The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

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Departments

Features

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From the Editor

Phil Corman

Be Busy Learning

I had a dear Mooniac friend crash and die last month. Events like this make us reflect. I've always felt that a Pilot Certificate was only a "License to Learn". As Bob Dylan almost sang, "If you aren't busy learning, you're busy dying".

I can truly say "to myself" and maybe you can also, that most of what I know about flying safely I learned after getting my ticket.

A formal way to keep learning is to attend **Safety Seminars or Webinars** on a regular basis. Some of these are amazing and you can learn a lot. In others, you will only re-learn what you already know, but it may end up reinforcing that learning in your mind.

Another formal method is to call a **Mooney CFI** and get a tune up. I did this a few years ago with Mooney Master Don Kaye and I am a much better Mooniac for having done so.

We Mooniacs have the Mooney Safety Foundation and their Pilot Proficiency Program (PPP) which is Mooney-specific and extremely useful to new and old Mooniacs.

An informal way to learn is to attend fly-ins. Groups will form and take up a topic or two and the wisdom of the group will give you new insights into safely flying your Mooney.

Hangar sessions can be useful as well. These are a bit like social media in that you may hear good and bad advice. But at a minimum, it gets you thinking and possibly researching the topic later.

Reading The Mooney Flyer and other flying magazines as well can be enlightening.

I also like MooneySpace and BeechTalk. These forums are excellent places to ask questions and read valuable insights. Like anything, you may have to sift through some useless posts, but when you find a gem, it's worth it.

When you are flying with another pilot, encourage discussion about flying. I have learned some valuable things talking with the pilot who is going to ferry my plane to an annual. Use the time to learn.

Picking up one tidbit, over time, accumulates into a library in your head of how to become a better pilot. Sounds extremely simple, but it works.

Be open to ideas and even criticisms from pilots you respect. Never take the attitude that it cannot help. It can, if you are open minded. And it might just save your life and those of your passengers.

Next month's poll: "Regarding OshKosh" **CLICK HERE** to vote.

Letters to the EDITOR

TheMooneyFlyer@gmail.com

I'd like to subscribe to your newsletter. You have amazing content. Please keep up the good work!
Derrick M

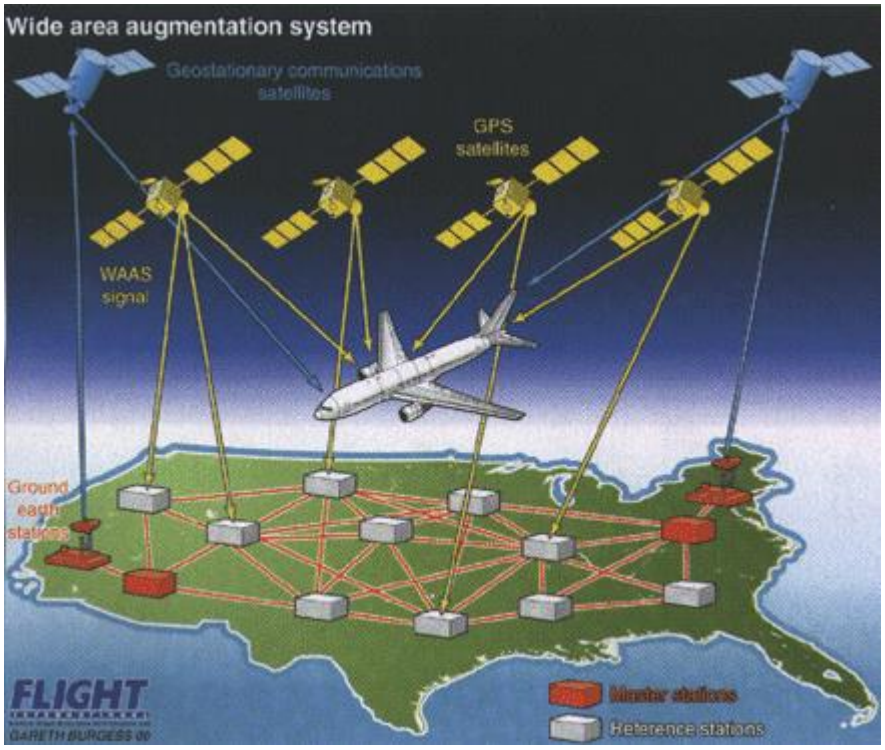
The Beauty of WAAS

WAAS is an extremely accurate navigation system developed for civil aviation. Before WAAS, the U.S. National Airspace System (NAS) did not have the potential to provide horizontal and vertical navigation for approach operations for all users at all locations. With WAAS, this capability is a reality.

WAAS Architecture

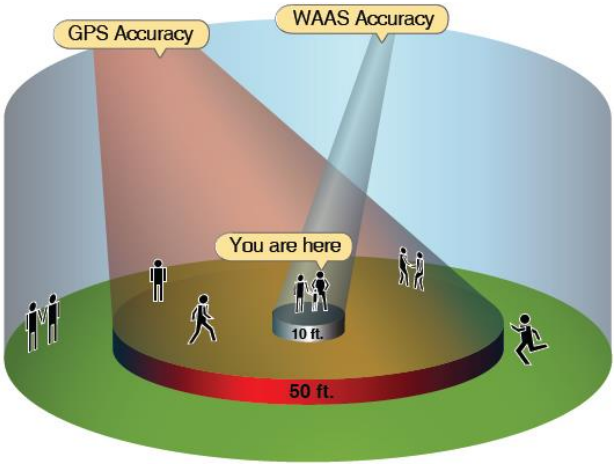
WAAS hardware consists of 38 ground reference stations, 3 master stations, 3 geostationary satellites with navigation transponders onboard, 6 uplink stations, 2 operational control centers, and the WAAS terrestrial communications network.

How Does the WAAS Technology Work?



WAAS uses a network of precisely located **ground reference stations** (shown as **grey** boxes). These monitor GPS satellite signals. Ground reference stations are located throughout the continental U.S., Hawaii, Puerto Rico, Alaska, Canada and Mexico. The stations collect and process GPS information and send the information to **WAAS master stations** (shown as **red** boxes).

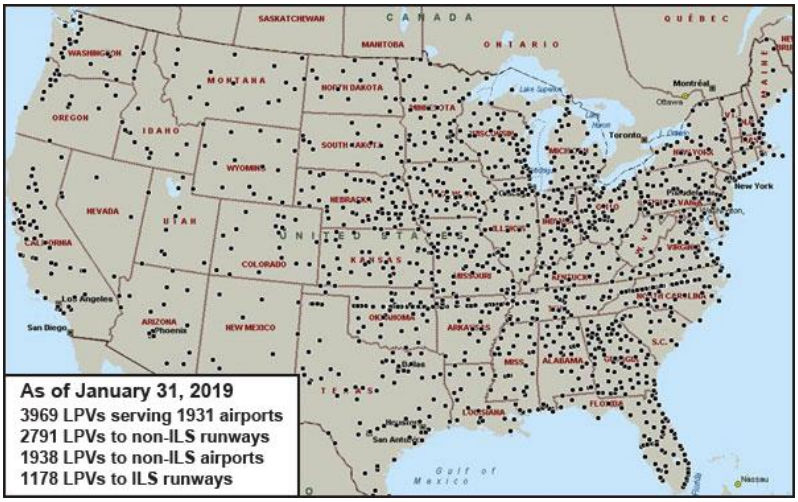
The WAAS master stations develop a WAAS correction message that is sent to user receivers (your WAAS GPS) via a 'GPS-like' signal from navigation transponders onboard geostationary satellites.



WAAS is more Accurate than plain old GPS

Using WAAS, GPS signal accuracy is improved from 20 meters to approximately 1.5 – 2 meters in both the horizontal and vertical dimensions. That's why WAAS is an essential element in ADS-B position reporting and NextGen surveillance.

GPS with Benefits



WAAS corrects for **the GPS satellite position errors, ionosphere delays, and other disturbances in the GPS signals**, improving the accuracy and reliability of the users' position solution.

WAAS provides service for all classes of aircraft in all phases of flight - including en route navigation, airport departures, and airport arrivals. This includes vertically guided landing approaches in instrument meteorological conditions at all qualified locations throughout the National Airspace System (NAS).

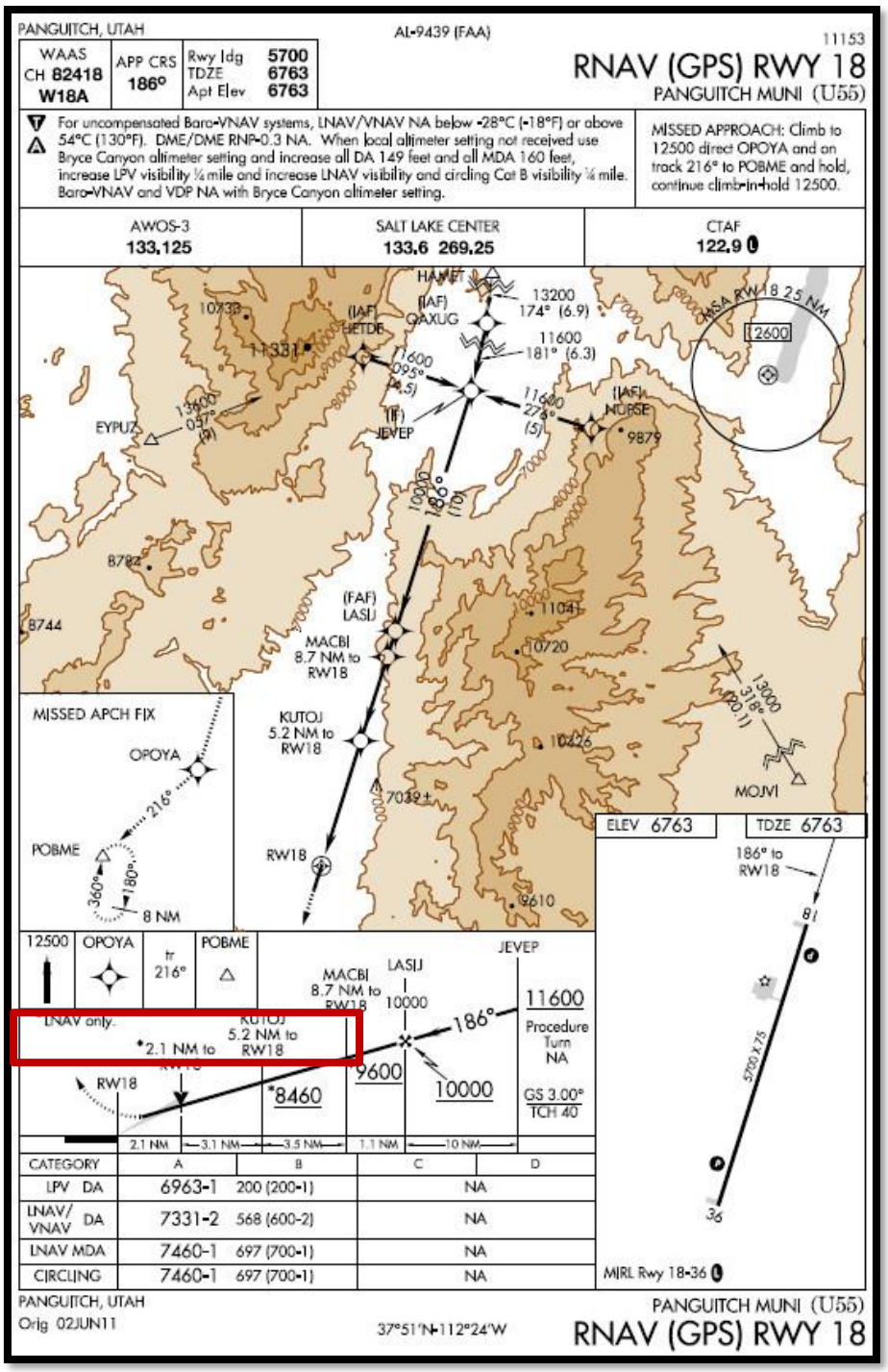
More importantly, WAAS quickly warns the pilot when the satellites are not functioning correctly and should not be used for navigation.

LPV Approaches (WAAS approaches that provide a Glide Slope)

The gold standard for WAAS approaches is the LPV, which stands for localizer performance with vertical guidance. Flying an LPV approach is virtually identical to an ILS (instrument landing system). LPV approaches allow descents as low as 200 to 250 feet above the runway, just like an old-school ILS.

LPV and ILS Approaches

There have been **3998 approaches** with LPV minimums published, whereas there are currently 1549 Category I ILS approaches published.

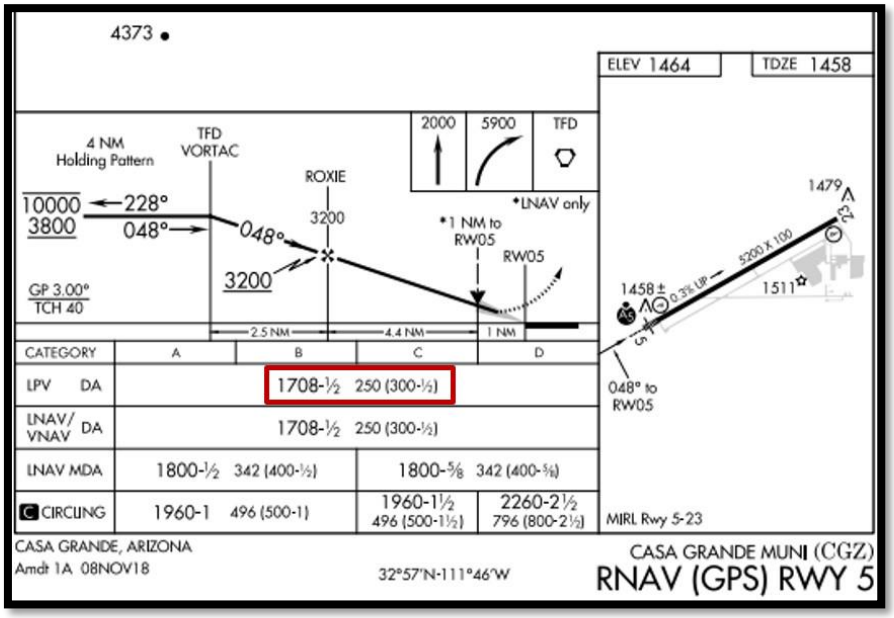


Panguitch, Utah (Estimated Population, 1,691)

Thanks to WAAS, Panguitch Municipal has an LPV approach with a Decision Altitude of 200 feet AGL – just like an ILS, but without the ground infrastructure.

Nuts, Bolts, and Satellites

A typical Category I ILS approach has a decision height as low as 200 feet and visibility requirement as low as one-half statute mile; 1800 RVR (Runway Visual Range) in some cases. Originally, LPV minimums only allowed decision heights as low as 250 feet. But in 2006 that was reduced to 200 feet, making the LPV equivalent to a Category I ILS.



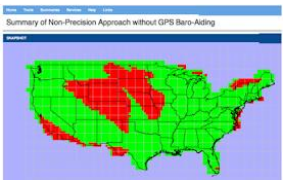
Some LPV approaches still have a decision altitude of 250 feet.

Precision vs Non-Precision Approach & Alternate Planning

ILS and PAR (Precision Approach Radar) approaches are considered “Precision Approaches”. Although the LPV approach is similar in outward appearances, it is not considered a precision approach. For arcane reasons, LPV and other WAAS generated glide slope approaches are considered an approach with vertical guidance (APV) rather than a precision approach.

> The standard minimum weather requirement for an alternate is **600-2, if there's a precision approach available,** and an 800-2 for a non-precision approach.

Since LPV is not considered a precision approach, an 800-foot ceiling is required to be considered an alternate.



RAIM Advantages

Receiver autonomous integrity monitoring (RAIM) is a **technology developed to assess the integrity of** global positioning system (GPS) signals in a GPS receiver system. GPS receivers with WAAS use separate signals broadcast from different satellites to indicate these problems directly. When filing IFR, **WAAS users** are not required to check the RAIM Prediction prior to flight.

Checking VOR accuracy every 30 days?

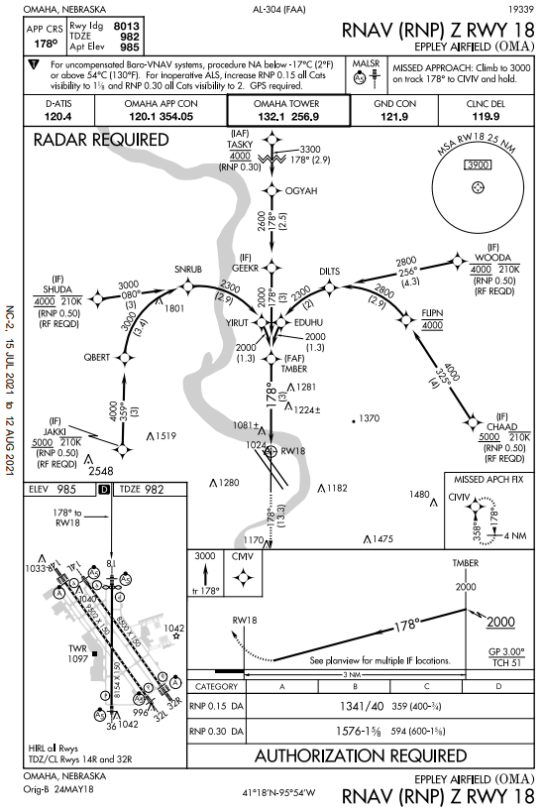
If you have a WAAS GPS navigator, you are not legally required to accomplish 30-day VOR checks. But, if GPS fails and you're on an IFR clearance, you will need to use the VOR. For that reason, WAAS users would be wise to continue to check VOR accuracy.

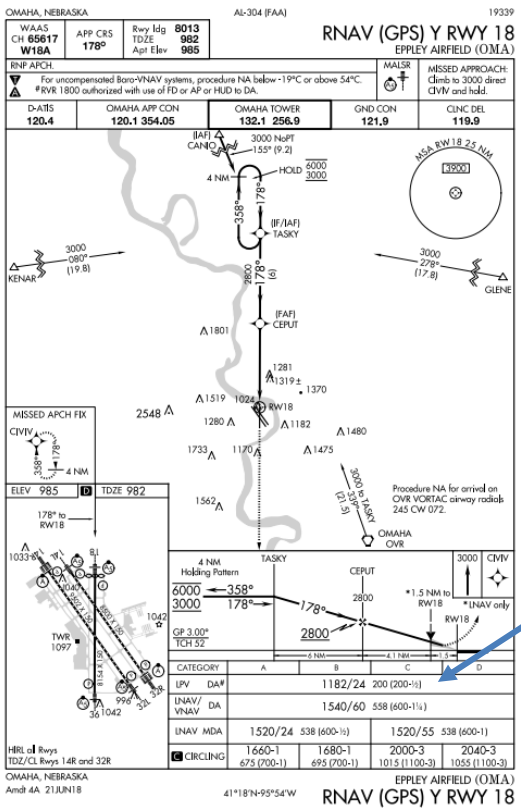
What is RNP?

RNP stands for Required Navigation Performance. Note the Omaha Eppley Airfield RNP approach to Runway 18, shown below. RNP permits the operation of aircraft along a precise flight path, which may include curves. RNP requires FAA approved training for the crew and FAA authorization for **the airplane**. Therefore, an airline pilot who is authorized to fly RNP approaches in his or her airline's B-737, cannot transfer that authority to his or her Mooney with a GTN 750Xi.

Your GTN, GNS (Garmin or Avidyne) may seem to have the RNP approach chart in the database, but you won't be able to load the approach. That's because Jeppesen can't sell the RNP database to a non-authorized airplane.

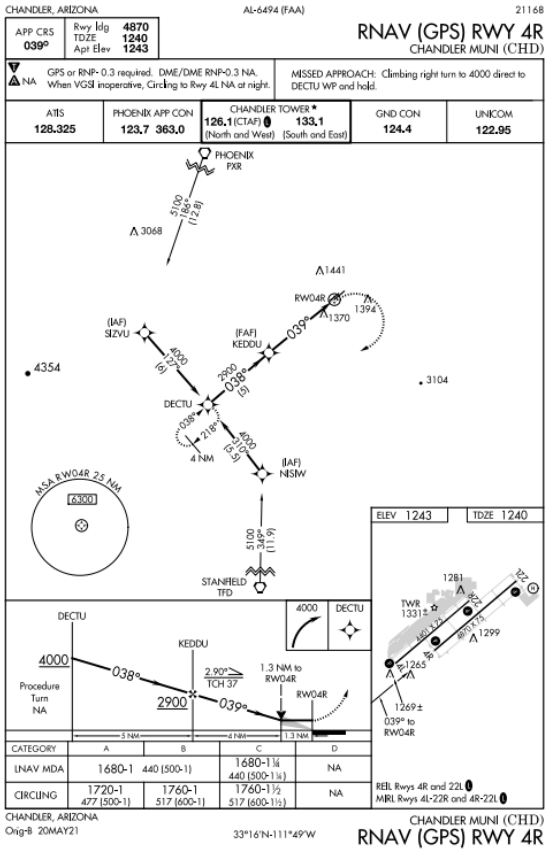
Who Needs RNP?





WAAS LPV approaches have a lower DA than an RNP approach.

LNAV and LNAV +V

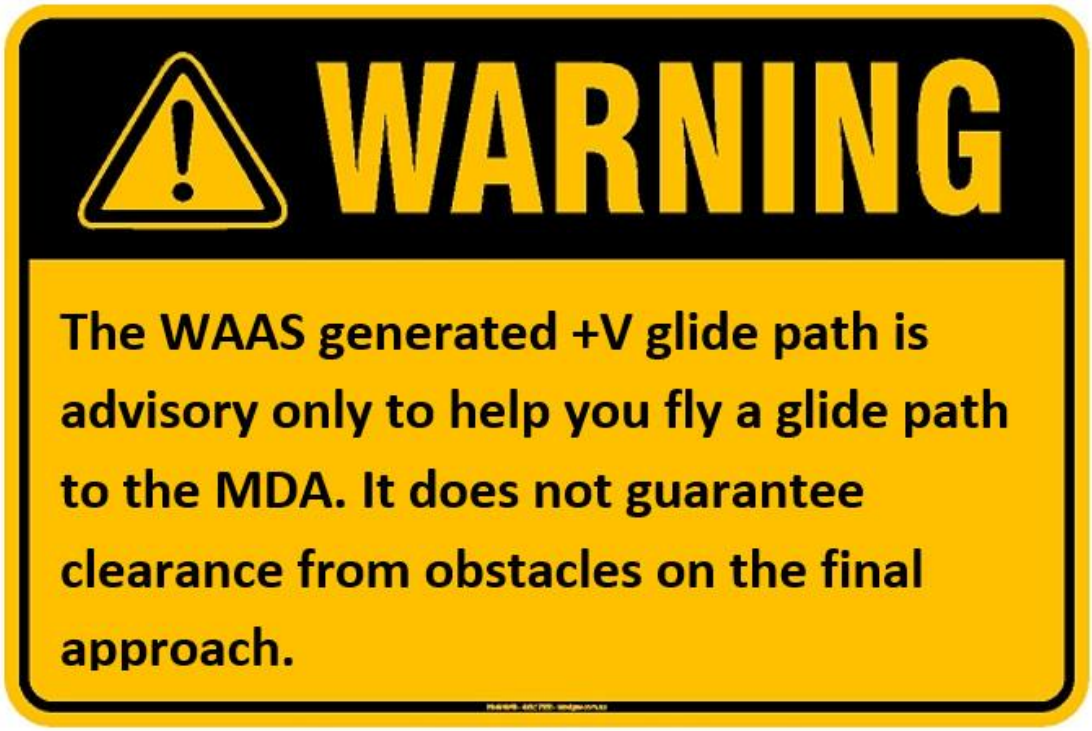


An LNAV (Lateral Navigation) approach is a non-WAAS GPS approach.

If you are equipped with WAAS, a glide slope may appear. That's the +V element. This glide slope is created by WAAS GPS and is only ADVISORY Vertical Guidance. The LNAV+V annunciation infers that your GPS has confirmed that RAIM is OK.

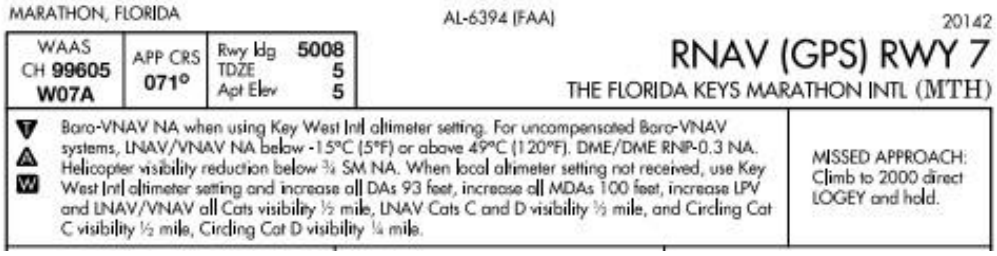
The glidepath reduces workload and you don't need to dive and drive, dive and drive, etc.

The approach will not indicate a DA (Decision Altitude) – just an LNAV MDA (Minimum Descent Altitude). You can use the Glide Path, but you are not approved to go below the MDA unless you have the runway in sight. If not, you must remain at the MDA, fly forward to the Missed Approach Point and then fly the missed.



Daily WAAS Outages

When a reverse **W** like this W appears on a government LPV approach chart, this means that outages of WAAS vertical guidance may occur daily due to initial system limitations. Jeppesen RNAV (GPS) approach charts will not utilize a reverse W symbol but will indicate in plain words, "WAAS VNAV outages may occur daily. WAAS VNAV NOTAM service is not provided."



MARATHON, FLORIDA — AL-6394 (FAA) — 20142

RNAV (GPS) RWY 7

THE FLORIDA KEYS MARATHON INTL (MTH)

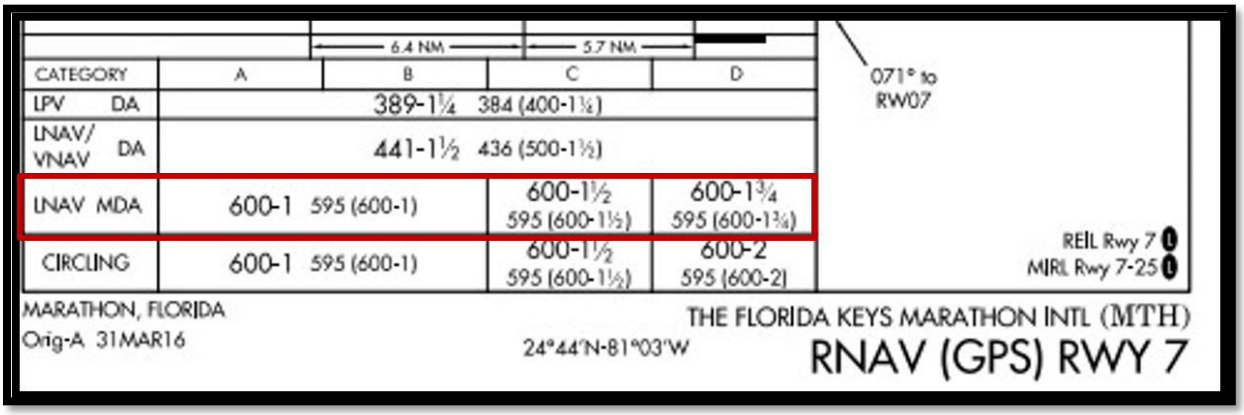
WAAS	APP CRS	Rwy Idg / TDZE / Apt Elev
CH 99605 W07A	071°	5008 / 5 / 5

Baro-VNAV NA when using Key West Intl altimeter setting. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -15°C (5°F) or above 49°C (120°F). DME/DME RNP-0.3 NA. Helicopter visibility reduction below ¾ SM NA. When local altimeter setting not received, use Key West Intl altimeter setting and increase all DAs 93 feet, increase all MDAs 100 feet, increase LPV and LNAV/VNAV all Cats visibility ½ mile, LNAV Cats C and D visibility ½ mile, and Circling Cat C visibility ½ mile, Circling Cat D visibility ¼ mile.

MISSED APPROACH: Climb to 2000 direct LOGEY and hold.

Many of these outages will be very short in duration but may result in the disruption of the vertical portion of the approach. This note indicates that NOTAMs or Air Traffic advisories are not provided for outages that occur in the WAAS LNAV/VNAV or LPV vertical service.

LNAV MDA minimums should be used for flight planning at these locations, whether the airport is as a destination or alternate. If upon arrival, the WAAS avionics indicate that LNAV/VNAV or LPV service is available, then vertical guidance may be used to complete the approach using the displayed level of service. Should an outage occur during the approach, reversion to Baro-VNAV or LNAV minimums may be required.



	6.4 NM		5.7 NM	
CATEGORY	A	B	C	D
LPV DA	389-1¼	384 (400-1¼)		
LNAV/VNAV DA	441-1½	436 (500-1½)		
LNAV MDA	600-1	595 (600-1)	600-1½ 595 (600-1½)	600-1¾ 595 (600-1¾)
CIRCLING	600-1	595 (600-1)	600-1½ 595 (600-1½)	600-2 595 (600-2)

071° to RW07

REIL Rwy 7

MIRL Rwy 7-25

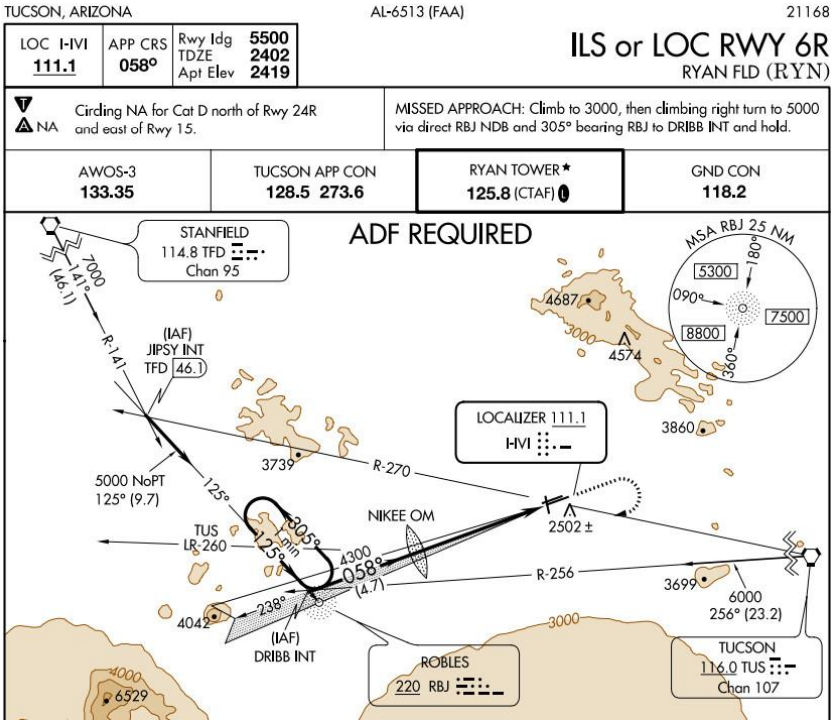
MARATHON, FLORIDA

Orig-A 31MAR16

24°44'N-81°03'W

THE FLORIDA KEYS MARATHON INTL (MTH)

RNAV (GPS) RWY 7



Replacing ADF

One of the advantages of GPS, is that it can replace ADF.

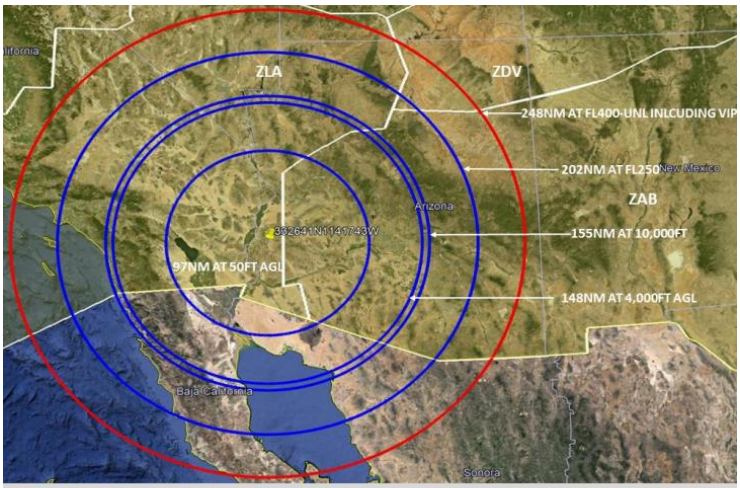
Situation:

Your Mooney no longer has an ADF but has a Garmin GNS 530. While flying to Ryan Field (RYN), Marine Corps Air Station Yuma decided to start dorking around, activating a planned GPS outage exercise. Sure enough, your GNS 530 indicates that GPS in not available.

Can you fly the ILS or LOC RWY 6R approach?

ANSWER:

You cannot accept any approach unless you can fly the published missed approach and the ALTERNATE MISSED APPROACH procedures. In this case, ADF is required because it is required to fly the missed approach procedure. Since the GPS isn't working, it cannot substitute for the ADF. So, at first glance, the answer is NO. Also, the Marines are off your Christmas card list.



YPG_AZ GPS 21-13 (Revision 1)
GPS INTERFERENCE TESTING

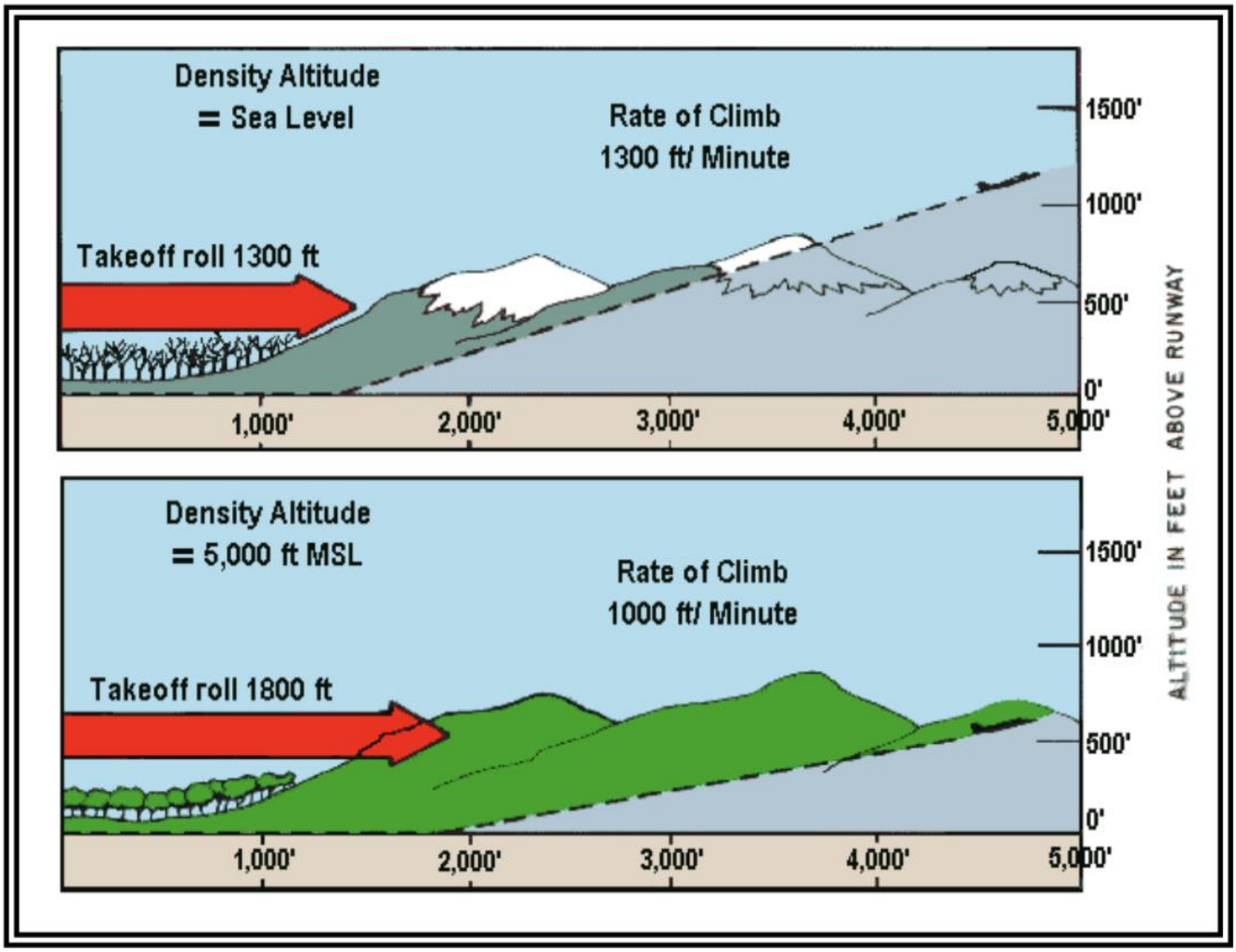
HOWEVER, YOU CAN STILL FLY THE APPROACH!

Simply tell ATC that you've experienced a GPS outage, and you don't have ADF. Then, simply ask ATC to give you ALTERNATE MISSED APPROACH INSTRUCTIONS. If those instructions don't include flying to the Robles ADF (RBJ), your problem is solved.

As an added bonus, you have found that you no longer hate the Marines.

Everything You Need to Know about Density Altitude

Everyone knows what Density Altitude is and how important it is to understand, especially at higher altitudes during the warm/hot months.



There are many different defined altitudes including:

- Indicated Altitude – The altitude shown on your altimeter
- True Altitude – The height above mean sea level
- Absolute Altitude – The height above ground level
- Pressure Altitude – The indicated altitude when your altimeter is set to 29.92 in
- Density Altitude – The Pressure Altitude corrected for nonstandard temperature

However, no altitude is more important to your Mooney's performance than Density Altitude. In the summer months, Density Altitude is almost always higher than the true altitude. Density Altitude is mostly affected by temperature. Standard temperature at sea level is 15°C. The standard temperature drop is 2°C per 1000' above sea level.

The formula to compute Density Altitude is:

Density altitude in feet = pressure altitude in feet + (120 x (OAT - ISA temperature))

Let's use KTVL (South Lake Tahoe) as an example. TVL is 6,268' MSL. Let's say the temperature is 30°C on a typical summer afternoon. We know that the standard temperature lapse rate is 2°C, so Standard temperature at this altitude is 15-(2*6.268) or 2.5°C. Then we compute the difference between OAT and standard temperature at 6,628'MSL. 30-2.5 is 27.5. and 27.5 x 120 = 3,300. So, Density Altitude is 6268 + 3300 or **9568' MSL**. That is SIGNIFICANT.

Density Altitude Charts

Density Altitude Rule-of-Thumb Chart

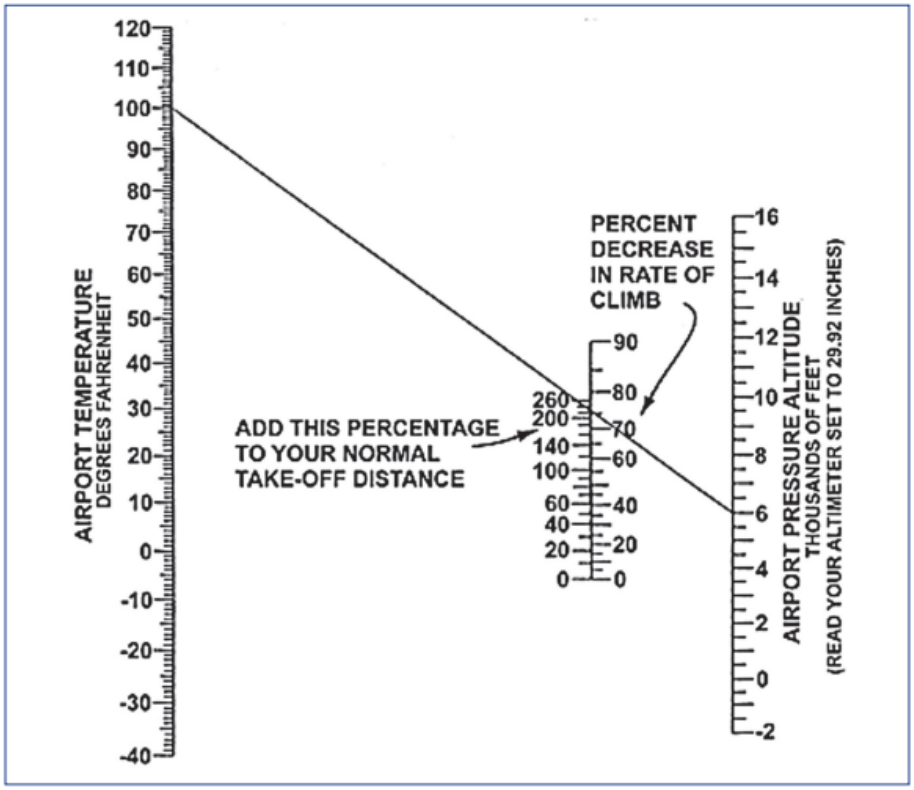
The chart below illustrates an example of temperature effects on density altitude.

Density Altitude Rule-of-Thumb Chart

STD TEMP	ELEV/TEMP	80 °F	90 °F	100 °F	110 °F	120 °F	130 °F
59 °F	Sea level	1,200	1,900	2,500	3,200	3,800	4,400
52 °F	2,000	3,800	4,400	5,000	5,600	6,200	6,800
45 °F	4,000	6,300	6,900	7,500	8,100	8,700	9,400
38 °F	6,000	8,600	9,200	9,800	10,400	11,000	11,600
31 °F	8,000	11,100	11,700	12,300	12,800	13,300	13,800

Koch Chart

To find the effect of altitude and temperature, **connect** the temperature and airport altitude by a straight line. **Read** the increase in takeoff distance and the decrease in rate of climb from standard sea level values.



Why is This?

Warmer air is less dense, and temperature plays a major role is density altitude. Humidity also plays a factor since humid air is lighter and less dense, but it is less a factor than temperature.

Higher altitudes reduce your Mooney's performance in a number of ways:

- Engine Performance is the most obvious. In a non-turbocharged engine, you lose Manifold Pressure (Power). Your POH can inform you of the power you can expect at different altitudes, but in all cases, engine performance will be diminished.
- Lift Performance is the next impact and Turbocharged Mooneys are equally affected by this. With less dense air, your wing produces less lift. Most of us know that. But you may remember Ron Blum's July 2021 article, that taught us that your propeller is a twisted wing. So, the propeller is also less effective.

Yikes! Less engine horsepower, less wing lift and a less efficient propeller. Figure out your Mooney's performance before getting into the cockpit. And then add a safety buffer because few if any Mooneys can expect "book" performance?

What's Next?

After figuring out Density Altitude, you're not even halfway to analyzing your takeoff run and climb performance.

Go grab your POH and figure out the runway requirement for departure. Again, add a safety margin. Do yourself a favor and know exactly how much fuel you have onboard, the weight in your cargo bay, and hat rack, as well as the true weights of your passengers. Maybe add a safety margin too.

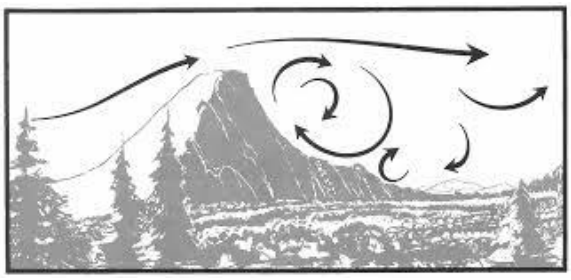
If you are in the mountains, take another factor into account. Usually there is a fair amount of mountain/mechanical turbulence as the wind passes over the mountains. If the airport is in a valley, after the wind rose up on the windward side of the mountains, then that air may be descending.

Computing only required runway is only half of your job. Now you need to figure out what you can count on for climb performance. It will be reduced, maybe significantly, by higher density altitude. It could be further reduced by downward wind if you are climbing out on the leeward side. You need to know exactly how much runway you'll need and climb performance after you are airborne. Believe it or not, most high-density altitude crashes occur during poor climb performance.

Back to South Lake Tahoe (TVL). There is a note for pilots departing to the south, directly into the teeth of the Sierra Nevada mountains. It states to turn slightly to the right and then circle over the golf course to gain altitude. There are downed Mooneys who have tried to depart on a left or right downwind without heeding this advice. Think about it. You are taking off towards the Sierra mountains, so as to depart into the headwind. But that is also the leeward side of the mountains, so there's a good possibility of downdrafts. I have departed to the north with manageable tailwinds to avoid this scenario. That way, on departure, I am over Lake Tahoe with plenty of flat lake terrain to climb.

*Your true airspeed will be higher at higher density altitudes. Whether taking off or landing, remember this and fly only your **indicated airspeed**. Don't let the sensation of higher speed affect your takeoff or landing speed.*

What's a PIC to do?



- Fly in the evening or early in the morning when temperatures are lower.
- Before flying to a high-elevation airport, know whether your Mooney climbs more efficiently with the first increment of flaps. Many aircraft do, but results vary. That first notch of flaps may add more drag than lift.
- Be sure the aircraft's weight is below 90 percent of maximum gross weight.
- Don't fill the tanks to the top (see previous tip).
- Fly shorter legs and make extra fuel stops. That's a tough suggestion to accept, but it results in less exciting takeoffs.
- Be ready to ferry one passenger to an airport with a lower density altitude, then come back for the other. If you are unsure of conditions, fly around the pattern once alone without baggage to test your aircraft's performance.
- Have 80 percent of your takeoff speed at the runway's halfway point, or abort. If your takeoff speed is 65 knots or MPH, that means you should have 52 knots at the runway mid point.

For normally aspirated engines, there is one more thing to do before departing. You must lean your engine to compensate for the high-density altitude. Failure to do so will definitely reduce your engine's performance as the mixture will be overly rich and that could cause more problems than a reduced performance. The easiest method I know for constant speed prop Mooneys with an engine monitor is 1) Add full power with feet firmly on the brakes, 2) lean until first EGT peaks, then 3) enrichen mixture approximately 100^{o}F. Then during your takeoff roll, adjust as necessary for peak performance.

Unsatisfactory Climb Performance

You successfully lifted off, but now your climb performance isn't good enough. Before departing, you should analyze where the updrafts and downdrafts are likely to be.

- If you are in a valley, figure out which side of the valley has the updrafts. If the winds are coming from your left, over a ridge, then updrafts are most likely going to be to the upsloping terrain to your right.
- Secondly, know which side of the valley has more sunlight hitting the ground. Clearly you can expect more convective uplift on the sunny side.

Summary

The trouble with Density Altitude is that it takes time to compute it and then figure out your runway and climb requirements. Don't be lazy. Be professional and take the time. Be conservative. Take less passengers and come back for the rest. Plan to have only the fuel you require plus reserves. Take off in the early morning.

Live to fly another day so you can read the next issue of The Mooney Flyer.

A lesson for us all

Reprinted from Airfactsjournal.com/2021/05/forced-to-land-in-Waco

Forced to Land in Waco by Al Cercone

It was July 10, 1982, and, looking for any excuse to fly, I offered to take my 12-year-old nephew from Dallas to Austin, Texas, for a track and field tournament. His father and his 8-year-old brother, my sister's whole family, would also be going. I had been a pilot for 10 years, but seven of those years were right after college, and absent the time and money, I put flying on hold. I eventually purchased a plane in 1981 when my accountant told me I could afford it. On the day of this incident, I had accumulated a total of only 95 hours since receiving my private license.

The weather forecast for the day was clear with a temperature in the mid-90s for both Dallas and Austin. I was eager to use the newly installed panel upgrades to my 1961 Mooney Mark 21: a new artificial horizon, new VOR with localizer and GS, digital DME, and digital coms. I previously added flap gap seals to reduce drag, modestly increase my airspeed, and improve the already impressive 12 to 1 glide ratio.

A great way to travel, until the RPMs unexpectedly increase

We boarded the plane mid-morning and departed Dallas Love Field. We flew direct to Austin's Robert Mueller Municipal Airport without incident. At the tournament, we watched my nephew compete. When it was time for the return flight, it was already later in the evening. My brother-in-law sat right seat and my two nephews sat in the back seats.

The first 90 miles of the flight were smooth and unremarkable, cruising at an altitude of 10,500. I was enjoying the benefits offered by my new avionics upgrade. We had just passed over Waco Lake, just south of Waco Regional Airport, on our way back to Dallas. We were all enjoying the smooth flight and the wonderful views of the ground and clear skies along the way.

A few minutes later, exactly 10 DME north of Waco Regional according to my new DME, my propeller speed instantly shot up from 2450 RPMs to the dial's peg. The sound of the prop increased with it and immediately got my attention. I first checked my gauges. The oil temperature and pressure gauges were both in the green, as was everything else. The only instrument indicating a problem was the RPMs of the propeller.

I immediately turned 180 degrees to go back to the airport I had just passed over, Waco Regional. At the same time, I began pulling the propeller control back to reduce the RPMs, with no effect. I then grabbed the throttle control and pulled it back. By reducing the throttle all the way, was I able to reduce the propeller speed back to within normal operating range. Although my propeller was still turning at 2450 RPMs, I could tell it was not producing thrust.

I quickly found the tower frequency at Waco and called to announce my intentions for a straight-in approach for runway 19, saying I was experiencing engine trouble. I then heard the tower immediately divert all other incoming traffic, including a commercial commuter. I could see the airport, so I set up the plane for best glide speed. From my view of the horizon, while assessing my rate of descent, I was confident I could easily make it to the airport.

While all this was happening, I was recalling the first three years after getting my license in 1972, when I would read copious accident reports from the NTSB, (something I still do), hoping to learn from the mistakes of others. The conclusion of a majority of fatal accidents was always the same: pilot error. Trying to stretch a glide to reach an airport without an engine when there was not enough altitude was usually the cause for loss of control on approach, which led to low altitude stall/spin fatal accidents. I was not about to try that. I also recalled that an in-flight mechanical failure is extremely rare, so I kept wondering, "*What could I have done to cause this?*" Then came the strong smell of burning oil.

My concern shifted to a fire in the cockpit and my 8- and 12-year-old nephews. That concern was short lived, as moments later, my previously invisible propeller turning at 2450 RPMs abruptly stopped, looking like the minute hand of a clock pointing to one o'clock. At the same time, complete silence—total power failure— dead stick.

My glide was compromised by the additional drag from the now frozen propeller. The concern of a cabin fire greatly diminished; I re-evaluated my gliding distance. It only took a quick glance to realize I would not make the airport. I called the tower again, this time to declare an emergency due to total engine loss and let them know I would not be landing at the airport.

The controller's voice cracked and changed to a high pitch, as if panic had tightened his vocal cords. I rhetorically asked my brother-in-law, "What's he worried about, we are the ones in the airplane?"

Then the controller calmly asked, "How many souls are on board and where they are seated?" That was a sobering and unanticipated question. Then he asked me if I knew where I was going to land.

When the airport that suddenly looked reachable is no longer an option, where do you land?

The search for alternative landing spots began. It was only a few minutes before dark, so I hoped to find a suitable road or field before I could no longer see, but all the roads were narrow, dirt farm roads with nearby fences and telephone poles, and all the fields were freshly ploughed. Seeing no better alternatives to either side, I proceeded straight ahead.

It was nearing decision time of where to put her down. The Brazos River was dead ahead and perpendicular to my path. The riverbanks were lined with trees, and it was going to be close, so much so my brother-in-law commented, "Are we going to hit the trees?"

I could see just beyond the river what appeared to be a large, unplowed field. I assured my brother-in-law we would miss the trees; confident I could make it to the field beyond. I contacted the Waco Tower to let them know I was attempting to land in a field approximately two miles from the airport. They told me to maintain radio contact. I responded, "I will if I can."

The diminished light prevented me seeing all the cows in the field until I was just over the river. Hitting a stationary, 1,200-pound cow was not desirable. Still looking, I saw a fence line to the right, parallel to my path by a few hundred feet, and not full of cows. I gently slid the plane to the right to avoid a stall and lined up to land. Because the rear of the vertical stabilizer and rudder of a Mooney slants forward, it is easy to make modest coordinated turns using only the rudder pedals.

It was a narrow field, but it was long, which gave the appearance of a runway. Almost dark, I did not see the bull in the middle of the field until I was lined up and my landing light illuminated him in the distance. He was positioned between the fence and a large tree, and standing under a large electrical highline (*yeh, I did not see that either*). Having to thread that needle, over the bull, under the highline, right of the fence, left of the tree, all while keeping my gear up until I cleared the bull, and then quickly lowering it before I landed in the tall grass was my last flying skills challenge. Fortunately, my Mooney had manual retractable gear, therefore I could raise or lower it in less than two seconds, or I could have left it up.

I lowered the gear as I passed over the bull and the plane touched down, harder than my usual, but no one else noticed. This was a soft field landing in tall grass. Not wanting to flip the plane by the nose gear hitting… who knows what… I was holding the stick against my chest to keep the nose gear as light as possible. With my headlight on, I saw posts and strands of barbed wire in the far fence I was rapidly approaching. I had to brake hard to avoid hitting the fence. The plane finally came to rest a few feet short of the fence, which was within the length of a football field from the farmhouse.

As soon as we stopped, I tried to contact Waco Tower by radio, but because I was on the ground with a belly antenna probably bent from rolling through the tall grass, I received no response. When I exited the plane, I was surprised see the entire right side of the plane covered in crankcase oil, from the front engine cowling all the way to the tail. I was finally relieved that whatever happened, it was not pilot error.

An open field is great, but what about livestock?

I saw the lights on at what I came to know as the Gorham Ranch house. I walked up the front porch steps and knocked on the screen door. An elderly lady came to the door with a look of surprise. I asked, "May I came in and use your phone? I just landed my airplane in your field and I need to contact the airport to let them know we are all alright."

She said, "Well, I didn't hear anything."

I responded, "That's the problem, that plane hasn't been making a sound for quite some time now." To lighten it up a little I then said, "You know I couldn't make out the runway numbers on that grass strip."

She immediately responded and said, “If had known you were landing there, I would have turned on the runway lights.”

Obviously good natured, she graciously let me in to use her phone. I called the tower to let them know we landed without incident. The tower told me they already dispatched the sheriff. I could not have been in the house more than a couple of minutes, but when I walked back outside, there was a helicopter circling above my plane with a spotlight, and the sheriff, an ambulance, and the *Waco Tribune* news truck all pulling up at the same time.

Their emergency response time was impressive, and the help offered by everyone was very professional and touching. I made the front page of the *Waco Tribune*.

We caught a ride with the sheriff to where we could
rent a car for the drive back to Dallas. My brother-in law was still a little shaken from the experience, so I had to drive. But when we got back to Dallas he said, “If you get that plane fixed and want to fly it out of that field, I’d be honored to fly out of there with you.”

The younger of the two nephews on board was the most anxious during the ordeal, but it apparently did not give him a phobia about flying. All grown up, and after graduating college, he now has a successful career as a pilot for Jet Blue, a job he has been enjoying for a couple of decades.

I made the trip back to Waco to view the engine once it was towed the two miles to Waco Regional, where they had a suitable repair shop. This was a high-performance airplane. The propeller was controlled by using differential oil pressure regulated by the propeller control lever in the airplane. The oil used was crankcase oil pumped to the propeller through a rigid tube that left the engine on the port side, turned 90 degrees, and connected to the propeller assembly.

Although the tube was not heavy, I noticed it had no structural support from the place where it left the engine all the way to the propeller. It broke from metal fatigue, probably due to engine vibration and the lack of any structural support. When it broke, it rapidly pumped out all the crankcase oil, which eventually caused the engine and propeller to seize.

Because of the failure, I had to replace both my engine and propeller. There was no damage to the airplane itself. I contacted the FAA and described what I thought happened with the unsupported rigid tube. From my information, they published an Airworthiness Directive for all engines like mine to immediately replace the rigid tube with a flexible, steel braided hose that would withstand the vibration without failing. Problem solved.

I was lucky the failure did not occur 10 minutes later, or I would have been landing somewhere in the dark. I kept that plane for another seven years until someone saw it, looked me up, and wanted it bad enough to pay whatever I asked. I miss flying my own plane because the familiarity is comfortable, like an extension of myself, instinctively knowing where everything is without having to think or search. I was able to remain calm, I knew how the plane would perform, and I remembered my instructor saying, “Keep flying the plane!”

In the best case, smoke can seem like a thin mist. In this case, you probably won't lose visual contact with the ground, but you may lose a "visual horizon" and this may force you onto instruments. The best thing to do is transfer to instruments immediately and possibly turn around for clearer air.

Another case is when you encounter smoke, but you are above it. You are officially in "VFR Over the Top", which is a legal VFR condition. The potential issue is that you may encounter this all the way to your destination. At some point you'll need to descend, which may very likely place you into IMC conditions. Unless you can file for an IFR descent and approach, this is not very wise.

A third condition is when the smoke initially begins as a thin smoke, but gradually and insidiously gets thicker and thicker. You may lose all contact with the ground or have a deep slant peek at the ground, with no horizontal reference. Again, the best response is to transfer to instruments relying on your AI, IAS, and Turn Coordinator. It is wise to let ATC know your predicament, once you are safely and positively "aviating". If you have an autopilot, that is a great aid. Call ATC and ask them if they know the altitude of the "smoke tops" and if those altitudes are doable. That can be a viable option for now.

Often overlooked is the fact that you may be inhaling smoke. At any altitude, this can affect your blood oxygen levels and lower levels can affect your ability to fly. Check your O_2 levels when in smoke and consider supplementing with oxygen. I recommend going to oxygen and forget the blood oxygen level. It's the safer decision. Ditto for your passengers. In addition to reducing your abilities, it can cause allergic reactions and nasal and/or chest congestion, both of which are undesirable.

If you have weather in the cockpit, you can check the weather ahead of your route. Pay close attention to METARs and TAFs for your destination and alternates. If things don't look rosy, turning around or landing is a very good decision. Check your fuel levels and ensure that an alternate is readily available. "Get-There-Itus" might kill you, so conservative decisions are good.

As you near your destination, if the smoke is still bad, you should advise ATC. Since you'll have to descend to land, it might be useful to descend via an approach. At least you will ensure terrain clearance. This decision is a last resort if you have no VFR alternatives. ATC can and will help. It's wise to enlist all sources of assistance in this undesirable scenario. ATC will give you nice vectors and altitudes to each fix and this can ease your load. Don't worry about busting FARs. Your only goal is to walk away from the landing. Without an Instrument Rating, this is your only goal.

You can avoid these situations by doing a thorough pre-flight. ForeFlight can show you all the Fire TFRs. Then look at Flight Conditions at all airports enroute for VFR, MVFR or IFR. Are there alternatives near your destination? Also check for Winds Aloft at your altitudes to see which way the winds are blowing the smoke. It may allow you to dance around the worst smoke. It's worth checking at least.

Also help other pilots by giving smoke PIREPs along the way. It makes it easier for pilots following your route later.

Sometimes the best decision might be to fly another day.

Sometimes it's better to be on the ground wishing you were flying, than flying wishing you were on the ground.

Part I - Oshkosh Rookie – Getting There

by Richard Brown

The uncertainty, the expectations, the anticipation, and a myriad of other thoughts and emotions combine to make the "First Time" different than all the rest, regardless of the event. Oshkosh, the mother of all air shows, is no exception. 2020 was going to be my Oshkosh Rookie year, but like many other things it was pushed to 2021. Over the next three articles, I will share my experiences getting there, my time at "The Show," and the journey home. If you are Oshkosh Veterans, perhaps it will bring back some memories. If you have never been, maybe it will be the fuel that lights your fire and gets you there in 2022.

I have a good friend who loves to go flying with me and he was more than willing to come along. My sweet wife was happy to send us on our way, a sort of "work the kinks out of the trip" before she joined me at Oshkosh in 2023. When I told her we were going to deviate and fly the Chicago skyline on the way home, I could see that she was regretting her decision to not make the trip.

The plane was flying great, and with my ongoing IFR training, it was flying regularly. The only thing that needed to be done was an oil change because of the number of hours required to fly there and back.

What do you need to bring to Oshkosh? That depends on if you are just flying in and staying at a hotel or if you are camping. We wanted to camp, so there were all the things you would expect to need, like a tent, sleeping bags, air mattresses, camp chairs, small cooler, tarp, etc. If you want an amazing sleep, get a basic twin air mattress and then a thin backpacking air pad and put it on top. It acts like snowshoes and spreads out your weight, so you don't end up like a taco in the morning. I also bought some 15.5" x 10" plastic cutting boards to put under the wheels to keep them from sinking into the grass. They are lightweight and worked perfectly. You can pack food to cook, buy stuff to cook at the markets or Target outside the North 40 gate. We packed snacks and ate meals at different vendors.

I bought Goal Zero solar panels and a power station for charging everything at night, but that isn't necessary. There are plenty of charging stations to charge a phone, or if you aren't comfortable leaving your phone, just plug a power bank into the charging station and retrieve it in the evening to charge your phone while in your tent overnight. I saw lots of power banks and phones charging unattended and people just left them alone.

You will also need tie-downs for your plane. "The Claw" is a popular one and EAA has plans to make your own. I decided to purchase the "Storm Force" tie-down kit and was pleased with it. Whitman Field does not recommend tying down with the screw in type, nevertheless, I did see some planes tied down that way.

I use Excel all the time at work, so putting together a spread sheet for the weight and balance was child's play. I have a W/B app on my phone so the variables I need to know are what can be loaded in the baggage area and what needs to go in the back seat.

Everything was weighed and the weights recorded in the spreadsheet. I moved things around on the spreadsheet and ended up with 102 lbs. in the back seat and another 91 lbs. in the baggage area. With full fuel, we were 60 lbs. under gross and within the CG envelope.

Friday after work we met at the airport and loaded up the plane, using the Excel list to make sure everything went where it belonged. We then made the short flight to Palm Springs, California (KPSP) so that we could get an early start Saturday and not be trapped by a morning marine layer in the Los Angeles Basin. We stayed at a "luxurious" Motel 6 in Palm Springs. Okay, it wasn't luxurious, but it was clean and although the lights weren't left on for us, the lights did come on when we flipped the light switch. Our Uber driver even told us that it was the "nicer" Motel 6 in town.

The trip truly began Saturday morning. It was beautiful and the temperature hadn't started climbing. With the anticipation of the adventure ahead, we began our takeoff. Little did we know that we would have a slight delay.

Just after taking off, we noticed that the top of the door had not latched all the way and had popped open about an inch.

Me: "Palm Springs Tower, Mooney 878, the top of our door popped open, and we need to come back around and land."
Tower: "Mooney 78878, make right traffic runway 31L, cleared to land."
Me: "Right traffic, 31L, cleared to land, 878."

We landed and got a "Welcome back, did you need to taxi to the ramp or just back to the runway?" I told her just back to the runway where this time I made certain the door was latched properly. Then, we were on our way.

CLICK HERE to view Richard's Most Excellent Video of the FISK Arrival to AirVenture 2021

The first leg would be the longest of the day, as there was a lot of moisture in the air, and even though it was early, there were a few storms to fly around. The scenery was beautiful and just over four hours later, we were touching down in Grants, New Mexico (KGNT). We fueled up, I checked the weather briefing for the next leg, and we were on our way. It wasn't any too soon, as there were thunderstorms to the north and directly east. We wound our way south around them, along the south side of Albuquerque, and then north-east to Garden City, Kansas (KGCK). Flying over the plateaus and canyons east of Albuquerque was stunning.

After 2.8 hours of flying, we landed in KGCK to get fuel for the plane and for ourselves. There is a nice little Italian restaurant on the field and the food was decent.

The final leg of the day would be 3.4 hours to Ankeny, Iowa (KIKV) which is on the north side of Des Moines. My weather briefing at KGCK had shown storms building to the north, so to get around them, we headed east to Topeka. In the time between when we took off from KGCK to when we turned north at Topeka, a second line of storms had developed. It was about 160 miles long. However, there was a gap about 60 miles wide and the storms weren't moving, so we headed for the gap and upon reaching the other side we were rewarded with a spectacular sunset. We landed at KIKV, booked a room, and had the most entertaining Uber ride I have ever had. The driver was just telling stories the whole ride.

But, enough about the flight legs getting to Oshkosh. For those that haven't been to Osh, you're probably wondering about the Fisk Arrival. I'm sure you have heard stories. Well, it was no big deal. Really, it wasn't difficult, nerve wracking, confusing, scary, or any of those other adjectives you might have heard. To prepare for it, I watched a lot of YouTube videos on the Fisk Arrival.

There are videos that EAA put out as well as a multitude of videos from the GA community. I also read, re-read, and then read again the NOTAMs.

I planned our arrival to be between the two mass arrivals for the day. If you get there at the same time as a mass arrival, you will have to hold. EAA added additional waypoints for 2021; the Endeavor Bridge, Puckaway Lake, and Green Lake Transitions before Ripon. Before we were close enough to pick up the ATIS, I was listening to ATC for the arrival. "We are starting at Portage right now" the voice on the radio said. "If you are not in the conga line yet, get in line at Portage, 1,800' and 90 knots" he continued. Portage is a town about 12 miles south of the Endeavor Bridge Transition. Although it wasn't part of the NOTAM, it is right there on the charts and because they pushed the starting point out further, it made for less confusion and conflicting traffic.

I highly recommend an ADS-B receiver because having ADS-B and traffic in the cabin is amazing. It was so simple to find a gap between a couple of planes, and we slid into the conga line about ¾ of a mile behind a Cessna. Crossing over Ripon, we followed the tracks and listened as the plane two ahead of us rocked his wings, then the Cessna in front of us. We heard, "Looks like I have maybe a Mooney over Fisk; rock your wings." I rocked them and heard, "Nice job, straight up the tracks runway 27, monitor tower eighteen-five. Where you in from?" "Los Angeles" I replied. "All right, great to have you here," he said. Then he was on to talking to the plane behind us.

We followed the tracks and entered a right downwind for 27. Everyone was currently landing on 27 because they had closed 36 temporarily so a pair of F-15's could arrive. Just before entering the downwind, a twin Comanche that was in the higher arrival for faster planes, dropped in between us and the Cessna we were following. On the downwind, off to our right, we could see the F-15s doing an overhead break for runway 36. It was awesome!

Tower extended the downwind out over the lake for some T-6s that were coming straight in on 27, but all we had to do was listen to the radio and follow the guy in front of us. If you can follow a plane in the traffic pattern you can fly the Fisk Arrival.

Coming across the numbers we heard, “Mooney see if you can run it all the way down to the green dot; keep it flying all the way down to the green dot. We’re trying to shrink this up here. Thanks for the help.” I added power to stop the descent, flew it down the runway, and nailed the landing on the green dot. It felt great! What followed was a long taxi. There was no talking on the radio. We just followed the Marshals’ signals.

The ground frequency was very quiet, but about halfway through our taxi we heard one of the Marshals say, “The Cirrus says he can’t taxi on the grass.”

As you all know, anyone can say anything on the radio, and you don’t know who said it. Well, a couple of seconds after the Marshal gave the message about the Cirrus, someone keyed up their mike and uttered, “Weenie.” It was hysterical. “Welcome to the show!”

If there are things you would like me to write about (or not write about) drop me an email at richard@intothesky.com.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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.

Let's Talk Dirt

Fifteenth in the series
by Ron Blum

When I say, "Let's talk dirt", I mean let's talk about the remnants of dirt, grime, grease, bugs, oil, etc. I am NOT talking about a "Twisted Affair" (the propeller discussion we had last month) or the gossip type that one would find on "Entertainment Tonight", "The View" or in the "National Enquirer". The gossip type spreads at the speed of sound and travels worldwide quickly. Our dirt doesn't travel very far or fast. We can learn a lot about aerodynamics from dirt if we only listen to it. You might be asking, "How?" Let's take a quick flight to hear what dirt has to say.

How many times have you heard pilots say they need to go fly to knock the dust off their airplane? Note: This comment is normally made to an uninformed spouse as an excuse to go flying. After the flight when they are putting the airplane away, they notice the dust is still there. Why?

In past articles we learned about the boundary layer; laminar, turbulent and separated flow. Notice in Figure 1, that the air next to the surface has no velocity. Note: There could be minor flow velocity with separated flow, but that would mean stalling at least a portion of the wing. The flow velocity would still be very slow.

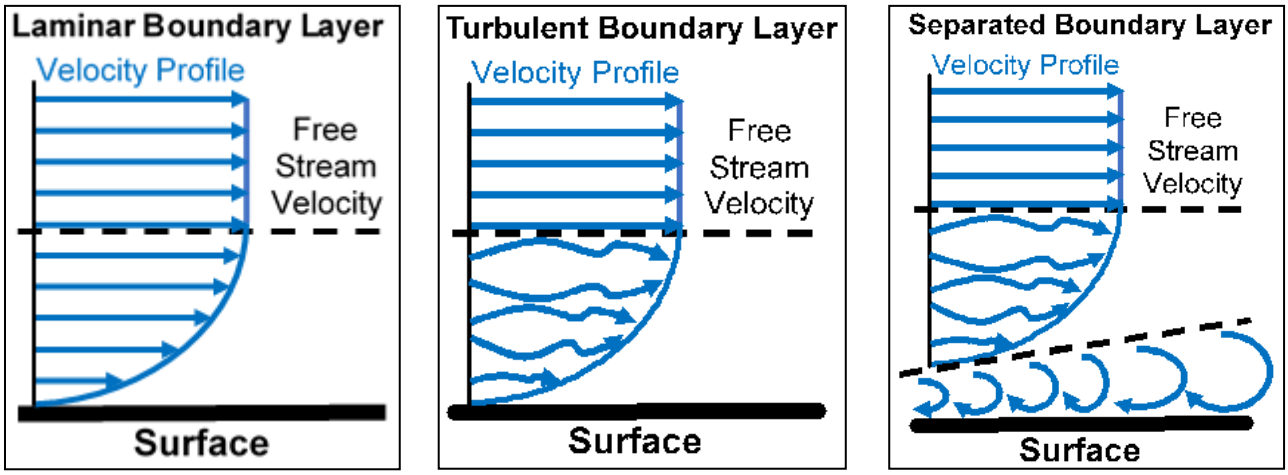


Figure 1

Flying a dirty airplane through a brief, light rain will show streamlines and areas of separated flow. On business jets, we would "paint" the fuselage and wing leading edges of the airplane with a Kool-Aid mixture to see where water from the nose wheel would hit the airplane, (hopefully not the engines), and look at the flow patterns to validate the pitot tube angle and the angle of attack sensor position.

Moving on to bugs, which is something else to clean off the wings ☹ . We are all taught that air hits the physical leading edge of the wing and goes up and over or down and under the airfoil. See Figure 2. Because the upper surface has camber (curvature) the air accelerates over it faster than the lower surface. This isn't exactly true. Flat plates and symmetrical airfoils produce lift, too. They just need a little angle of attack to produce positive or negative lift.

Figure 2

In reality, air hits the airfoil at what aerodynamicists call the stagnation point, see Figure 3. The stagnation point is below and behind the physical leading edge of the airfoil. The stagnation point moves aft as angle of attack increases or when flaps are deployed. What does this have to do with bugs … and icing (hint, hint)?

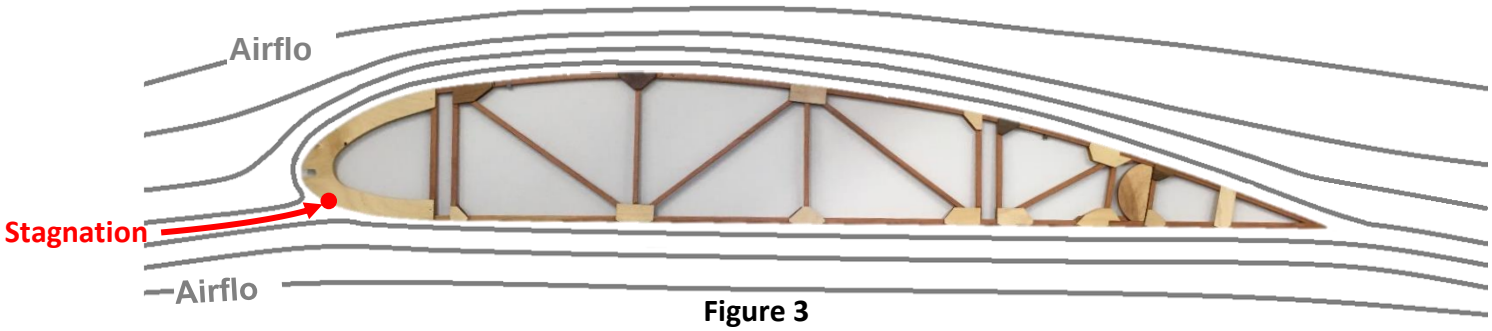


Figure 3

Bugs hit near the stagnation point. Smaller bugs hit closer to the stagnation point because they have less inertia and, as a result, follow the streamlines more. In other words, because they are lighter, they move with the airflow more easily than larger insects. Larger bugs have more inertia and are not as affected by the streamlines, so they hit in a larger chordwise percentage. The Mooney leading edge radius is pretty small, so this is somewhat difficult to see. What does this have to do with icing?

Icing starts at same place the smaller bugs hit – the stagnation point. Because water droplets come in different sizes, they hit the airfoil at different places. Smaller drops tend to hit near the stagnation point or are carried around (off) the airfoil by the streamlines. Larger ones hit in a larger area, at about 20% of the chord. An airplane equipped with de-ice boots illustrates the extent of how far back water droplets will contact the airfoil. Smaller radius leading edges will collect ice faster than larger radius leading edges. In other words, if your wing is starting to collect ice, your horizontal and vertical stabilizers leading edges already have more ice.

Speaking of the wing stagnation point, that is what the stall warning vane/switch uses to tell when the angle of attack (AOA) is nearing the stall AOA. Referring back to Figure 3, when the stagnation point goes below/behind the little vane, the airflow pushes the vane upwards, flipping the switch. When the switch makes contact, the stall warning sounds. It's a simple, expensive, momentary contact switch.

The leading edge of your flaps have a stagnation point, too. Check the leading edge of your flaps for bug remnants. Another stagnation point is the base of the windscreen. Larger bugs can hit just about anywhere on the surface. The smaller bugs will be forced upward by the streamlines before they hit the window.

Oil on the belly of the airplane will show you where the air is going. If one knows what to look for, they can even tell if the flow is turbulent or separated. One method of reducing drag is to place colored oil drops just ahead of the area of interest to see how the drops change in flight. Listen to the dirt; it's talking.

I really want to know your comments, questions and concerns about this article. I appreciate suggestions on where to take these articles and/or answer any questions you may have. Please email me at solutions@blueontop.com. 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.

Volume 10 Number 9 September 2021

MAINTENANCE YOUR WAY

by Ray Reher

Most aircraft owners probably perform at least some kind of maintenance on their plane, even if it is nothing more than checking under the hood between annuals (highly recommended), and inspecting for leaks, cracks, chafing, broken wires or anything that just doesn't look right. Others get more involved with tasks performed themselves, or under the supervision of, or with their A&P Mechanic. Knowing your machine and its systems is invaluable, and any participation in maintenance helps toward that goal.

But CAUTION: Three risks involved in self-performed maintenance include, (1) an inadvertent violation of safe procedures, (2) the threat of FAA enforcement, and (3) insurance carrier non-performance. Of course, no one wants to end up in the dirt or deal with the FAA because of a simple mistake. But also, an often-overlooked risk is the fact that an insurer can easily deny a claim if the plane is deemed to have been flown in a less than airworthy status. Risk can be mitigated, and owner-performed maintenance should not be intimidating, if you just comply with the "WHO", "WHAT" and "HOW" laid out in the FAR's.

WHO can do it?

14 CFR 43.3 (g) "Except for holders of a sport pilot certificate, the holder of a pilot certificate issued under Part 61 may perform **preventive** maintenance on any aircraft owned or operated by that pilot, which is not used under FAR Part 121, 127, 129, or 135 of this chapter."

WHAT may be done?

14 CFR 1 Definitions and Abbreviations: "PREVENTIVE MAINTENANCE means simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations." 14 CFR 43, Appendix A (c): "Preventive maintenance is limited to the following work, provided it does not involve complex assembly operations:" This FAR is explicit about what may be accomplished by the pilot and lists 32 specific functions determined by the FAA to meet this definition. The list is too long to include, but you definitely should review these items, because if a function is not on this list, it is NOT AUTHORIZED to be accomplished by the pilot. You may also be surprised at what is on the list. Whether "complex assembly operations" limits any of these items may vary by make/model. In most cases, it is a judgment call. Notice, "**complex assembly operations**" is repeated and is obviously one of those regulatory catch-all's that may leave an argument of compliance open to interpretation.

HOW to do it?

CFR 43.13 in summary, requires the maintenance be done using methods and techniques in a current manufacturer's maintenance manual, or other approved guidance such as AC's published by the FAA. The FAR also includes a statement about "… using material of such quality…" etc. Ace Hardware is great but is not an authorized aviation parts supplier. The regulation also holds our feet to the fire on using

proper tools, to include special tools or test equipment required by the manufacturer to complete the task. The bottom line on "HOW TO", is to research what you plan to accomplish, have whatever reference material is available with you, and have the proper tools. And if it's not stupid simple, have your A&P mechanic help you with it, at least the first time you try an item. The approved list of functions includes items such as replacing fuel lines and lubricating wheel bearings. How tight should the fuel line connectors be? How are the axle nuts on the wheels tightened, so as not to cause damage with too much play, or fry the bearings if too tight? How do you tighten a plug that requires a crush washer? Some of us with elderly planes, are only able to obtain crude service manuals with limited guidance. A look at AC 43.13-2B "Acceptable Methods Techniques and Practices" is worth it but understanding all 137 pages can be difficult. Using you're A&P as an instructor is well worth it. My mechanic has been in the business for 40 years. I admit that although authorized to replace fuel/oil/hydraulic lines etc., I will not torque B-nuts and flare fittings associated with these critical items. I just don't have his feel for it. Some other items I would not attempt without a lesson from my A&P are metal patches, mainly because I don't want to make a chocolate mess of my plane. Looks simple, but if you have no experience with applying safety wire, a lesson from the mechanic is a good idea.

HOW to document it?

An aircraft is not considered airworthy unless maintenance performed is documented properly. 14 CFR 43.9 requires an entry when returning the aircraft to service to include: (1) A description of work performed (2) Date of completion. (3) The signature, certificate number, and type of certificate held by the person approving the work. The signature constitutes the approval for return to service only for the work performed.

Finally, A&Ps are human, and a second set of eyes and common sense helps. You should be the final inspector. Examples: An oil filter safety wired backwards, wire cutters left on top of the engine (cowling on), set screw improperly safety wired, jamming the prop governor, and a screwdriver left in the fuel tank after replacing the quantity sensor. The reason I cite these particular items, is that they were all done at factory certified service centers (the gold standard) – Mistakes are not common and shouldn't happen, but they do. The more you know your machine, the more you can catch, and the more confidence you will have in its airworthiness. This article only covers some bare bones basics with only some references, or it would be many more pages. It's meant to get someone pointed in the right direction, help keep the nuts and bolts tight and you out of trouble.

Unusual, Unusual Attitude, Huh?

by Jerry Proctor, CFII

Well, there I was! You know all good aviation stories begin like that. I am using this opening, but this is not destined to be one of those great aviation stories. However, I hope it is entertaining and a somewhat informative.

So again, there I was, flying home in my Acclaim, returning from a MAPA Safety Foundation Pilot Proficiency Program at Ft Worth Alliance Airport, Texas. There were 22 students, and it was the second PPP of the year. I'm glad the Safety Foundation is back because their training program is outstanding.

I live in southeastern Arizona and the distance to or from Ft Worth is around 680 NM. Thus, it is a super one bag flight. I felt even better, given that due to an earlier very large high-pressure system, I had a 25 knot HEAD wind going to Texas. Grumble! Flying home and heading West, I was at 14,000 feet with a True Airspeed of 193 knots. For this flight, I at least had a slight tail wind component, which was good.

When I took off from Ft Worth, I was assigned a Standard Instrument Departure (SID), which really was just vectors. Somewhere in the climb, I heard ATC say, "Mooney 606MR, can you accept direct El Paso?"

I had to stop myself from saying, "Hell Yes", and instead said, "You bet!" I love 400 NM direct clearances.

The air was smooth, cool and I just enjoyed watching the landscape of West Texas float by. When I was just about over ELP, I slid my seat back and reached into the backseat to get my frozen soda. In doing so, I bumped the O_2 hose hard enough to knock the O_2 tube out of the nipple. BEEP, BEEP, BEEP!!! Oh shoot, (modified for a G rated audience), and I spun my upper body around even more, grabbed the tube and worked to insert it back in the nipple.

I guess it took 10 – 15 seconds to do this. When it was secure, I turned around and looked at my instruments and what-thaaa!??

I had that startle moment and wondered, "Why am I in a 20-degree right bank and 150 feet below the assigned altitude. I also looked outside and having been on the ground and flown over Fort Bliss and El Paso, Texas many, many, times, I knew I was going in the wrong direction.

Without putting my seat back in place, I grabbed the yoke and got the plane level and headed in the right direction. The urgency was greatly highlighted by being only about two miles north of the US Mexican border. I then realized that I had moved the yoke easily, from the full aft seat position. What the heck, hit me again. After a couple more seconds, I realized that I had created two issues. First, the unplugging of the O_2 hose, but unknown until just this moment, I had bumped off the autopilot. "George" was no longer in charge! Had those two things not happened at the same time, I would have heard the autopilot alarm going off. Instead, I was too busy saving my O_2.

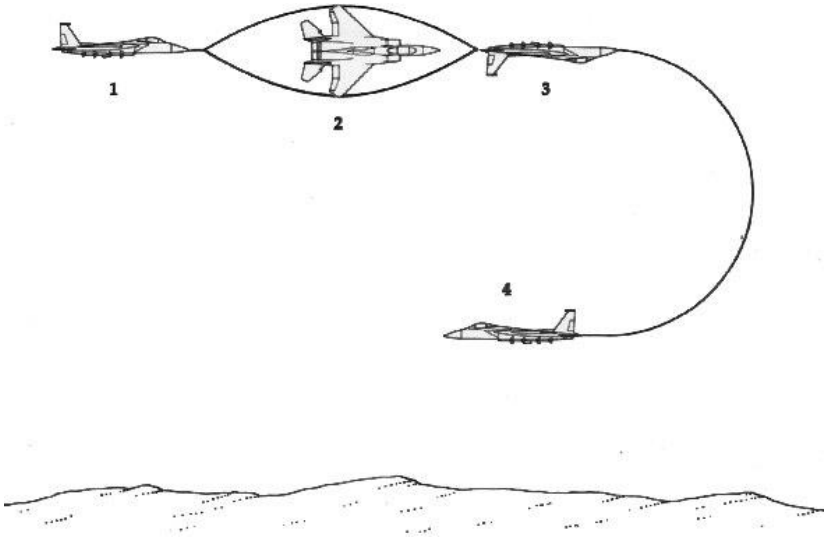
So, I hand flew until I got my CDI centered and back on altitude. I was glad that ELP approach was so busy with other planes that they didn't notice my issue.

A short while later, having reflected on this event, I realized that all of us have been given unusual attitudes during our flight training. As a CFII, when placing a pilot in an unusual attitude, I try to be innovative and sneaky. But let's be honest. The pilot receiving the training almost always knows when the unusual attitude is going to happening. Thus, the startle factor is greatly reduced.

When I was a student on a training flight, flying an OV-1 Mohawk over the ocean, south of Corpus Christie, Texas, I was subject to a most unusual, unusual attitude. It was a hazy day, the sky and the ocean were both gray, so there was no discernable horizon. My Army Instructor Pilot (IP) maneuvered for some period and put me in a 40 degree nose up climb. Suddenly, I was inverted and facing south, (remember no horizon). Waaaaa, the #@$% !!!

My attitude indicator and the outside references made no sense. I finally figured out that I was inverted with zero Gs. So, what did my young mind tell me to do? Well, I did what any other self-respecting aerobatic Mohawk pilot would do. I did a Split S maneuver.

I was kind of proud of myself, plus the Split S was kind of fun. I then learned that my IP didn't think that maneuver and net altitude loss was a very good option.

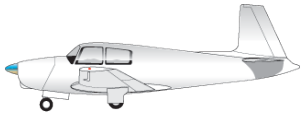


So, what is the lesson I hope you learned from this article? Hopefully, it's that unusual attitudes can and do happen, and they can happen a CFI is not playing tricks on you. So, keep practicing them. When a real unusual attitude sneaks up and bites you, you'll be grateful you had the practice.

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

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

Mooney Maintenance



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

Click here

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

Click here

LASAR
Fanatically Mooney. Exceptionally Fast.

Ask the Top Gun

Tom Rouch
Founder of Top Gun Aviation, Stockton, California

Send your questions for Tom to TheMooneyFlyer@gmail.com

Question: This is not your ordinary question. You know a ton about Mooneys because of your long career and vast experience. Just thinking about it, what things would you have designed differently that would have improved the Mooney airplane and/or improved life expectancy and maintenance?

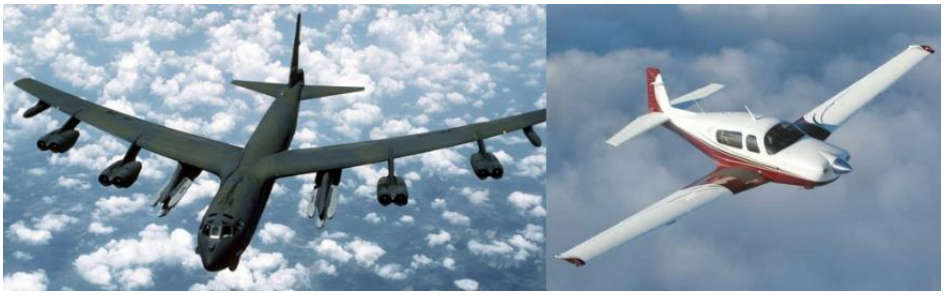
Answer: You are right. It's not an ordinary question, but I will make an attempt to give you a great answer.

What is obvious is that the original Mooney design was exceptional, and it has been improved every year since the beginning of production.

A good example of this is (for those familiar with our F/G model, as we call it) was to take a 69 F and with many later year model parts and convert it to a very improved J model with some additional items that were added to make it faster. One big item we added was a three-blade composite prop, saving weight and providing better performance. We started with a 145-knot plane and ended with a 170 plus Mooney. One thing I didn't do, was keep track of costs. I bought a wrecked plane and just started rebuilding it for the next couple of years. Mark did almost all the work, which kept the labor cost down. When you look at the current Mooney models, we now have the fastest single engine production plane on the market. It is pretty hard to improve on that.

I will now take a different approach to answer the question from a maintainers point of view. The Mooney does take more skill to maintain, since it incorporates systems not normal to GA airplanes. Things like the push-pull control system, the shock disc landing gear, one piece wing, no control tabs on the flight controls, and other very good systems. The one thing that caused me the most trouble and also loss of money, is the fuel tanks. Obviously from a weight saving item, the tanks are very good, but from a maintenance standpoint, they are very labor intensive. I know many times we used more man-hours than we could bill. This brought us to two solutions. Install Monroy fuel tanks or find one of the very few shops in the country that can reseal a tank. I would have preferred removable fuel cells. I know they add more weight, but they are maintainable everywhere. The wing construction was a real challenge to repair with the overlapping wing skins. We had to get factory skins since they are specially formed. On the other hand, I can repair a Cessna with a sheet of aluminum; bending it to fit.

Obviously, I chose my civilian career to be totally Mooneys and most of my military career was spent on the Boeing B-52, the two best airplanes ever built.




N7454I
number 1 in sales*
since June 1961
Mooney's position as the top seller in retractables is positive proof of its impressive performance and value. Every day more and more of those who fly Mooney BUY Mooney! ■ The Mooney Mark 21 for '62 packs a bigger payload . . . has a new "Safe-Lift" flap system,a completely new exhaust system that gives you lower noise level and more cabin heat. New T-formation flight panel means added safety and efficiency. ■ Mooney gives you more real value in every detail . . . in design, in construction, in styling, in high speed performance and efficiency . . . it's unmatched by anything in its class . . . BUT YOU WON'T BELIEVE IT 'TIL YOU TRY IT! Ask your nearest dealer for a demonstration flight . . . but remember ownership is contagious!
199
83
165
MOONEY
MOONEY AIRCRAFT, INC. KERRVILLE, TEXAS

New line of magnetos from Kelly Aero

Kelly Aero now produces all new FAA/PMA direct replacement four- and six-cylinder magnetos. The new line of mags will serve as a drop-in replacement for Champion and Slick magnetos.

"We have manufactured millions of magneto parts and we have overhauled well over 100,000 magnetos over our history," stated Kelly Aero President and CEO Jeffrey Kelly. "Introducing a new direct replacement Kelly Magneto further cements our commitment to piston engines in general aviation. It has been 30 years since a new direct replacement magneto line this robust has hit the market, so it is quite an accomplishment by our team."
The mags are manufactured at Kelly's Montgomery, Alabama, facility and will begin shipping in September 2021.

GPS III's Long Journey Is Picking Up Speed

With the launch of a fifth new-generation satellite, the US finally has a constellation able to globally beam M-Code signals that are tough to spoof or jam.

THE US Space Force launched its newest satellite, one of only a handful of the new GPS III design, which is more accurate and more resistant to interference—like signal-jamming—than its older siblings.

The launch means that an increasing amount of the country's GPS satellite constellation has stronger position, navigation, and timing abilities and is designed to live longer than its predecessors—around 15 years, by which time people not born yet could be using its services for tasks that seem sci-fi now. (Designing for the longer term also leaves less space trash to clean up.) The GPS satellite club — "GPS" being the name for the American brand of the generic "global navigation satellite system," or GNSS—already has 31 operational members, 27 of them from three previous generations. This is only the fifth GPS III orbiter and will supplant one of the older satellites.

For More Information, CLICK HERE

FAA approves removal of attitude indicator with installation of Aspen Avionics Pro MAX

The FAA has approved changes to backup instrument requirements for general aviation pilots with the installation of Aspen Avionics' Evolution EFD1000 Pro MAX primary flight display (PFD).

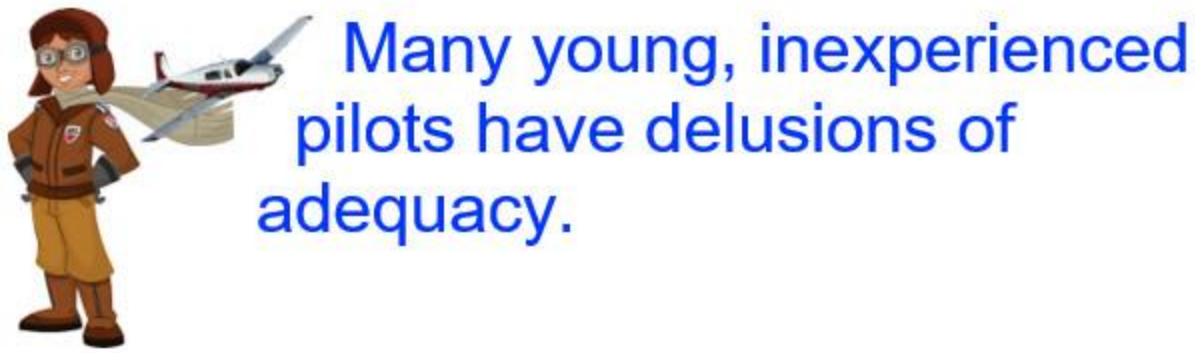
The approval allows aircraft owners to remove the attitude indicator when installing a single Evolution EFD1000 Pro MAX PFD with the latest released software (v2.11) and the new extended duration battery, company officials explain. A turn and bank indicator, along with airspeed and altimeter, must be retained as the three required backups.

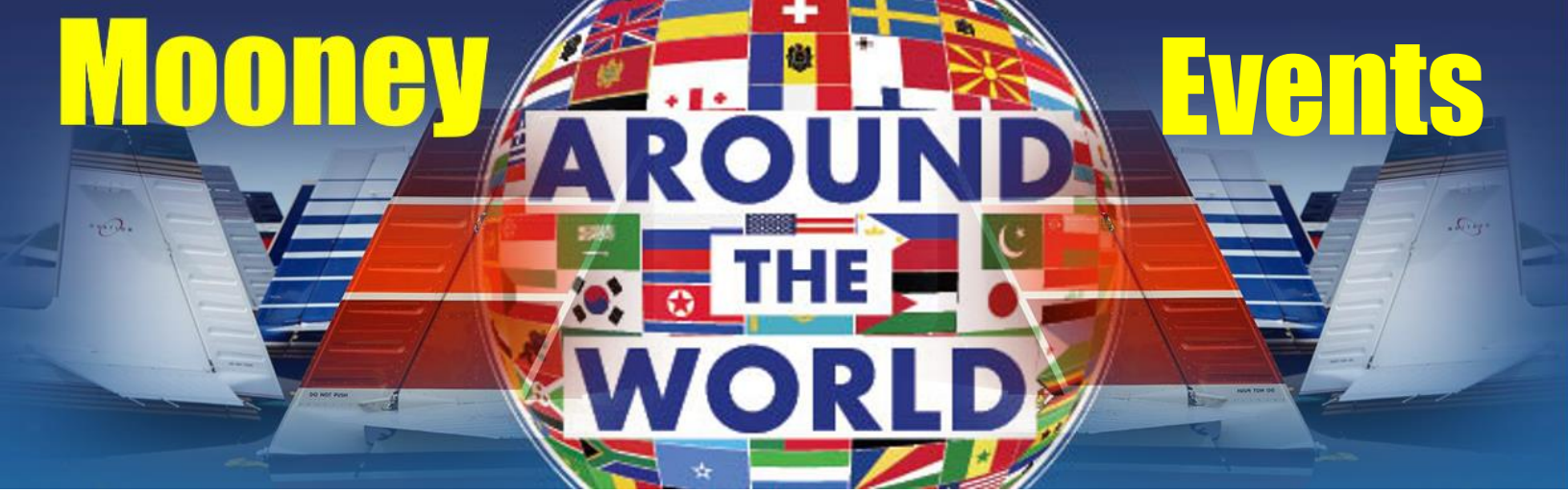
"This is a game-changing development for aircraft owners looking for an affordable, full-featured primary flight display while allowing removal of outdated mechanical attitude indicators," said Aspen Avionics' Scott Smith. "We are cleaning up panels while reducing our customer's maintenance cost and giving them some extra weight savings as well."

Key Features:

- Consolidates traditional attitude indicator and HSI into a single display
- Synthetic Vision included at no cost
- Works with existing avionics and interfaces with most autopilots (removal of attitude indicator may require an autopilot adapter if aircraft has an attitude-based autopilot installed, such as Bendix/King or Century)
- Patented form-fit design slides into existing panel cutouts

Current owners of the Aspen Pro MAX PFD can be field upgraded by Aspen authorized dealers to the extended duration battery and latest software. The new software is free of charge from Aspen Avionics.





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* September 11: Venice (VNC) October 9: Flagler (FIN) November 13: Sebring (SEF) December 11: Winter Haven (GIF)
Mooney Caravan	
MooneySafety.com	Sep 10-12: Chicopee, MA Oct 15-17: Wichita, KS **Sign Up at** https://www.mooneysafety.com/ppp-registration/
MOONEYSUMMIT	October 22-24: CLICK HERE for details
Australian Mooney Pilots Association	October 8-11, 2021: Spring Fly-in, Merimbula, NSW. **CLICK HERE** for the AMPA website's *Event Page*. March 17-21, 2022: Mount Gambier Fly-In
EMPOA	CLICK HERE for details
Other Mooney Events	

TMF PRODUCT REVIEW

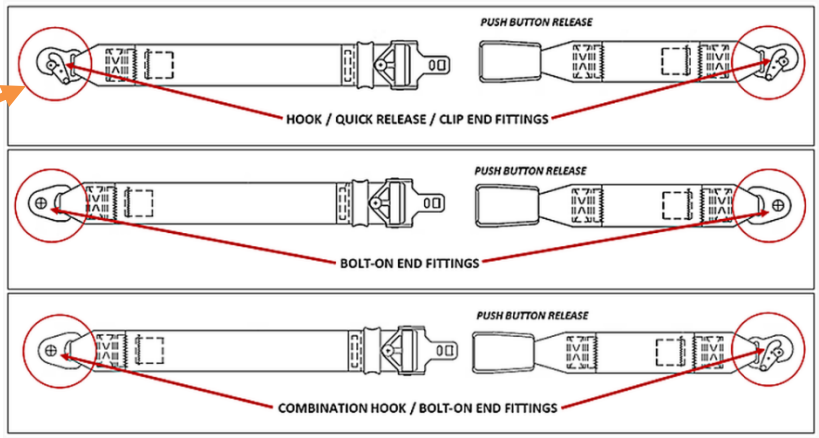
Alpha Aviation's Seat / Lap Belt Upgrade (Mooney M20, A Thru K)

For a long time, I have wanted to upgrade my 1989 M20-K 252 seat belts / shoulder harnesses to Alpha Aviation's Inertial Reel shoulder harness with an easy push button seat belt release – like those that are found in modern cars.

Recently, I called Alpha Aviation and talked with a wonderful staff member who helped me choose the right model. I learned that AmSafe® makes FAA/TSO, OEM quality 3-point diagonal restraints for older Mooney M20 aircraft. I also learned that I could upgrade the front seats to a 3-point diagonal shoulder harness by incorporating Alpha Aviation's "**Minor Change Kit**".

Replacement restraints are available for later M20 J and M20 K models with the factory 3-point installation.

I first needed to determine how the seat belt is attached to the seat – Does it use a Hook / Quick Release fitting or is it bolted on? A quick trip to the aircraft determined that I had the Hook / Quick Release fitting.



This restraint includes one complete assembly – shoulder and lap belt for the pilot, co-pilot or J/K model passenger position. 2-point rear seat lap belts are also available. Alpha Aviation also provides an 8130-3 airworthiness certificate.

I ordered two assemblies for both front seats and asked my local MCC, Chandler Aviation to install them.

After the installation, my wife and I went on a long trip. It was so satisfying to hear my wife say, "These seat belts are wonderful and much easier. I love them!" On each leg of our trip, she said, "Have I told you how much I love these new belts?"

It was worth it!

Alpha Aviation is in Owatonna, Minnesota. Call them. You can thank me later.

Jim Price

Alpha aviation. inc.

800.653.5112 Phone
507.451.3480 Phone
952.210.8822 Text Only
cs@alphaaviation.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 Seperator
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 online
FREE
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