newer airplanes also have a piano hinge to assist with stopping the lateral movement of the empennage), allow the entire empennage to roll around the factory, independent of the fuselage and wing. The wing and empennage are actually attached to the fuselage very late in the build process, allowing much easier total access to the entire airplane as it comes down the line. Again, Genius!

For several years, I have been looking for a misplaced, Mooney magazine advertisement. I finally found an electronic copy of the ad that explains the empennage, direct from Mooney. The date of the ad puts it long after Al and Art moved on to Lockheed and right in the middle of the Ralph Harmon days. Simply turn the page to see the advertisement from the ***April 1967, Flying Magazine***.

Got a future topic? Email me at solutions@blueontop.com or (316) 295-7812. Until next time keep the blue on top.

Blue on Top

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.



Is the Mooney tail on backwards?

No, it isn't! The Mooney tail is put on the way it is for two very good reasons — better performance and less cost. Unlike some of the old fashioned designs, the entire Mooney tail trims as a unit for best angle of attack. Whether you're climbing, cruising, taking off or landing, the rudder, elevators, horizontal and vertical stabilizers are coordinated to work with the airplane for excellent control and maximum performance.

Mooney uses a "wrap around" aluminum skin on wings, elevator and horizontal stabilizer. By keeping leading edges straight, skins wrap around at 90° to the leading edge which affords economies in metal costs and also provides an aerodynamically smooth leading edge with metal laps parallel to airflow for maximum performance.

Yes, we could put the tail on backwards and it would work but it works better just the way it is and it costs less to manufacture. It's just one more reason why Mooney is one of the world's most efficient airplanes. We could do a lot of things with the Mooney that would give you less airplane but we take a lot of pride in the knowledge that dollar for dollar, pound for pound there just isn't a better value anywhere.

Compare them all on structural integrity, modern safety features, performance, speed, operating costs and downright good looks and you'll discover you get more that is new, and better, and safer in Mooney — the modern one.

See your dealer . . .
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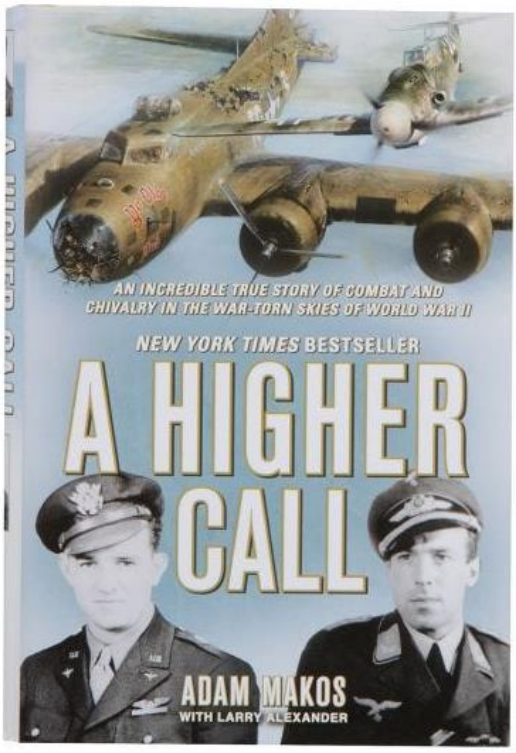
CIRCLE NO. 59 ON READER SERVICE PAGE

FLYING—April 1967

3



A Higher Call

I knew the story about this World War II incident, full of unselfish humanity. However, I wanted to know more about the lives of each man. I wondered if I would like it, but soon found that I could not stop reading A Higher Call. I learned about the character of the Luftwaffe and US Army Air Corps pilots and what they endured. This book increased my already great love for history and aviation. It is outstanding, and for me, it changed my heart.

Jim Price, co-editor

Five days before Christmas 1943, a severely damaged American bomber struggled to fly over wartime Germany. At the controls was 21-year-old 2nd Lt. Charlie Brown. Half his crew lay wounded or dead on this, their first mission. Out of nowhere, a Messerschmitt 109 fighter pulled up on the bomber's tail. The pilot is German ace Franz Stigler and he could destroy the young American crew with the squeeze of a trigger. What happened next would defy imagination and later be called "the most incredible encounter between enemies in WWII." A Higher Call follows both Charlie's and Franz's harrowing missions. Charlie would face takeoffs in English fog over the flaming wreckage of his friends' planes, Flak bursts so close they would light his cockpit, and packs of enemy fighters that would circle his plane like sharks. Franz would face sandstorms in the desert, a crash alone at sea, and the spectacle of 1,000 bombers, each with eleven guns, waiting for his attack. The U.S. 8th Air Force would later classify what happened between them "top secret." It was an act that Franz could never mention for fear of facing a firing squad. It was the encounter that would haunt both Charlie and Franz for forty years until, as old men, they would search the world for each other; a last mission that could change their lives forever. Hardbound, 392 pages.

Available at Amazon, Sporty's (author autographed), and AbeBooks

Get Ready for Autumn

As winter approaches, we always think of how it will impact flying. This article, however, is about how we can prepare for autumn flying.

Shorter Days mean Earlier Nights

Most of us, especially older VFR pilots, do the vast majority of our flying during daylight hours. In the northern hemisphere, during autumn and through winter, each day, the sun sets earlier and earlier. So, remember that to be "current" you must have done three takeoffs and landings to a full stop within the past 90 days.

If you are comfortable flying during night hours and are current, you are all set. But if not, you might consider landing before sunset. In addition, you might consider going up with an instructor to refresh the different sight view at night, especially if you are flying where there is limited city lighting.

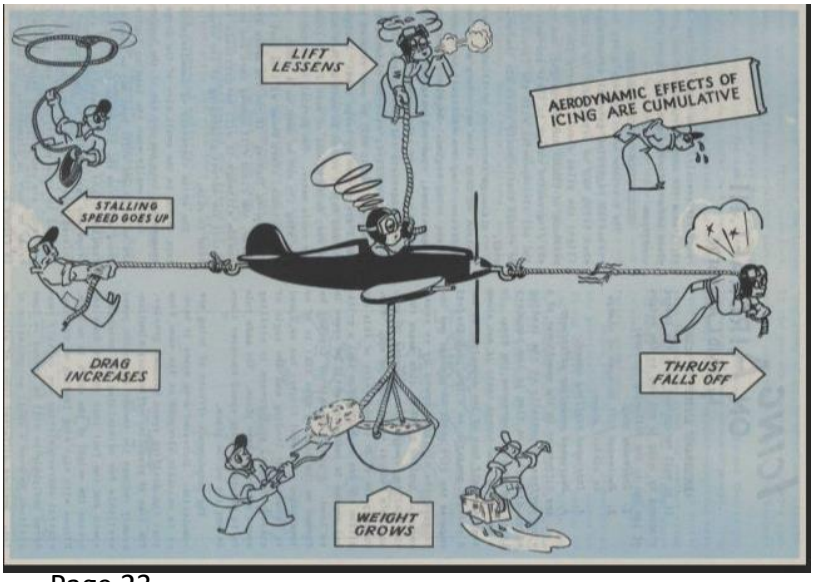
Lowering Icing Conditions

During the summer, when flying at or below 14,000'MSL, the Icing Levels are mostly a non-issue. But as the temperatures cool down in autumn, the freezing levels drop into our favorite cruise altitudes. ForeFlight excels at showing you Freezing Levels, enabling you to avoid them.

It is just good to be more cognizant of lower freezing levels. This is important, as our Mooneys are not very tolerant of ice on the wings, empennage or fuselage.

You can plan your flight to avoid these areas. Secondly, if you encounter ice, the easiest solution is to make a 180° turn to exit the icing.

A second plan might be to descend to warmer air, but this option is less of a guarantee. Also, you need to consider terrain avoidance.



Runups

In the summer, my Mooney's oil temps are always warm enough by the time I am ready to perform my runup. But in the cooler autumn temperatures, and especially early in the morning, I sometimes have to wait for my oil to reach the appropriate temperature before accomplishing a runup.

Waiting for the oil temp to rise is important to the life of your engine. Most damage to our engines takes place as the oil warms up. Running your engine up to 1700 RPM before the oil is warm is not good.

Bird Migration

I often need to be aware of birds where I fly. At Watsonville, for instance, where we fly for breakfast or lunch, there is a municipal dump off the end of Runway 22. So, I often turn left after wheels up to avoid the profuse sea gulls.

In autumn, birds are more prevalent and at higher altitudes, primarily due to migration. A goose can do considerable damage to your wing, break your windscreen, and threaten you and your passengers.

It behooves you to be more alert for migrating birds at your cruise altitude. You can only see and avoid migratory birds as they have not been approved for ADS-B as of this writing.

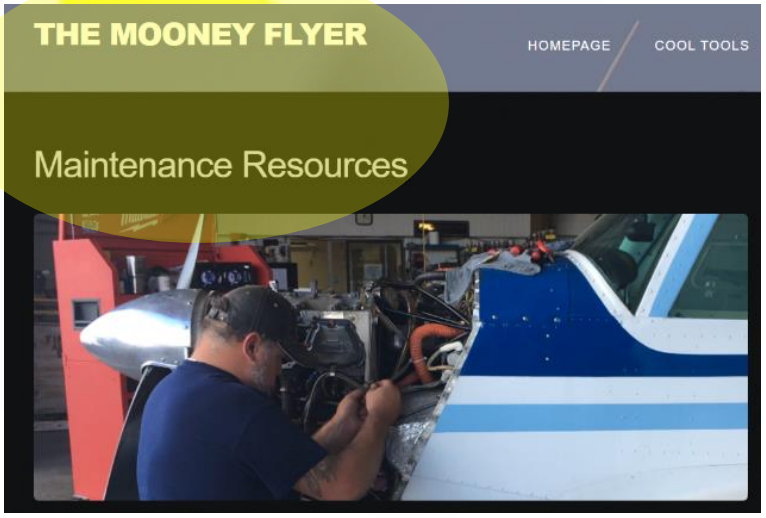
Survival Equipment

It may not surprise you that many pilots survive an off airport landing only to not survive in the environs.

In the autumn, I carry the following stuff on long flights, especially over inhospitable terrain such as mountains or deserts:

- A PLB (Personal Locator Beacon) that can send a satellite transmission with your GPS coordinates. This is much better than a 121.5 ELT (Emergency Locator Transmitter)
- A Heavy Blanket
- Warm clothes
- Water & Nutrition Bars
- Matches
- Flashlight
- Medical Kit, capable of dealing with more severe injuries

Spotlight on



At TheMooneyFlyer.com, we have links resources that will help you find answers to many of your questions. This month, we will highlight a few of the many links on our **Maintenance Resources** page.

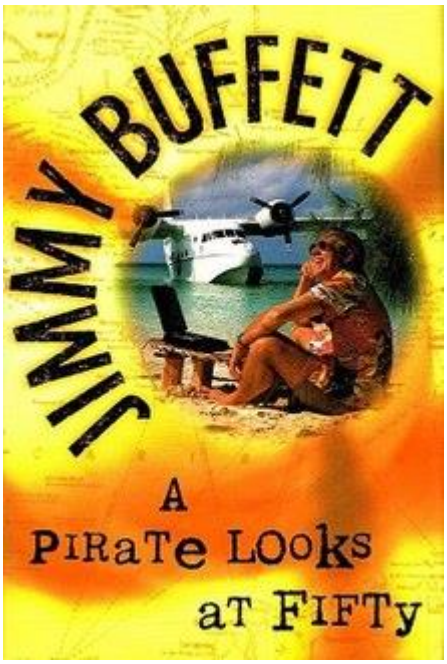
At Maintenance Resources, you can download the Mooney 100 hour Inspection Checklist from Mooney; stay informed with Mooney.com's current Mooney Service Bulletins (SBs) and Service Instructions (SIs); search for ADs and SBs at the FAA's new Dynamic Regulatory System website or download an AD log. There is a link to help you subscribe with the FAA so you can receive notifications when ADs and other Air Worthiness Information are published. If you have a Continental Engine, Lycoming Engine, or Slick Mags, you can download their Service Bulletin(s). Are you looking for a Mooney Service Center or a Mechanic with Mooney experience? Yes, you can find one here. Got a leaking fuel tank? You can find a list of Mooney wet wing experts that can patch or seal your tank(s). There is even a checklist to help you navigate a proper Pre-Buy.

You can also learn from articles written by Mooney experts like **Don Maxwell** and **Kerry McIntyre**.

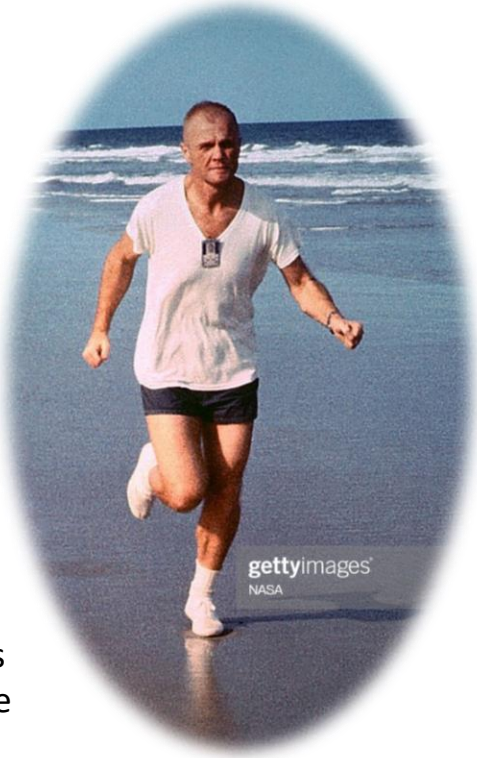
There is a mountain of information just waiting for you at https://themooneyflyer.com/tech.html

A Pirate Turns 70

By Jerry Proctor



I suspect most if not all Mooney Flyer readers are fans of Jimmy Buffet. I know I am. In 1998, Jimmy published a book entitled, *A Pirate Looks at Fifty,* which alludes to his 1975 song, *A Pirate Looks at Forty*. I really enjoyed his book. Looking back on my life, I am not sure why turning 40 or even 50 was such a big deal.



Yes, to someone in their 20s, 40 sounds rather old. In 1962, I was 10 and I saw a Life Magazine picture of John Glenn jogging on Florida's Cocoa Beach. I knew he was an astronaut, and I was quite concerned. Why is he jogging? He is 40 years old, and he could have a heart attack! Well, 40 ain't no big deal.

Now that I'm 70, perhaps that is worth writing about. Hang on. Fortunately, I have taken rather good care of myself. This article will be published 1 October, and 27 days later, I will be 70. I still weigh what I did decades ago, and while I have an artificial hip, which means no more running, I do well in the pool and still compete at swim meets. That said, my grandfather passed away at age 77. Yes, I am sure cooking with bacon grease in those days didn't help!! Also, my Dad had his first heart attack at 77, but lived until he was 86.

During my seventh decade, I have informally planned to hang up my wings when I reach 76 or 77. That is a big deal for guy who was a private pilot at 22, an Army pilot at 24, and someone who had many, many, great flight experiences. At no other decade did I think I would hang up my spurs. I do quietly desire to be awarded the Wright Brothers 50 year award in 2024. I am close, but not there, yet.

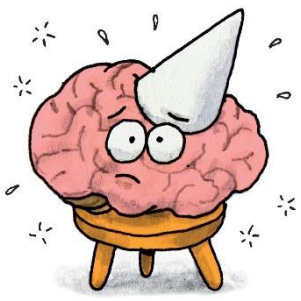
It seems as I near 70, the Obituaries feature more and more people I know – or make that "knew". 70 has also brought to my door step my wife's medical condition and that is a game changer. Let's simply call it moderate memory loss. It is the reason I am no longer a MAPA Safety Foundation director and instructor pilot.

I served the US Army for 40 years and I was gone a LOT, traveling all around the world. I am glad that is over because now, I cannot leave my wife alone for long periods of time.

I just paused my active membership in the Civil Air Patrol because being gone four hours for the simplest of CAP flights, distresses her.

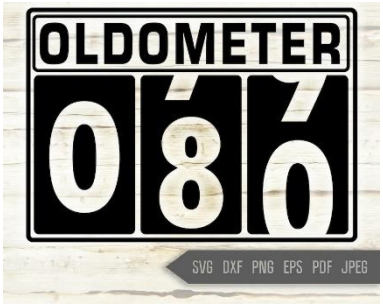
I have one great airplane, a 2015 Acclaim S, but now I only fly locally, usually with my wife. Do I really need this tremendously capable long distance airplane when a 70 mile trip is about as far as we fly? Do I really need this much money tied up in a plane when a simple Cessna will do the job?

In many cases, turning 70 changes one's behavior from growing and improving to one of sustainment. What does that mean? Well, until two days ago I had a weight bench and barbell in my garage. I sold them. I still use my Bowflex and dumbbells, but the idea of straining to push 150 pounds or so on my bench started to sound – well dumb. I intend to keep good muscle tone, but I am not the physical type that has the ability to bulk up.



The airlines require pilots to retire at 65, so based on their rules, am I still a good pilot? I do believe so. However, I think I can detect some slowness when ATC throws me a curve ball. However, I think I can still hit the ball. But, with our scaled back, shorter flight patterns, I might start missing.

If you read my articles, you probably know I have a Redbird TD 2, which helps me keep the instrument skills and the required number of approaches up to speed. I flew a flight last night, which I will talk about in the future.



So, before I see virtual snoring, I had better wrap this up. 70 is okay but it is different from 40, 50 or even 60. That's partly because what follows 70, if you are fortunate, is 80. Indeed, it is a game changer decade where your strength and skills are certainly in decline. This Pirate is doing okay but I am increasingly beginning to check my six, just to make sure.

SO, hopefully, here's to a good decade; one of change, reflection, thankfulness, and acknowledging that I truly have been blessed.

May you be blessed as well, especially if you are parking at Ramp 70 or higher.

Quiz Time

1) **During the preflight, you find that the Master Switch is ON and your battery is dead. You tell your spouse and friends that someone must have snuck into your hangar and turned the Master Switch ON. (Surely, you would never forget to turn the Master Switch OFF!) Can you replace the battery yourself? Yes or No.**

Yes. **Part 43 Appendix A (c) (24) says you can replace and service the battery yourself.**

Travel tip: Prior to shut down, when turning interior and exterior lights off, leave the strobe or rotating beacon ON. When you are putting your aircraft to bed in the hangar or on the ramp, if you left the Master Switch ON, the strobe or beacon will shout, "Hey you amazing pilot, the Master Switch is still on."

2) **Your right main tire is low on air. Can you fill it up yourself? Yes or No.**

Yes, In fact, Part 43 Appendix A (c) (1) allows you to remove, install, and repair landing gear tires under preventive maintenance.

Travel tip: Check the pressure in your tires monthly. After a while, you will understand the natural pressure loss of your tires. When the pressure loss exceeds what you feel is normal, this will alert you that you might have slow leak which needs to be addressed.

3) Yes, You've been landing and taking off on a gravel runway, and your aluminum propeller is starting to get a few large nicks in it. Assuming you have the equipment to fix the blades, can you smooth them out yourself? Yes or No.

No. **This procedure is classified as a 'propeller major repair' under Part 43 Appendix A (b) (3). Repairs to a propeller blade need to be done by a mechanic.**

4) During run-up, you discover one of your spark plugs is fouled, and you can't burn it off. Can you remove the spark plug, gap and replace it yourself? Yes or No.

Yes. **Part 43 Appendix A (c) (20) indicates that replacing or cleaning spark plugs and setting the gap clearance can be done as preventive maintenance.**

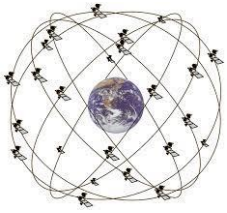
5) While pushing your plane back into the hangar, you accidentally bumped the right aileron into the hangar wall and put a small dent in the metal. Can you take the aileron off fix it yourself? Yes or No.

No. **Repair of a control surface is considered a major repair and needs to be done by a mechanic.**

6) It is during daylight hours and the weather at the airport is below VFR minimums. When is ATC required to turn on the beacon?

a. When ceilings are less than 1,000 feet or visibility is less than 3 miles.
b. ATC isn't required to turn the beacon on during the day.
c. It depends.

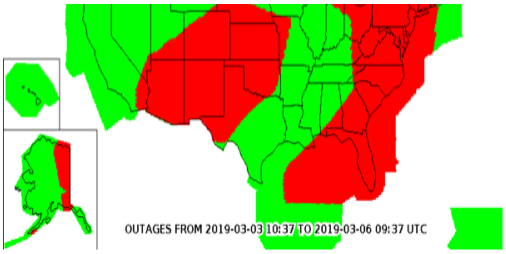
The answer is c. **According to the AIM, there is no regulatory requirement to turn on the airport beacon when weather drops below VFR minimums. At some airports, the tower can't control the beacon because it's controlled by a photoelectric cell or a timer. At airports where the tower can control the beacon, FAA Order 7110.65 requires tower controllers to turn on the beacon between sunrise and sunset anytime the weather drops below basic VFR minimums. So, since you don't know if the tower can control the beacon at an airport, you should use the latest weather observation to determine if the field's IFR – not the beacon.**



7) In order for your GPS to gather position and altitude information, how many satellites need to be in view at all times? Is it 3, 4 or 12?

GPS receivers need 4 satellites in view to get an accurate position and altitude.

8) What does RAIM stand for?



RAIM stands for Receiver Autonomous Integrity Monitoring. It is a system that monitors the integrity of signals transmitted from satellites to determine if they are reliable or not.

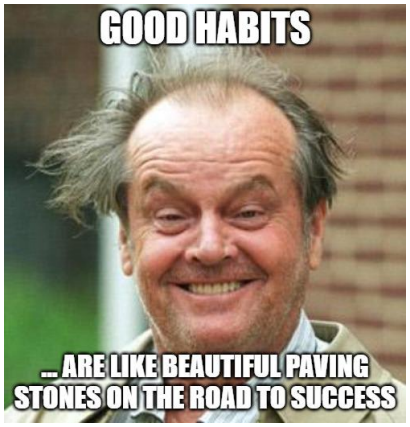
9) How many satellites are required for RAIM to detect a bad satellite and continue navigation (excluding baro-aiding) in the event of a failed satellite? 10, 6, or 5?

A minimum of 5 satellites is required to detect a bad satellite. At least 6 satellites are required to detect and exclude a bad satellite from the navigation solution if your receiver has a fault detection and exclusion (FDE) RAIM capability.

10) Your static port is blocked while you are in a constant 500 FPM climb. What indication will your VSI show? 500, 250 or 0?

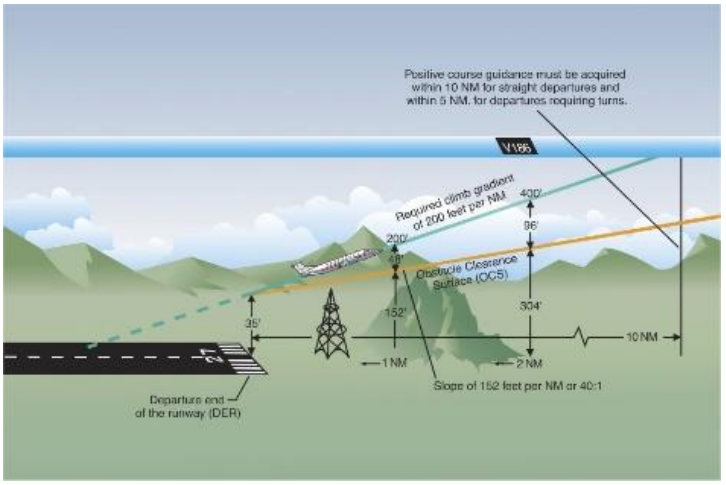
Because there is no static pressure for the instrument to sense a climb or a descent (trend and rate), it will show an indication of 0.

Travel tip: If your aircraft has static system drains, make a habit of checking those prior to every flight, not just when your aircraft has been exposed to precipitation.



11) If you are taking off from a runway that has significant obstacles at the departure end, what initial airspeed would be best in this situation? Vx or Vy?

Vx, or best angle-of-climb airspeed, will give you the greatest altitude in the shortest distance. This speed is important during climb-outs over terrain and obstacles.



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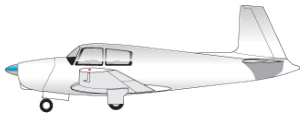
Paul Loewen is offering them online, or by phone. The website is www.LoewensMooneySalvage.com, and he can be contacted in Lakeport, California at **707 263-0462** or by cell at **707 272-8638.** Email is PaulLoewen98@gmail.com. The used inventory is also still available through LASAR Parts at 707. 263-0581

Mooney Maintenance



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

Click here

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

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LASAR

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Ask the Top Gun

TG

Tom Rouch

Founder of Top Gun Aviation, Stockton, California

Send your questions for Tom to TheMooneyFlyer@gmail.com

QUESTION

Dear Mr. Rouch,
What is the cause of Mooney Fuel Tank Leaks, and as an owner, what steps can I take to reduce the leaks?

Tom's Answer

When we discuss Mooney Fuel Tanks, we must first emphasize that rather than building airplanes with bladder fuel tanks, Mooney elected to go with the wet wing fuel tank. Why? Bladders add weight to the basic airplane and because the bladders take space, this reduces fuel capacity. Also, when building a plane, tank sealant is less expensive than bladders.

Now we can discuss reducing leaks. Age of course is the biggest cause of leaks. Sealant deteriorates with age and through the years, the composition of the fuel can "wear" the sealant. Hard landing can cause fuel leaks and good maintenance of the shock discs, tires, etc., can help reduce fuel leaks. These leaks eventually affect where the sealant seals the skin to the ribs and spars.

The next item the owner can do is keep the tanks as full as possible. Letting the tanks sit partially full will allow the exposed sealant to slowly dry out, especially of the aircraft sits outside. Keeping your Mooney in a hangar is the absolute best way to protect the fuel tanks.

I might add that trying to repair fuel leaks is the very last job a shop wants to do. Access to the interior and the leak(s) is extremely limited. Leaks are not very obvious as they could be under the main spar and running to a different point than where the fuel leak shows on the exterior.

Scraping away the old sealant and applying new is very time consuming. Some shops have developed a system to clean out the old sealant, making it possible to reseal the tanks, but it can be quite expensive. In my opinion, the installation of a bladder kit is a wonderful solution.


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Greater Speed
greater climb
less take-off distance
more room
Greater comfort
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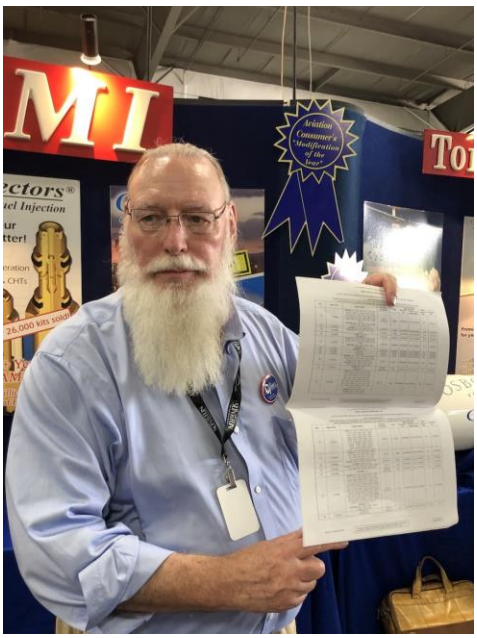
Seeing is believing and flying a Mark 20 is the clincher! YOU be the judge . . . compare and discover . . . the Mark 20 for 1958 is at your distributor now. For information write
MOONEY AIRCRAFT inc. KERRVILLE, TEXAS

GAMI Unleaded Avgas Approved For GA Piston Fleet – AvWeb, 1 Sep 2022

Finally, the FAA has approved supplemental type certificates (STCs) for the use of General Aviation Modifications Inc.'s (GAMI) G100UL 100-octane unleaded avgas in **all** general aviation piston aircraft. GAMI co-founder George Braly stated that the fuel will initially be produced in small batches while the manufacturing and distribution infrastructure is established. Although pricing for G100UL has not yet been determined, Braly noted it will cost "slightly more" than 100LL until production volume increases.

"This is a big day for the industry," said Braly. "It means that for a lot of our general aviation communities, and especially for a high fraction on the West Coast, relief is on the way. And it means that our industry will be able to go into the future and prosper and provide the essential infrastructure for this country for everything from Angel Flights to critical training of our future airline pilots."



George Braly, GAMI Co-Founder

As previously reported by *AVweb*, the new STCs come after significant controversy surrounding the approval process. GAMI received its first STC for G100UL in July 2021 and STCs for around 600 additional engines the following October. The company began work on G100UL 13 years ago in 2009.

Braly said the expanded STC covers all of the spark ignition engines (including airframes) in the general aviation fleet. If field experience reveals any oversights, the FAA has agreed to allow amendments through Designated Engineering Representative signoffs.

G100UL will require an STC, which Braly said will be available through a web store the company is setting up. Prices haven't been established yet, but he expects them to be similar to those charged for the Petersen autofuel STCs, which typically vary by horsepower between $130 and $500, but more for some engine models.

Production details remain to be determined. GAMI has a production distribution agreement with Avfuel to manufacture and distribute G100UL. Avfuel says it will engage with any refinery qualified to manufacture the fuel. Avfuel's Craig Sincock said last year that developing the market will take **several years**.

Initially, Braly said, California Aeronautical University in Bakersfield, California, has agreed to be a launch volume customer for G100UL. Fuel components will either be shipped in and blended or a finished fuel will be shipped from a refinery in Texas by rail.

G100UL's approval culminates nearly 13 years of research and testing that began shortly after the EPA announced gathering research on leaded fuel emissions near airports.

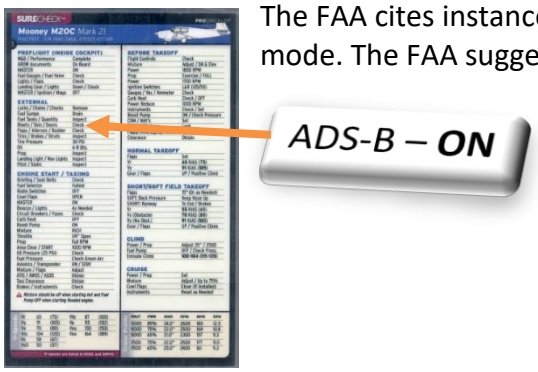
It's widely believed that the EPA will announce a finding of endangerment on leaded avgas before the end of the [2022].

Swift fuel has been selling 94UL for several years and the University of North Dakota had adopted it as its sole piston fuel. Swift is working on its own 100-octane unleaded fuel.

George Braly credits AOPA's Mark Baker who worked behind the scenes to encourage the FAA to complete the project.

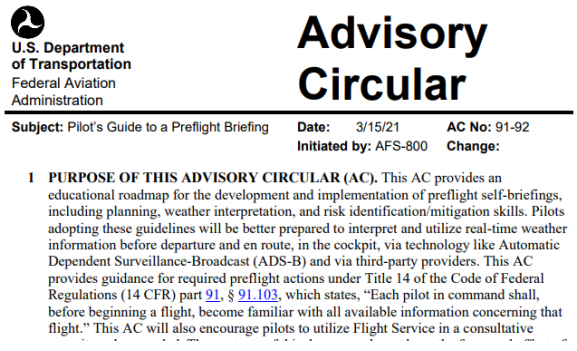
The FAA suggests pilots add a step to their preflight checklist to include the operation of their ADS-B

Did you know that to comply with rules that cover ADS-B requirements, your ADS-B equipment must be in the "transmit" mode at all times (14 CFR section 91.225(f)), both during flight and while taxiing? It seems like a simple requirement, but it's actually not that simple, depending on the ADS-B system.



The FAA cites instances where the ADS-B has been inadvertently left off, or in the wrong mode. The FAA suggests that pilots add a step to their preflight list to make certain the ADS-B is on. They recommend it for all flights, regardless of the airspace in which you intend to operate. When ADS-B Out equipment is installed, it generally must be operating at all times during flight even where not otherwise required, per FAR 91.225(f).

Preflight Self-Briefings



U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Pilot's Guide to a Preflight Briefing **Date:** 3/15/21 **AC No:** 91-92
Initiated by: AFS-800 **Change:**

1 **PURPOSE OF THIS ADVISORY CIRCULAR (AC).** This AC provides an educational roadmap for the development and implementation of preflight self-briefings, including planning, weather interpretation, and risk identification/mitigation skills. Pilots adopting these guidelines will be better prepared to interpret and utilize real-time weather information before departure and en route, in the cockpit, via technology like Automatic Dependent Surveillance-Broadcast (ADS-B) and via third-party providers. This AC provides guidance for required preflight actions under Title 14 of the Code of Federal Regulations (14 CFR) part 91, § 91.103, which states, "Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight." This AC will also encourage pilots to utilize Flight Service in a consultative

As more online weather resources emerge, pilots are more likely to conduct self-guided preflight briefings, the AOPA report notes. That led the FAA to release **Advisory Circular 91-92** in 2021 to provide guidance for pilots on proper self-briefing procedures and to provide references to the many online sources of government-provided weather, NOTAMs, and airspace status.

However, AOPA's 2022 weather survey found that a whopping 68% of pilots have never heard of or are only "slightly familiar" with the Advisory Circular.

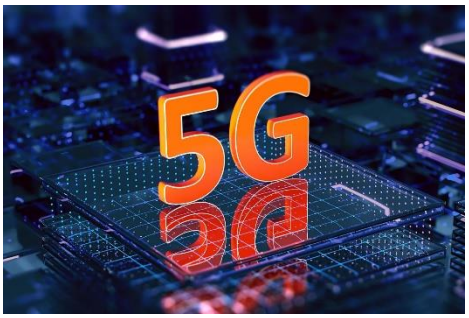
What do Pilots Use?

Pilots in the continental United States primarily use aviation apps and Flight Service more than any other resources, although the use of flight service has decreased 20% in the last five years.

Pilots in Alaska turn to FAA weather cameras and Flight Service specialists for their preflight weather information, according to the survey results.

The report notes there is an increased use of non-aviation-related weather resources, such as **Windy.com**. Researchers hypothesize that pilots are drawn to the weather visualization and design that these platforms use.

Most Commercial GPS Safe From Ligado 5G, however, Military Faces Problems



A study by the National Academies of Sciences, which was ordered by Congress and funded by the Pentagon, determined that the Ligado network, which will carry 5G signals in frequency bands close to those used by GPS, "will not cause most commercially produced general navigation, timing, cellular or certified aviation GPS receivers to experience harmful interference."

However, the military might be in some trouble because the main effect will be on Iridium satellites, which are under contract to the Defense Department. The study indicates that Iridium terminals "will experience harmful interference" within 2,401 feet of Ligado terminals. It also noted that satellite services provided to the military by Iridium's competitor Globalstar are unlikely to be affected.

Ligado spokesperson Ashley Durmer said the study also confirms what her company and its supporters have argued, that "A small percentage of old and poorly designed GPS devices may require upgrading. Durmer added that "Ligado, in tandem with the FCC [Federal Communications Commission], established

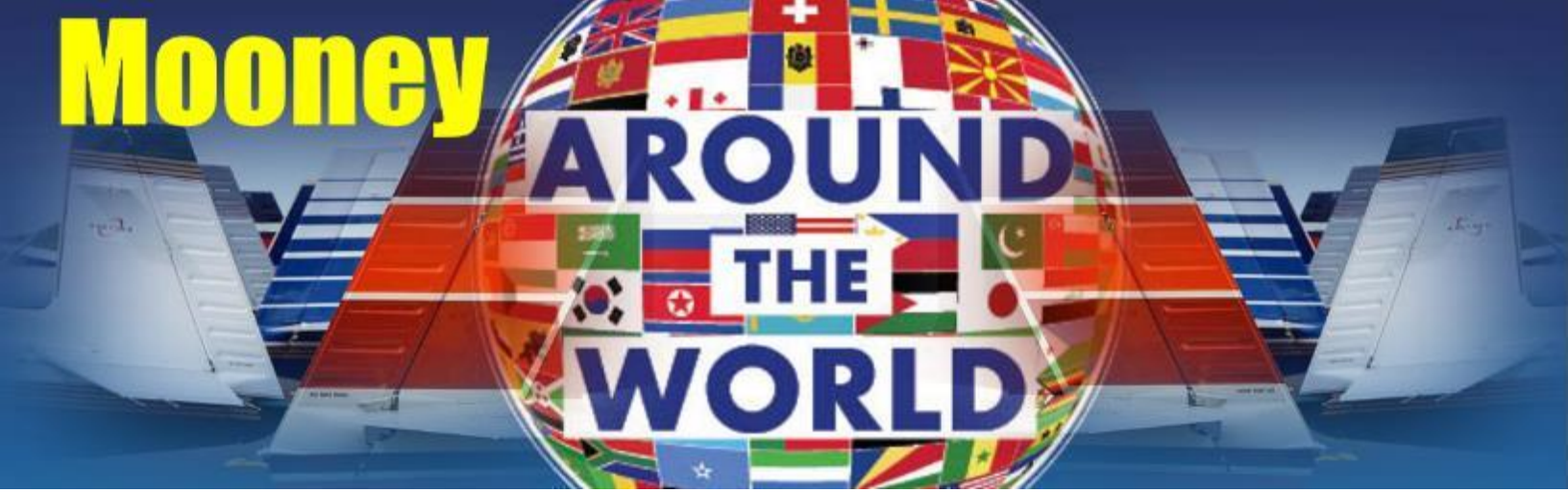
a program two years ago to upgrade or replace federal equipment, and we remain ready to help any agency that comes forward with outdated devices. So far, none have."

Ligado will soon begin operational testing of its 5G system. It was given a license to use a portion of the L-Band radio spectrum by the FCC two years ago. That prompted the formation of the Keep GPS Working Coalition that has been lobbying Congress and organizing opposition to force the FCC to overturn its spectrum award to Ligado.

Stratus 3 ADS-B Receiver Adds New app and Avionics Compatibility

Stratus 3 works with almost every aviation iPad EFB app available, including ForeFlight. Garmin Pilot, Fltplan Go, WingX, FlyQ, iFly GPS, and others. Thanks to a recent update from Avidyne, it can even supply ADS-B weather (FIS-B) and traffic (TIS-B) to some certified panel-mount avionics systems.

Using a portable device like Stratus 3 to provide ADS-B traffic and weather to panel-mount avionics provides a more cost-effective option over a certified/installed receiver and provides the same weather and traffic information. **The IFD** (Image File Directory) **software update is available free from Avidyne avionics dealers.**



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* Oct 8: Flagler (KFIN) Nov 12: Sebring (KSEF)
MOONEY SAFETY.com	**2022 Events** Oct 21-23: Redding, PA Sign Up at https://www.mooneysafety.com/ppp-registration/
MOONEYSUMMIT	**Learn more at** https://www.mooneysummit.com/
Australian Mooney Pilots Association	
EMPOA	**Learn more at** https://www.empoa.eu/index.php/en/
Other Mooney Events	

TMF PRODUCT REVIEW

Lightspeed Headset with Built-in CO Sensors

Lightspeed Aviation has introduced Delta Zulu, a new ANR aviation headset that includes a built-in carbon monoxide sensor, as well as a built-in audio equalization system that adjusts audio output to compensate for hearing loss.

The built-in carbon monoxide measures carbon monoxide levels in the cockpit any time the headset is turned on. The headset also will produce audible alerts.

The companion Lightspeed app allows pilots to personalize their own alert thresholds based on their tolerance and within limitations. With it, they can check CO sensor data visually during flight and review the full sensor history later.

Delta Zulu also features HearingEQity, a built-in audio equalization system that adjusts the headset's audio output to compensate for any individual hearing loss.

Through an automated 12-frequency hearing test that can be taken through the Lightspeed app, HearingEQity sets the hearing level in each ear of the headset to create an individual hearing profile that helps compensate for any hearing variations between ears.

Other features include:

- **Cockpit voice recorder:** The Lightspeed app also allows pilots to record radio conversations, play back transmissions, and archive flight recordings for post-flight briefing and training.
- **Changeable battery packs:** Gives customers the option of using rechargeable lithium-ion batteries or AA batteries.
- **UAC plug:** Allows people to connect to other devices directly from the headset for charging, audio, and data transmissions. It can also be charged while flying via USB. Delta Zulu has options for 4 cable configurations, from UAC to USB-A (included), USB-C, 3.5 mm, and Lightning plugs (optional)
- **Personal Safety Data Partnership Program:** By opting into the anonymous collection of sensor data from their headset, customers provide data that will be used by general aviation experts and scientists to improve GA's understanding of safe piloting practices, company officials noted.

Preorders for the new headset can now be placed for shipments in the second half of September 2022.

Price: $1,099. To watch Flying Magazine take it for a test flight, CLICK HERE.

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)

FOR Sale:

Robotow electric towbar (**Mooney** specific) w/lithium battery & charger, like new condition; $775. Waldo Freeman: 703-354-4057 or freemanwd64@verizon.net

X-Naut iPad Cooling Case for the iPad Air2, 7th Generation (9.7”) with Ram Claw Yoke Mount – Both for $75 **(Includes shipping – US shipping only)** (The X-Naut is available new at $200). (The Ram Claw Mount is available new at $56).

Contact Jim Price:

jaspriceaz@gmail.com

480-772-1527

RAM EZ-ROLL iPad Mount for the iPad Air2, 7th Generation (9.7”)

$10 **(Includes Shipping – US shipping only)**

(Available new at $25)

Contact Jim Price:
jaspriceaz@gmail.com
480-772-1527


Rusty Pilot or Old Pro
INSTRUMENT PROFICIENCY CHECK
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J D Price, CFII, MEI, ATP
FLIGHT REVIEW
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