The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

February 2022

Editors

Phil Corman | Jim Price

Contributors

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

Departments

Features

If you love ***The Mooney Flyer*** and want to keep it healthy, just click on **the "Donate" button**.

Subscribe and we will email you when a new issue is published.

Find all the back issues (starting in 2012) or use our powerful search engine to find a past article.

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

From the Editor

FTE

Phil Corman

Mooney Fly-Ins

Hosting a Mooney Fly-In is an extremely rewarding endeavor. I was reminded of this last month when Trevor Jones setup a fly-in to Sedona, AZ (KSEZ). Sedona is drop dead beautiful. With its red rock mountains, the setting is breathtaking.

If that's not good enough, the USS Sedona, (called that because it is situated on a mesa). KSEZ is one of America's greatest airports for a scenic approach and somewhat challenging landing.

This article is more about deciding to host a Mooney Fly-In. You won't be sorry. It's a ton of fun. You'll meet new and old Mooniac friends and tell Mooney lies to each other as you admire each other's Mooney on the ramp.

It's easy to do. Here are the steps:

- Decide on a location
- Decide on a date. You can simply pick a date in the future or ask people on MooneySpace.
- If there is a restaurant on the field, let's eat. If you want more people to attend, lunch is better than breakfast. If no restaurant, sometimes the FBO can help bring food to the airport.
- Publicize your fly-in on The Mooney Flyer EVENTS page and on MooneySpace "General Mooney Talk" or "Miscellaneous Aviation Talk".
- Work with the Airport Manager and/or FBO to inform them of a Mooney Fly-in and your guess of how many airplanes. Ask for a fuel discount; most will oblige.

Then show up. I over saw about 80-90 fly-ins over a 9-10 year period in the early 2000s and I still remember the fun we had. I hope this little editorial motivates you to host one.

Next month's poll: "In 2022, Mooney Aircraft will" **CLICK HERE** to vote.

Letters to the EDITOR

TheMooneyFlyer@gmail.com

Another GREAT Issue. I really appreciate you guys and your work. I know it takes a TON of work to put that together monthly!!!!! You do a great job on it !!!

Richard S

Just a note to say thank you for the informative Mooney Flyer your team provides each month.

Although I'm not a full scale pilot, I love the Mooney airplane and my son aspires to be a commercial pilot or ATC controller. He spends hours either flying or providing ATC ground and tower support via virtual flight simulation on VATSIM and X-plane 11. He's also an active member of our local EAA Chapter 4; supported by Brown Field airport (KSDM).

I'm an RC pilot and over the summer, while visiting my parents in Longview, Texas, my son and I had an opportunity to visit Don Maxwell's Aviation Services. I called Don to express my interest in stopping by to tour his shop, shortly after taking my son for a VIP tour of LeTourneau University - College of Aviation and Aeronautical Science. Both facilities are co-located at Gregg County Airport (KGGG).

We were thoroughly impressed with both facilities. Don provided a personal tour of his maintenance shop and he also allowed us to take a few pics from inside the cockpit of a Mooney. Although my son has logged many hours in a Cessna 170 taildragger, it was our first time sitting inside of a Mooney. I asked Don if there was a publication supported by the Mooney community and he mentioned The Mooney Flyer which is how I discovered you. It was an awesome experience overall.

Don invited us to stop by whenever we're visiting my folks in Longview, and I very much look forward to it.

I've also joined the Mooney Space to gain insight from the various forums.

I mentioned earlier that I'm an RC pilot. I spent a great deal of time looking for an RC Mooney kit or airplane to build and fly. Since I had no luck finding one, I decided to complete a partial scratch build of the Ovation M20U.

https://youtu.be/h6LUiCzl5aY

I've sent a small donation to your organization. Very best wishes towards the New Year 2022!

Randy M

Here is a heart-warming video from Jose G, shot while giving his granddaughter her first ride in a Mooney. CLICK HERE to view it.

My CHTs are High, Oh My

In a previous issue, we wrote an article regarding EGTs and how they are mostly relative temperatures. They can also be an indication of things failing or needing maintenance.

Cylinder Head Temperatures (CHTs), on the other hand, are absolute temperatures that you should monitor and not let the CHTs get out of hand. High CHTs can severely shorten your engines life, especially the top, or worse.

Do NOT Exceed CHTs

There are REDLINE or never exceed CHTs for both Continental and Lycoming engines. For Lycoming, the redline is 500F and Continental is slightly less at 460F. But let me emphasize that these are absolute redline and you should not let your CHTs get even close to these numbers. Mike Busch recommends keeping your CHTs below 380F, but in most Mooneys, that number may not be realistic. In your Lycoming, it's best to keep your CHTs below 420F and in Continentals, below 400F. If you want to be more conservative, shoot for 380F and 400F respectively. Often, our CHTs run a little hotter on the initial climb, so, let's look at how to manage them during a climb.

Managing CHTs on Initial Climb

You're typically flying at a slower airspeed on your initial climb, which provides less cooling. You have several steps you can take to manage hotter CHTs in the climb:

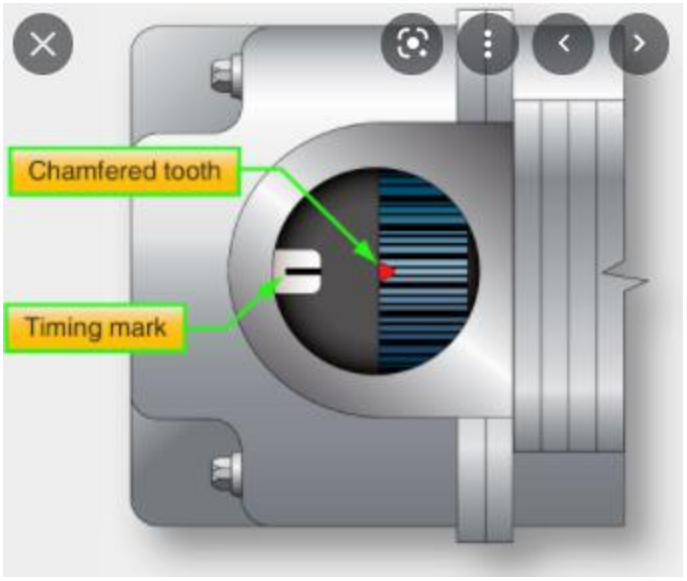
- Enrichen the mixture. A lean mixture will cause your CHTs to rise. In an injected engine, the culprit might be a clogged injector. In a carbureted engine, it could be an induction system leak.
- Flatten your climb, which will increase your airspeed and airflow into the engine
- If you have them, open your cowl flaps
- Reduce the RPM and/or reduce the Throttle

Baffling – Another Cause of Hot CHTs

Another common reason for a hot-running cylinder is insufficient cooling air passing over the cylinder's cooling fins. That's generally due to some issue with the engine's rigid cooling baffles or flexible baffle seals. If there's a cooling air problem, the cylinder will run hot both ROP and LOP, since the cooling airflow isn't affected by the mixture setting. Even a slight issue with your baffling can drive your CHTs warmer.

Often, especially in Continentals, you can have a cylinder run 30-40F hotter than the others. In my IO550, it was #5. I called Don Maxwell and he indicated that I should not be concerned. My #5 sits right behind the alternator, which might be affecting the cooling. I switched CHT probes to see if it was a bad probe, but #5 remained hotter than the rest. Subsequent compression and borescopes revealed no issues in the cylinder.

Timing – Another Cause of Hot CHTs



Incorrect timing is another reason for high CHTs. It is a serious issue that needs immediate attention—particularly when all cylinders are running hot. Your magneto (or electronic ignition) is supposed to be set to a specific number of degrees before top dead center (BTDC) which is marked on the engine data plate—typically between 20 degrees and 28 degrees BTDC. It is essential that the timing be set very accurately. The tolerance is plus 0 degrees and minus 1 degree and it should be set using a digital inclinometer accurate to 0.1 degree. If the timing of one or both mags is even slightly advanced, i.e., too many degrees BTDC, it will have a profoundly adverse effect on CHT.

Spark Plug(s) and/or Magnetos

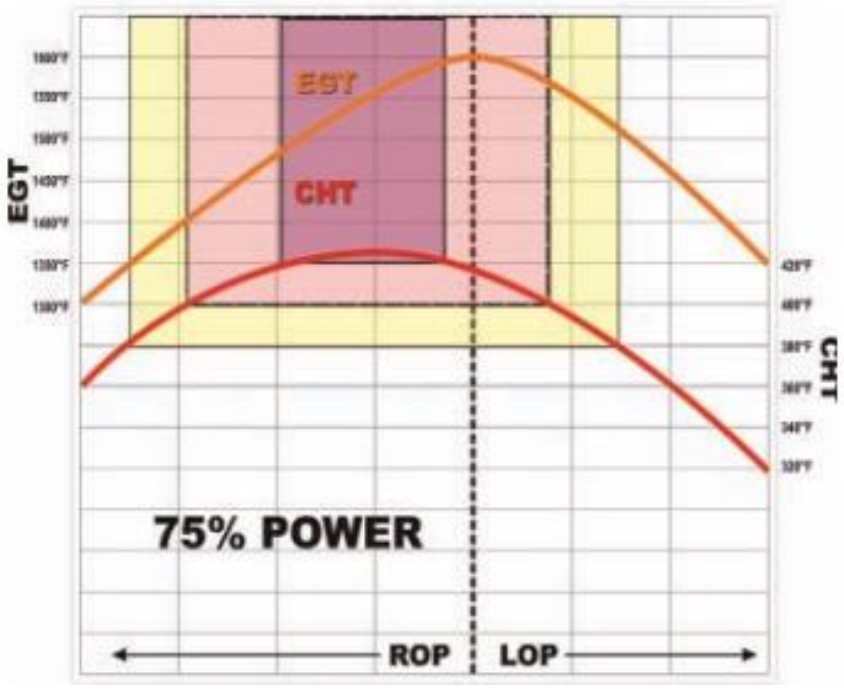
Failure of one spark plug or magneto can also affect CHT because the air-fuel mixture takes longer to burn when it is ignited by only one spark plug, instead of two. This causes the burn to occur later and CHT decreases. High CHTs can also be caused by detonation or pre-ignition. Both put high stress on your cylinders and can cause dramatic failures.

In rare cases, an exhaust leak at the cylinder exhaust gasket could be "blow torching" your CHT probe. In this case, it's wise to make an immediate precautionary landing.

Summary

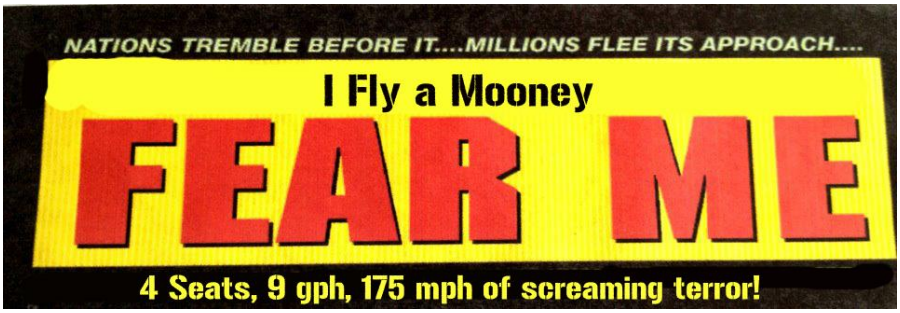
CHTs are not simply an indication of the temperatures inside your cylinders. They also indicate a much more significant issue – Internal Cylinder Pressure (ICP). At high ICPs, you are putting unnecessary and engine damaging pressure on your cylinder, valves and rods. Usually, you will get peak ICPs at 50°F Rich of Peak (ROP). Unfortunately, many of us were taught to run at this setting and many POHs still specify this. Back in 1978, I was taught to lean until the engine ran rough and then give it two enrichening twists on the throttle. This put the engine at 50°F ROP. Ouch.
With our engine monitors, it's easy to stay out of the "Red Box" while running either ROP or Lean of Peak (LOP). There's no excuse. **CLICK HERE** to learn more about the Red Box.

If your CHTs are a little warm on the initial climb, you can take the steps mentioned earlier in this article to mitigate those temps. It is not too uncommon to have your CHTs run warmer on the initial climb as long as they fall into the green once you are at enroute cruise. Reducing the climb rate, reducing the throttle and reducing the RPMs can have a positive effect on climb CHTs.

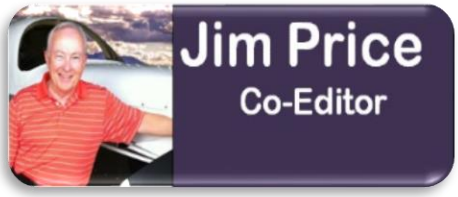


Accomplish regular compression checks and borescope each cylinder regularly, including cylinder walls, exhaust valves and piston heads.

Also, monitor your CHTs. If you cannot keep them at acceptable levels, have your mechanic check for firm and flexible engine baffling, magneto timing, sparkplugs, injectors, etc.



Understanding USB-C and Power Delivery



The familiar USB plug with a rectangular shape was first invented more than 25 years ago. It has since been used for everything from laptops to coffee makers. While the plug is not bidirectional—to the frustration of everyone who has ever tried to jam a cable into a plug upside down—its prevalence and universality makes it easy to charge your iPad. From airport lounges to cigarette lighter plugs to battery packs, all you had to look for was the familiar USB plug.


USB-A ports and plugs

USB- to Micro B is another type of connection. The Micro B, like the USB-A is unidirectional, meaning it can only be plugged in one way.


USB-A to USB-Micro B

The familiar USB-A port is slowly fading away and it seems that there are more USB-C plugs and ports. Introduced in 2014, the USB-C has some important advantages. **First**, it is smaller. **Second**, it is bidirectional … hallelujah! **Third**, it supports higher data transfer speeds, and **fourth**, it charges devices faster.


USB-A to USB-C

USB-C ports are on many portable devices. For example, the newer iPad Pro models and both the Stratus and Sentry line of ADS-B receivers, all feature USB-C charging plugs. For some of these devices, that means USB-C plugs are on both ends of the charging cable. Perhaps your flight bag should include multiple types of charging cables?


USB-C to USB-C

The familiar USB-A to Lightning cable won't cut it for many devices. However, there's a remedy. Just purchase a USB C Female to USB Male


Adapter Pack (A to C)

Adapter 2 Pack, Type A Charger Cable Power Converter. $9 at Amazon.

In my Mooney, I had a USB charger that was rated at 2.4 amps. It could not keep up with my iPad, but it would keep up with an iPhone or iPad mini. On long flights, the iPad would start out at 100% charged, but at the destination, it would be only 70% charged. In 2021, I updated the charger with a more robust Garmin USB-A charger, rated at 3.0 amps. I can now recharge a smartphone and a tablet while they are in use, and upon arrival, they will be 100% charged.

Both Garmin and Appareo produce a 3.0 amp charger with both USB-A and USB-C ports. You can have one installed in your panel to keep your iPad or ADS-B receiver, charged up. (Stratus: $400 and Garmin $390)

Many charging accessories have adapted to the new standard of USB-C. The popular Flight Gear Battery Pack ($80) features a USB-C port in addition to traditional USB-A port so you can charge an older iPhone and a new iPad Pro at the same time. The Flight Gear Wall Charging Plug ($23) includes two USB-A ports as well as a USB-C port. You might notice another note on the plug just below the USB-C port: PD/QC.

PD = Power Delivery

Power Delivery refers to a particular technical specification that allows for faster charging. Think of PD as a two-way conversation between the plug and the device being charged. Essentially, the device tells the plug how much power it needs, and the plug adjusts the output to charge as fast as possible. The result is your device can charge 50-75% faster with PD than it can with a traditional charger—up to 30 watts for some tablets.

To take advantage of PD, you need all three parts of the equation to support it:

- the plug
- the cable
- the device

Look for PD or Power Delivery next to a USB-C plug to be sure it's supported and make sure to use high quality cables. The iPhone 8 and newer all support PD. Supported iPad models include: iPad Air (3rd gen), iPad mini 5, iPad Pro 10.5", iPad Pro 11" (all generations), and iPad Pro 12.9" (all generations).

What About a Nervous Flyer?

Richard Brown

One of the joys of flying is sharing it with others and one of the true joys of flying is taking someone on their first flight in a small plane. If that first flight in a small plane happens to be their first flight in ANY plane? Well, most of the time, that is the icing on the cake.

I was talking to a new friend and Mooney owner recently and he asked if my wife liked flying. He related that his wife is a little nervous about flying. I told him my wife didn't always love the flying and shared some of the things that I think have helped her go from nervous to tolerating (not enjoying) a few bumps in a flight. As I have thought more and more about that conversation, I decided it might be a good topic to write about. Many of the experiences that I have had taking people on their first flights applies to the subject. The reality is that my wife doesn't even like getting on the Silly Symphony Swings at Disneyland, but she will get in our Mooney.

One of the biggest rules for success is, "No Surprises." I've been flying for a little over five years and my wife has somewhere around 400 hours in the plane. This doesn't apply to her anymore, but I like to explain certain things about the plane before I take someone flying.

I will get there early, pre-flight the plane without distractions, and then, when the passenger(s) arrive, I will go through the pre-flight again, taking time to explain what I am checking and why I am checking it. When I talk about the engine, I explain the redundancy of having two spark plugs in each cylinder, that they are driven by magnetos. The mags generate spark as long as the propeller is turning, and even if we lost all electrical power, the engine would continue to run and get us safely to the airport.

I also like to prepare them mentally for what to expect in the air. I explain that although we can't see the air moving, it is going over and around objects just like a stream flowing over and around rocks. The analogy that I like to give is that if flying on a big commercial airliner is like riding a bus down the highway, flying in a small airplane can at times be more like a four-wheel drive going down a dirt road. Sometimes it is smooth, and sometimes you can get bounced around. However, I explain that the plane wants to fly, and as long as we have enough air flowing over the wings, it will keep flying. If something went wrong and the engine quit, we wouldn't fall out of the sky. We would just become a glider looking for a place to land.

So far, I have successfully flown everyone who has shown up for a flight – and they have all enjoyed it. Even the son of a friend, who was so nervous he was visibly shaking while I went through my pre-flight routine/explanation, took one trip around the pattern and decided it wasn't as scary as he imagined.

So, we taxied back and departed on a local sightseeing flight which he loved. Again, I think the secret is, “No Surprises.” Explain everything before you do it, and while you do it.

Now, getting back to flying with my wife. What has helped and what hasn’t helped? How did I get to the point that she can tolerate bumps here and there where her butt leaves the seat? We all know owning and flying is not an inexpensive past-time, and if your spouse or significant other enjoys it then the odds of you having a long and enjoyable flying career increases exponentially. I told my wife what I was writing about this month and asked for her input.

First, have a purpose for the flight, and going to get lunch doesn’t always qualify. She enjoys a short flight for a meal, but while she will put up with some bumpy air to go see the grandkids, her tolerance level goes down quickly if the flight is just for a bite to eat. If she wants to turn around and go back, we turn around. We were going for breakfast once and had barely left the pattern when we started getting bounced around. She said, “Let’s go back.” So, we turned around and went back and landed. Of course, she would have put up with those same bumps if we were climbing to a cruising altitude to go see the grand kids.

On the topic of bumpy air, pay attention to AIRMETs and PIREPs. If it looks like it is going to be a bumpy ride, I will discuss the weather with my wife. If it is just a local flight, she will turn it down, but if we are going to see family a couple states away, she’ll ask, “Do you think I will need a Dramamine?” My whole goal is for her to enjoy it; and sometimes the benefit of getting there faster than driving, overpowers the dislike of the bumps. On the occasions where winter storms have forced us to drive to Salt Lake (10 hours) instead of fly (4 hours), I have been known to comment, when approaching Las Vegas with another six hours of driving ahead, “Hmmm, wish the weather was better and we were flying. We would be landing in Salt Lake right about now.”

Make your flights point A to point B and try to make them airline smooth. While practicing climbs, turns, landings, etc., could qualify as a “purpose,” I can assure you that the person in the right seat probably doesn’t share your point of view.

My first “Discovery Flight” was supposed to be to Catalina Island, fly around the island without landing, and back to Chino. The Discovery Flight is the flight school’s chance to get a hook in you so that you will want to take lessons. I took my wife and oldest son along on my flight, thinking it would be a beautiful experience. However, Catalina was socked in, and we couldn’t go there. I told the flight school I had been “hooked” my whole life and just wanted to go fly. So, we took a short flight out to the practice area. I should have left my wife on the ground. The CFI let me fly the whole time. I practiced climbs, descents, gentle (not steep) turns, and then flew back to the airport where the instructor guided me with some input on the yoke through two touch-n-go’s, followed by a full stop that I did without his help. I had the time of my life! I didn’t know that my wife was in the back seat, terrified, digging her fingers into my son’s arm. I think he may still have bruises.

Bottom line, save the air-work for when you are solo or flying with another pilot. If you are taking a spouse or significant other for a flight, make it as boring as possible. My goal is not to have an exciting flight.

The biggest failure, and the only time she has almost gotten sick, was when she tried to distract herself by watching a movie on the tablet. We never did that again. I do have a 10" tablet on the right side, which she enjoys using to see where we are, what little town is below us, how much longer is left in the flight, etc. You don't have to break the bank on a tablet. In the January 2021 edition of The Mooney Flyer, I wrote an article, "Oh The Places You'll Go – Part II" and I discussed affordable ways to put a tablet with a moving map in your plane.

The last thing that she mentioned was one of the upgrades to the panel. Most avionics upgrades improve the safety of flight, but don't do anything for the passengers. There is one upgrade however, that does provide direct benefits for your passengers. That's a good audio panel. Installing a PS Engineering PMA450B was a game changer. Connecting her phone to the audio panel and listening to an audio book while looking out the window makes those 3 – 4 hour flights zoom by.

If you have a nervous flyer, don't try to force it. Find a reason to fly somewhere on a smooth day. Make it far enough that the benefit of the Mooney will shine, but not too far. A twenty-minute flight to a nearby airport for lunch doesn't accomplish that mission. However, when we make a 45-minute flight each way to spend the day in Solvang, instead of a three hour slog each way through Los Angeles – now we're talking.

The biggest rule is, "No Surprises." I know whenever we are flying over the mountains north of San Bernardino while going to or from Salt Lake, it is going to be a little bouncy. So, I remind her and tell her where and when it should be smooth again. When I lean out the engine, I tell her, so that when it stumbles, she knows exactly what is happening. If it looks like there might be light turbulence, I discuss it with her and let her be a part of the go/no-go decision.

Be patient. Be selective on when you take others flying, and hopefully you can help them overcome their nervousness. They may never get to your level of love of flying, but hopefully they come to appreciate it, if only because it gets them where they want to go going faster.

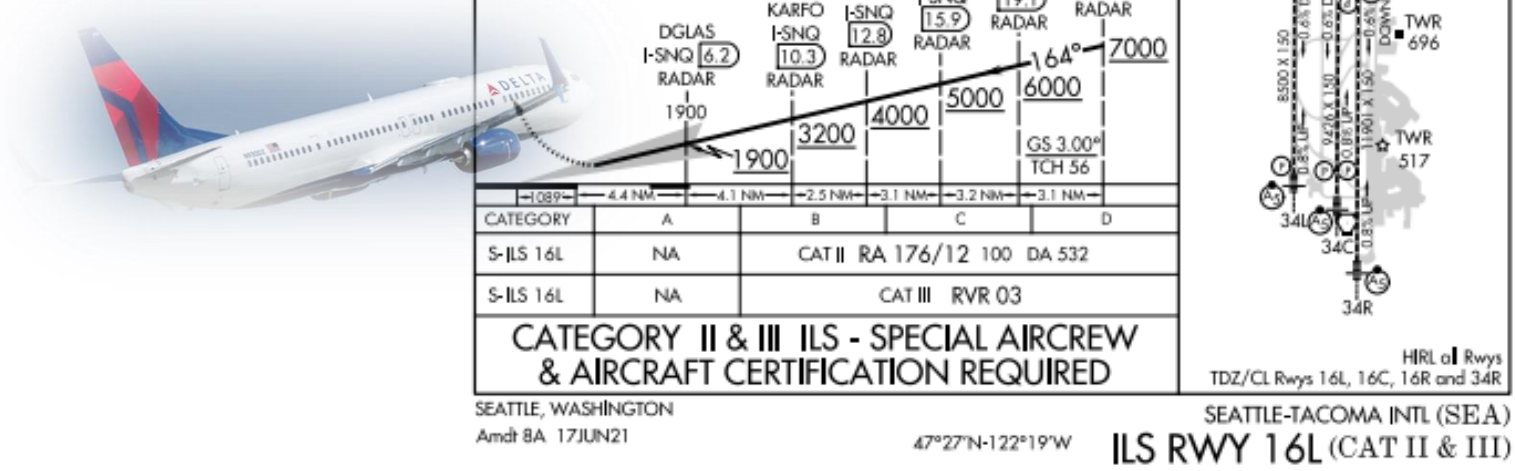
As always, thank you for taking the time to read. If there are things you would like me to write about (or not write about), or if you just want to say hello, drop me an email at richard@intothesky.com.

Flying and 5G

Jim Price
Co-Editor

Can 5G interfere with your aircraft? The FAA is concerned that it will interfere with some panel installed radar altimeters. However, unless your Mooney has an emergency Autoland or a radar altimeter installed, you should be okay.

Radar Altimeters allow for the use of CAT II and CAT III ILS approaches by specially certified flight crews. Furthermore, many systems on the Boeing 747-8, 747-8F and 777 aircraft rely on the radar altimeter. These systems include the autothrottle, ground proximity warning, thrust reversers and Traffic Collision Avoidance System.

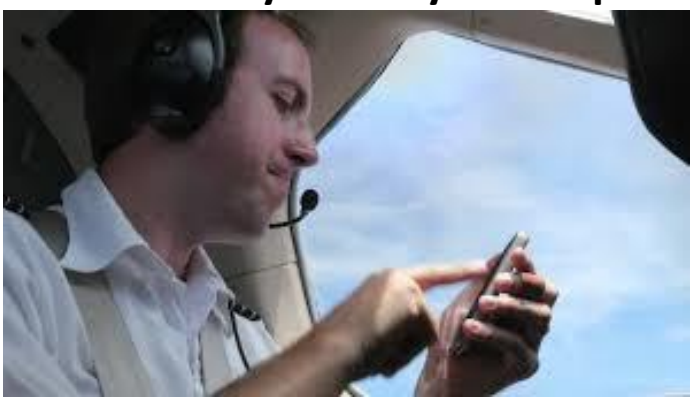


5G / Radar Altimeter Crisis Almost Averted

In late January 2022, the CEOs of American Airlines and United Airlines say cooperation and collaboration in the past week between airlines, telecommunications companies and government agencies minimized the effect of the rollout of 5G cell service to airline service. The release of details on the strength and nature of the 5G signals by the telecoms made it possible to avert the crisis they'd been predicting. We now have what should have been going on for quite some time, which is the manufacturers, the telecoms, the government agencies all sharing information that they need to ensure that this can be rolled out in a way that all Americans get 5G and all Americans know that their flights aren't going to be impacted by 5G.
American Airlines CEO Doug Parker said, "I don't think you're going to see any material disruption going forward because of this."

United CEO Scott Kirby said, "This problem has been resolved collaboratively" and that "while we don't have a final resolution quite yet, I'm confident we'll get there." The FAA approved another set of radar altimeters for use where 5G signals are present and it means that 78 percent of airliners, including virtually all Boeing and Airbus aircraft, are cleared to perform low-visibility landings. Some Embraer 170 and 190 models are also cleared. The FAA is continuing to evaluate the remaining altimeters and warns some may not be approved. To preserve safety, aircraft with those altimeters will be prohibited from performing low-visibility landings where 5G is deployed because the altimeter could provide inaccurate information.
However, 5G is still a problem. On Jan 25, 2022, the FAA issued an airworthiness directive (AD), prohibiting Boeing 747-8, 747-8F and 777 aircraft from landing at airports where Verizon and AT&T's 5G C-Band wireless broadband networks could cause radar altimeter interference. The AD requires airplane flight manual (AFM) revisions to add limitations prohibiting dispatching or releasing affected aircraft "to airports, and approaches or landings on runways, when in the presence of 5G C-Band interference.

Can you use your 5G phone while flying?



The FAA does not mandate that you cannot use a 5G phone in the air. According to AC91.21-1D, pilots in command operating under Part 91, should conduct tests while VFR to ensure that the 5G phone doesn't interfere with the aircraft's avionics. AC91.21-1D, **7.2.1 Aircraft Designed and Certified PED Tolerant states, "**If an aircraft model has demonstrated tolerance for both transmitting and non-transmitting PEDs (Personal Electronic Devices), the operator may allow PED [Personal Electronic Device] use during all phases of flight on this aircraft model."

It is safe to use PEDs, especially Electronic Flight Bags (EFBs). They will not interfere with contemporary avionics. AC91.21-1D, paragraph **8.3 Use of a PED as an Electronic Flight Bag (EFB) states, "**An EFB is any device, or combination of devices, actively displaying EFB applications authorized per AC 120-76, Authorization for Use of Electronic Flight Bags. EFB applications may be displayed on a PED. Additional guidance for part 91 operations can be found in AC 91-78, Use of Class 1 or Class 2 Electronic Flight Bag (EFB)."

Texting

At higher altitudes, it is almost impossible to find enough “bars” to make a successful phone call. However, texting seems to work if you can find an area with adequate cell tower connection. Sometimes it is impossible to text with four bars, but one tiny bar can yield surprisingly great results.

To be honest, I text, but typically it is while I am cruising on autopilot in low workload situations and need to tell my wife when I expect to be home. When is texting inappropriate? That is where the discussion becomes more of a debate.

If the device is not being used for flight-critical information such as charting that you need, put it down until your attention may be sufficiently diverted in a safe manner.

Flight Safety is our primary concern. Using a cell phone to send a text or to take photos and video can be distracting. Your primary task is Flying the airplane. We all like to use our cell phones to contact loved ones or friends and update them on our arrival times or let them know when we have left, but there are times when our risk management efforts should make us put them down. Before you grab that cell phone to check a text or send one back, consider if you are at a point where the distraction of a text might increase the risk of other things going badly.

Fly Safe, Jim

Mooney-Specific Stuff to Check when on Pre-Buy

People often ask “What Mooney-specific items must be checked on a Mooney Pre-buy?” There are a few items that need to be clarified before we can begin.

Pre-Buy Definition

There is no FAA definition for a pre-buy and if you ask 100 pilots for the definition, you will get a lot of different answers. Some buyers make their own checklist of items to be checked. Less often, they create this checklist with their mechanic.

I think the better answer is that an “**Excellent Pre-Buy = Annual Inspection**”. An Annual Inspection will identify all the airworthy items and much more. It will ensure that all Airwothiness Directives and Service Bulletins have been complied with. Remember, the Annual Inspection is just that, an inspection. It does not mean that all airworthiness issues are remedied, only identified. CLICK HERE for a good pre-buy checklist. Secondly, please understand that a good pre-buy is mostly the same for any single engine complex or high performance piston. I hope to cover stuff that is Mooney-specific in this article.

A thorough pre-buy starts with Log Books.

Log Books

The Log Books must be complete and accurate. Missing Log Books or missing timeframes from log books is either a non-starter for a buyer or at least a signficant reduction in the selling price. Ensure that all ADs and SBs have been complied with.

Corrosion

Mooneys are not made of composites. They are good old metal airplanes and they are susceptible to corrosion. Service Bulletin 208B addresses this. It is critical to check for corrosion in the side panels, the fuselage, wing and empennage.
Has the plane been maintained in a hangar? Near an ocean? In a humid climate? These will all be factors in the risk of corrosion. Corrosion in the wrong places such as wings/spars is mostly a non-starter. Check thoroughly.

Fuel Tanks

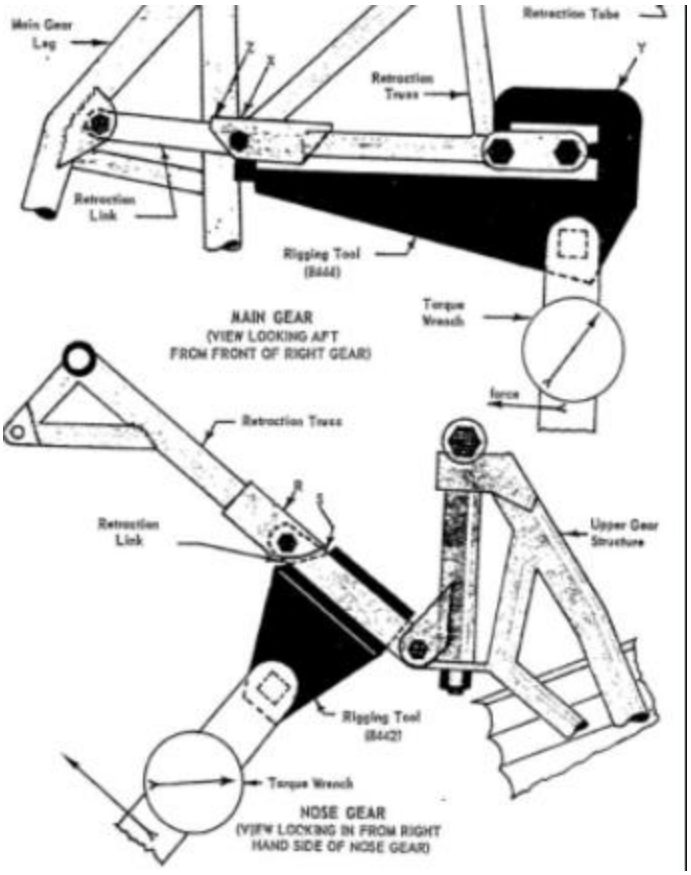
Remember when Harley Davidson motorcycles were constantly leaking oil on the garage floor? Well Mooneys have similar, but different issues – leaky fuel tanks. We have wet wing tanks and over the years, the sealants weaken/crack and begin seeping/weeping/leaking 100LL. Mooney has defined seeping, weeping and leaking, but in a pre-buy, any of that is a concern and you'll probably want it addressed. Ensure that the tanks are filled and permitted to sit overnight, then check to see if any leaks to show up. Blue stains under the wing and in the gear wells is another telltale sign. The cost to remedy is based on whether a patch or a strip and seal is warranted. The latter is more expensive but usually comes with a mult-year warranty.

Manual Gear

Vintage mooneys came with manual gear – "The Johnson Bar". These are amazingly reliable systems but they have an achilles heel. The bracket that the Johnson bar locks into when putting the gear down wears out. Instead of being circular, over time it becomes oval in shape as the J-bar is slid into the bracket. There have been occurences of such a worn bracket failing upon touchdown, resulting in a gear up. That is very costly. The fix, however, is not. LASAR sells a very durable replacement. You should have this checked before buying/flying your prospective new Mooney.

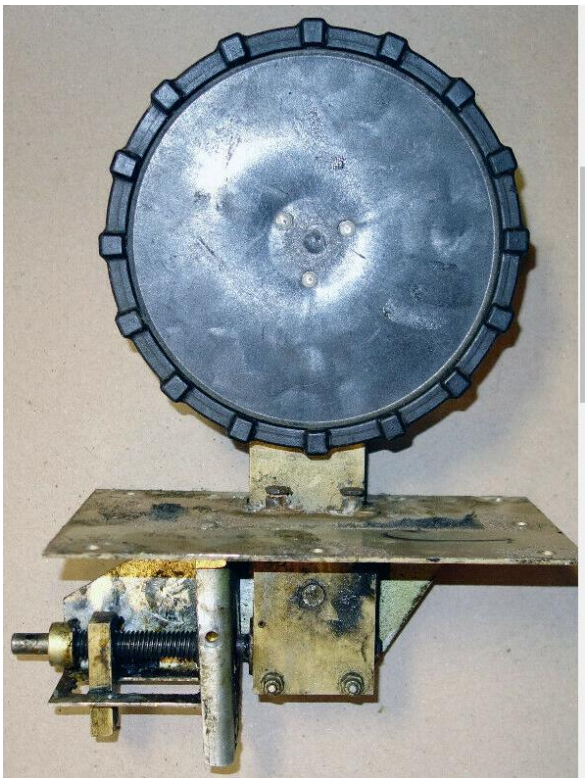
Gear Adjustment

Mooney landing gear systems are very robust, but require accurate adjustments. If not properly rigged, you could face serious future costs. Improper overcenter rigging can result in gear up landings. Typically, you need a Mooney experienced mechanic to rig the gear, overcenter, gear doors and tensions across the system. This and the gear motor should be throughly inspected. CLICK HERE to see all that is involved.



Mooney Elevator Jackscrew

Another unique feature of our Mooneys is the empennage. The entire empennage moves forward and backward as you trim your Mooney. This is facilitated by the Elevator Trim Jackscrew, pictured below.



Over time, the jackscrew will wear somewhere near the middle due to typical trim settings and normal wear. This is a good item to inspect it.

> Set your trim to takeoff setting. Go to the empennage and reach under the tail cone. Lift and feel the free play. It should just click a little. If there is excessive free play, have it looked at immediately.

The Engine

Check the compressions and borescope each cylinder in detail. Dump the EGT/CHT data from the engine monitor and look for high CHTs which can change the metalurgy of your cylinder. Also, look for abnormal sine wave patterns in the EGTs, indicating a failing valve. Engine problems can be costly and the tight engine compartments are conducive to hotter operating engines. You should also thoroughly check the baffling.

Nose Turning Limitation and Bushing

Mooneys have a strict turning radius limitation that can be exceeded when towinig. If this limitation is exceeded, bad things happen and your nose truss will need replacement. (See illustration to the right).

Sometimes, well meaning FBO staff can exceed this limitation when moving your airplane. It's good to inspect the nose truss for dents during a pre-buy.

Also, the bushing in the nose gear steering horn, in which your nose wheel does the turning, can wear out over time. Stressful landings, such as a nose first landing, can also damage it. To check for this, place the Mooney on jacks, then grab the nose wheel and shake it. There should be little, or no, freeplay. If there is, you may need a new oversized bushing. (See illustration below).

Mooney Shock Disks (aka "biscuits")

The models M20 A thru M20J are less than 2000 pounds and the shocks will usually last 12 years. Mooney models M20K and on are heavier and may compress below limits in 6 months. The Service Manual has extended the compressed limit to allow longer use. Disc compression is measured by the space ,or no space, under the collar at the top of the shock link on both the mains and nose gear.

Figure 1

It is risky to allow discs to age to the point that they don't fully extend the lower leg and tire. Three things can happen:

1. The Gear Extension Safety switch may not function correctly.
2. The possibility of the shock spacer plate at the top of the disc stack may rotate to a place where it may contact The Retract mechanism on the main spar in the wheel well and prevent gear retraction. That could lead to a sequence of a popped circuit breaker and failure to lower the gear on landing.
3. Gear legs that don't fully extend may misalign with the gear door and mating fairings and cause damage when retracted.

The biscuits typically run $100 per +/- and take a few hours to replace all of them.

Summary

This article only begins to identify Mooney-specific items that you should examine when considering the purchase of a "new-to-you" Mooney. If you are aware of other Mooney-specific items, please send us the information and we will publish it for our readers. I hope you found it useful.

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.

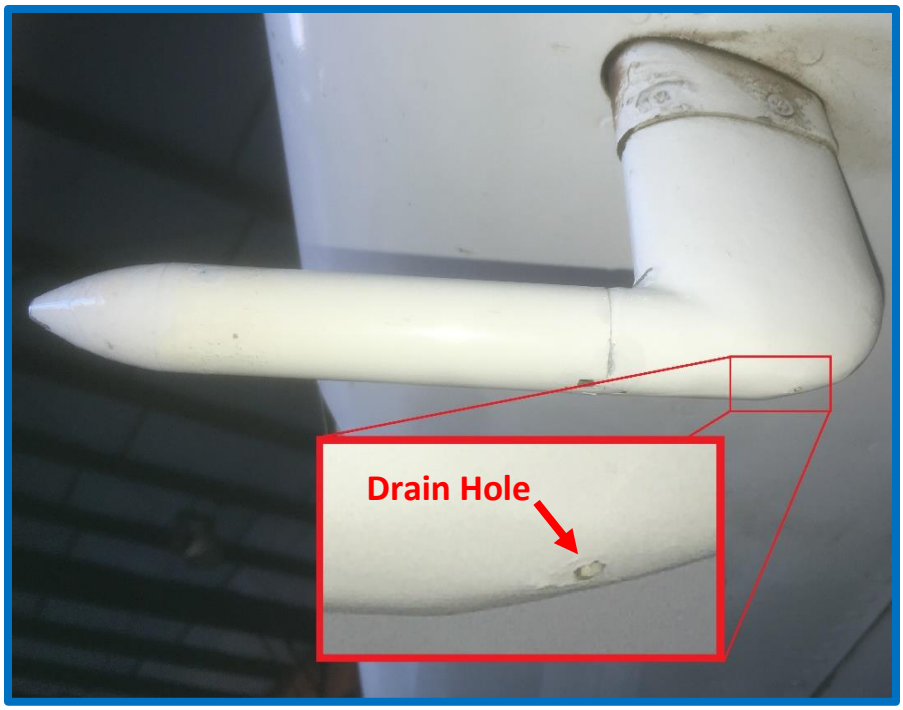
Wisconsin Aviation offers a complete line of general aviation services including air charter, aircraft maintenance, avionics repair and installation, flight training and aircraft rental, aircraft management, aircraft brokerage, and fueling services. The corporation has locations in Madison, Watertown,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

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

Psst, Pitot-Static Systems Thoughts

Twentieth in the series
by Ron Blum

Now that I have your attention, let's talk about pitot-static systems. In this article we'll talk about basic student pilot knowledge, plus items that you were taught as an instrument student, and yet more thoughts from an engineering/aerodynamic point of view. We'll also dispel a couple myths along the way. If you read anything that doesn't sound right, feel free to ask questions. I'm always learning!



Two Independent Systems – The pitot and static systems are separate and totally independent of each other. How they are used and interact with each other, depends on the instruments that are installed and whether the airplane utilizes an Air Data Computer (ADC). More on this later.

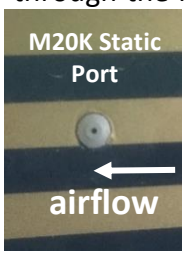
No Flow Systems – The pitot and static systems are both considered to be "no flow" systems. In other words, air doesn't really flow into the pitot tube or into the static ports. The passing air simply changes the pressure within the systems.

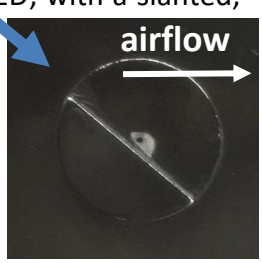
Systems Plumbing – As a student pilot, you learned that static pressure is plumbed to the airspeed, altimeter and vertical speed indicators (VSI). Static pressure is the only input for the altimeter and VSI. The airspeed indicator also needs pitot (total) pressure. The airspeed indicator is simply a very precise differential pressure gauge, comparing total pressure (Pt) to static pressure (Ps). Roughly speaking, 1 PSID (pressure per square inch differential) equals 200 knots. This ratio is a squared function (100 knots ~ 0.25 PSID and 50 knots ~0.06 PSID). One can see how accurate these instruments need to be, and why they cost $$$. The airspeed indicator displays what engineers call Qc (compressible dynamic pressure, $\frac{1}{2}\rho V^2$). Note: Although considered incompressible below Mach=0.3 for easier calculations, air is actually compressible.

Finding Leaks – Both systems need to be leak checked and your mechanic will know the allowable leak rates on each system. NEVER ever blow into a pitot tube. You could: a) burn your lips or b) damage the airspeed indicator. You are capable of > 2 PSI. Performing an altimeter check by simply lowering the pressure on the static port(s) without having the same pressure on the pitot tube, will damage the airspeed indicator (pneumatic, electronic or ADC). Static pressure can change ~15 PSI.

Don't forget that most heated pitot tubes (IFR) have a drain hole, (pictured previous page). This drain hole allows water, (rain, ice, etc.), to exit the probe. This hole is taped over when performing a pitot system leak check. Also note that some pitot and/or static systems have a manual water drain valve at the system low point where condensation collects. Make sure these are seated properly, too. Ironically, the drain hole in the pictured probe above has been painted over. Oops!

Static Ports – Static ports can be as simple as a hole in the side of an airplane or a pull rivet with a hole through the middle, like the M20K, or as complicated as this machined port Cessna P172D, with a slanted, aft-facing step. This step lowers the pressure, raising indicated altitude and airspeed. Many, many "tricks" can be utilized to make indicated values closer to correct values. Each airplane typically has two static ports: one on the left side and one on the right side of the fuselage. The two ports are not for redundancy, but for cross-porting. When an airplane is in yawed flight like a crosswind landing, static pressure on one side will lower and static pressure on the other side will raise. These ports are plumbed together to "average" the static pressure. Static ports are typically located in non-icing areas; however, some are heated, but that is not typical.





Airspeed Lag – We've been taught for decades that airspeed indicators lag. This is just not true. What lags is the airplane itself. That is because an airplane has inertia. For example, when an airplane has just been stalled, the good pilot immediately lowers the nose and advances the throttle. However, it takes a little time to accelerate the 2,000 - 3,000 lbs. aircraft. The airspeed is correct, but the airplane is a little slow in responding.

There may be lag in air data if the units are electronic. What? In copper, electrons operate at the speed of light! However, electronic units and Air Data Computers (ADCs) also have filters and data busses that take time. Go figure. I'm requesting Mooniacs that have both pneumatic and electronic airspeed indicators installed, to video these two units during takeoff. I'd like to add this information to presentations. Some advanced ADCs will predict airspeed ahead by using accelerometers, reducing the filtering and data bus real-time lag.

Finding Airspeed Issues – If you're having problems with your air data systems, here are a few items to consider. Most air data errors are found in the static system. Static port alignment and position are critical. Pitot pressure is easy to collect. (The early airplanes used brake line or aluminum tubing). Check for leaks which is easy to do. First, tape over the pitot tube drain hole. Then, put a length of rubber hose over the pitot tube and start rolling up the tube, while watching the airspeed indicator. Stop at a certain value, (150 or 200 knots). Hold the rolled-up tubing stationary and check to see if the airspeed decreases. If it does, this indicates a leak. The static system leak check is a little more difficult. There are many good online procedures to calibrate your air data systems via GPS. In Flight Test, we assume, (yes, I know …), that pitot pressure is prefect, and all the error is in the static system.

Got a topic? 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.

"Close that #@^* Door!"

by Jerry Proctor, CFII

I had the great fortune of growing up in Deadwood, South Dakota. What a cool deal to live in a small-town that people travel many miles to see. Deadwood got its start in the 1876 Black Hills Gold Rush. There is enough history there to fill many books, but where did the title, "Close that #@^* Door!" come from? Well, my house was one of the earlier houses in the Deadwood. I once saw an 1880s picture of a sparsely housed hillside and, there it was – our house. We never used the front porch that faced Lincoln, our address street. If I were to enter the house through that front door late at night, my mom would have probably shot me, as NO ONE entered that door.

The door we always used was on the opposite side of the house. We would come down two steps and across a small porch, make a right turn and boom, enter the house. Now, it so happens that this is the kitchen door. Not just the kitchen, but the door is right next to the oven. So, guess where Mom would be standing as you came in. Imagine, Deadwood with its 6+ months of winter and you just walked in. If you weren't as quick as a football running back, that frigid air would hit my mom. She would then yell, "Close that #@^* Door."

So, we grew up being very, very aware of open doors. DO NOT leave that door open! That has been the rule for every house I have lived in since. It is not just house doors, but it's anything that has a door, such as cars, cabinets, refrigerators and yes, Airplanes. CLOSE THAT DOOR!

Mooney Doors

So, let us get serious about Mooney doors. Most of us have two doors. Yes, I am including the cargo hatch as a door. Also, there are those with newer Mooneys that have three doors. Those lucky dogs should read this article twice.

When you are outside your hangar, pre-flighting your plane, if you need to walk over to the bathroom, do you leave the entry door open? Don't! One never knows when a gust of wind or some prop blast will whip that door all the way open, and you may not be able to close it.

Who closes your entry door? Do you direct someone to do it, or do you push the handle to the locked position yourself? I vote to push the handle myself. Is the door part of your passenger briefing? My briefing is, "Be gentle and don't slam it shut like a Cessna!"

Have you ever had an entry door open in flight? I see some hands up! In general, it is not a big deal. I hope when it happened to you, it wasn't raining or cold. Remember to be calm. The plane still flies, but it is a bit noisy. You can come around and land. I had one open on my Mohawk, but it was on the crew side.

When you park your Mooney in the hanger, do you fully close the entry door latch? I do not. This only compresses the seals for a week or two at a time. I partially close it – enough to keep the dust and bugs out.

Cargo Hatch – The Other Door

I make sure everyone has put loaded their stuff and then, only I shut it. When I stand on my step magnificent, reference my November 2021 issue article, "That Little Step", I grab the handle and lean outboard. I tug on the hatch door handle just to make sure it is secure. In the wintertime, does your passenger complain of cold air coming in? Well far from an A&P am I, but house weatherstripping did the trick.

When parking and letting a passenger out, place the door so they can walk directly away from the propeller to the destination. Yes, it is likely that the engine is shut down, but it is a good habit to have, especially if you occasional let someone out while the prop is still turning.

When faced with an engine failure, follow the checklist and crack the door open. There are many stories of the door being jammed after a hard or crash landing. It looks cool on TV when the hero kicks the door open, but you really want to avoid that.

So, keep your doors in good shape, treat them well and remember what my mom would say if she saw your door open!

Fly Safe, Jerry

Aircraft Problems

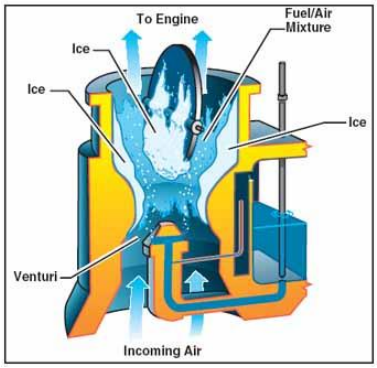
1. Your engine has seized. Now it is time to look for a place to make an off field landing. What airspeed should you maintain until you are ready to land?

a. Vfe
b. Vx
c. Vy
d. Best Glide

The answer is d, Best Glide. This speed provides the most glide range. Do you remember your best glide speed?

2. You are in a C model Mooney. Your RPM drops and you believe it is because of carb ice. After turning the Carb Heat to ON, the engine begins to run very rough. What should you do?

a. Turn the carb heat OFF
b. Leave the carb heat ON

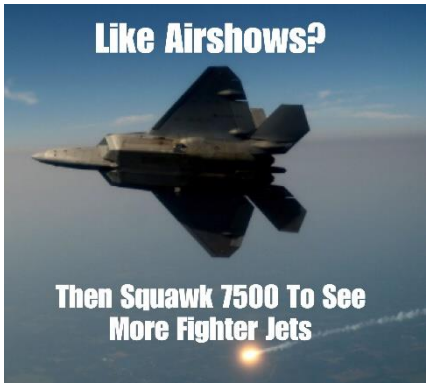


The answer is b, Leave the carb heat ON. If you have carb ice, turning the carb heat to ON will start melting the ice and the water will run through your engine. This will cause the engine to run extremely rough. Nevertheless, keep the carb heat ON. Eventually, the ice will melt, and the roughness will subside.

3. You can no longer transmit on your radios. What transponder code should you squawk to let ATC know that you are NORDO (no radio).

a. 7500
b. 7600
c. 7700

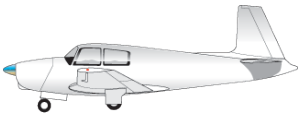
The answer is b, 7600. 7600 alerts ATC and they will try to clear the air around you. 7500 tells ATC that you have been hijacked. 7700 tells ATC that you are in an urgency or distress situation.



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

What is the difference between the 201 and the improved 201 model, the 205, which increases speed to 205 mph? The only visible difference I can recognize is the extra wheel cover fully closing the wheel well gap. Next question: In spite of the extra speed, why was the "205" not as popular as the 201 and offered only for a short time?

Tom's Answer

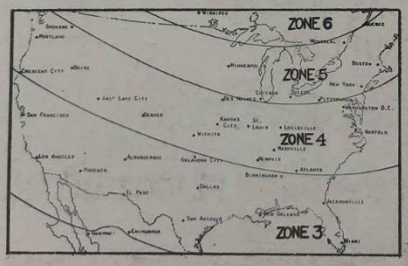
You just about stumped me with this question because the speed difference is only 4 more knots top speed for the 205. To me, the most notable difference was going to a 24 volt electrical system. The increase in gross weight was notable. I can't remember, but I think they added sculptured wing tips. Even the closing of the wheels would help in increasing the airspeed. If you remember, Mark and I converted our F model into a highly modified J with a couple of things we added from later models. We got speeds even better than the 205 – by a few knots. It was really fun doing that. The plane is still at the shop for Mark to fly. I think your question of "popularity" was more due to the Introduction of the larger Ovation and then the price of the 205. The introduction of the Porsche was also a mistake. It was too slow to be a Mooney. But questioning what happened with Mooney would be a large book, filled with hundreds of different opinions.

PC IS THE FOUNDATION FOR THE MOONEY-BRITTAIN AUTO-PILOT

FROM HERE — YOU JUST "ADD-ON"!

MOONEY-BRITTAIN AUTO-PILOT GROUP ONE

Group One incorporates the basic modes needed for cross country operations. These functions include heading, capture, track and localizer modes.



Since heading information is obtained from the earth's magnetic field, provision is made to set up the proper magnetic zone in the head of the mode selector. Consult your special Mooney-Brittain Zone Chart for the area in which you are flying, then switch the selector to that number.

HEADING MODE

With the heading azimuth turned to the desired course, the mode selector is positioned on "Heading". The magnetic field information for this mode is obtained by reference to the earth's magnetic field rather than a directional gyro. The aircraft will turn toward, then accurately maintain the selected heading without precessional errors.

CAPTURE MODE

With a desired omni radial set on the heading azimuth and on the OBS omni indicator, the mode selector is positioned on "Capture". The aircraft makes a diagonal approach toward the radial.

TRACK MODE

When the mode selector is placed on "Track", the aircraft gradually turns inbound to the radial and wind drift corrections are introduced. When on the radial with the omni needle centered, the aircraft will remain on course to the omni station

LOCALIZER MODE

For an ILS approach with the localizer frequency set-up on the radio, the mode selector is switched to "Localizer" at the outer marker. The aircraft will fly on course to the runway, with descent controlled by the pilot's use of power.

Garmin Smart Glide available for G3X and G5

Garmin's Smart Glide technology, a safety tool that helps pilots in "loss of engine power" emergencies by automating tasks to reduce pilot workload, is now available as a free software update for the G3X Touch and G5 electronic flight instrument in certified aircraft equipped with a GTN Xi series navigator. Smart Glide compatibility can be added to a G3X Touch or G5 through the Garmin Authorized Dealer network and dealer installation fees may apply.

Smart Glide assists the pilot by recommending a suitable airport estimated to be within glide range, as well as providing critical information to the pilot and optimizing select avionics settings, helping save the pilot precious time and workload," officials added.

When paired with a compatible Garmin autopilot, Smart Glide can automatically engage the autopilot and pitch for the aircraft's best glide speed while simultaneously navigating the aircraft within the vicinity of the selected airport so the pilot can execute an approach and landing, according to Garmin officials.

Compatibility with other Garmin Systems

In addition to the G3X Touch and G5, Smart Glide is also available for certified aircraft equipped with a GTN Xi series navigator paired with a G500 TXi/G6000 TXi or a GI 275 electronic flight instrument.

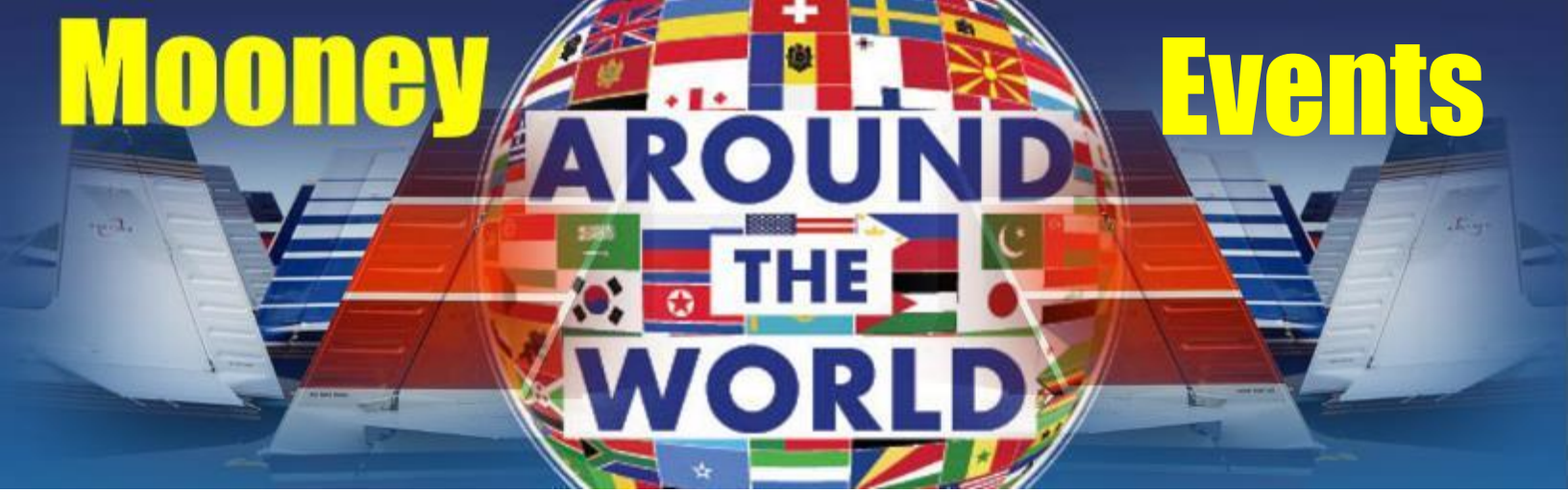
Compatible Garmin autopilots such as GFC 500 or GFC 600 can be automatically engaged when Smart Glide is activated. For aircraft without a compatible Garmin autopilot, Smart Glide will still provide critical information and features to help manage engine emergencies and help to reduce pilot workload.
Experimental aircraft with G3X Touch and a G3X autopilot can also enable Smart Glide technology when appropriately equipped.
An optional Garmin Smart Glide activation button is also available for $129.
For more information: Garmin.com/SmartGlide or Garmin.com/Aviation.

NTSB Asks FAA To Require CO Detectors for GA Aircraft

The National Transportation Safety Board (NTSB) released a safety recommendation report on Thursday, January 20, 2022, calling for the FAA to require carbon monoxide (CO) detectors in general aviation aircraft. In addition, the report specifies that the agency should require CO detectors that comply "with an aviation-specific minimum performance standard with active aural or visual alerting." The recommendation applies to all enclosed-cabin aircraft with reciprocating engines.
"The FAA's current recommended exhaust system inspections and replacement schedules have not prevented fatal aircraft accidents due to CO poisoning," the NTSB said in its report (PDF). "The NTSB is concerned about the continued hazards resulting from CO poisoning because the FAA does not require CO detectors on enclosed-cabin aircraft. The NTSB concludes that use of a functional CO detector to alert a pilot through visual and auditory means to the presence of CO before the pilot's judgment is impaired is necessary to the continued safe operation of the aircraft."
The NTSB says it has identified 31 accidents attributed to CO poisoning between 1982 and 2020, 23 of which were fatal. Of those, it found that only one of the accident aircraft was equipped with any kind of CO detector. The Board first asked the FAA to require CO detectors in GA aircraft with enclosed cabins and forward-mounted engines in 2004.

PILOT ADS-B ERROR DECLINES, BUT STILL ROOM FOR IMPROVEMENT

The FAA hopes outreach and education will reduce call sign mismatch events to zero. While the number of such events—which trigger alerts in air traffic control facilities and signal a regulation violation—has declined since ADS-B Out became mandatory in certain airspace on January 1, 2020, a significant number of aircraft continue to broadcast incorrect Flight ID information in their ADS-B Out transmissions. Click Here to read more



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

Robust Universal iPad Suction Cup Mount

Robust Universal iPad Suction Cup Mount

You shouldn't have to buy a new mount every time you change your iPad. The Robust Universal iPad Suction Cup Mount will fit every iPad and tablet. With an infinitely adjustable arm, heavy-duty suction cup, and quick grip clamp, this mount will quickly become your favorite.

The mount includes 4 pieces:

Robust Mount Suction Cup

The tough, low vibration pedestal measures approximately 3" inches high from the bottom of the mount base to the top of the ball. It features an 80mm TPU suction base that works well in all climates.

Robust Mount Shaft 3.75"

This Mount Shaft is part of the Robust Mount Series and can be used with 25mm (1 inch)-compatible mount bases and heads to create your own custom mount solution. The mount shaft measures 3.75" tall.

Robust Mount Universal iPad Holder

The Robust Mount Universal iPad Holder with 4-Hole AMPS Mounting Pattern is ideal for holding any size of tablet. The holder is compatible with most Robust Mount and third-party 4-Hole AMPS mounting pedestals or adapters.

Robust Mount 4 Hole AMPS to 25mm Ball Adapter

This adapter has the standard 4-hole AMPS pattern on a plate attached to a 25mm ball on the other side. Constructed with a durable, yet lightweight composite material, this adapter fits the Robust Mount Universal iPad Holder and will work with a Robust Mount shaft or other 1" socket mounting solutions.

Fits all large tablets with 7"-18.4" screen size, including all Apple iPad mini, iPad Pro, iPad Air, iPad 2-9, and most Android tablets.

Parts for Sale

Sun Visor set for 1968-1999 Mooney (my is a 1966) never used, in original packaging asking what I paid

Purchased From Chief Aircraft Search results for: 'Mooney sun visor' - Chief Aircraft Inc. $459.00

Sunvisor Mooney, 1968-1999 Models, Rosen 13" x 7"

The Rosen "NSA" Sun Visor system is fully FAA PMA'd and STC'd for many single and light twins. Distortion free dark gray lens tint reduces 94% of the glare, filters out most harmful UV light, and reduces 70-80% of the infra-red heat rays. Visors have multimotion capability and follow early morning or late afternoon sun.

Brackets are machined aluminum and are anodized black. Oversized visors also increase safety margin while in close proximity to airports and heavy traffic areas.

Contact: dingramkc@icloud.com

This Cowling was removed from a M20E and replaced with a M20J (201) cowling. The cowling is located at Fullerton Airport (KFUL) and is in excellent condition. Offers accepted.

Contact: Bernard Lee – leebern@msn.com (562-865-2547)

P/N 310309-501
P/N 310309-502

These fairings are new and priced @ $280.00 each or $525.00 for both. Priced elsewhere @ $362.69 each.

Contact: Bernard Lee – leebern@msn.com (562-865-2547)

Bushing P/N 914007-003 - 2- Bushings in the original package @ $35.00 each. Priced elsewhere @ $45.00 each.

Bushing P/N 914007-005
1-Bushing in the original package @ $59.00
1-Bushing loose @ $50.00
Priced elsewhere @ $69.00 each

Contact: Bernard Lee – leebern@msn.com (562-865-2547)

Access Covers P/N 3000-901 (2-available) - 1-without nuts attached.
Make offer. Contact: Bernard Lee – leebern@msn.com (562-865-2547)

Items for Sale

Call Tom 303-332-9822

New Hartzell Propeller Hub HC-C2Y (K, R)-1 Serial CH41782B
This hub will comply with AD2006-18-15 and superseded by AD2009-22-03
This AD affects many IO-360 aircraft.
Current Hartzell price is $4,275.

Price $3,999

Brand new, never used, two-person portable oxygen system
Bottle, carry case, two masks, two nasal cannulas, and all associated tubing, flow indicators, and regulators

Price is $400

New never used aircraft wheel stand
Used when tire and rim assembly is removed. This stand slides onto the bare axle to hold up the aircraft for safety and to avoid damage to bare axle. This stand is adjustable for different heights.

Price $75


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