

The Mooney Flyer

The Official Online Magazine for the Mooney Community
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Editors

Phil Corman | Jim Price

Contributors

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

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The Mooney Flyer’s goal is to educate, inform, and entertain Mooniacs.

From the Editor

Phil Corman



FTE



How to Anticipate Turbulence

Few of us enjoy turbulence, especially when it lasts a long time. Many times, it pops up when we least expect it. But often, if we look and plan, we can anticipate it.

Frontal Passage

If you intend to transit a front, you can surely anticipate some bumps, so that is an easy thing to pay attention to during your pre-flight planning.

PIREPs

Looking for Turbulence PIREPs is probably the easiest and the most reliable way to anticipate some turbulence. You cannot rely on the severity of the turbulence since Moderate to one pilot is light chop to another. But at

least you know the air is unstable.

Mountain Wave Turbulence

Often, mountain waves are not bumpy, but instead cause relatively strong updrafts and downdrafts which you will notice as changes in your ground speed. In a mountain wave updraft, your ground speed will increase since your Mooney is descending through it. The opposite is true of a downdraft. Stronger mountain waves can result in the flow breaking, which causes really fun turbulence.

Convection

Out west, flying over the desert in summer afternoons is pretty much a guarantee of a rough ride. Many westerners try to be on the ground before noon. Convection can also affect you when flying from a light area to a dark area, or vice versa, since the air is rising over the darker terrain.

Rapidly Changing Wind Speed and/or Direction

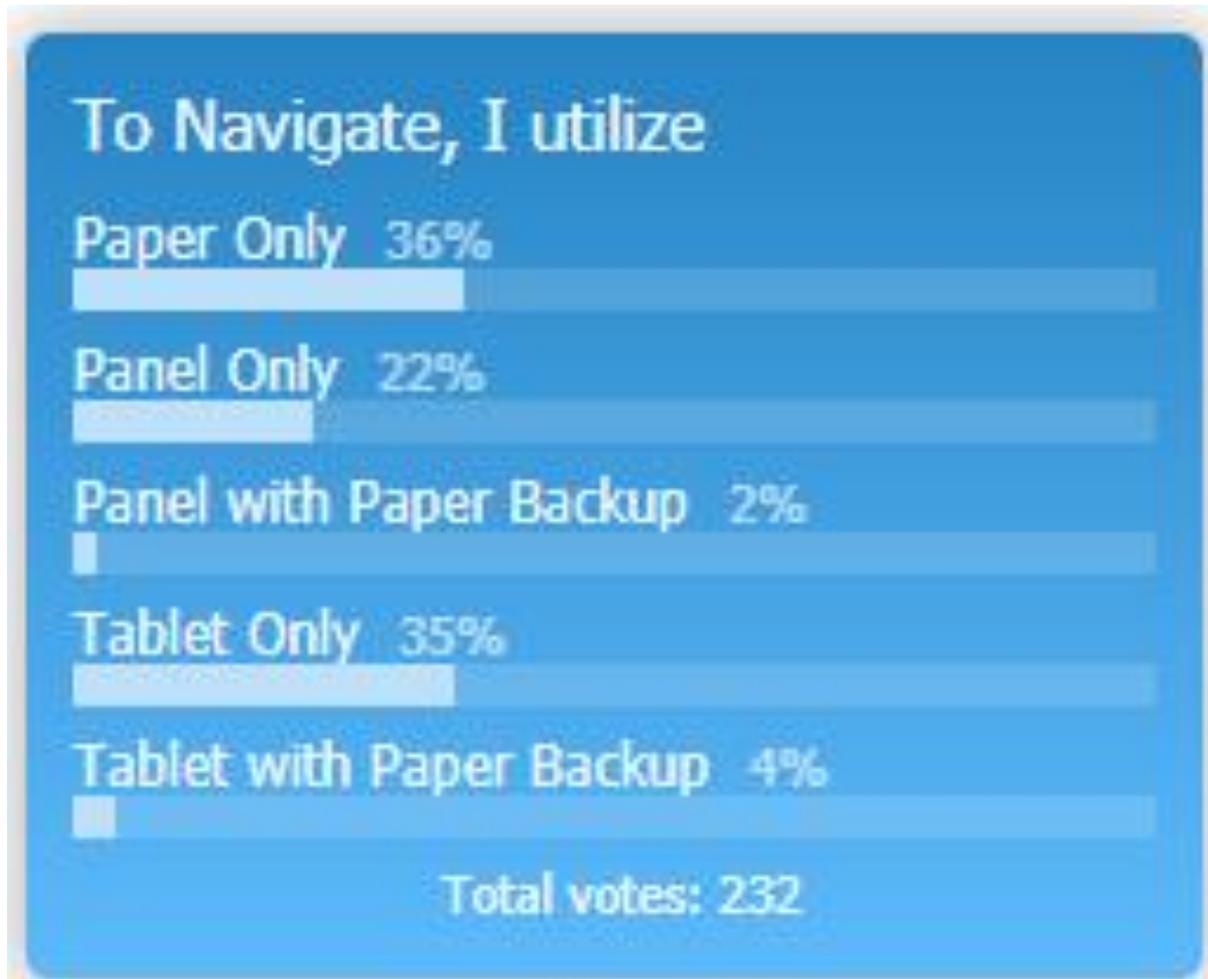
Many EFBs such as Foreflight/Garmin Pilot/FlyQ are great at showing enroute Winds Aloft. Also, if you're equipped with ADS-B IN, FIS-B will display the winds. If they are changing velocity, expect some bumps.

Flying Under Cumulus

Cumulus clouds usually indicate unstable rising air. The bumpiest place is below them, and often the smoothest air is above them. If the cloud tops are manageable, there's your solution.

Lenticulars

Lenticular clouds are like BIG SIGNPOSTS indicating moderate to severe turbulence. If you go near them, you deserve the turbulence, right? Outside of thunderstorms, these are the second worst area of a good ride. Remember that thunderstorms have significant updrafts adjacent to downdrafts. At the boundary, it can bend an aircraft – even our Mooneys. The best place to go around a thunderstorm cell is on the upwind side, but you should still give it plenty of miles. Despite all of these indicators, you will sometimes get surprised by turbulence, but hopefully paying attention to these signs will reduce those surprises and surprises are seldom good for us.



Next month's poll: "I Use the following Oil" [CLICK HERE](#) to vote.



APPRAISE IT
Check Your Mooney's Value



[M20C](#) [M20E](#) [M20F](#) [M20G](#)
[M20J](#) [M20K](#) [M20R](#) [M20M](#)

Mooney Instructors

CLICK HERE for the most comprehensive list of Mooney instructors in the United States



Letters to the

EDITOR

Editor@themooneyflyer.com

RE: Harry Moyer – Here's a cool video on Harry:

https://www.youtube.com/watch?v=6OihW1up_Pg

Rae W

RE: Ask The Top Gun – Ref. Your article in the March 2021 Mooney Flyer oil consumption, here is some background to the subject.

Firstly, from FAR §33.39 Lubrication system.

(a) The lubrication system of the engine must be designed and constructed so that it will function properly in all flight attitudes and atmospheric conditions in which the airplane is expected to operate. In wet sump engines, **this requirement must be met when only one-half of the maximum lubricant supply is in the engine.**

In short, the aircraft must perform (endlessly and) absolutely normally with oil at the minimum level. In the M20J, the engine is the Lycoming IO-360-A3B6D, which has a stated maximum of 8 quarts and therefore by definition a minimum of 4 quarts.

I suspect strongly that the engine designers first established the minimum safe level of oil at 4 qu. This then dictated the maximum level at 8 qu. I don't think they cared too much about what happened to the 8th quart of oil, as long as it did not make too much of a mess as it was ejected from the engine. At an oil burn rate of, say, 0.3 qu. per hour, 3 qu. (i.e., 7 - 4 qu.) should last 10 hours, which comfortably exceeds the maximum flight duration of around 7 hours (LOP of course!).

What many Mooney drivers have come to realize is that 7 qt. of oil is the real maximum, being the amount that is relatively long-lasting in the engine. If the designers at Lycoming had stated this, then they would be honour-bound to prove the engine on 3.5 qu. of oil, and that's a problem.

I think the mistake might be that the engine was not designed for 9 qu. of oil with 8 qu. being the real maximum! In any case, from a practical point of view. the current design works even if the rules are bent a bit.

Neil F

RE: Poll on Navigation Methods - Phil: Couple of quick notes. First, is the May fly in at Paso Robles still on? Second, in your monthly survey you need another category, Panel plus tablet. I use my new Garmin GNC 355 along with two iPads running Fly Q. On an approach, I load the approach on one iPad but keep the second on the map function which permits me to track where I'm at over the ground, plus keeps me informed of traffic coming in on ADS B.

Dave B

Please reference the "From the Editor" section in the march edition of the Mooney flier. I just need to clarify with you that just because an engine received an STC to use UL94, doesn't mean your airframe is certified to use it.

To use it, in your airframe, there has to be a system level test for hot day operations to ensure the engine and the fuel system does not vapor the fuel. The diameter of the plumbing, the pressures, the temperature, the fuel flow all are factors which will affect the fuel vaporizing. You cannot do this by analysis, it has to be a test. It's not a straightforward thing. Frankly, I just see an alternative fuel getting to market. The cost alone to certify would be prohibitive.

Tony D

Editor Note: *Swift Fuel has STC for about 60% of engines at a lifetime cost of \$100.*

RE: A Voltage Review - Towards the end you said, "You have enough on your plate without needing to make a manual gear extension, followed by a no-flap landing to an unlit runway in a NORDO, unlit plane." This EXACT thing happened to me last November on a night cross country, thankfully after coming out of IMC. I had a panel upgrade completed about two weeks before with a G3X among other things. The new EIS was built in to the G3X and replaced all my other gauges. The shop had not programmed any of the colored arcs or limits or warnings on the EIS, so I had figured that out myself. One thing the shop (and I) had not programmed was low volts/amps cautions and warnings. Imagine my surprise when the autopilot turned off suddenly, followed by the #1 Nav/comm, then the lights, then the #2Nav/comm, etc. My alternator had jammed completely stuck and the belt had shredded. I flew along blissfully unaware until the battery was dead. Thankfully, I was able to land safely. Unfortunately, I completely forgot about the handheld radio I had bought a few days prior because I wasn't used to having one.

As always, it's been a pleasure reading The Mooney Flyer.

David M





So, You've Lost an Engine, What now?

The Pratt & Whitney engine that failed on a United 777 got me thinking what we should do when we lose an engine during cruise. We only have one engine, so it is very significant how we respond. It's another test of your pilot certificate and critical to additional flights for you and your passengers.

Here is a simple procedure for a failed engine:

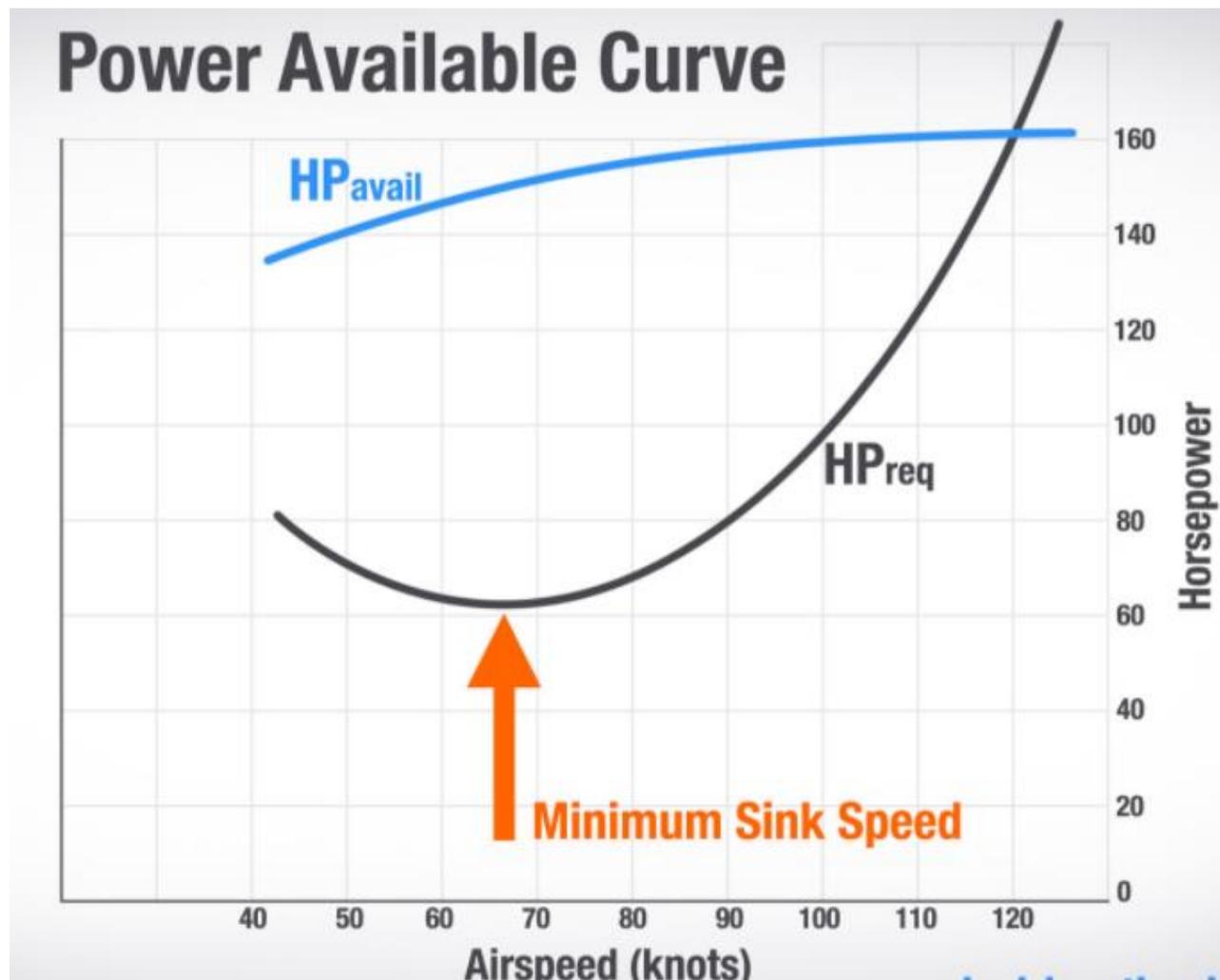
- Aviate, Aviate, Aviate.
- If you changed something just before failure, change it back.
- Look for an airport. If none, look for a suitable landing zone (ForeFlight is amazing for this). Turn towards your landing area.
- Slow to either Best Glide or Time Aloft airspeed (more on this below).
- Communicate with ATC and Set Transponder to 7700
- Go through engine restart, unless it's obvious that it won't restart.

It's probably wise to setup Best Glide airspeed as it will enable you to glide the farthest. Two key things to remember are wind speed/direction and your current gross weight. The Best Glide speed in your POH is airspeed at Gross Weight. Keep this in mind if you are lighter, Best Glide will be slower/less. I use a 4 knot decrease in Best Glide for every 300lbs under gross weight. Your mileage may vary.

My M20S Eagle glides at about 10:1. That's an easy computation in my head regarding how far I can glide in a no wind situation. I utilize ForeFlight to show me the actual distances which are based on terrain height and winds aloft, which is amazingly valuable. Without Foreflight or another EFB that shows gliding distances, the next best thing is to select Nearest Airport on your

GPS. Failing both options, be aware of airports as you pass them for consideration, should you need them later.

If you want to stay in the air for the longest period of time, then consider Time Aloft airspeed. This is not in my POH and I doubt it is in yours. It is also known as Minimum Sink airspeed. Minimum sink is always slower than best glide, because it's the point on the power required curve where the least amount of power is required. Keep in mind, though, you are going quite a bit slower than your best glide speed, and that can significantly impact your glide range. Unless you have a good landing site below you, and you're trying to maximize your time aloft to troubleshoot the engine and talk to ATC, minimum sink isn't necessarily going to be as helpful as sticking with best glide.



When able, you should communicate with ATC. But what frequency should you use? I like to use Flight Following on longer cross-country flights. Among other advantages, I am already talking to ATC, so if I have an emergency, I'm all set. If you are not taking with ATC, switch to 121.5 and proceed from there.

Landing at an Airport

Now it's time to land on either an airport or a suitable landing zone. For an airport, circle the airport until you are about 1000' AGL, and then enter a downwind. Pick your touchdown spot. If the runway length is sufficient, I recommend selecting a spot slightly less than 1/3 of the runway. This is a good way to help avoid landing short. You should be at your normal pattern speeds now. On final, you make your adjustments. As you know, if the landing spot is not moving on your windscreen, you are setup. If it's moving up your windscreen, you are going to land short unless you make an adjustment. And if it's moving down your windscreen, you are about to overshoot. In this situation, it's time to get your Mooney dirty with flaps, gear, speed brakes and slips. If you cannot completely get back to your desired touchdown, don't force your Mooney down. Don't drop your gear too soon or apply flaps too soon. Wait until you are relatively assured of making the runway.



Landing Other Than an Airport

Setup at 1000' AGL as you would for an airport, but in this case, say to yourself, "The Insurance company now owns my Mooney". Your main objective is to use the significant protection that the "cage" will offer and then, walk away. Remember to use the wings, the gear, and bottom of the fuselage to slow your impact. Our Mooneys will provide a fair amount of protection, up to about 9Gs. The goal is to touchdown at

the slowest groundspeed without stalling. **Look at these examples:** if you're flying at 50 MPH, the required stopping distance at a 9 G deceleration is about 9.4 feet. And if you're flying at 100 MPH, the required stopping distance at a 9 G deceleration is about 37.6 feet.

As for dropping the gear, it's too situational to recommend anything on this topic. But if you are landing on something "soft", consider leaving your gear up so that it doesn't bite into the surface and flip you around. If it's a relatively hard surface, putting the gear down might work.

The main thing to remember here is to fly your Mooney as far into the crash as you can. Land like your about to touchdown at O'Hare.

Low-Cost Method for Sealing Seeping Fuel Tanks Around Inspection Plates or Rivets

by Nat Ostroff



Recently I had the need to seal an aluminum marine fuel tank and was introduced to a product used by both civilians and the military for sealing leaking fuel tanks.

My 1981 M20K Rocket has had a staining inspection plate on the bottom of the right wing for a long time. It was not drippy but would leave the tell-tale blue stain after being filled. Also, several rivets on the top of the wing would show blue stains if the tank was left

full.

Not wanting to start a process that might escalate into a much bigger job, I opted to apply this unique sealing product to the inspection plate interface seam between the aircraft skin and the inspection plate. This is a space of about 1/16 of an inch.

The product is called **GLUVIT** and is available from Amazon and other sources. It is a two-part epoxy and is designed for sealing fuel tanks and aluminum boat hulls. It is not affected by avgas as it is used by the military for aircraft tank sealing. It sets up hard but flexible, so it won't crack under vibration conditions.

The process that I used was to empty the tank of all fuel, using the cabin drain valve. Then, allow the tank to remain empty for several days to clear any remaining residue from the inspection plate/aircraft skin interface. I used a dental pick to remove any old sealant from the space around the inspection plate to skin interface. This was done until I saw a shiny metal surface. Acetone was used to clean the area. The GLUVIT was mixed and applied using a small artist's brush. The GLUVIT has the viscosity of honey and sets up clear in about 24 hours. I also applied it to the staining top wing rivets.

The results are that with full fuel in the tank there is no blue stain either from the bottom inspection plate or the top rivets. It has resulted in a clean job with no cosmetic impact and a sealed tank.

I hope this can help fellow Mooney owners with a low-cost fix for those annoying blue stains. A quart of GLUVIT costs less than \$40.

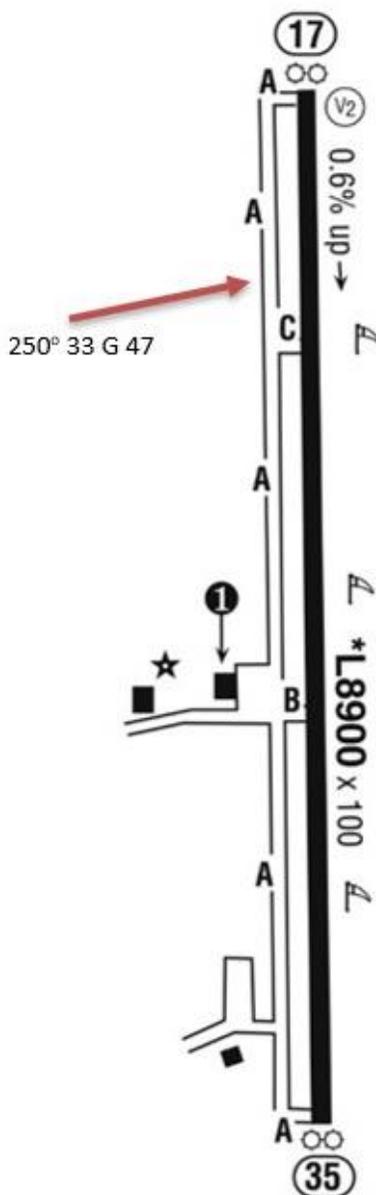
Crosswinds and Turbulence



Jim Price
Co-Editor

Don't Bet your Life on it!

On March 3, 2013, in the early afternoon, a Mooney Pilot and three passengers arrived at the [Angel Fire, New Mexico, airport \(AXX\)](#). They had been enjoying the local ski resort and it was time to return to their homes in the San Antonio, Texas area.



The automated weather observation system (AWOS) was reporting winds out of the west from 250 degrees at 33 knots gusting to 47 knots, visibility 10 miles, a clear sky, temperature 47 degrees Fahrenheit, dew point 17 degrees F, and a barometric pressure of 29.93 inches of mercury. The density altitude was calculated at 9,549 feet. (The north/south runway at Angel Fire is 8,900 feet long, and the airport elevation is 8,379 feet).

Airport manager, Harvey Wright said, "We had all kinds of warnings posted at the front desk, plus we questioned the pilot as to whether he really wanted to go in that weather."

However, the pilot indicated that he planned to fly and that the winds would not be a problem.

At about 1:20 pm, the pilot taxied his E model Mooney to Runway 17. An FBO employee relayed the current wind and altimeter to the pilot, who repeated the information.

When the Mooney was airborne, it had a significant crab angle into the wind, about 40 degrees right of the runway heading. The airplane rose and fell repeatedly as its wings rocked. Then the airplane's right wing rose rapidly. The airplane rolled left and descended inverted with the airplane's nose pointed straight down."

A witness driving by the airport reported that the Mooney was struggling and only reached an altitude of about 100 feet, hovering momentarily before the left wing dropped and the aircraft descended nose-first to the ground. There were no survivors.

Killed were the pilot, John Verhalen, 33; his sister, Sara Verhalen, 41; her daughter, Chloe Marie Jameson, 13; and John's girlfriend, Jennifer Warren, 26.

John Verhalen had 459 hours total flight time with 384 hours in type. His occupation was engineering. He had previously worked at Mooney Aircraft Co., and Boeing. At the time of the accident, he was employed by SyberJet.

An old copy of the airplane's weight and balance found in the wreckage was used to estimate weight and balance. Luggage was destroyed, but the NTSB estimated that it had weighed 60 pounds. With approximately half fuel, takeoff weight was calculated at 2,519 pounds, about 56 pounds below maximum. However, the center of gravity was computed slightly aft of the envelope.



FAA Type Certification Requirements: Maximum Demonstrated Crosswind

Every airplane type certificated by the FAA must first be flight tested to meet hundreds of airworthiness requirements.

One of those requirements is a demonstration of crosswind controllability, and more specifically, how the aerodynamics of the airplane allow pilots "with no exceptional skill or alertness" to safely take off and land in crosswind conditions.

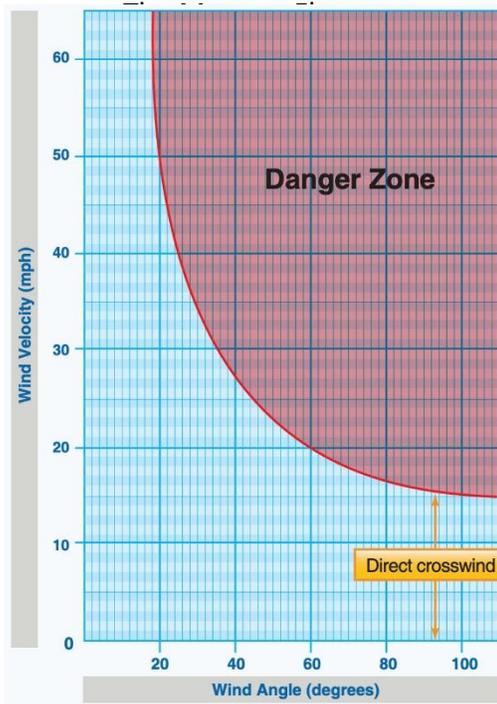
The test pilot must be able to control the airplane in 90-degree crosswinds *not less than* a velocity equal to 0.2 V_{so} , or the stalling speed of the aircraft in a landing configuration. That is a wind speed equal to at least 20% of the power-off landing configuration stalling speed.

Manufacturers can and often do, test aircraft at crosswind velocities *higher* than 0.2 V_{so} , but that's the minimum speed.

In addition to the 0.2 V_{so} limitation, "The airplane must be satisfactorily controllable in power-off landings at normal landing speed, without using brakes or engine power to maintain a straight path until the speed has decreased to at least 50 percent of the speed at touchdown." (FAA)



According to former Mooney engineering test pilot Bob Kromer, regarding crosswind landings, "I think you will find a common consensus of test-pilot opinion that most Mooneys can be operated in 90-degree crosswinds up to 15 knots with an acceptable level of pilot workload. Fifteen- to 20-knot winds can be handled but require a much higher level of pilot proficiency and skill in crosswind landing techniques. Twenty knots or above, you should consider finding another airport to land." Takeoffs might be slightly more forgiving, but this is a good guideline.



The FAA developed this chart to emphasize the hazards associated with intensifying crosswind conditions.

Welcome to the Mountains!

Angel Fire Airport is in a basin surrounded by mountainous terrain. According to the NTSB, "Mountains to the west and northwest of the airport have peaks between 10,470 and 13,160 feet.

Accident Weather

A weather study was compiled for the accident site. An upper air sound for 1400 mountain standard time (MST) depicted an unstable vertical environment, which would allow mixing of the wind on the lee side of the terrain. Winds as high as 55 knots could occasionally reach the surface. Satellite imagery at the time of the accident, recorded a large amount of standing lenticular clouds near all the mountainous terrain around the accident site. These clouds indicated the presence of a mountain wave environment. At 3:22 a.m. and 11:34 a.m., the National Weather Service issued wind advisories for the accident area that warned of a west-of-southwest wind between 25 and 35 miles per hour (mph) with gusts to 50 mph."



A weather model predicted a "turbulent mountain-wave environment, with low-level wind shear, updrafts and downdrafts, downslope winds, and an environment conducive for rotors."

There was no record of the pilot receiving a weather briefing. Airport manager Wright noted that no other flights had arrived or departed that day.

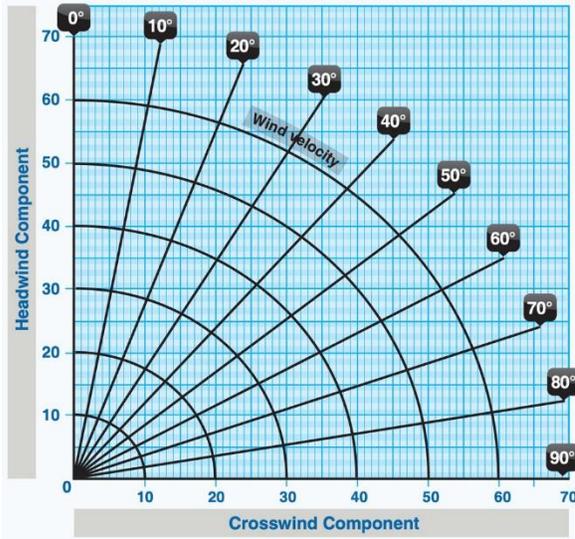
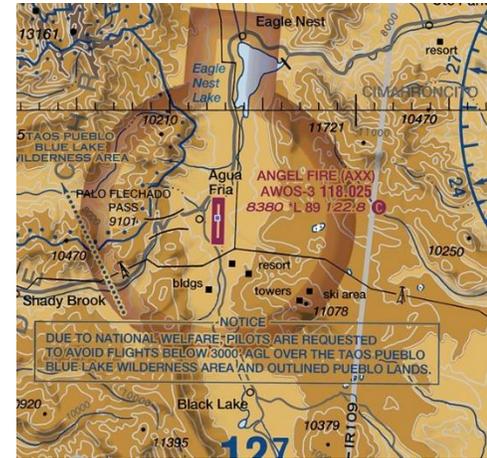
The NTSB determined that the probable cause was “the pilot’s loss of control while flying in a turbulent mountain-wave environment. Contributing to the accident was the pilot’s overconfidence in his ability to safely pilot the airplane in gusting wind conditions and his lack of experience operating in mountainous areas.”

Departing Angel Fire, you must gain altitude quickly or circle around. The mountains to the south are closer to the airport than those to the north. This might be a challenge for a heavy or overloaded aircraft.

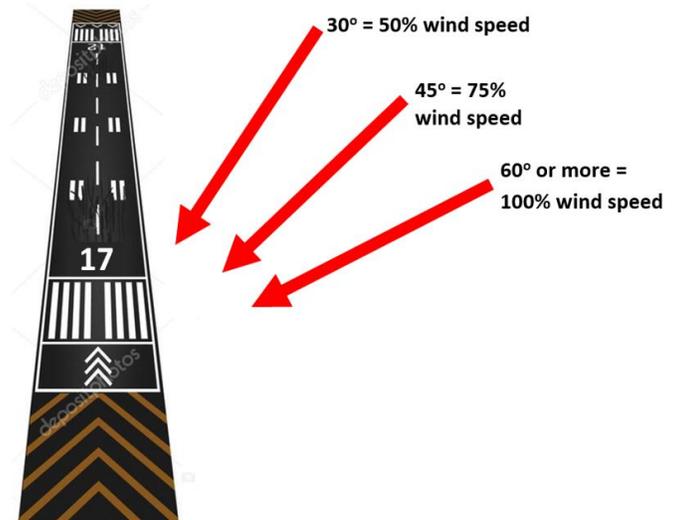
Wind can be merely uncomfortable, or disastrous. High winds in the mountains require an appreciation for the power of updrafts, downdrafts, wave action, shear, and rotors.

Twenty-five-plus knots in the mountains is far nastier than similar winds in the midlands and coastal plains. Flying early or late in the day may be a much better strategy than taking off in the middle of the day.

Many pilots use a wind chart to determine the crosswind component.



But what if a chart is not readily available? You can use the degree/percentage rules of thumb:



Yes, the degree/percentage rules of thumb are slightly conservative, but they will give you a good understanding of what the winds are about to do to you and your airplane.

It's all About Timing

METARs from the day of the accident show that a departure at 7 a.m. would have encountered winds of 120 degrees at 8 knots. At 6 p.m., winds were 200 degrees at 8 knots with a lower temperature, lower density altitude, and a far safer scenario.



What's Your Strategy?

Do you have a personal limit established for crosswinds? If you are new to your airplane, perhaps your crosswind limit is less than the crosswind tolerated by a test pilot or a Mooney owner with lots of experience.

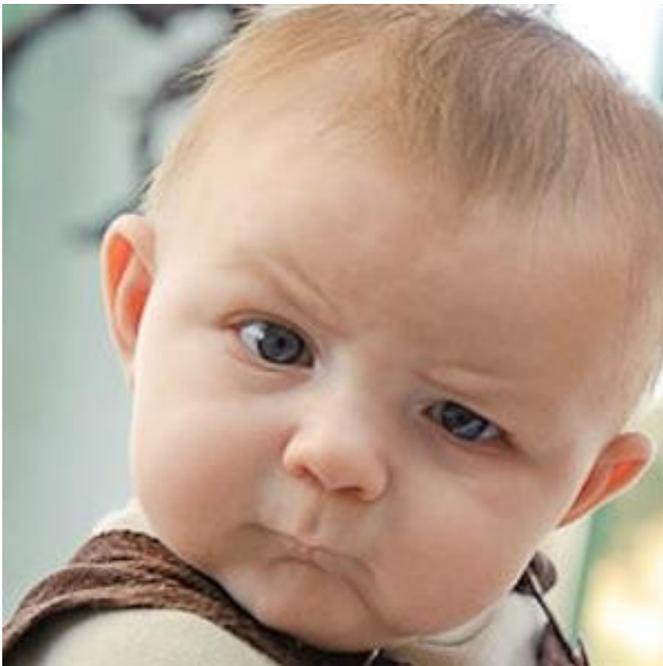


Additionally, you should bear in mind that flatland winds are a bit safer than a “turbulent mountain-wave environment, with low-level wind shear, updrafts and downdrafts, downslope winds, and rotors.”

No matter how experienced you are, remember, you are not paid to be a test pilot!



The Voices of Experience



If the local pilots and airport staff are questioning your intent to fly and looking at you like your head is mounted backwards, that is a red flag. Listen to the voices of experience. Your family will appreciate your caution and professionalism.

Cameras, Mounts, and Cables

by Richard Brown

Recording your flights does not have to be an expensive endeavor. You can spend hundreds on each camera if you want to buy GoPros, Sony Action Cams, Garmin VIRB, or the like. However, there are other options. Years ago, before I ever thought I would realize my dream to fly, I bought a GoPro Hero 3+. At the time, it was a lot of money. Now you can get them for about \$100. They are a good camera and I still use it inside the plane facing backwards to capture the cabin and audio. The main reason I use it, is its compatibility with the NflightCam cable that both records audio and charges at the same time. The cable is referenced later in this article. I will give you a short review of the four different cameras I have used, as well as the mounts I use and what you need to capture the audio from the radios.



The two biggest problems with action cams are short battery life and the price tag. If the camera is inside the plane, you can overcome the battery life issue by plugging it in to a USB outlet to keep it charged. Take manufacturer claims of battery life with a grain of salt. Also, keep in mind that turning the camera WiFi OFF will help extend the battery life.



I have not used the Garmin VIRB, Sony Action Cam, or any GoPro besides the Hero 3+. These data points are from internet searches. The Garmin VIRB proclaims a battery life of 3 hours and it will run you around \$300-500, depending on the model. The Sony Action Cam boasts a battery life of just under 2 hours and will run you around \$200-500, depending on the model. GoPro has several different models, all of which claim to have around 90 minutes of power and you will spend around \$200-500 per camera.

If you want just one camera, maybe \$200 isn't too much to spend. However, if you want one facing you and another looking forward from behind you to see the panel/controls, and another one (or two) outside capturing different angles, and maybe one (or two) inside the plane pointing out, you are now talking about 4-7 cameras and the price has jumped up into the AMU range. (*I assume everyone reading this knows what an AMU is, but in the event some of you are new to the game, it is an Aviation Monetary Unit where 1 AMU = \$1,000*).

You may have seen the GoPro knockoffs and wondered if they were any good and worth your money. I have tried a few. The recording quality is good and while the battery life on some is marginal, I did stumble on one that was excellent. The following are all cameras that I own and have used.

Cameras

- GoPro Hero 3+ – As I mentioned earlier, it is a good camera. The video quality is good, but the battery life is marginal. As an inside camera, it does well when plugged in and charging. It is good at capturing the audio.



- [Apeman Cameras](#) – This is a GoPro knock-off and the video quality is very good. They cost around \$90 at Amazon, but sometimes they are available in the \$50 range. Unlike the older GoPros they have a screen on the back and the camera comes with two batteries, a case, a remote to turn it off and on, and some accessories. If you have multiples, then the remote will start and stop all of them at the same time. If you have the camera outside, you can control it with the remote. But, once you start the plane's engine, there is too much interference and you will no longer be able to connect to it. The battery life is between 45-60 minutes. 
- [Dragon Touch 4K](#) – This is another GoPro knock-off. These appear to be identical to the Apeman Camera and the batteries are interchangeable between the two. They are \$50 at Amazon with special pricing from time to time around \$40. They come with two batteries, remote, accessories, charging port to charge 2 batteries at a time, but no case. The battery life is the same as the Apeman at 45-60 minutes and the video quality is good. 
- [Drift Ghost X](#) – I stumbled on this camera searching for better battery life. They boast 5 hours and while I have not tested it to that length, I do get more than four hours when the WiFi is off. That makes it an excellent outside the plane camera because I can just start it recording, climb in the plane, and know it is going to still be running when I land even after a four-hour leg. The list price on Amazon is \$100, but if you wait a month or two, you will see it for \$80-90. Another excellent feature of this camera is the rotating lens. You do not have to try and come up with an assortment of mounts to angle it just right for the perfect picture level. Just mount the camera and turn the lens until the white arrow is at the top. There is no screen on the camera, but you can easily connect it to your phone. When I set up the camera, I turn on the WiFi, connect to my phone, and make sure it is pointed where I want. Then I turn off the WiFi and press the record button. 



SD Cards

You will need an SD Card for each camera. I believe all the action cameras use Micro SD Cards. All the cameras I have used take Micro SD Cards. They come in various sizes and speeds. Be sure to check for any limitations on the maximum size the camera will recognize. Recording in 1080p, a 30-minute file from any of the above cameras is just under 4GB, so a 64GB card will record approximately 8 hours of video. Given how inexpensive memory cards are now, I prefer to go with SanDisk; I have never had problems with their cards. The [64 GB Ultra Micro SD](#) is fast enough to record video and is about \$12 a card. The [64 GB Extreme Micro SD](#) is a faster card and at about \$14, it is still a bargain. Keep in mind that if you are going to record in 4K it uses a lot of memory. If you are just watching the videos on a computer or uploading to YouTube, you likely won't notice the difference between 1080p and 4K.

Cables – Or How to Capture the Radios

If you want to have the audio from the radios on your video, you need a way to capture it. If you have an audio panel that will connect via Bluetooth to a phone or tablet, I think you can capture it that way, but I have not tried it. [NflightCam](#) makes several different cables that will connect to

either a camera or plug into a phone. It goes between your headset and the jack. I have been using it for 100+ hours of flight and there is no loss in the quality of transmission or reception of the radios. **A note about plugging the NflightCam cable into the aircraft power system.** NflightCam states that it will not work, however there is a way around it to make it work. If you plug it in and then try to start recording, it does not work. If you start the GoPro recording and then plug the cable into the camera, it will continue recording, pick up the audio, and charge the camera.

Mounts

Just like you can spend a lot of money on cameras, you can bury yourself in camera mounts. The mounts that use 3M double sided tape work well on a wing, vertical stabilizer, or other areas. If you are like me, I am nervous about how well they will stick and that someone will walk out in their backyard to find that they are the proud new owners of the camera that used to be attached to my plane. I have had one on the vertical stabilizer and it has remained in place even when coming downhill and seeing 180-185 mph IAS on the ASI.

My favorite mount outside the plane is the one I made from some old GoPro mount pieces and parts from Home Depot. It is made up of a 1/4-20 set screw, fender washers, neoprene washers (to act as a dampener and keep it from slipping), a lock washer, wing nut, and JB Weld.

- [1/4-20 Set Screw](#) - \$1.24 for a pack of two
- [2" Fender Washer](#) - \$1.18 for a pack of two
- [2" Neoprene Washer](#) - \$1.24 each
- [1/4 Lock Washer](#) - \$1.18 for pack of six
- [1/4-20 Wing Nut](#) - \$1.18 for pack of four
- [JB Weld](#) - \$6.98 for the easy-to-use style

Put some JB Weld on the set screw and screw it into the mount. Put a little more on one of the fender washers and attach it to the mount. It is not required but it ensures that the washer won't fall off the screw. Make sure you clean the exposed threads from any extra JB Weld. It is also a good idea to run the wing nut all the way down the threads while the JB Weld is wet. After that it is just a matter of which pieces you need to get the camera where you want it. Here are pictures of the mount and the camera attached to the tie-down.



For the GoPro that is mounted facing me, I use a handlebar mount attached to the center post. This doubles as a holder for my keys and my PLB lanyard with when parked in the hangar. 😊



I like having cameras inside and pointing out in front of the wings. They make for a great angle when taking off, landing, making turns in the pattern, as well as just switching between cameras throughout a flight. I use a [RAM Suction Mount](#) (\$14.99), [RAM Double Socket Arm](#) (\$14.49), and [RAM Ball Adapter ¼-20 Post](#) (\$9.49). This setup has the fewest pieces for less vibration. Some of the pieces are available on Amazon in addition to the RAM site.

Editing

Once you have your cameras all set up and recording, you will want to edit and produce the footage. There are several free and paid for programs. I have used [Shotcut](#) for a long time. It is free, has a little bit of a learning curve, but there are lots of YouTube videos on how to use it. It does not have a lot of bells and whistles, but you can produce some decent videos with it. I recently started using [HitFilm Express](#) which has both a free and paid for version. The free version offers just enough to produce good videos, but they try to entice you into purchasing the full version and that leaves you wanting more. The paid for version can do incredible things in editing, but there is a learning curve to it.

If you are like me, you will find that it takes longer than you want to edit and produce videos, leaving you with hours and hours of footage trapped on your computer. You may also find, like me, that it is great to be able to pull a picture from the footage and get a shot you would otherwise, never have captured. The shot to the right is one of my favorites. It was captured on short final to runway 24 at Fullerton, CA (KFUL), with the setting sun shining off the railroad tracks.



Short final to runway 24 at KFUL

Sample Videos

[This video](#) shows what the different angles look like (described above). It was before I found the Ghost cameras, so it also shows the video quality of the Dragon and Apeman cameras.

[This video](#) shows the quality of the Drift Ghost X. It is all at normal speed (and long), but you can just jump around in it. If you want to see some of the best footage, skip ahead to the 30-minute mark. The sun has set, there is a thin marine layer, and the lights from the numerous container ships anchored offshore are glowing up through the clouds.



Who Has the Right-of-Way?



If you are operating at a non-towered airport and you see one or more ultralights maneuvering to enter the pattern, who legally has the right-of-way? Legally, you and your Mooney have the right of way.

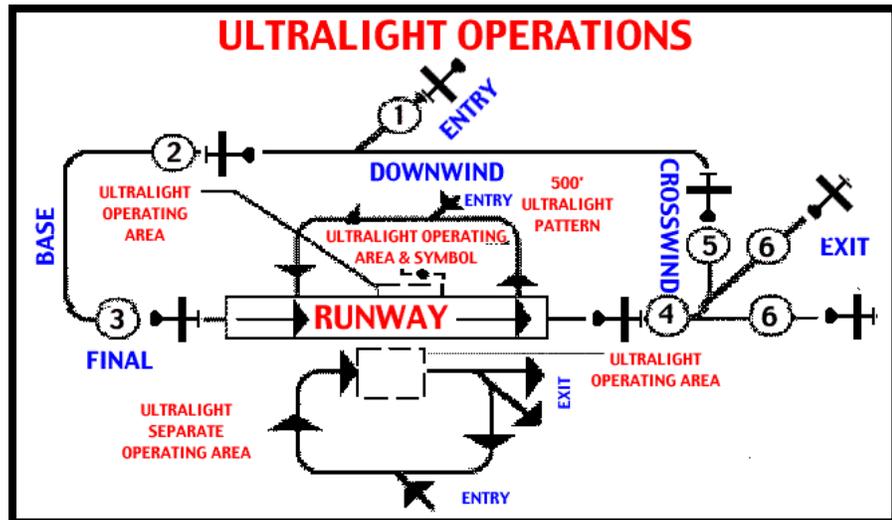
According to FAR Part 103

Ultralights generally fly a rectangular pattern, but it is 500 feet below and inside the standard pattern established for an airport. FAR Part 103 reads, “Each person operating an ultralight vehicle shall maintain vigilance so as to see and avoid aircraft and shall yield the right-of-way to all aircraft.”

Ultralight aircraft operate under the stricter limits of FAR Part 103, not Part 91, so the usual right-of-way rules regarding converging aircraft of different categories don't apply. The limits of Part 103 ensure that ultralight pilots don't create a hazard for people or property. One of those limits is yielding the right-of-way to all aircraft.

An ultralight vehicle:

- Weighs less than 155 lbs. (unpowered) or less than 254 lbs. (powered).
- Must have a fuel capacity of less than 5 U.S. gallons.
- Has a level flight top speed of less than 55 KCAS.
- Has a power-off stall speed below 24 KCAS.



It Might Look Like an Ultralight, but . . .

To be classified as an Ultralight, it must meet the weight and speed limitations of an ultralight, specified in the previous paragraph. If it doesn't, then it could be certified as, and operated as a Light Sport Aircraft (LSAs). Take for instance the E-LSA Antares USA Ranger weight-shift control trike (shown at the left).

So, even if the flying machine you're converging with is clearly an ultralight, and even if that means you legally have the right-of-way, don't assume that you'll get it. The ultralight pilot may not even see you. So, know the rules—but don't assume anything!



Do you fly like you drive? Is there a connection?

By Jerry Proctor, CFII MAPA SF



Recently, I was driving my stick shift Mini Cooper Convertible and I caught myself before I semi-rolled thru a stop sign. At that moment, the following thought struck me. Is there any correlation between driving skills and habits and flying skills and habits? Hummm!

Well, very unscientifically, I will state the following. There are at least correlations and here are a few examples.

When we were young, most of us wanted to learn how to drive. Many of us also wanted to fly. When we were still young, 14-16, we were trained and licensed to operate a mechanical vehicle – a car. One friend of mine did not yet have a driver’s license, so his Mom drove him to the airport so he could take flying lessons.

When learning to drive, like learning to fly, one must attend training. Obviously, flight training is much more intense. In both driving and flying, one must demonstrate to an examiner, one’s knowledge and skills. When I was 14 years old, I got my learner’s permit at my hometown of Deadwood, SD. It was November and the roads that day were solid snow and ice. I was driving a stick shift Volkswagen. As I was driving uphill on the icy Main Street, the examiner said, “OK son, now parallel park here.” Gulp! As in other stressful situations, you remember the event well, and gratefully, I passed the test.

You are probably thinking that clearly, there are not similarities between flying and driving.

There are things like taking a semiannual Flight Review that comes to mind. This is obviously a good thing in airplanes, and many of us have thought it would be a good idea for some ‘idiot’ drivers as well.





The complexity of flying versus driving shines bright. A fuel starvation on the highway, leaves one with a red face and maybe a tow charge. That is far different from a potential life or death experience in the plane.



So where am I going here? One day, I was in town, making a right turn onto a boulevard that had two lanes. I was also planning a left turn in about two blocks, so I slid over to the left lane, rather

than staying in the right lane and then clearing for traffic, turning on the blinker, and then moving to the left lane. I caught myself. I was not performing to standards. I was not driving properly, and this move would have flunked me on a driving exam. Was I safe, at that point? Yes, I was because there wasn't anyone in the other lane. But it still wasn't proper! I vowed not to slide to the other lane in the future.

How about you? Are you self-correcting when you drive? More so, are you self-critical and self-correcting as you fly?

For example, do you remind yourself that you should not rush the preflight? Or are you just calling out the items on the before starting checklist, rather than methodically touching each knob, switch or instrument? Do you counsel yourself for failing to follow the taxiway's yellow brick road because you think you can multitask and poke in GPS points while taxiing? Are you really listening to the taxi flow and do you perform your run-up in a New York Minute?

The list can go on, with such things as, when you are on takeoff roll, are you right on centerline? Is your climb out at a specific speed or is it just whatever speed you happen to hit? Think of your last flight. Would the examiner have given you a pink slip?



Here is a very key point that will help you:

Keep a diary or journal of your flying. I do. When I write down my slipups or mistakes, I know I am less likely to repeat them. How about you? I will wait for the Statutes of Limitations to expire and I will share some of my entries.

So, are you self-correcting when you drive? Are you self-correcting when you fly? How do you know?

You never make the same mistake twice. The second time you make it, it is no longer a mistake, it is a choice.

Be safe, Jerry



A Hot Engine Can Cause Fuel To Vaporize In The Injector Lines



Phil Corman
Co-Editor



Hot Starts in Continentals

This is a case where the POH is not always correct. Every engine is different and sometimes a different cold or hot starting procedure is warranted.

When my engine is cold, my Continental IO550 starts like a charm. The reason: A Continental tech told me at Oshkosh years ago that his engine loves fuel. He recommended running the high boost for 8-9 seconds, then a few twists on the throttle. He was right! Most of the time, it starts on the first turn.

Hot starts are another thing. The hot start technique in my POH technique didn't seem to work. Then I stumbled across Don Maxwell's technique and it works every time. My engine is fuel injected and the fuel lines vaporize the fuel (see above). With that in mind, here is Don's procedure: **1)** Mixture – IDLE CUTOFF. **2)** Low boost pump – ON, 20-30 seconds. (In Idle Cutoff, the fuel returns to the tank). **3)** Throttle – Normal starting position. **4)** Engage the ignition while moving the mixture from idle cutoff to rich at a moderate speed. **5)** When the fuel/air mixture is right, the engine will start. Don Maxwell claims this works every time, and it sure does for me.

Hope this helps.

A DEATH IN THE HANGAR

by Ray Reher

The inspirational words tugged at our hearts and left us misty eyed. But it's over. It can't be undone. Move on! Bury him; shell out a couple or three hundred plus, locally or online. A couple days later it's on your doorstep. You top up the charge, clean the leads and the box, and connect it up. Power is back. Throw away the Ambien and Zoloft. Life goes on.

But it can happen anywhere. You stop for gas at the Cheapsville Airport.

Click Nothing! Click ... Click. This time the eulogy is more like an uninterrupted string of four-letter words until you run out of the classics and make up some new ones. Now what? Anybody around? Is Guber on duty? Do you have tools? Where to get a battery that fits your plane? Stay overnight or two or have the wife or hubby drive to pick you up? Miss a day or two of work? Rent a car? Now you are digging in the trash bag for your Zoloft and digging even deeper into your wallet. This time, how much does that few hundred bucks plus battery cost? Did you ever get to your destination?

It's not that hard to get over death in the hangar, but death on the road is another story. Preemptive replacement is obviously a good idea, but how long should a battery last, and how do you know when it's about to give up the ghost? That's what this is about: How to take care of your starting buddy, and when to bury it and move on.

EVEN THE GOOD DIE YOUNG

Aircraft batteries are designed to last more than a few years, if they are kept in a constant fully charged state, and always at or below a maximum electrolyte temperature of 77 degrees F. Yeah, like that's going to happen. The problem is that batteries are basically suicidal. When not used, they tend to lose about 1% of their charge per day. The lower the charge, the lonelier the lead sulfate molecules become. They look for a friend and attach to the plates, filming them over. Capacity, or available power is basically determined by the amount of lead that is exposed to the electrolyte. Sulfation, the number one battery killer, interferes with that exposure, and the ability of the plates to cleanly react with the solution. If this coating becomes thick, it can permanently block the plates, reducing that ability to an unusable level. The coating may also break off in chunks, either during the charging cycle or from vibration, accumulating sludge at the bottom of the case to a point where buildup shorts out the plates. Charging the battery can bring at least some of the lead sulfate film back into solution. The more these molecules are kept in solution and off the lead plates, the longer the battery life. Thus, a plane seldom flown, is a hit man aiming for the battery.

Don't ever let your battery get close to fully discharged. That will significantly reduce its life.

I'M MELTING! I'M MELTING!

Lead-acid batteries are rated at an electrolyte temperature of 77°F (25°C). A lower operating temperature will decrease the capacity by about 0.5% per degree F below 77°F. However, this has little effect on battery life. In general, cold = good and hot = bad. A higher temperature, which is anything above 77°F, increases the chemical activity, raising the capacity. But on the downside, higher temperatures increase the discharge rate, and most importantly, shorten the life of the battery. The technical data is consistent across a wide variety of plentiful sources. Opinions vary of course, only because everybody has one. Technician opinions on aircraft battery life range from 5 to 8 years, while some claim 10 to 12 years. The most popular opinion seems to be 7 or 8 years for maximum life in perfect conditions. Manufacturers just won't make commitments or comment on expected life. Gill recommends that their lead acid battery be replaced between 2 ½ and 3 years and 5 – 6 for a sealed battery. However, the effect of temperature is definitive and significant. Using historical monthly average temperatures and equations and charts provided by the Institute of Electrical and Electronics Engineers (IEEE), the approximate temperature effects on the lifespan of lead-acid batteries can be calculated. Let's take the middle of the road, and say you think you have an 8-year battery. If you live in Phoenix, Arizona temperatures, your 8-year battery is now a 5.9-year battery. Throw an extra 5 degrees onto the averages for being in a hangar (pretty conservative) and recalculate. Now you have a 5.1-year battery. If your battery is in the engine compartment, it will get very hot when you fly, so subtract some life expectancy because of this added heat. Do not forget, this is based on the fact that you kept it in a perfect fully charged state 24/7.



Note: Speaking of opinions, I actually read where a guy periodically drops his battery from 9 inches onto a hard surface to knock off the sulfation. Darwin was taking a nap.

We're Here to Pump You UP!



Considering the sulfation process, charge is critical. A battery left to discharge below the 50% level is on the fast-track way to Hospice Care. However, overcharging can be just as bad. Aviation batteries are a different animal, mainly because of size and weight limitations. To get the cranking amps out of an aviation battery, they use a higher specific gravity (stronger/hotter) fluid. In the simplest terms, charging applies voltage to the battery that is above what the battery is producing, reversing the chemical action that produced the original electricity. If you charge a battery at a faster rate and higher capacity than it can accept, the electrolytes will vaporize and lead dioxide will flake from the plates, causing damage. Sealed batteries have vent valves, so are not exempt from this vaporization.

Car Chargers and Undercharging

Car chargers put your aviation battery on death row because they charge at the faster rate and higher capacity. On the other hand, if your battery is repeatedly undercharged, it will lose its ability to accept a full charge. Charging is complicated.

BatteryMinder

A good aircraft battery charger like the **BatteryMinder**, operates in phases. It begins with a constant current charge (at a rate that will not overheat) to restore a majority of the capacity. It then shifts gears to a lower voltage to top off the charge slowly and safely. Finally, a float voltage (very slightly above the battery's full rested voltage) is applied to keep the battery at max capacity, kicking those pesky lead sulfate molecules off the plates and back into solution. One of the reasons the process is so complicated, is that batteries are overly sensitive to charge voltage, and required voltage rates vary with temperature (colder more, and hotter less). A small amount over the float voltage for an extended length of time can ruin a battery. A good charger compensates for temperature, adjusting the charge voltage during the process. The bottom line is that using a cheap single-phase charger, or one designed for another type of battery, can promote "batticide".



Extra Points

1. Do what you have to, to keep the fluid level of your flooded battery above the plates. Exposed plates are permanently damaged, and capacity is permanently reduced.
2. When you top up the battery, add distilled water only. Adding additional acid will kill it within days.
3. Using automotive electrolyte to activate a flooded cell battery will ruin it.
4. Just because your aircraft voltmeter reads 12.8, this does not mean your battery will produce acceptable cranking amps, a reasonable discharge rate, or receive a full charge. As your battery gets closer to whatever you decided for a replacement date, you may want to take it in for a capacity test. You just can't see what's going on inside the battery.
5. Starting your plane takes a lot of amps and gives the battery a real punch in the gut. Depending on the condition and charge state of the battery, how often you fly and your aircraft's electrical system, it can take up to two hours of flight time to recover full capacity. If you usually fly short, infrequent flights, in between those flights, keep your battery connected to a **BatteryMinder**.

I realize that this article would probably cause an electrical engineer to choke and spray coffee through his nose, but I think it makes a point. Joe Bob Billy might get eight years out of his batteries, but Harvey Knucklefutz had one that died in two. The point is, in the words of Dirty Harry, "DO YOU FEEL LUCKY? WELL, DO YOU?"



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



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

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

For more details, visit: www.WisconsinAviation.com or www.JaegerAviation.com

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

Wisconsin Aviation offers a complete line of general aviation services including air charter, aircraft maintenance, avionics repair

and installation, flight training and aircraft rental, aircraft management, aircraft brokerage, and fueling services. The corporation has locations in Madison, Watertown, and Juneau, Wisconsin.

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





Replacing Lightbulbs on Moritz Gauges

by James Barth

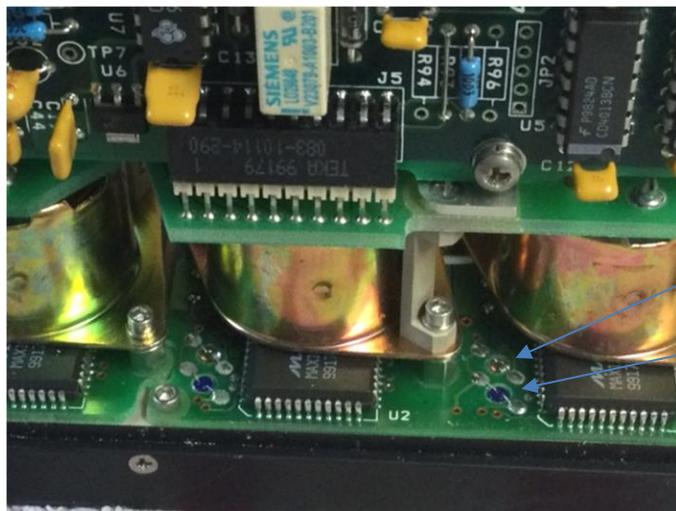
It is hard to get service on old Moritz gauges. Many times, all we need is to change one of the two types of lightbulbs, background and dimmer. This article will show you how to do just that for pennies. The clear bulbs cost less than 50 cents each, so order 20 for reserve. The blue bulbs cost about \$2.00 each. The digital portion of the gauge will appear blank if the clear bulbs are burnt out and for less than 50 cents, they can be brought back to life.



Here is the Moritz gauge. The style and features vary somewhat depending on the year the M20 was built. It uses the same harness for the Ovation and Eagle. The lightbulbs are also the same.



Remove the 4 perimeter screws. This voids the warranty, but don't worry. The five year warranty expired long ago and Moritz has ceased operations.



You do not have to remove the face, but you should identify which bulbs need replacing before opening the unit.

This clear bulb is the backlight. Without this, the display is blank.

This is the blue 24v dimmer bulb.

Each digital display has a clear backlight bulb. Do not supply power to these bulbs as polarity becomes important.



This unit can have the vacuum and fuel flow interchanged, but the harness is the same, as are the bulbs.



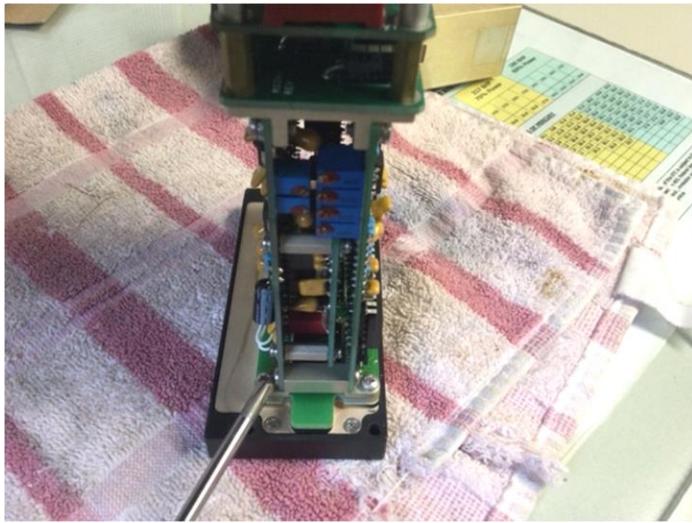
Remove the 4 outer/corner screws. Do not remove the others.



Here is the cover removed



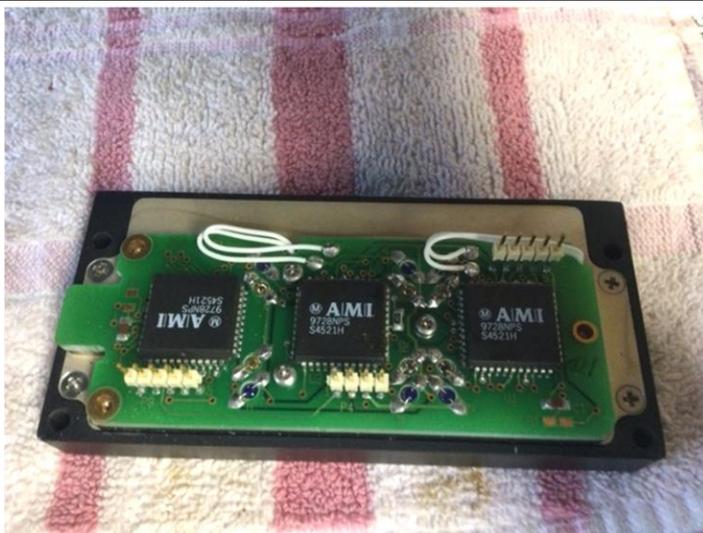
Remove this screw.



Remove both the left and right screw, shown here.

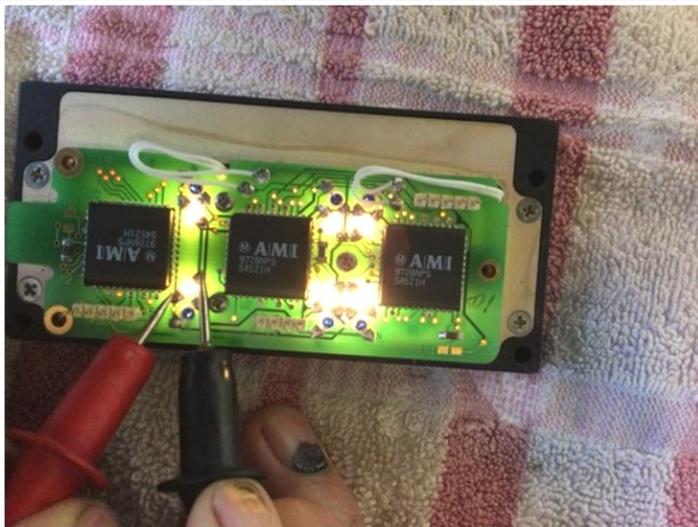


Shown here is the front face separated, (unplug the face). Note the alignment to reconnect the face. Unlike the other unit, you must remove the face to get at the bulbs.





This is a DC power supply. The clear bulbs are 5v DC and the blue bulbs are 24v DC. Don't oversupply the clear bulbs or you will ruin everything.



Lighting the bulbs. They are in parallel so all bulbs will illuminate.



#680 bulb box and sample clear (backlight) bulb



A closer picture of the bulb



Using a dental pick and light soldering pencil . . .



. . . get the dental pick under the lead.



To avoid overheating the board, you should de-solder quickly.



Cut it to length and tin the lead. Then reassemble the units.

The blue bulb (Part #6838B) (pictured below) can be purchased at BulbTown

(<https://www.bulbtown.com/SearchResults.asp?Search=6838b>)

TERMINAL BASE

Bulb Town



Wire Terminal Base

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The clear bulb (Part #680) can be found at:

https://www.bulbtown.com/680_Miniature_Bulb_Wire_Terminal_Base_p/680.htm

Go light your Maritz gauges for a few pennies and 1-2 hours. Hope this helps.



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Mooney M20J Facts

Found on MooneySpace

On a simple 4-cylinder engine, the Mooney squeezes out quite a bang for the buck. The following compares the 201 model's comfort, load, performance, efficiency and safety to other aircraft. Enjoy!

Comfort

One common misconception is that the Mooney ain't the roomiest plane around. People have said that the cabin feels cramped. Despite that claim, the Mooney is still bigger than most four-seater planes.



Check out this Cabin Comparison:

Aircraft	Cabin Width	Cabin Height
Mooney 201	43.5"	44.5"
Beechcraft V35 Bonanza	42.0"	50.0"
Cessna 182	42.0"	48.0"
Piper Arrow	41.0"	45.0"

As you can see, the Mooney has the widest cabin among all of these aircraft. But it also happens to have the shortest cabin height, which is probably why it has the reputation for being somewhat cramped inside. Nevertheless, it's a reputation that's hardly deserved.

Utility

Let's take a look at the load-hauling capabilities of various airplanes:

Aircraft	Useful Load	Payload w/Full Fuel
Beechcraft V35 Bonanza	1270 lbs.	826 lbs.
Mooney 201	1100 lbs.	716 lbs.
Cessna 182	1219 lbs.	691 lbs.
Piper Arrow	960 lbs.	572 lbs.

Ok, compared to the Bonanza, when it comes to hauling a load, the Mooney is obviously not as good. But if you look closer, you'll see that the Mooney 201 can actually haul more. The funny thing about the Bonanza is that if you take off with full fuel and four passengers, as you burn off fuel, the center of gravity moves aft of the limit! The Bonanza has a very narrow CG range. So, unless your Bonanza is equipped for in-flight refueling, the Mooney ends up being able to haul a bigger load farther. And when the tanks are topped off, the Mooney even beats the Cessna 182 in terms of the crap you can carry. Not too shabby for a "smaller" plane.

Performance and Efficiency

Since we are talking about topping off tanks, let's get down to the real heart of the Mooney's superiority. Regardless of what the factory claims (169 knots), my 1977 Mooney 201 cruises at 160 KTAS at 8000' at 70% power. This is while sipping a mere 10.5 gallons per hour of 100LL. Let's take a look at performance figures for various aircraft.

**All figures represent 75% power, leaned to best economy, VFR reserve.
The trip cost is calculated with a fuel price of \$2.50 per gallon:**

Aircraft	HP	Climb Rate	Usable Fuel	Cruise Speed / Fuel Consumption	Endurance / Range	Mi. per Gallon / 500nm Trip Cost
Mooney 201	200	1030 fpm	64 gal	160 kts / 10.5 gph	5:35 / 895 nm	15.2 / \$82
Piper Arrow	200	831 fpm	72 gal	137 kts / 10.5 gph	6:20 / 870 nm	13.0 / \$96
Beechcraft V35 Bonanza	260	1150 fpm	74 gal	160 kts / 14.0 gph	4:45 / 765 nm	11.4 / \$109
Cessna 182	230	924 fpm	88 gal	140 kts / 13.5 gph	6:00 / 842 nm	10.4 / \$121

As you can see, in the performance and efficiency category, the Mooney is flying circles around its competition. The Mooney literally covers more distance in less time using less fuel! Why is this so? How does a Mooney manage to squeeze out that kind of performance from just a 200 hp four-banger? It all comes down to design. The Mooney is one of the cleanest planes out there (pre-composite era, of course). The 201 cowl and aerodynamic cleanup was a major accomplishment on the part of Roy LoPresti and Mooney.

Here's a great comparison of various lightplanes and their respective dragginess:

Parasite Drag Coefficients & Flat Plate Area

Aircraft	CDP	Flat Plate Area (sq. ft.)
Mooney 201	0.017	2.81
Beech Bonanza	0.019	3.47
Piper Arrow	0.027	4.64
Cessna 182	0.031	5.27
Beech Sierra	0.034	5.02
Piper Warrior	0.034	5.83
Cessna 172	0.036	6.25
Cessna 152	0.038	6.14
Beech Skipper	0.049	6.36
Piper Tomahawk	0.054	6.64

Handling

The Mooney's handling is, in a word, impeccable. With control rods all around, the plane responds immediately to the slightest input from the pilot. Yet when you trim the plane up, it flies completely hands-off! You really don't need an autopilot, (although it's irreplaceable for IFR flight).

Also, despite what people say, Mooneys are not hard to land, and they're not difficult to slow down. If you stay ahead of the aircraft and plan your descents and power changes, it's trivial. Speed brakes definitely help pilots descend more quickly without having to chop power, (although there's still quite a bit of debate over whether or not shock cooling is really a factor), or pick up excessive speed, (although the yellow arc and redline in my 201 are very liberal). However, I don't have speed brakes and I don't feel like I need them. Still, I'm sure any Mooney pilot will tell you that the Mooney really separates the good from the bad, in terms of the pilot at the controls.

Safety

When you address the issue of safety, the Mooney 201 is one of the safest planes in the sky according to the statistics. The Mooney's steel tube rollbar cabin frame provides exceptional structural integrity. I have read countless articles and have seen photos that provide evidence of this. People have walked away from crashes in Mooneys where the cabin remained intact, saving their lives. In most other aircraft it would not have ended that way.

I've also heard people talking about the Lancair's strength, and how the test rig broke before the wing spars did. Yeah, yeah, whatever. Here's a little-known fact: The same thing happened at Mooney. Mooney factory engineers broke a static test fixture at 9.3 Gs while trying a destructive test on the J model wing. Anyway, you're not going to break a Mooney!

So, there you have it. That's just a handful of the reasons why I love owning a Mooney. Sure, there are quirks, like with any other aircraft, but at this point in my life, (until I can afford a TBM-700, Meridian, or Pilatus), the Mooney is perfect for me.





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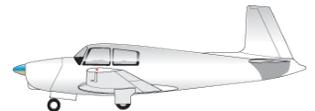
Call: 707 263-0462 Cell: 707 272-8638

www.loewensmooneysalvage.com paulloewen98@gmail.com

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

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

Mooney Maintenance



Visit our Website for all kinds of maintenance resources

The Mooney Flyer
The Magazine for the Mooney Community

Click here

Click here

Download Mooney's 100 Hour Inspection Guide

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

Click here

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

Click here



Ask the Top Gun



Tom Rouch

Founder of Top Gun Aviation, Stockton, California



Send your questions for Tom to TheMooneyFlyer@gmail.com

Dear Tom,

Question: First of all, thank you very much for your solutions to our questions every month. As a new owner, I find it very valuable.

My question is, "From your experience, what are the most overlooked maintenance issues you have found over the years?" I ask, because I want to ensure that I'm aware of them and keep an eye on them.

Answer: It would be difficult to try and list items as each owner's flying needs are different. What I will comment on in general is that many owners get an Annual inspection done but do nothing during the year, especially those that fly over 100 hours a year. There are many items required at 100 hrs., that don't get done, especially lubrication. For example, there was a flap rod end that broke in flight causing one flap to go up while the other stayed down. It was caused by the rusted rod end breaking. The one thing different on the Mooney, against most other aircraft is, that all the flight controls are manually operated with rods and bearing, while most other aircraft use wire cable control systems.

This gives the Mooney very positive controls but also requires much more lubrication. Another item is checking tire pressures. This is very much abused/neglected and increases tire wear.



To summarize, I would suggest that owners really research mandatory and recommended inspection and lubrication requirements, especially the lube. Most lube items an owner can do. As a shop owner, I have a special view of how maintenance should be done and of course, I am pretty much by the book, which of course gives me more business. However, it is more expense for an owner, but I do have to say the "paper book" annuals probably cost me more heartburn than anything. We will get an airplane in

that we have never seen and while going through the logs, we can see that for years, it has only had "minimum" inspections. Then, of course, we find items ignored for years and come up with an overwhelming list of items to be repaired. I know the world will not change and we have more work that we can handle, but I suggest you owners really review how you care for your plane. I want to add that as a shop, we have been having a hard time finding and keeping A & Ps.

Top Gun Aviation



Specializing in Mooney and Cirrus

(209) 983-8082

For Service and Maintenance, ask for Mark or Tom

FAX: (209) 983-8084

6100 S. Lindbergh St., Stockton, CA 95206

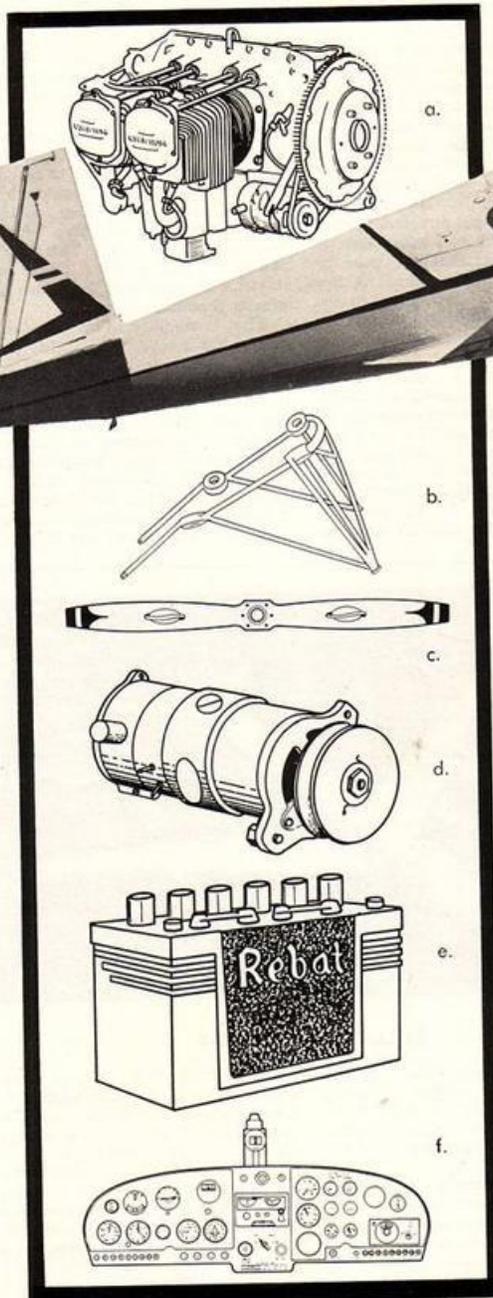
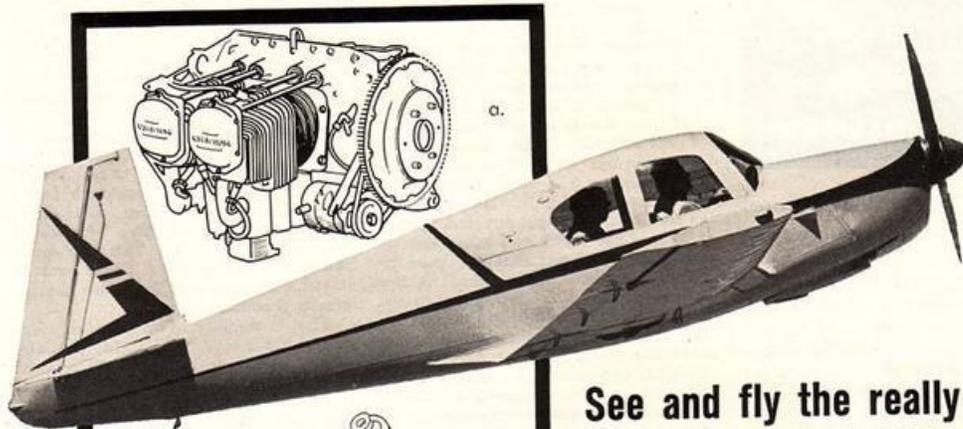
or visit our website at www.topgunaviation.net



Avionics Repair and Installation Services now available on site thru J&R Electronics

OUT IN FRONT!

... in design ... in performance ... in equipment



See and fly the really new MOONEY MARK 20A

... the result of advanced engineering combined with superior features and quality standard equipment.

Features engineered into EVERY Mooney Mark 20A make it the most exciting, sweetest performing 4-place plane on the market today. Compare EVERYTHING ... detail for detail and discover the many advantages of flying a Mooney Mark 20A. Standard equipment includes:

- a. 180 h.p. high compression Lycoming engine ... uses less gas per h.p. hour.
- b. Dynafocal engine mount means smoother engine operation, less vibration, longer engine life and a more comfortable ride.
- c. McCauley propeller for greater smoothness of operation.
- d. 35 amp generator for today's electronic accessories.
- e. 33 amp battery to provide extra current for electrical loads.
- f. Shock-mounted instrument panel ... designed for easy, accurate reading plus beauty and utility.

When you see and fly the Mooney Mark 20A, be prepared to want one! It's the super companion model of the Mark 20, today's economy champion.

Write today for the name of your distributor.

MOONEY AIRCRAFT, INC.
KERRVILLE, TEXAS



Have you
HEARD?



SayWeather automated airport weather advisories now available on ForeFlight

MARCH 1, 2021 Airports that have installed [SayWeather](#) systems can now make METARs for their airports accessible through ForeFlight.

The completion of a collaborative effort between Connectsix, which makes SayWeather, and [ForeFlight](#) means that SayWeather METARs can now be accessed through ForeFlight's "airport view," according to company officials.

SayWeather is an automated weather reporting system that retrieves weather from an on-airport solar-powered weather station and provides that information via an AWOS-like advisory over the airport's UNICOM frequency. In flight, the pilot keys their microphone four times and SayWeather responds with an audio advisory that includes wind speed, wind direction, gusts, temperature, dew point, and altimeter setting.

SayWeather™

is now available on



ForeFlight

A Boeing Company

When flight planning, ForeFlight shows airport METARs that include SayWeather advisory information along with added text for density altitude and humidity.

ForeFlight METARs for SayWeather PRO+ equipped airports will provide additional information if optional sensors are installed. This can include visibility, sky condition, cloud height and present weather (precipitation).

METARs from SayWeather-equipped airports are updated on ForeFlight several times per hour so pilots are always assured of seeing current, accurate surface conditions. Pilots don't need to rely on a distant AWOS, which could be reporting conditions that don't match those at the destination-airport.

When compared to an AWOS, typically costing well over \$100,000 to procure and install, SayWeather is an affordable alternative for small municipal and private airports and heliports, with complete systems starting at \$5,245.

Connectsix is offering internet weather publishing, including connectivity to ForeFlight, free to SayWeather-equipped airports through the end of the 2021. For pilots looking for the iOS ForeFlight app, it is available to users starting at \$99.99 for a year subscription.

For instance, Mogollon Airpark (AZ82), a private airport that utilizes the SayWeather system, now reports METARs on ForeFlight.

AOPA Calls for Standardization of GA Parking Labels



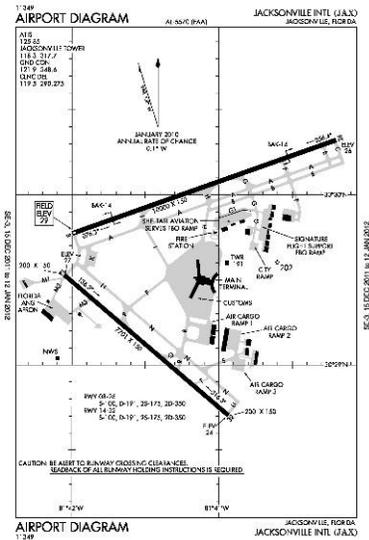
The Aircraft Owners and Pilots Association (AOPA) is calling for a standardized set of airport diagram labels for general aviation aircraft parking. According to the organization, it found 30 different terms for the same ramp types when reviewing airport diagrams for airports in Southern California alone. Standardizing parking area terms would help pilots identify parking options and assist with preflight planning along with promoting transparency.

AOPA is recommending the use of three parking-area terms and definitions:

- **FBO Ramp:** An apron where itinerant general aviation operators can park their aircraft and expect to have access to traditional FBO services subject to terms and conditions.
- **GA Transient Ramp:** An apron where itinerant general aviation operators can park their aircraft without FBO services and subject to terms and conditions.
- **GA Tenant Ramp:** An area designated for parking of based general aviation aircraft, i.e., tiedown area.

AOPA's proposal is currently supported by a group of 300 pilot and aviation groups from across the country.

More Airport Diagrams on the Horizon



A few uncontrolled airports like Casa Grande, AZ (KCGZ) and Paso Robles, CA (KPRB) have an FAA government airport diagram. However, many airports were skipped by the FAA airport diagram program. So, for most uncontrolled airports, you will need a Jeppesen subscription to view a detailed diagram. ForeFlight also produces an airport diagram, but many of these lack details, such as taxiway designations, etc.

That is about to change. The FAA plans to expand the number of airports required to provide an airport diagram from about 700 today, to nearly 3,000.



ACR's Bivy Stick

The Bivy works with your smartphone to offer all the benefits of a GPS unit and satellite two-way communicator. The 100 gram Bivy Stick offers marine, aviation and outdoor enthusiasts an affordable solution to send SMS messages, track and share location information, access GPS maps, view live weather forecasts and initiate a distress call in an emergency. Offering a more flexible pricing structure than similar products, users can pay for only the months they use it, with no annual contract or activation fee required.

PRICING PLANS

- Basic - \$17.99 - 20 Credits
- Plus - \$39.99 - 100 Credits
- Unlimited - \$49.99 - Unlimited Credits
- Overage - \$0.50/Credit

No hidden fees or contract. All plans are active for 30 days.

When you activate your Bivy Stick, you are given credits to use. Each credit is basically one action of the Bivy Stick. 1 credit = 1 message, or 1 location share, or 1 weather report, or 1 hour of tracking. Preset Check-In messages, however, are unlimited and free. Your credits are valid for as long as your Bivy Stick is active. If you use all credits and are way off-the-grid out of service, your device will still work and you will be charged \$0.50 per additional credit used. If you do not use all of your credits by the end of 30 days, and you pay the monthly base plan to keep the device active, all unused credits will rollover and are available to use later.

[CLICK HERE FOR MORE INFORMATION](#)

Did you have COVID-19? If so, how will it affect your next visit to the Aviation Medical Examiner?



The answers are in a new memo from the [FAA](#) that includes guidance for AMEs regarding pilots and air traffic controllers who had COVID-19.

The March 26, 2021, [memo](#) notes that “it is important to adequately evaluate and track the health of airmen and Air Traffic Control Specialists (ATCS) who have disclosed a history of COVID-19 infection for sequelae that may affect their ability to perform safety-sensitive functions.” Sequelae is an after effect of a disease, condition, or injury.

The memo notes that for people who are fully recovered — who have no residual symptoms or clinical findings — the AME can issue a medical certificate.

The AME also can issue a medical for pilots who are fully recovered following a prolonged case of COVID, as well as pilots who were hospitalized with COVID, **as long as they were not admitted to intensive care.**

In each of the cases where pilots are recovered from COVID, **the AME must provide details about the length of stay in the hospital and treatments given.**

If a pilot or ATC specialist was diagnosed with COVID and was admitted to the intensive care unit, the AME must defer the medical to FAA doctors. The FAA will request additional information, including from the hospital and treating physicians. The FAA will then determine whether to issue the airman medical certificate or whether a special issuance or denial is indicated.

AMEs also must defer medicals to pilots who are experiencing ongoing residual signs or symptoms of confirmed COVID-19, which “may include but are not limited to cardiovascular dysfunction, respiratory abnormalities, kidney injury, neurological dysfunction, psychiatric conditions (e.g., depression, anxiety, moodiness), or symptoms such as fatigue, shortness of breath, cough, arthralgia, or chest pain.”

This guidance allows AMEs to issue medical certificates for most pilots and controllers who have had COVID-19, requiring deferral in only the most severe cases.



Mooney

Events

AROUND THE WORLD

	<p>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</p> <p>May 8: Sebring (KSEF) June 12: Winter Haven (KGIF) July 10: Williston (X60)</p>
	
 <p>MAPA Safety Foundation Pilot Proficiency Program</p>	<p>2021</p> <p>April 23-25: Santa Fe, NM Sep 10-12: Chicopee, MA June 18-20: Fort Worth, TX Oct 15-17: Wichita, KS</p> <p>Sign Up at https://www.mooneysafety.com/ppp-registration/</p>
 <p>MOONEYSUMMIT</p>	<p>CLICK HERE for details</p>
<p>Australian Mooney Pilots Association</p>	<p>March 27, 2021 - AGM 2021 at Annuka Resort, Coffs Harbour</p>
	<p>CLICK HERE for details</p>
<p>Other Mooney Events</p>	<p>May 14-16: The 8th Annual Mooney Caravan Formation Flying Clinic at KHYI (San Marcos, TX). FBO: Berry Aviation at KHYI: (512) 353-2379. Meeting Area: CAF Hanger (at East end of Ramp)</p> <p>Sep 10-12: The Mooney Flyer Fly-In to Paso Robles (KPRB) – Wine & Food Friday Evening, Saturday presentations, wine tasting, and hot air balloon rides, Dinner and more.</p>



Custom Model of Your Mooney



I have ordered models of my first Mooney M20C and then my current M20S, from Factory Direct Models. They aren't cheap but they are stunning, and you have a lot of customizing that's available.

First, they will replicate your exterior with your specifics and then paint it identically.

You also have the option to order a presentation case.

You can order an amazing custom-built desktop model of your airplane. Using your

photos, they will build you a personalized model with your paint scheme, logos, registration number, antennas and all the details that make your airplane unique. You can even personalize your model with a fully customized interior to match your seats, seat colors, instrument panel and all other fine interior details. Each meticulously detailed scale model is custom-manufactured and precisely engineered to your exact specifications. They will build you a model that will not only meet your expectations but exceed them!

Visit Factory Direct Models at <https://www.factorydirectmodels.com/>



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)



N9426V
1970 Mooney M20F s/n 700029

5725 Total Time
475 SMOH in 2013
1384 SNEW Prop, 3 Blade Hartzell **\$69,900**

Paint: AcraGlo in 2010. Condition 8, normal wear
 Interior: 2002. Grey Leather. Condition 6

Avionics:

#1 Nav/Com King KX155 w/ GS. Coupled to HSI
 #2 Nav/Com King KX170B
 King KCS55 Slaved HSI
 Narco AT-150 Linked to Uavionix Tail Beacon, ADS-B Out
 JPI EDM 930. Full function with Fuel Flow
 PS Engineering 4 Place Intercom
 Airtex 406 ELT
 Vertical Card Compass

Airframe:

201 Windshield and ¼ Side Glass
 Aero Resources Cowl Fairing and Landing Light Cover
 Lake Aero Gap Seals
 StandBy Vacuum System
 Brackett Air Filter
 M20 Air/Oil Separator
 Spin on Oil Filter
 Throttle Quadrant
Fuel Tank Reseal in 2007, No Leaks

Useful Load: 1036 lbs.

Annual 6/2020 IFR/ALT/TXP 5/2019

Damage:

Gear Up Landings in 1981, 1984, and 1997. 337's for repairs with Factory Parts



Contact John Echols at echolsjt@geospectrum.com or 432-559-3119

1/3 SHARE FOR SALE

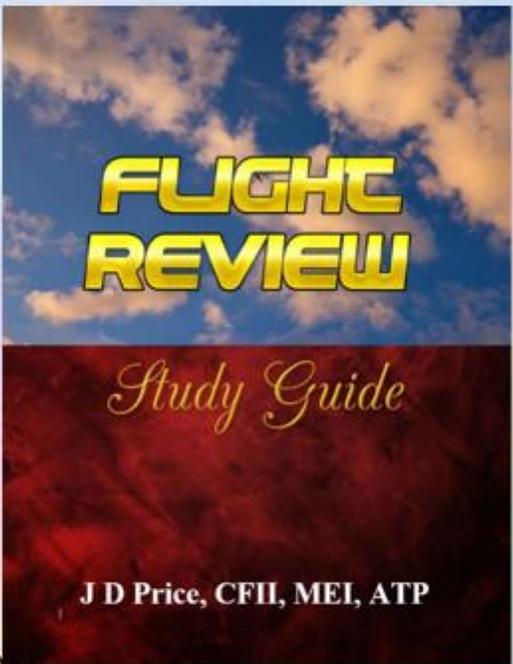
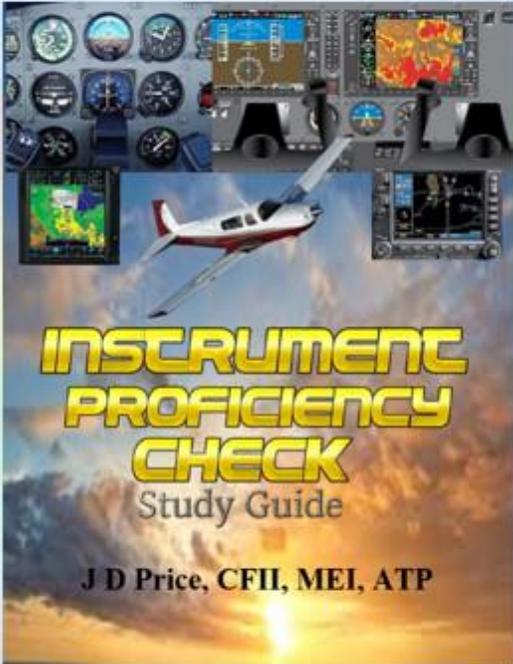
Two partners are offering the final 1/3 co-ownership share in this excellent, incredibly unique and well-equipped aircraft. Over \$50,000 spent over the last two years, upgrading and sorting it out. The share price is \$45,000. TTAF is about 3160, engine SMOH About 1320 (Mattituck Red/Gold). We have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

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



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

Rusty Pilot or Old Pro



INSTRUMENT PROFICIENCY CHECK
Study Guide
J D Price, CFII, MEI, ATP

FLIGHT REVIEW
Study Guide
J D Price, CFII, MEI, ATP

Prepare **FREE** online

JDPriceCFI.com