The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

January 2021

Editors

Phil Corman | Jim Price

Contributors

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

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

From the Editor

Phil Corman

The Cult of Mooniacs

There is no question that our Mooneys are exceptional airplanes; the best in the GA piston fleet. But I have always felt that the camaraderie of us Mooniacs is also unparalleled. We share a love of our Mooneys, but we also create bonds with each other that grow and grow, as we fly and meet each other at Mooney Events.

We also have the best federation of independent organizations that further the enjoyment and safety of flying. Of course, The Mooney Flyer is included in this grouping. Each month, we strive to provide information, knowledge, experience, and enjoyment.

Look at this list:

- ✓ **MAPA** (https://mooneypilots.org) – The Mooney Airplane and Owner Association with its publication MAPA Log and its list, mapalist
- ✓ **Mooney Summit** (https://mooneysummit.com) – "Better the Breed", founded by Dr. Ron Dubin and CFI Mike Elliott. This is no doubt the gold standard for increasing Mooney pilot safety.
- ✓ **Mooney Safety Foundation** (www.MooneySafety.com) – Annually, providing Pilot Proficiency Programs around the USA, providing premier Mooney-based instruction.
- ✓ **MooneySpace** (www.MooneySpace.com) – Provides the only set of forums dedicated to Mooniacs sharing knowledge and information. It's clearly the "Go To" for sharing and receiving information concerning flying, maintaining, or upgrading your Mooney. We can't live without it.
- ✓ **Vintage Mooney Group** (on Facebook https://www.facebook.com/groups/129815803822368/) – With more than 2,500 members, this is another valuable source, especially to Mooniacs with vintage Mooneys.
- ✓ **EMPOA** – (https://www.empoa.eu/index.php) – The European Mooney Pilot and Owner Association sponsors events in Europe throughout the year.
- ✓ **AMPA** (https://www.mooney.org.au) – The Australian Mooney Pilots Association publishes an exceptional quarterly newsletter and sponsors events across Australia throughout the year.

And then the Flying Groups:

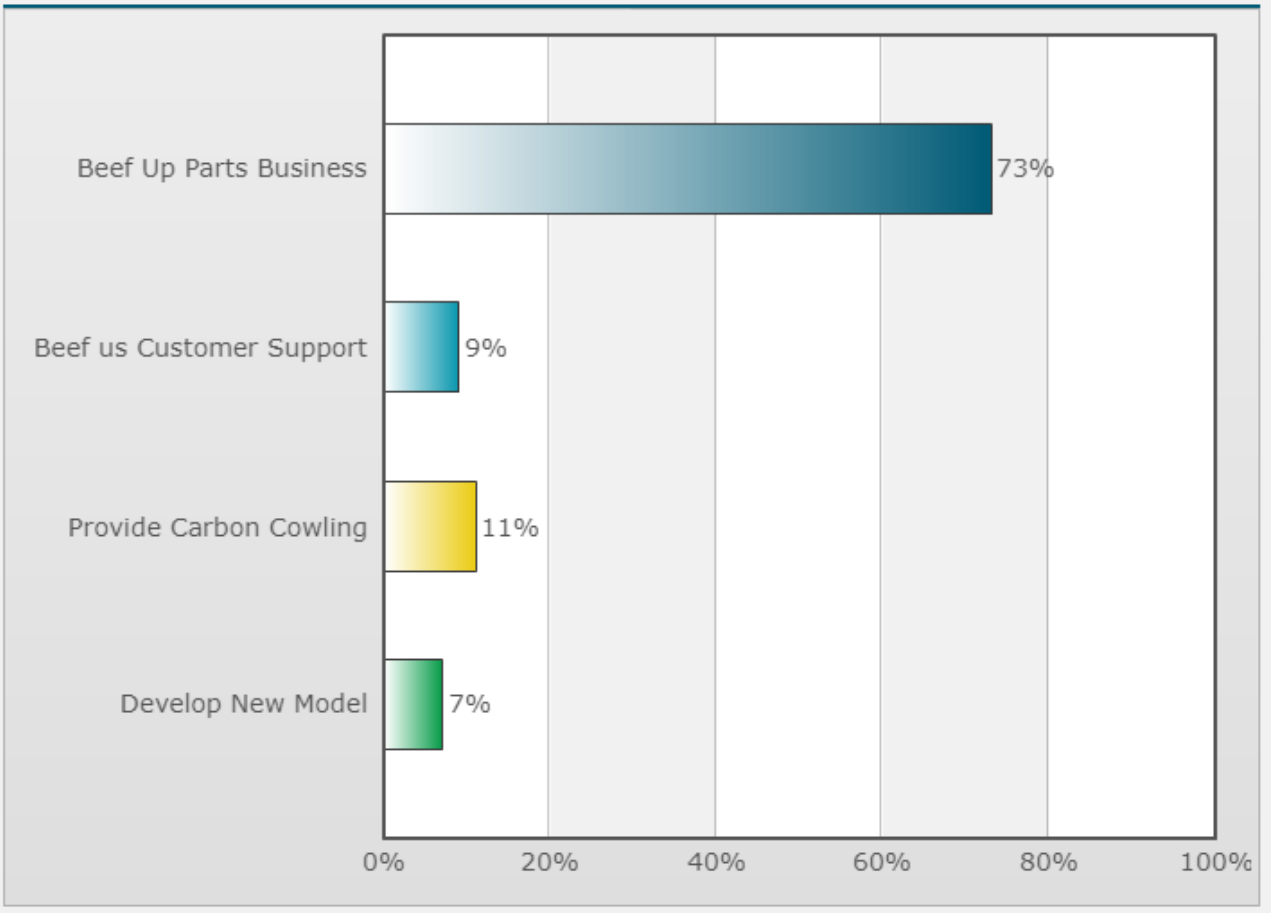
- ✓ Paul & Shery Loewen's West Coast MAPA was the beginning of the Mooney Flying Groups. West Coast MAPA ended years ago, but will be remembered forever. It spawned the Vintage Mooney Group, which for more than a decade, sponsored fly-ins almost monthly – around the USA and Mexico. It was first led by Don and Barb Larsen and later, Phil Corman and Larry Palmer. The group ended a few years ago.
- ✓ Now there is the West Coast Mooney Club, founded by Michael Rodgers and we have heard rumors of a Northeast Mooney Club being formed.

If we have left any groups out, we are sorry. Please send your information and we will include you in the next issue. Despite 2020, we are excited about the state of Mooney Aircraft and the Mooniacs.

I hope the "new" Mooney Owners

Poll created by Phil Corman on 11/02/2020

Poll Results



Next month's poll: "Has COVID affected your Flying?" **CLICK HERE** to vote.

Letters to the EDITOR

Editor@themooneyflyer.com

From **Albert Dyer**, Caption: "Excuse me, sir, would you please point that thing a few degrees to the left?

Can you add your idea for a caption?

Here's another famous N number that has been re-issued – N736PA. That's the N number from the Pan AM 747 that was involved in the world's worst air disaster at the Tenerife Airport. A 1967 M20F now has that N number.
kcarey

Regarding your page 3 of the December issue, you wrote, "Preheating can keep your oil more viscous." I know what you meant to say ... but preheating makes the oil "less" viscous, not more viscous. Less viscous oil flows better than more viscous oil.
Regards, **Bob**
Editor Note: *Thanks Bob, apparently, I am viscous dyslexic*

I appreciate all the hard work you put into this excellent magazine, and the good advice you offer in the December issue regarding cold weather. I would add two details:

1: Preheating: You correctly note that continuous preheat can pump moisture into the engine via hot-cool cycling. But this will occur also in an engine without preheat, as the day warms and cools. The solution to this is to leave the engine pre-heater on continuously using a thermostat to maintain a constant temperature. The set temperature should be close to the day's maximum for the season, and at least above the season 's expected dew point temperature.

As you know, hydrocarbon fuel burns to carbon dioxide and water. Some of that water can be seen dripping out of the breather tube.

The solutions are anticorrosion additives in one's oil (e.g., Phillips XC + CamGuard or Aeroshell or Exxon Elite) and engine dehydrator. I have used the Engine-Saver for more than a decade, and when the engine was overhauled 4 years ago, there was no rust.

2: Shocking engines: Ed Kollin, former director of the Exxon engine test lab and the inventor of CamGuard says, "There is no such thing as shock cooling! -- but there is shock heating! Pilots often take off with full power without allowing their engine to warm up. Oil should be at least 100 degrees Fahrenheit before applying full power, ideally at operating temperature."

Ed loves to teach -- he might be open to writing an article for The Mooney Flyer...

3: CO detectors. I second that motion! A CO detector with ppm readout saved me and my wife a few years ago when it alarmed early in a long, long XC trip. Because it showed ppm, I was able to modify cockpit ventilation to keep CO at a safe level and complete the trip -- and because it alarmed, I was able to get the cracked exhaust manifold welded after I landed.
Best wishes, **Dan J**, N9582U M20K

RE: Corrosion -- I've read that metal hangars are "moisture sinks" -- the mechanism is straightforward: When the dew point is close to the ambient temperature (nearly every wee-hours before-dawn morning), the air infiltrates the shed, and the water condenses out of it onto every piece of cold metal. The extraction of the water brings in the additional humid air. This is the reason that tools and equipment rust when left in the shed and it is why engines and airframes, whether simply in a cowling or in an unheated hangar, gradually acquire corrosion, even though they are protected from sun, wind, and hail.
Airplanes are just big metal objects, and their engines are just as much "moisture sinks" as the sheds in which we protect them.

A couple of years ago, I wandered by a friend's hangar one spring morning as he was opening it. The weather had been cold. During the night, a warm, humid tropical air mass made it into central Wisconsin (a typical spring event, actually). The man's Cessna was *dripping* with dew.

We did not take off the cowling, but there was no doubt that the inside and outside of his engine were wet. The wiring behind his panel may not have been dripping wet, but they were equally cold-soaked and bathed in the same humid atmosphere.

I've been told repeatedly by maintenance guys in the automotive and avionics business that the #1 cause of electrical problems is *corrosion*. With electrical gremlins, the wise tech first checks the resistance of all the grounds, and then other connectors. After installation or maintenance, some rare avionics technicians spray Corrosion-X or another non-conductive anti-corrosion film onto exposed connectors.

This is a reason that I had Corrosion-X applied to the interior of my Mooney's wings and tail some years ago. It is why I treated behind the panel after my avionics upgrade, and why I paid a lot of money to modify my hangar by putting in large wall vents and big roof-mounted turbine vents. The result of this is that the hangar dries out within 24 hours of a moisture event. Before that, it remained humid for 3 or 4 days, especially when the ground was soaked after a heavy rain. Concrete is porous and unless treated, it wicks water from the ground into the hangar floor.

Corrosion is the number one reason for GA engine overhauls, and, I guess, the #1 reason why airframes corrode.

A couple of years ago, an old Bonanza came into our local shop for annual. Extensive corrosion was found within the left wing, turning a nice old airplane into junk. It was a huge loss for the owner.

More recently, a local pilot bought a nice twin, and brought it to our local shop for post-buy spiffing. When they pulled some interior pieces, they found extensive corrosion. The poor man had bought a junk-airplane that had passed some sort of a pre-buy. How many pre-buy inspections involve looking for corrosion on the insides of the nicely painted aluminum skin? As the fleet ages, this may be the most important part of a pre-buy!
Best wishes, **Dan J**

Got to have one Mooney Comment. On page 3 [December issue], you recommend Phillips Oil. I have zero experience with that. No doubt it is good, but I believe it has competition, based on personal experience. 15W50 Aeroshell was in my Lycoming 0-360 A1D when I got it. Yes, the 180 horse without injectors. I bought it from a good friend who had done the overhaul himself; not an A & P, but oversight by Frank Nervino. This friend built Merlins at Packard during WWII and was a Sports Car racing mechanic. He had gone to extremes in balancing and more in selecting components in what he considered to be the best place in the tolerance ranges. Break in had been per factory recommendations and there were 100 hours on the engine overhaul when I got it. I got nearly 3,000 more out of it before valve heads coming off, etc., became a concern. The oil consumption had also gone from 8 hours per quart down to 7. So, I got a Zero Time Factory Reman to save down time and get a known good device. I broke it in per Lycoming recommendations, single weight oil, and then back to the Aeroshell. With 500 hours on the engine, my engine now uses oil a bit slower than the 8 hours, likely due to new factory tolerances. It's been resting a while, but I did go out for a BFR this fall and it ran perfectly. Plus, an oil analysis did not show any problems. High altitude and dry climate may have helped with that. It also has a wing tip ADS-B and it works well. It's amazing to see what happened on "Flight Aware." I no longer use my Mooney for business; just go places to see people. I presume I'm retired. Age 87 is enough work! Oh, Falcon [Insurance] has me covered, no problem.
Lin M

RE: Oil for Lycomings - My name is John Mitchell and I co-own a Mooney M20C (N721LP). I was reading the latest edition of your online magazine and had a question about your recommendation of Phillips XC oil. Two years ago, while at OSH, I asked about using it in our Lycoming engine and was told it did not contain a certain wear ingredient required by Lycoming. Recently the Victory Oil has been added having that required wear ingredient in it and we have switched from Shell to Phillips Victory oil. For Continental engines, I don't think that is an issue. Perhaps those flying with Lycoming engines would be better off using the Victory oil, which appears to be exactly the same, but with the wear ingredient in it. Your online publication is excellent.
Regards, **John M**

Editor Note: John is correct. Phillips 66® Victory AW 20W-50 Oil is an ashless dispersant, multi-grade engine oil specially formulated for year-round use in aircraft piston engines. Victory AW 20W-50 is pre-blended with the proper concentration of antiscuff/antiwear additive (LW-16702) mandated by Lycoming Service Bulletins 446E and 471B and Service Instruction 1409C. In most engines, it provides distinct performance benefits compared with single-grade engine oils, including easier starting, faster oil circulation at low temperatures, reduced warm-up time, and reduced oil consumption. It maintains its film strength under high loads and at high temperatures to protect against wear and piston scuffing.

Phil Corman

Co-Editor

Is Your Mooney Trying to Talk to You?

Last month I wrote about learning how to interpret your Engine Monitor indications. I hope that you found that useful. This month I will focus on a different approach to detecting potential issues with your Mooney. Most of this requires you to "own" your Mooney or rent the same Mooney regularly. That you must use your senses, such as smell, sight, or hearing. These are an invaluable line of defense.

For this to work, you must also rely a bit on your intuition.

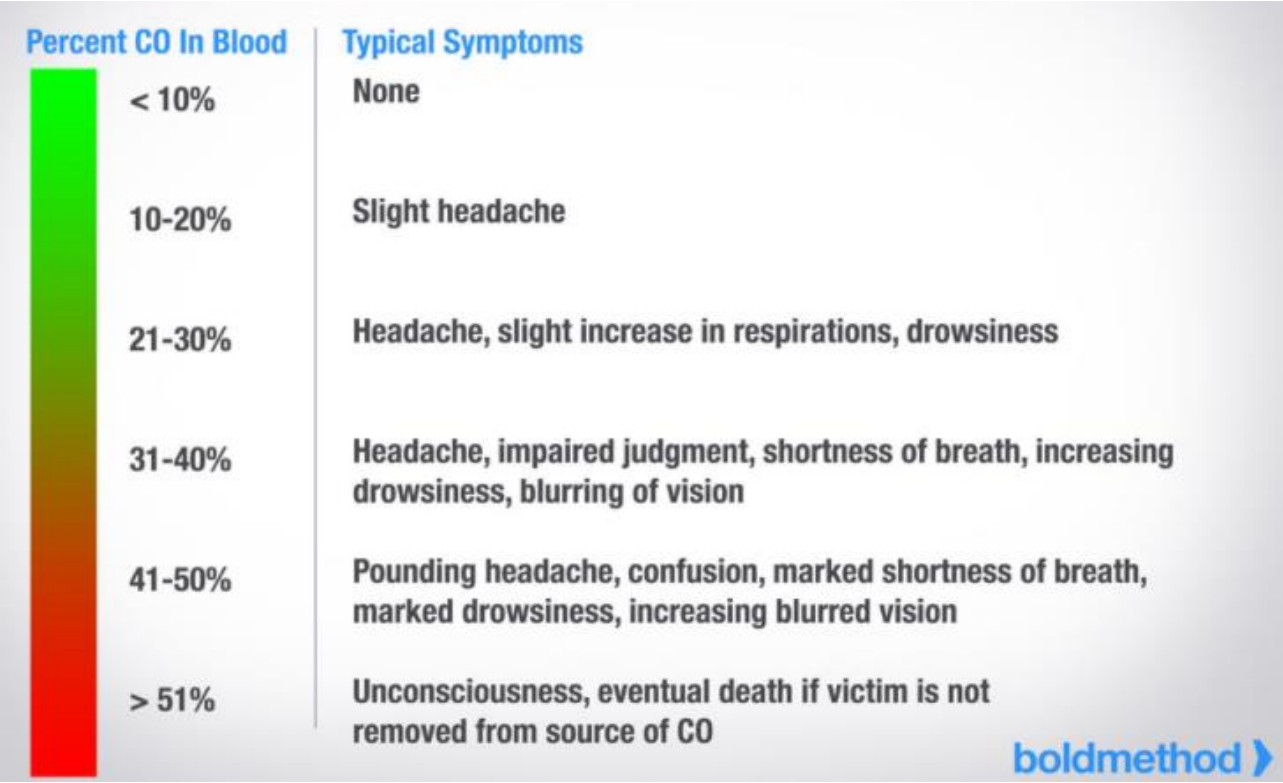
Noises

Our Mooneys talk to us. If you should hear a "new" noise or a "noise that is different", you should not ignore it. Some examples of new/different noises include:

- A cooling fan for your avionics. You probably won't crash, but you could damage the avionics and that might cost a few AMU (Aviation Monetary Units)
- Your gear retracting/extending noise – The motor on your gear drives a worm gear and the motor is very powerful. It can bend or break things if obstructed or bound up.
- A new sound from your engine. At startup, if your engine runs rough for a bit, then smooths out, you might have "engine morning sickness", which translates into a stuck valve. Borescope your cylinders and check it out.
- "Tick, Tick, Tick" when you try to start your Mooney. This is a sure sign of a weak battery.
- A whirring noise when you try to start, coupled with the prop not moving. More than likely this is your Bendix solenoid. Time for repair and/or replace.

You're Not Feeling Well

Whenever you have your heater on (and sometimes when you don't), you might experience Carbon Monoxide Poisoning. Your symptoms can run the gamut, but a headache, blurred vision or nausea are confirming symptoms.



Vibrations

These are never good in your Mooney, especially in the air. Here are a few examples:

- Could be a stuck valve – this is a good warning, but a bad symptom and you should initiate landing without delay.
- A clogged injector – You will feel the roughness/vibration which can be confirmed easily with an engine monitor.
- Have a carburetor? Pull the carb heat and if the roughness/vibration ceases, then you don't have mechanical issues.
- Roughness or vibration could be caused by a poor mixture setting. This is easy to troubleshoot by adjusting the mixture.
- Another source of engine roughness could be a spark plug or even a magneto.
- Another less common vibration could be a loose or improperly adjusted gear door which does not close fully. The slipstream could cause a slight vibration.

Euphoria or Lightheadedness

Hypoxia and Dehydration can cause similar symptoms, and both can be lethal at altitude. It's hard to self-diagnose sometimes, but your copilot may recognize them for you. The symptoms include Euphoria, Cyanosis, Visual Impairment, Headache, Impaired Judgement, and Drowsiness.

Smells

A short circuit behind your panel or overheated avionics could start an electrical fire. Nothing is worse in a cockpit at altitude than a fire. The heat and smoke can prevent you from using your skills to get on the ground safely. Electrical fire is usually easier to discern. You may see smoke emanating from your panel and the smell of wires or electrical components is distinctive.

If you smell fuel, you should probably seek the nearest airport. If the leak is bad, it could start a fire or fuel starvation. Either way, if you smell fuel, landing ASAP is a good idea. Use your nose.

Different Control Pressures

If you notice a different level of control pressure needed to move the yoke, rudder or trim, this could be a sign of improper rigging, something obstructing clear movement of control surfaces, or something failing. This should also result in a landing soon to investigate on the ground.

ADS-B Weather

JIM PRICE ATP, CFI-I, MEI

ADS-B weather, (Flight Information System Broadcast or **FIS-B**), is continuously broadcast from a network of ADS-B ground stations established across the U.S. and its territories.

You can receive the ADS-B broadcast without panel mounted display equipment.

iPad and Tablet pilots flying with portable ADS-B receivers like the Stratus or Sentry, love the free weather. ForeFlight's Sentry is a bit cheaper and includes a built in Carbon Monoxide detector. I have heard great things about both products.

Two Bands

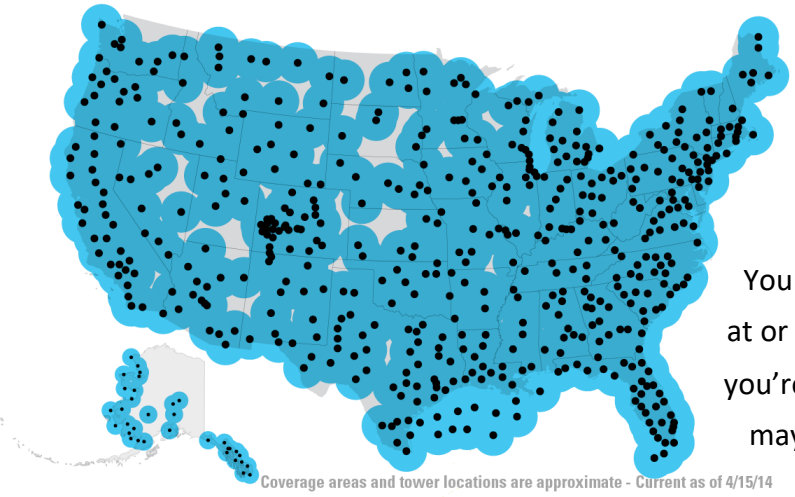
There are two frequency band components of the ADS-B system, 978 MHz and 1090 MHz. While traffic data (Traffic Information System Broadcast (TIS-B), can be broadcast on both frequencies, the weather component, FIS-B, is only available on the 978 MHz frequency. That's because 978 has enough bandwidth to carry the weather package and 1090 does not.

To display ADS-B weather on your panel display, you'll need a receiver like a Garmin GDL 88 Universal Access Transceiver (UAT).

You can also receive weather on a 1090 MHz Extended Squitter (ES) Transponder like the L3 Lynx NGT 9000.

Receiving

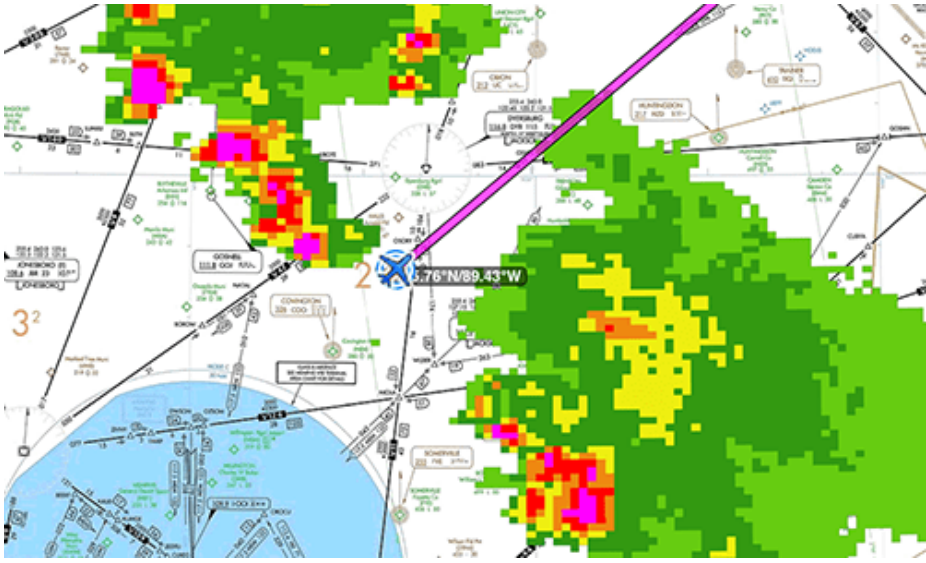
ADS-B weather broadcast requires you to be within line of sight of the towers. The system currently provides coverage for most of the lower 48 states, the Gulf of Mexico, Puerto Rico, the Virgin Islands, with partial coverage in Hawaii and Alaska.



You can usually receive FIS-B when at or above 1,500 AGL. However, if you're flying in the gray areas, you may need to climb higher to receive a signal.

NEXRAD Updated every two minutes

Thanks to recent enhancements to the ADS-B data stream, regional radar imagery is now updated every two minutes. (NOTE: The A.I.M. and AC 00-63A have not been updated to reflect this change).



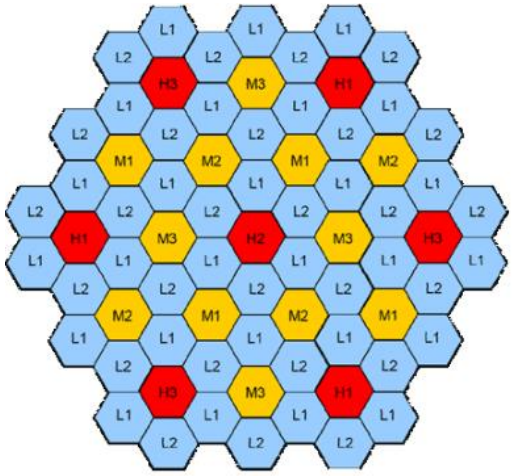
Latency

From a practical standpoint, it's important to remember that the initial processing and transmission of next-generation weather radar (NEXRAD) data can take several minutes. This means that pilots must assume that data link weather information will always be a minimum of 7 to 8 minutes older than what is shown on the display timestamp. This delay is called "Latency".

More Amazing Products Available

You can receive and display more than NEXRAD with the ADS-B weather system. You can display lightning, METARs, TAFs, PIREPs, NOTAMs, AIRMETs/SIGMETs, Cloud Tops, Turbulence, Winds Aloft, Freezing Level, and Special-use airspace status.

Satellite imagery is displayed only on the ground through a WiFi connection or your carrier's data plan.



The Service Tiers

Like VORs, there are different service tiers for ADS-B towers. The "look-ahead" range of regional radar is 150NM for low-altitude towers, 200NM for medium-altitude towers, and 250NM when receiving from high-altitude towers. The lower-resolution national radar imagery will be displayed for the area outside this radius.

The Tools are Wonderful

In 2005, a few months before I retired from the airlines, my wife and I bought our first Mooney. I soon discovered Sirius XM weather, and later, ADS-B weather (FIS-B) and ADS-B traffic (TIS-B). My Mooney suddenly was an information powerhouse and was way ahead of the airliners that I had been flying a few years before. I now receive more meteorological information than I ever imagined possible. FIS-B is an amazing advancement in aviation and provides a wonderful tool to help you make safe and practical inflight decisions.

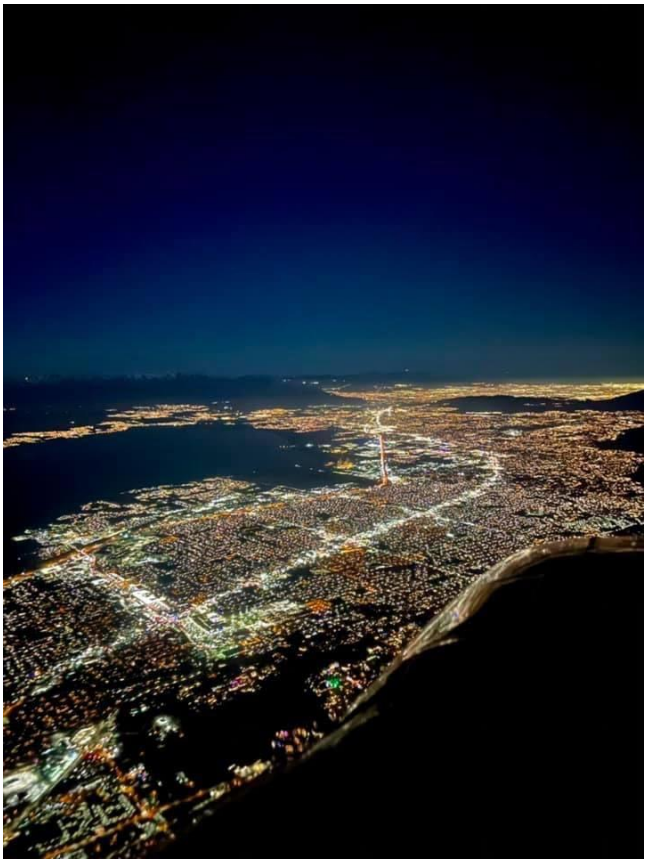
Just do it!

If you are not taking advantage of inflight weather and traffic information, please consider investing in a receiver, iPad or tablet and an app subscription, such as ForeFlight or Garmin Pilot. You can thank me later.

The Kindness of Strangers

by Chris Eaves, Skypark, Bountiful, Utah (KBTF)

In late November 2020, I was almost stranded in Hanksville, Utah (KHVE). It is Northeast of Bryce Canyon and Southwest of Moab. It is truly a middle-of-nowhere airport with no people, no FBO, and no fuel. HVE has nothing but a runway. I had landed to water a sagebrush and found that my battery didn't have enough charge for an engine start. My new alternator was powering everything, but it wasn't recharging the battery. I only had an hour of sun left, and I was wondering how cold my night was going to be out there. I called my mechanic friend in Salt Lake and he started the 3-hour drive to Hanksville. I then started the 3-mile walk to the little town of 200 people to see what might be open.



As I was walking down the highway, I heard a truck slowing down. The driver and his son asked if I need anything, and added, "Are you the Mooney pilot?"

I learned that the father is a pilot and owns a Cherokee 235. He's also an A&P from Salt Lake City. He and his son had been riding dirt bikes in the desert for the past two days. He saw me fly over low, and jonesing for flying, he decided to go over to the airport and see if I was there. They saw the empty plane and then they saw me walking on the highway and put 2 and 2 together.

We went back to the airport and used his super long set of cables to jump start the plane. He then unhooked the cables and waved me off. He and his son ran out to the runway and waved as I took off.

The nearly full moon, stars, and cold smooth air made for an absolutely beautiful flight home. I was able to call my mechanic from the air and tell him to turn around. I also called my girlfriend to assure her that I wasn't sleeping in the plane! I was saved by incredible luck and the kindness of strangers! People in the flying community are so awesome! Back at my home base, we fixed the problem.

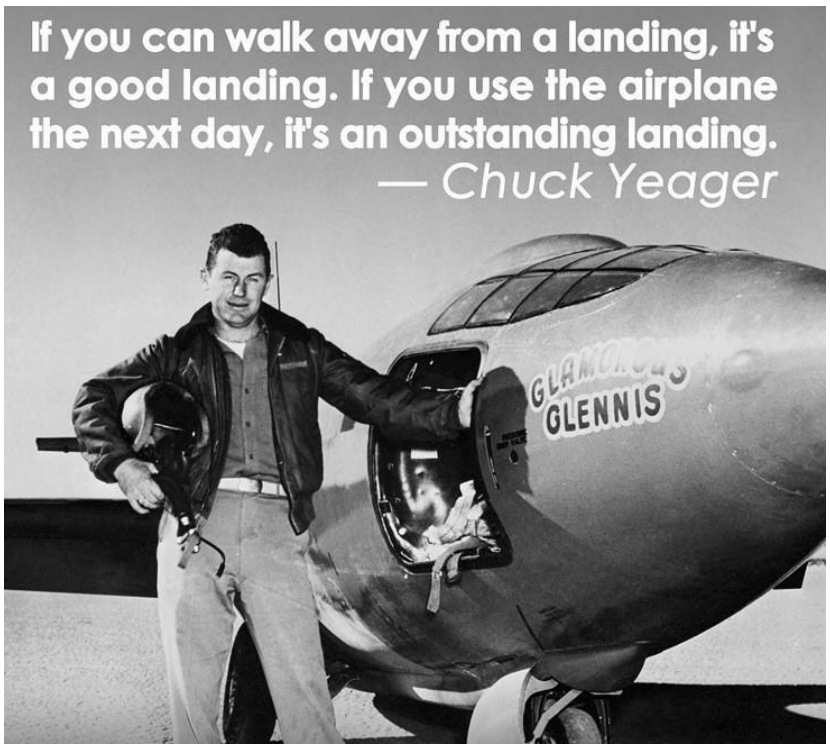
If you have a story that highlights the kindness of strangers, we would love to share it with others. Send your story to editor@themooneyflyer.com

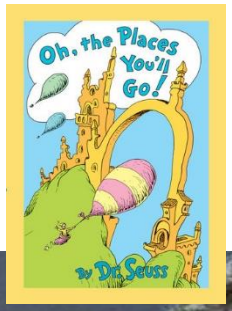
Vaccines are FAA Approved

Following the Emergency Use Authorization from the U.S. Food and Drug Administration for **both Pfizer and Moderna COVID-19 vaccines**, the FAA has determined that pilots may receive the vaccine under the conditions of their FAA-issued airman medical certification. FAA Air Traffic Controllers, who are subject to FAA medical clearance, may also receive the vaccine.

To maintain the highest level of safety in the National Airspace System, the agency will require aviation professionals with medical certifications or medical clearances to observe a period of 48 hours following the administration of this vaccine before conducting safety-sensitive aviation duties, such as flying or controlling air traffic.

Modera vaccine requires two doses, **28** days apart for maximum effectiveness. The Pfizer vaccine requires two doses **21** days apart for maximum effectiveness. The 48-hour waiting period after each dose applies to both brands.

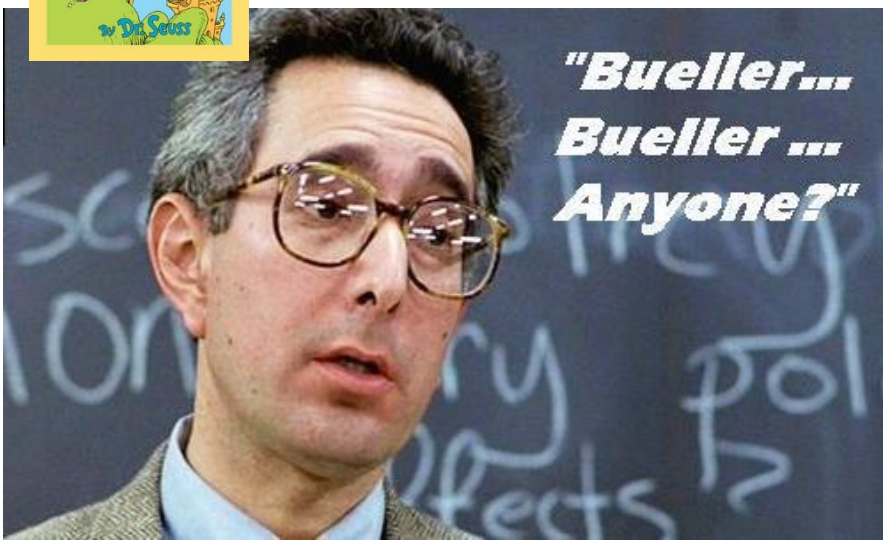




Oh, The Places You'll Go – Part II

by Richard Brown

Ok, let's have a show of hands. Last month, how many of you went out and flew to a few airports you have never been to or ones you haven't been to in a long time? Anyone? Bueller?



I took my own advice and we flew to Gillespie, California (KSEE) for lunch with some friends. I had only been there once before – almost three years ago for transition training in my Mooney – and that was going the inland route. This time we flew the coast and were cleared through the Bravo flying right off the approach end of the Miramar runways. We also flew to Kern Valley, where I had been once before, a little over two years ago. They were both fun trips which brought back the fun of going someplace different.

It is often said that Mooney owners are notoriously frugal. In fact, there seems to be a club mentioned from time to time whose name would imply that the members are not only frugal, but also questions the legitimacy of their births. I was a proud member of that club, but I may have lost my membership after my panel upgrade. I am hopeful that by doing the installation myself to save money, that the members might let me back in the club.

In this installment we are going to look at how to get a moving map in the plane as well as weather and traffic, without taking out a second mortgage.

Most everyone knows about iPads and Foreflight. If you haven't used these, then you probably know someone who swears by them. I'm not going to discuss iPads and Foreflight because I have no experience with them and I want to offer less expensive options. While I am told iPads and Foreflight are amazing, the combination is not exactly "inexpensive."

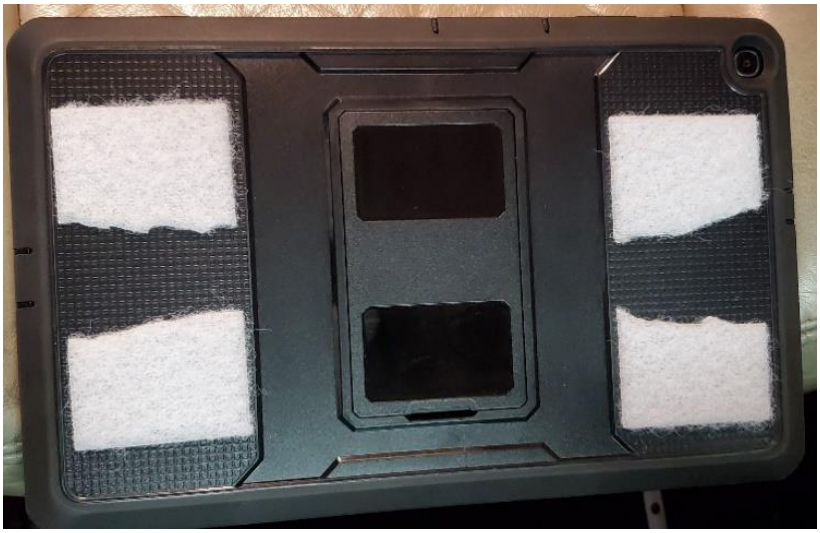
If all you are looking for is a moving map, look no further than a tablet like the Samsung Galaxy Tab A 8.0. This costs around $100. The battery life is great, and I have never had it overheat and shut down on me, even when flying in the summer. Another advantage of the Android tablet is that almost all of them come with internal GPS, unlike an iPad where you have to buy the model with Cellular to get the GPS. A 10" tablet will also fit on the yoke, but it will likely cover up the bottom half of your DG. I flew with a 10" on the yoke for a few years before recently switching to the 8" on the yoke and relegating the 10" to the right-hand side of the panel. My wife likes having it there. She can follow along on the trip, zooming in to see what town we are passing. It also helps her when looking for the traffic on the tablet. I have had other tablets by Asus, but found that the Samsung had better battery life, and for $100 you can't go wrong.

Once you have a tablet, you are going to need an app. I mentioned last month that you could get a moving map in the plane for about $100 with no subscription fees. Two of the most popular free apps are Avare and FltPlan Go. They both offer all your charts, airport diagrams, georeferenced approach plates, taxi diagrams, etc.

With your tablet purchased and your app downloaded, you are going to need a way to mount it in the plane. My tablet on the yoke uses a RAM Double Ball Yoke Clamp Mount and a RAM X-Grip Universal Holder for 7”-8” Tablets. Yes, I realize that adding the mount is going to push you over the aforementioned $100, but you have to know by now, that anything having to do with a plane is a slippery money slope.

If you want to put it on your leg like a knee board, an option would be the MyClip Multi Kneeboard Strap. It is less expensive than the yoke mount and it works well. I used one when I was going from plane to plane during my PPL training. A third option, if you have room on the panel, is just to use some Velcro strips. At Home Depot, you can find 4" x 2" strips for less than $3 and it works great. This is what I use to mount the 10" to the panel. Just be aware, it doesn't take much to hold it there. I had to cut them down to this size because any bigger made it extremely difficult to remove the tablet from the panel without potentially damaging it.

Once you have a tablet in the plane, you are going to want to have weather and traffic displayed as well. You don't need to buy the latest and greatest avionics and have them installed in the plane to get traffic and weather. There are a couple of options. If you want to spend $700, you can buy a Stratus ADS-B receiver which will feed ADS-B "In" to your tablet for subscription free traffic and weather. The Stratus works well and has an 8-hour battery life.

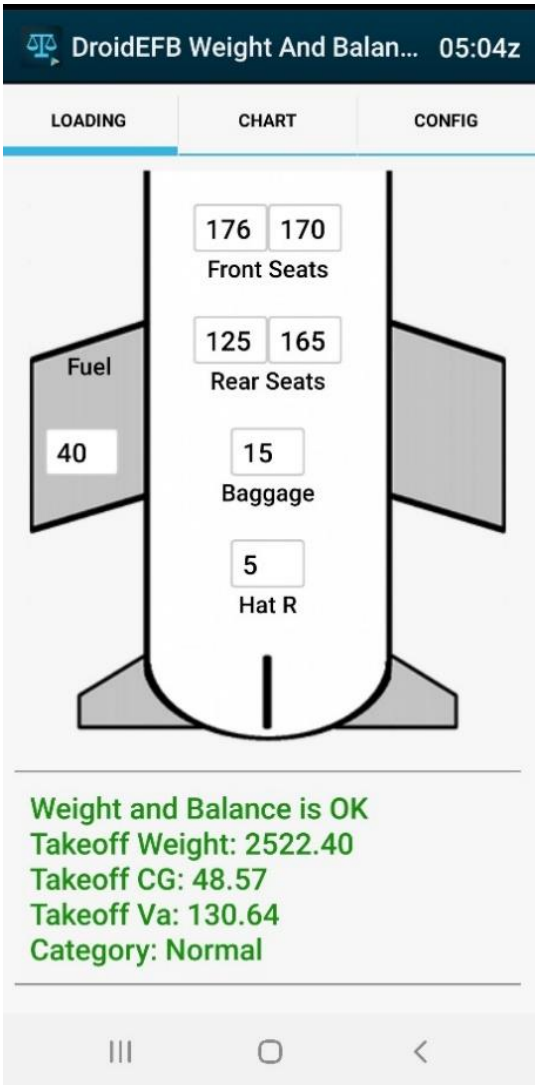


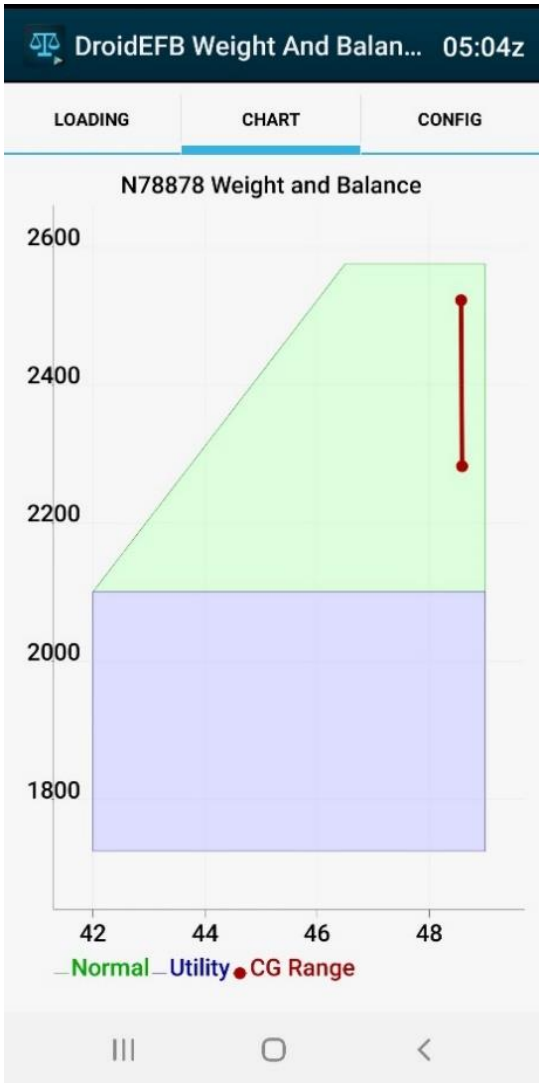
The lesser-known cousin of the Stratus is the Stratux with an "x". If you are semi-handy and like playing around with electronics, you can build your own for about $150 or so. Just go to the website at www.stratux.me and you'll find everything you need to build one listed with links to purchase pieces and the instructions. I built one about four years ago and have been using it mostly trouble free ever since. Twice, the Micro SD card was corrupted, which cause it to stop broadcasting Wi-Fi to the tablet. Re-writing the image on the card corrected the issue. However, the last time it happened was a few years ago and the software has been updated since then. If you aren't handy, you can buy one fully assembled from Amazon for $250. (The Flightbox, sold by Aircraft Spruce costs $360. It is just a Straux with a battery pack, the same as the $250 option on Amazon). Both the Stratus and the Stratux will interface with the apps on your tablet and provide traffic and weather. The Stratux will also work with Foreflight if you are already running that on an iPad. A complete list of the compatible EFB's is available on the Stratux website.

If you are looking for an app with a few more bells and whistles than the free ones, two that I have used are DroidEFB and iFlyGPS. I used DroidEFB for almost three years before switching to iFlyGPS. I have used iFlyGPS for the last year. They both accept input from a Stratus/Stratux and both offer a 30 day free trial. There is also Garmin Pilot. I have not used it, but I have read that Garmin Pilot will not interface with either Stratus or Stratux. This eliminates the less expensive route to receive weather and traffic.

One last tip, if you are looking for a handy, easy to use, weight and balance app, check out the one built into DroidEFB. While you do have to pay a subscription to use the charts and flight planning portion of DroidEFB, the weight and balance portion of the app is free, and it is very user friendly. After putting in the configuration settings for your plane, all you do is fill in the boxes with the

weights and it tells you where you are in your CG and how much over or under gross. The middle tab gives you a chart showing where you fall in the CG envelope.





As a disclaimer, I am not an expert, I am not a meteorologist, and it has been quite a few years since my last stay at a Holiday Inn Express, so I am sure the magical benefits touted on their commercials has long since worn off. Hopefully, you are checking out some new airports and if you do not have a tablet in the plane, this might give you some things to think about. Next month I'll wrap this up with some basic weather planning and use of the weather on the tablet while en-route, as well as what to do about maintenance issues when you are away from your home base. Until then, keep dreaming of those Mooney destinations. If you dream about them long enough, you will find a way to make them a reality.

Art of the Aerodynamic Tuft

Eighth in the series
by Ron Blum

Is tuft a noun? Is tuft a verb? Is tuft an adjective? The answer to all of those is "Yes." It just depends how "tuft" is used in the sentence. We have found that color, length, girth, or stiffness of the tuft matters. In the next couple pages, we will also answer, "What is an aerodynamic tuft?" And, for fun, we'll even look at a couple real-world M20J examples.

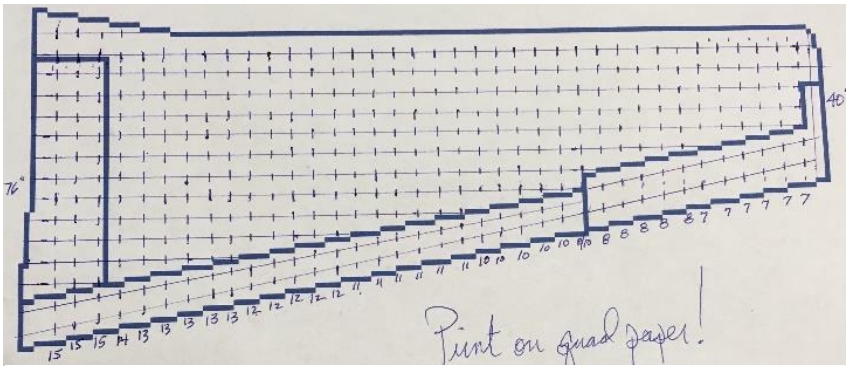


Figure 1 – Grid Pattern

With respect to most GA airplanes and in most scenarios, a tuft is simply a short piece of yarn, taped to the airplane. It is designed to tell the direction of airflow at that location. Tuffs are normally taped in a grid pattern (see Figure 1) in an area of concern, (a problem area).

Who do you think was the first to use a tuft? Yep, none other than our favorite brothers, Orville and Wilbur. In their case, they used a single, longer tuft to show angle of attack (AOA) and angle of side slip (yaw). That instrument, costing less than one cent, is still used in sailplanes today. It is called a yaw string. With a turn coordinator, we "step on the ball". With a yaw string, one pulls the string to center it.

Can tufts change the flow pattern? No. Not if the right size and stiffness of tuft is selected. **Can tufts change aerodynamic characteristics?** Yes! Adding tufts will make the flow (boundary layer) turbulent … no more laminar flow – period. In addition, each tuft is a little vortex generator (VG). Here's a fun little example story. There was an entry-level business jet that when stalled in a certain manner would roll inverted. We fully tufted both wings. The airplane stalled perfectly. We removed all the tufts. The airplane went inverted again. We fully tufted both wings again, which made the mechanics unhappy. It stalled perfectly again. We started removing one span-wise row of tufts at a time. The airplane continued to stall perfectly, until we removed the most forward row of tufts (no tufts on the wings), and the airplane went inverted again. The wing was stalling (separated airflow) starting at the leading edge. To solve the problem, this airplane now has VGs buried in the leading edge de-icing boot.

Does color matter? Color did matter, but now, not as much. Cameras have gotten a lot better with handling bright spots from the Sun and very bright white areas (wings), with dark backgrounds (ground). Many people use florescent orange. Flight Test calls this color "International Orange", but cameras still have a hard time distinguishing orange from dark surfaces, especially in shadows or looking directly into the sun. Ironically, white typically works well everywhere, even on white

surfaces. The camera will show shadows from white tufts. Plus, white tufts get dirty and become grayish.

Does length matter? Yes, it does. Combined with girth and stiffness, a longer tuft has a tendency to show an "average" flow direction – more so as stiffness/girth increases.

Does stiffness matter? As mentioned above, yes. Girth and stiffness (related) will change whether an average or an instantaneous flow direction is shown. Girth and stiffness are also important to size of the area being examined. Looking at a wind tunnel model, (down to 1/8th scale), a piece of yarn would be huge. Single strand threads are used in those cases and are super glued to the model.

Why tuft an area of an airplane? As an OEM, airplanes are tufted to find problem areas, define the problem and present potential solutions. The "Art of the Tuft" is knowing what the tuft is saying. I was recently asked a great question. Is the airflow following the pressures, or is the airflow defining the pressures? Airflow will tend to travel away from high pressure and into low pressure, but it's not that easy. Airflow may not change direction with significant pressure changes.

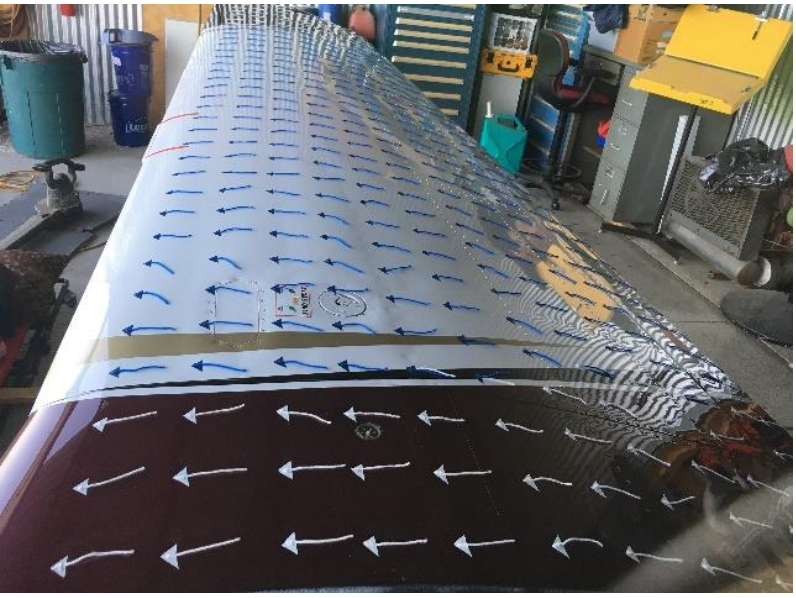


Figure 2 – Tuft pattern in the hangar

Let's get "real world" and practical. To the left, (Figure 2), is Scott Sellmeyer's M20J with the right wing fully tufted with 4.5" tufts on a 6" grid. We tufted the wing to look at stall progression. Note there are two chord-wise pieces of red tape near the leading edge to show where the stall strip is located.

Now let's go perform a flaps UP, gear UP (clean) stall. The clean configuration is typically the worst configuration for stall characteristics, but that's a whole other article … or two … or three. Come to my Oshkosh forums ☺.

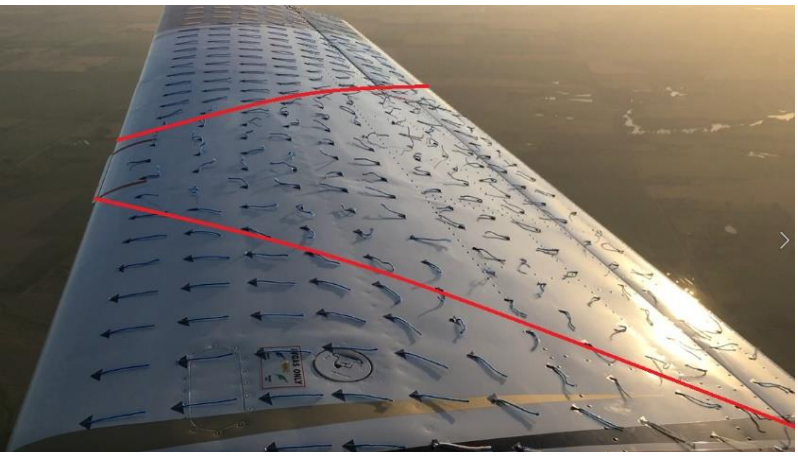


Figure 3 – Clean wing stall

As can be seen in Figure 3, for the "J" wing, stall progression is totally dominated by the stall strip. Nice flow outside the red lines (lower pressure) – yes, even inboard with separated flow (higher pressure) between the red lines. The inboard tufts pointing inboard show a good example of airflow direction not always indicating a pressure problem. Another important point to note here is that the areas outside the red lines are still producing full lift, while the areas inside the red lines are producing roughly 50% lift. The total lift on the wing at this point is still between 80-90% of C_{Lmax}.

Now let's look at some bonus data that's a little out of the ordinary. Once airflow has separated from a surface, it rarely reattaches to the surface. Here's a rare exception below (Figure 4). I believe this particular case is full flaps, gear up (though the gear position doesn't matter). As the wing first begins to stall, there is separation (due to the stall strip), but it reattaches downstream. A slight increase in AOA and the flow separates the full chord. Go figure.

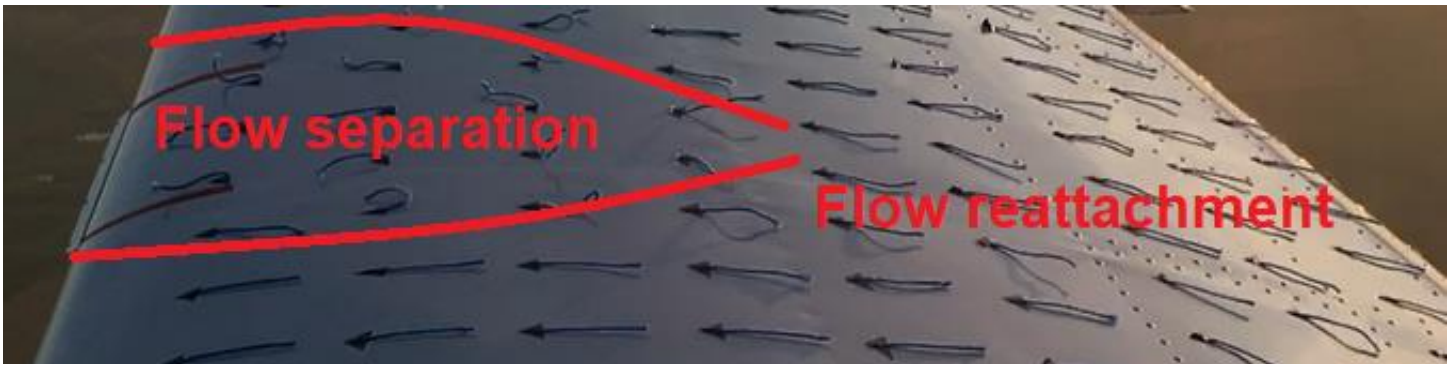


Figure 4 – Separated flow reattaching … a rarety!

I will appreciate suggestions on where to take these articles and/or answer any questions you may have. 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. In 2018, he founded Blue on Top LLC, an Aviation engineering and management consulting firm. Ron provides FAA flight analyst DER services and is a keynote speaker.

I have flown in just about everything, with all kinds of pilots in all parts of the world – British, French, Pakistani, Iranian, Japanese, Chinese – and there wasn't a dime's worth of difference between any of them except for one unchanging, certain fact: the best, most skillful pilot has the most experience. Chuck Yeager

Everything You Wanted to know About UL94

Unleaded fuel is coming to an airport near you soon and Swift UL94 is now available at a handful of airports. I hope to inform you about UL94 and share some data that I feel will be useful 3-4 years from now, when it is widely available.

What's the cost? Currently, at the Rochelle Municipal Airport-Koritz Field, IL (KRPJ), full serve (FS) UL94 is $4.50 per gallon, and FS 100LL is $4.55. Dublin, TX (9F0) sells only UL94 FS and it is $4.10. Just like 100LL, UL94 will not be a high-volume fuel.

Did you know that with UL94, you can fly more hours between spark plug and oil changes? For more information, read the Lycoming Service Bulletin below.

TO: All Owners and Operators of Lycoming Direct Drive Engines

SUBJECT: Extended Maintenance Intervals for Spark-Ignited Engines Operated on Unleaded Fuels

NOTICE: Incomplete review of all the information in this document can cause errors. Read the entire Service Letter to make sure you have a complete understanding of the requirements.

This Service Letter identifies extended maintenance intervals as benefits of routine exclusive use of approved unleaded fuels identified in the latest revision of Service Instruction No. SI-1070 for Lycoming engine models.

Continued and consistent use of unleaded fuel decreases the risk of lead fouling of spark plugs and contamination of engine oil with leaded combustion byproducts. As a result, engines continuously operated on unleaded fuel could realize the following advantages:

- Extended maintenance intervals for spark plug rotation/replacement
- Extended operating hours between oil changes.

Schedule for Extended Maintenance Intervals

Table 1 identifies both the current and extended maintenance intervals applicable for engines continuously operated on approved unleaded fuel after **first completing the required Transition Procedure in this Service Letter.**

NOTICE: Oil change intervals have been extended in the schedule in Table 1. Oil filter inspection and replacement and oil pressure screen inspection and cleaning intervals remain the same to ensure continued engine condition monitoring.

Although the exclusive continuous use of unleaded fuels is expected to extend spark plug life, continue to follow inspection guidance from spark plug manufacturers (Champion, etc.).

Table 1
Operating Hour Maintenance Intervals

Maintenance Task	Operating Hour Maintenance Interval	
	Leaded Fuel	Unleaded Fuel
On engines with an oil filter, after the initial transition 50-hour change, complete subsequent oil change	50 hours*	100 hours*
Oil filter replacement (after initial transition change)	50 hours	
On engines with an oil pressure screen, after the initial transition changes, complete subsequent oil change	25 hours*	50 hours*
Oil pressure screen /removal/inspection/cleaning (after initial transition changes)	25 hours	

*Or every 4 months, whichever occurs first; also, remove, examine, clean and re-install/safety the oil suction screen. Refer to the latest revision of Service Bulletin No. 480 for guidance on inspection of oil filter and oil pressure screen contents.

⚠ **CAUTION:** IF LEADED FUEL IS USED AFTER USING UNLEADED FUEL, YOU MUST COMPLETE THE TRANSITION PROCEDURE AGAIN BEFORE RETURNING TO USE OF APPROVED UNLEADED FUEL TO ENSURE CORRECT ENGINE OPERATION.

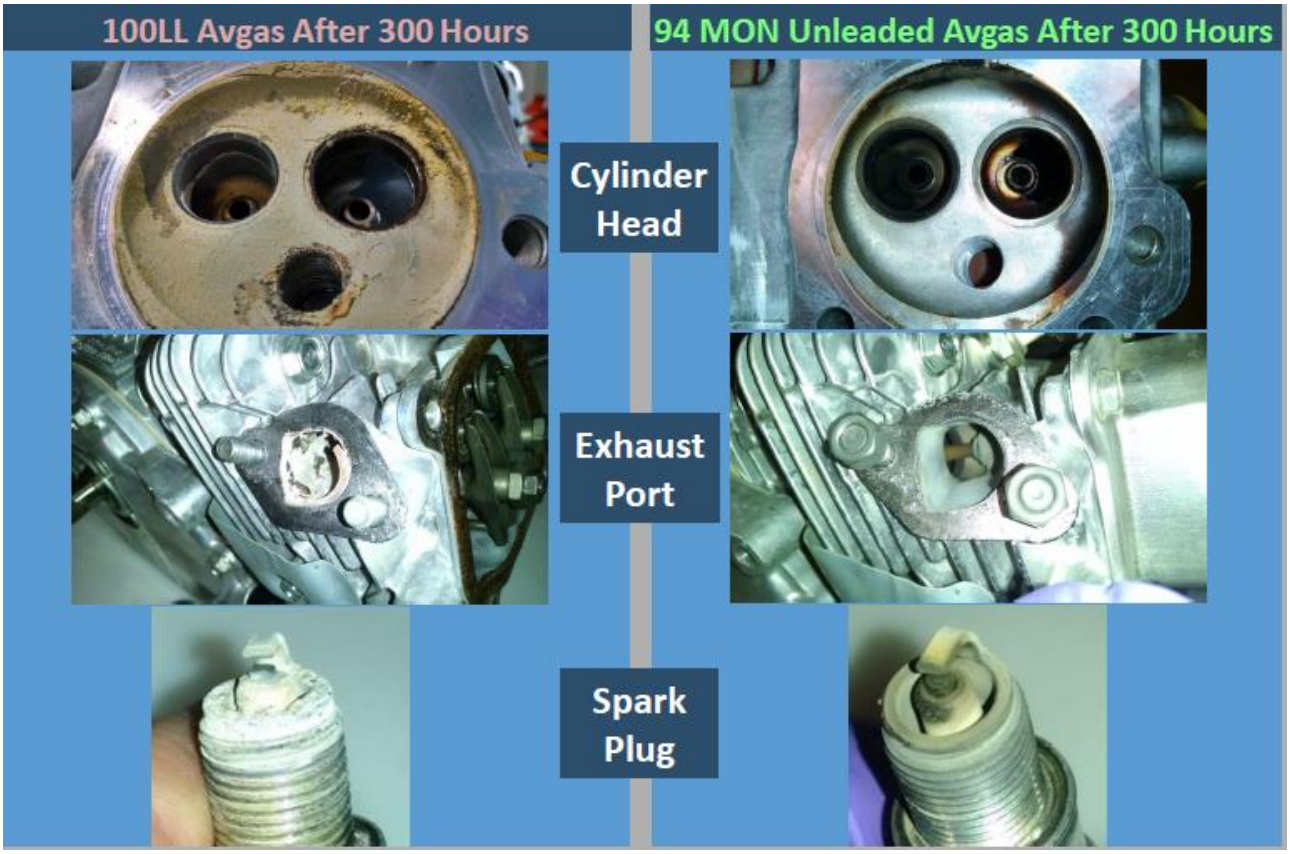
Transition Procedure from Leaded Fuel to Unleaded Fuel

To transition from leaded fuel operation to unleaded fuel operation, complete the following steps prior to introduction of unleaded fuel:

1. Per instruction in the applicable Lycoming maintenance manual:
   - A. Complete an oil change with approved oil identified in the latest revision of Service Instruction No. SI-1014.
     - (1) Per the latest revision of Service Instruction No. SI-1070, use an oil additive or an equivalent finished product when using approved unleaded fuels.
     - (2) Be sure to securely torque and safety wire the oil sump drain plug(s) per the latest revision of the *Service Table of Limits SSP-1776*.

     NOTICE: Lycoming recommends oil sample collection and analysis with each oil change to monitor trends.
   - B. Either complete an oil filter change or remove, clean, and re-install the oil pressure screen. Safety the oil filter.
   - C. Remove, examine, clean, and re-install the oil suction screen.
2. Engine operation:
   - A. For engines with an oil filter, operate the engine normally for **50 hours** on an approved unleaded fuel.
   - B. For engines with an oil pressure screen, operate the engine for **25 hours**, remove, examine, clean and re-install the oil pressure screen (per the applicable Lycoming maintenance manual) and operate the engine for another 25 hours.
3. After 50 hours of unleaded fuel operation, per the applicable engine Lycoming maintenance manual, complete a 50-hour inspection (including oil change, oil filter replacement or oil pressure screen removal/examination/cleaning and re-installation)
4. If there was no unusual engine operation or evidence of component wear, continue engine operation using unleaded fuel and follow the extended maintenance interval schedule in Table 1.

ROP vs. LOP – Which leaning process leaves your cylinders in better condition? That is still being debated. However, the pictures below clearly show that engines are cleaner after using UL94.



Can you use UL94 in your Mooney? Check out the Lycoming and Continental usage tables below.

Lycoming Engines Approved for UL94

Lycoming Engine Models		AVGAS ASTM D910 100LL	AVGAS ASTM 7547 UL94
O-235	-C, -E, -H	•	•
O-235	-K, -L, -N	•	•
O-235	-M, -P	•	•
O-290	-D	•	•
O-320	-A, -B, -C, -D, -E	•	•
IO-320	-A, -B, -D, -E	•	•
AIO-320	-A, -B, -C	•	•
LIO-320	-B	•	•
AEIO-320	-E	•	•
O-360	-A, -B, -C, -D, -F, -G, -J	•	•
HO-360	-C	•	•
IO-360	-B, -E, -L, -M, -N	•	•
LO-360	-A	•	•
HIO-360	-B	•	•
HIO-360	-G	•	•
IVO-360	-A	•	•
LIO-360	-M	•	•
O-435	-A, -C	•	•
GO-435	-C, -C2	•	•
GO-480	-B, -D, -F	•	•
O-540	-A, -B, -E, -F, -G, -H, -J	•	•
IO-540	-C, -D, -N, -T, -V	•	•
IO-540	-W, -AB, -AF	•	•
VO-540	-A, -B	•	•

Lycoming Engines Requiring 100LL (DO NOT USE UL94)

Lycoming Engine Models		AVGAS ASTM D910 100LL
O-235	-F, -G, -J	•
O-320	-H	•
IO-320	-C, -F	•
LIO-320	-C	•
AEIO-320	-D	•
O-360	-E	•
HO-360	-A, -B	•
IO-360	-A, -C, -D, -F	•
IO-360	-J, -K	•
LO-360	-E	•
TO-360	-A, -C, -E, -F	•
VO-360	-A, -B	•
AIO-360	-A, -B	•
HIO-360	-A, -C, -D, -E, -F	•
LIO-360	-C	•
LTO-360	-A, -E	•
TIO-360	-A, -C	•
AEIO-360	-A	•
AEIO-360	-B, -H	•
LHIO-360	-C, -F	•
IO-390	-A	•
AEIO-390	-A	•
VO-435	-A, -6, -23	•
VO-435	-B	•
TVO-435	-A, -B, -C, -D, -E, -F, -G, -25	•
O-480	-1, -3	•

Lycoming Engine Models		AVGAS ASTM D910 100LL
O-480	-A	•
GO-480	-C, -G	•
GSO-480	-A, -B	•
IGO-480	-A	•
IGSO-480	-A	•
O-540	-L	•
O-540	-9, -9A	•
IO-540	-A, -B, -E, -G, -J, -K, -L, -M,	•
IO-540	-P, -R, -S, -U, -AA, -AC, -AE	•
VO-540	-C	•
HIO-540	-A	•
IGO-540	-A, -B	•
IVO-540	-A	•
TIO-540	-A, -C, -E, -F, -G, -H, -J, -N,	•
TIO-540	-R, -S, -U, -V, -W, -AA, -AB,	•
TIO-540	-AE, -AF, -AG -AH, -AJ, -AK	•
TVO/TIVO-540	-A	•
AEIO-540	-D	•
AEIO-540	-L	•
IGSO-540	-A, -B	•
LTIO-540	-F, -J, -N, -R, -U, -V	•
TIO-541	-A, -E	•
TIGO-541	-D,-E,-G	•
IO-580	-B	•
AEIO-580	-B	•
IO-720	-A,-B,-C,-D	•

Lycoming Engines Approved for UL94

Lycoming Engines Requiring 100LL (DO NOT USE UL94)

Continental Engines Approved for UL94			
Continental Engine Models	Cylinders	Fuel Grade	CR
C-85	4	80/87	6.3:1
C-90	4	80/87	7.0:1
C-115	6	80/87	6.3:1
C-125	6	80/87	6.3:1
C-140	6	80/87	6.3:1
C-145	6	80/87	7.0:1
C-175	6	80/87	7.0:1
E165	6	80/87	7.0:1
E185	6	80/87	7.0:1
O-200-AF	4	UL94	7.0:1
O-200-A & B	4	80/87	7.0:1
E225	6	80/87	7.0:1
O-300	6	80/87	7.0:1
IO-346	4	91/98	7.5:1
IO-360-AF	6	UL94	7.5:1
O-470-J, K, L, M, R, S	6	80/87	7.0:1
IO-470-C	6	91/96	8.0:1
IO-470-J & K	6	80/87	7.0:1
Continental Engines Approved for UL94			

Continental Engines Requiring 100LL (DO NOT USE UL94)			
Continental Engine Models	Cylinders	Fuel Grade	CR
O-200-D, X	4	100/100LL	8.5:1
IO-240-A & B	4	100/100LL	8.5:1
IOF-240-B	4	100/100LL	8.5:1
IO-360-C, CB, D, DB, G, GB, H, HB	6	100/100LL	8.5:1
IO-360-ES, J, JB, K, KB	6	100/100LL	8.5:1
TSIO-360-A, AB, C, CB, D, DB	6	100/100LL	7.5:1
TSIO-360-F, FB, H, HB, JB, LB, MB, SB	6	100/100LL	7.5:1
L/TSIO-360-E, EB, KB, RB	6	100/100LL	7.5:1
O-470-U	6	100/100LL	8.6:1
IO-470-D, E, F, H	6	100/130	8.6:1
IO-470-L & M	6	100/100LL	8.6:1
IO-520-B, BA, BB, C, CB, D, E, M, MB	6	100/100LL	8.5:1
IO-520-F, L	6	100/130	8.5:1
TSIO-520-B, BB, E, EB	6	100/100LL	7.5:1
TSIO-520-C, H, J, JB, N, NB	6	100/130	7.5:1
TSIO-520-(M), P, R, T, U, UB, VB, WB	6	100/100LL	7.5:1
GTSIO-520-D, H	6	100/130	7.5:1
GTSIO-520-L, M	6	100/100LL	7.5:1
IO-550-A, B, C, D, E, F, G, L	6	100/100LL	8.5:1
IO/IOF-550-N, P, R	6	100/100LL	8.5:1
TSIO-550-B, C, E, K, N	6	100/100LL	7.5:1
TSIOL-550-A, B, C, G	6	100/100LL	7.5:1
TSIOF-550-D, J, K	6	100/100LL	7.5:1
Continental Engines Requiring 100LL (DO NOT USE UL94)			

As you can see, currently the larger bore engines from both Lycoming and Continental cannot use UL94. However, Swift's goal is to replace 100LL with a 100 Octane Unleaded fuel that is compatible with all engines within 3 years.

Swift Fuels is also rolling-out its new "FOREVER" Avgas Supplement Type Certificate (STC) to all Avgas STC purchasers. This will entitle the holder to receive all future Avgas STC's issued by the FAA to Swift Fuels for specific aircraft and piston engines at no extra charge – Forever!

Read more about Swift Fuels at https://www.swiftfuelsavgas.com/

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.

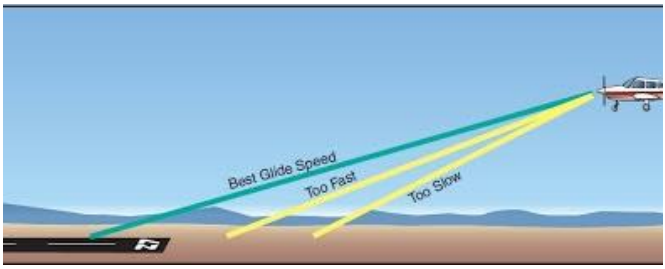
Wisconsin Aviation offers a complete line of general aviation services including air charter, aircraft maintenance, avionics repair and installation, flight training and aircraft rental, aircraft management, aircraft brokerage, and fueling services. The corporation has locations in Madison, Watertown,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

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

January 2021 Quiz

VFR and IFR Pilot Quiz

1. **Something smells "fishy" and you notice smoke emanating from the instrument panel. You think it's an electrical fire, so you comply with the emergency checklist procedures. You have turned the Master and Alternator(s) switches "OFF". Will your engine continue to run with the Master switch off?**
   A Yes
   B No
   The answer is a, Yes. Aircraft electrical systems and ignition systems are separate systems. With the Master Switch off, your engine will keep running, because your spark plugs are powered by magnetos. Your avionics and radios will be inoperative, so be careful.



2. **You hear a loud "BANG", and your engine quits. Fortunately, ForeFlight's *Glide Advisor* indicates that you are within gliding distance of a nice airport. What airspeed should you try to maintain?**
   A Vfe
   B Vy
   C Vx
   D Best Glide
   The answer is d, Best Glide.

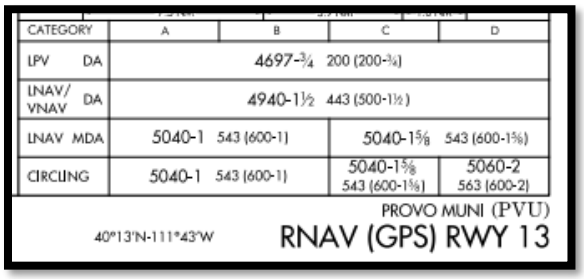
3. **Your RPM is dropping, and you suspect carb ice. You turn the carb heat on, but the engine starts running rougher. What should you do?**
   A Turn Carb Heat off
   B Leave Carb Heat on
   C Press the panic button 'cause you're doomed
   The answer is b, leave the carb heat on. If you have carb ice, turning on carb heat will start melting the ice and the resulting water will run through your engine and that doesn't burn very well. Your engine will run extremely rough, but eventually, all the ice will melt. I hope you brought an extra pair of underwear.

4. You're flying to visit family and suddenly, you realize that you have a stuck mic. To avoid being an annoyance to ATC and those around you, you turn off both radios. What transponder code should you squawk to notify ATC your radio has failed?
A 1200
B 7500
C 7600
D 7700
The answer is b, 7600. That notifies ATC that you've lost radio communication, and they'll move aircraft out of your way so you can safely land.
NOTE: 7500 means "I've been hijacked." 7700 would be "overkill" because that means you have an emergency.

5. It's cold outside and you're using the aircraft heater. You begin to experience a headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. Hmmm. You realize that those are the symptoms of Carbon Monoxide poisoning. What should you do?
A Descend to a lower altitude where it's warmer.
B Turn the heater off and open the fresh air vents
C Leave the heater on and open the fresh air vents
The answer is b, Turn the heater off and open the fresh air vents. If you start feeling sick when the heater is running, chances are your aircraft has a leaky heater shroud and you're being poisoned by carbon monoxide. Get some fresh air into the cabin.

IFR Pilot Quiz

6. You are planning a flight to Salt Lake City (KSLC) and the forecast weather, plus or minus one hour of your arrival is 2,000 feet broken and 2 miles visibility. Do you need an alternate?
A Yes
B No
The answer is a, yes. If the weather forecast is less than 2,000 and 3, you'll need to file an alternate.



7. You plan to use Provo (KPVU) as the alternate. It is forecast to be 600 and 2 and there is a NOTAM indicating that the ILS glide slope is out of service. However, Provo has an RNAV (GPS) approach with LPV minimums that are similar to ILS minimums. Can you name PVU as the alternate?
A Absolutely, use Provo as the alternate.
B No, Provo's weather is too low.
The answer is B. Although LNAV/VNAV and LPV approach minimums approximate ILS approach minimums, and Garmin refers to them as "precision approaches" with a Decision Altitude (DA), the FAA considers them to be non-precision approaches. Technically, they are classified as an Approach with Vertical Guidance (APV). The Provo weather would need to be 800 & 2 or more to qualify as an alternate.

8. The Ogden (KOGD) forecast is 800 and 2, so you file OGD as the alternate. Approaching SLC, the ATIS is reporting weather below minimums for every approach. Salt Lake Approach tells you that Ogden is also below minimums for every approach. However, Provo's ILS glide path is back in service and PVU is reporting 300 and 1. What weather does Provo need so you can fly there and land?

A 800 & 2

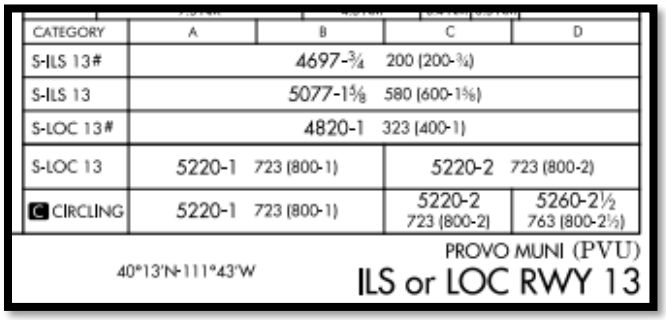
B 2000 & 3

C 600 & 2

D The minimums for the approach

The answer is d, the minimums for the approach. If you are planning and filing, the minimums must be 800' ceilings and 2 SM visibility for non-precision approaches, and 600' ceilings and 2 SM visibility for precision approaches. However, since you are in-flight, you are only required to meet the minimum criteria listed for the specific approach you choose to fly.

9. For Category 1 approaches, like the ILS at PVU, at least one of several visual references for the intended runway must be visible and identifiable before you can descend below DH/MDA. Which of the following is NOT one of those items?



CATEGORY	A	B	C	D
S-ILS 13#		4697-¾	200 (200-¾)	
S-ILS 13		5077-1⅝	580 (600-1⅝)	
S-LOC 13#		4820-1	323 (400-1)	
S-LOC 13	5220-1 723 (800-1)		5220-2 723 (800-2)	
C CIRCLING	5220-1 723 (800-1)		5220-2 723 (800-2)	5260-2½ 763 (800-2½)

40°13'N-111°43'W

PROVO MUNI (PVU)

ILS or LOC RWY 13

A Visual approach slope indicator

B Runway or runway markings

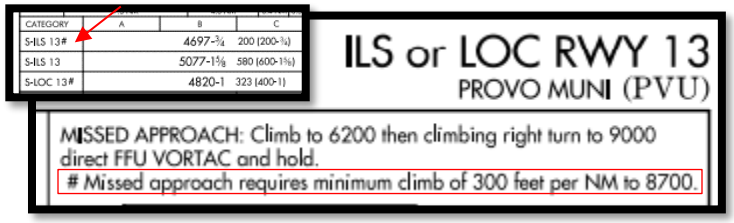
C Runway hold short lines

D Threshold or threshold markings

E Touchdown zone lights

The answer is C, runway hold short lines. According to 91.175, if you see answers A, B, D or E, you can descend from the DA/MDA for landing. Other visual sightings that allow you to descend below DA/MDA are REILs, runway lights, touchdown zone lighting, and threshold lights. That assumes that you have the required flight visibility, and you're in a continuous position to land.

10. The lower DH at PVU requires at least ¾ mile visibility being able to fly a missed approach with a minimum climb of 300 feet per NM to 8,700. How can calculate what you will see on the VVI?



CATEGORY	A	B	C
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S-LOC 13#		4820-1	323 (400-1)

ILS or LOC RWY 13

PROVO MUNI (PVU)

MISSED APPROACH: Climb to 6200 then climbing right turn to 9000 direct FFU VORTAC and hold.

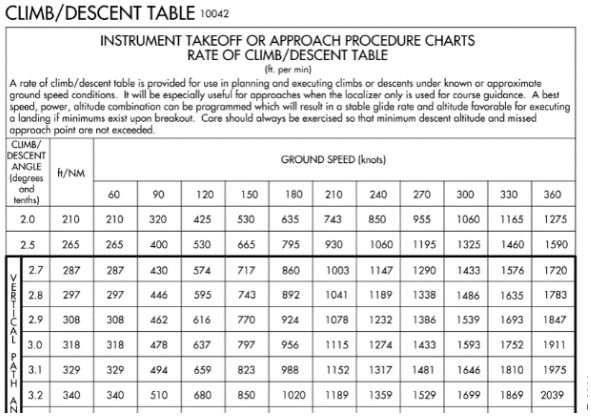
Missed approach requires minimum climb of 300 feet per NM to 8700.

A Your ground speed in nautical miles per hour, divided by 60 minutes per hour, and multiply by the climb gradient in feet per nautical mile = required rate of climb in feet per minute.

B Use the CLIMB/DESCENT TABLE found on the next to last page of the U.S. Terminal Procedures Publication.

C Both A and B.

The answer is C. Example: 90 knots GS / 60 = 1.5 x 300 = 450 ft/min. The table indicates 478 ft/min (28 ft/min more).



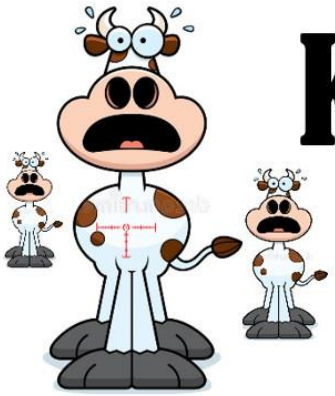
CLIMB/DESCENT TABLE 10042

INSTRUMENT TAKEOFF OR APPROACH PROCEDURE CHARTS
RATE OF CLIMB/DESCENT TABLE
(ft. per min)

A rate of climb/descent table is provided for use in planning and executing climbs or descents under known or approximate ground speed conditions. It will be especially useful for approaches when the localizer only is used for course guidance. A best speed, power, altitude combination can be programmed which will result in a stable glide rate and altitude favorable for executing a landing if minimums exist upon breakout. Care should always be exercised so that minimum descent altitude and missed approach point are not exceeded.

CLIMB/DESCENT ANGLE (degrees and tenths)	ft/NM	GROUND SPEED (knots)										
		60	90	120	150	180	210	240	270	300	330	360
2.0	210	210	320	425	530	635	743	850	955	1060	1165	1275
2.5	265	265	400	530	665	795	930	1060	1195	1325	1460	1590
2.7	287	287	430	574	717	860	1003	1147	1290	1433	1576	1720
2.8	297	297	446	595	743	892	1041	1189	1338	1486	1635	1783
2.9	308	308	462	616	770	924	1078	1232	1386	1539	1693	1847
3.0	318	318	478	637	797	956	1115	1274	1433	1593	1752	1911
3.1	329	329	494	659	823	988	1152	1317	1481	1646	1810	1975
3.2	340	340	510	680	850	1020	1189	1359	1529	1699	1869	2039

VERTICAL PATH AN



Killing Sacred Cows

Installment XVI

Brian Lloyd, CSEL/CMEL, CFIA/CFII

Happy New Year! I think that we all will be looking forward to putting 2020 behind us.

The big event for me this past month, was finally being able to go pick up my “new” CAP10B I will be using for aerobatic instruction.

I know, this is a Mooney publication and I know I should be flying a Mooney, but as far as I know, Mooney made only one aerobatic aircraft, and that was a primary trainer demonstrator for the military. I would love to fly it, but it continues to gather dust in the Mooney factory hangar. So that means if I am going to be doing spin, upset, and aerobatic training, it is going to have to be something other than a Mooney.

The CAP10B is a lovely little 2-place, side-by-side, low-wing, and fully aerobatic airplane. It is also made of wood. (Shades of the Mooney Mite and the M20A!) It has inverted fuel and oil systems so it can fly inverted for about 2 hours, as long as there is fuel in the forward fuel tank. I have found that after about a minute, I am tired of hanging from the straps. Still, it is pretty cool to fly along upside down, even if the airplane seems to turn backwards. When inverted the rudder seems to work backwards and requires a completely different coordination.

The only problem with the CAP10B is that so few of them were made, (between 300 and 400), and relatively few are in the US. Downloading the FAA’s registration database for all CAP10B aircraft on the FAA’s rolls shows only about 20 in the US, with a handful more living in Europe but keeping their N-number. Now I own 10% of the CAP10B fleet in the US.

The airplane had belonged to a fairly well-known aerobatic competitor, Pete Poland. Pete owned the CAP10B and an Extra 300. Unfortunately, Pete passed away after a protracted battle with cancer. Rumor has it that a week or so before his passing, he went out to the airport and flew both aircraft one last time. I will not get into a discussion about whether or not it was a good idea, but I certainly can understand why he did what he did.

Once I found out about the aircraft, I contacted the attorney handling the estate. There were a number of people vying to acquire the Extra 300, but I was the only one interested in the CAP10B. I made a low-ball offer, based on the fact that the aircraft hadn’t flown or had an annual inspection for 3 years. (Maybe it flew once in 3 years.) I was, and am, worried about the possibility of corrosion on the camshaft and lifters that may require an overhaul of the engine. After some haggling, we settled on an agreeable price that will still leave me comfortable, even if I have to overhaul the engine in the near term.

I was expecting to have to get a special flight permit, (SFP - what most people call a “ferry” permit), so I could get the plane to Texas. To my surprise and delight, the IA doing the pre-purchase inspection felt confident in the aircraft’s airworthiness and signed it off on an annual

inspection, thus eliminating the need for an SFP. I would be able to fly it home any way I wanted to. With that in mind, I ordered the Appareo/Stratus transponder/GPS with ADS-B in/out combination package. After all, I would need ADS-B, so this took care of that issue.

Realizing I would have some flexibility I decided I would try to make contact with many friends in the Southern California area I haven't seen for some time. I sent emails asking when would be a good time to visit in the upcoming week after I picked up the airplane. Before I got any replies, I scheduled my flight on Southwest to get from San Antonio to Burbank, the closest "big" airport to Camarillo.

Flying commercially during the COVID-19 pandemic is interesting. The first leg, San Antonio to Las Vegas, was nice. I had the entire emergency exit row to myself. Plenty of leg room and not too many worries about COVID-19 exposure. The leg from Las Vegas to Burbank was not at all the same. The flight was full to capacity. None of this "empty seat between people" thing now. At least I got a seat in the emergency exit row again. I may have been shoulder-to-shoulder with other people, but at least I had leg room.

Just a quick comment on my carry-on luggage. I took my parachute. For a moment I actually thought about donning my 'chute before getting on the plane. I imagined my comment to the flight attendant to be, "Hi! You can call me DB. Could I have a seat next to the emergency exit please?" Somehow I figured this wouldn't end well either.

On landing at Burbank I had to get my checked luggage. I had packed a suitcase with my Oregon Aero seat cushion, my trusty Leatherman Wave Multitool, and other tools I like to have with me when flying that the TSA won't allow you to carry on-board. I fetched my rental car and headed off to Camarillo.

The next morning, Monday, I got out to the airport, met the broker, signed the papers, and transferred the money. I owned the CAP10B. I then headed over to meet with the A&P/IA working on the airplane. He had received the Appareo/Stratus package to replace the old King KT-76A tube-type transponder, but unfortunately hadn't started the installation. The A&P/IA didn't understand avionics and decided to wait for me to get there. That ended any schedule I was hoping to keep.

The first thing we found out is that the altitude encoder already installed in the airplane as part of the existing transponder installation, was not suitable. We needed one with 10' altitude resolution. Fortunately Aircraft Spruce is located on the other side of the LA basin in Corona. Unfortunately, that is still a two-hour drive each way. So I opted to let UPS deliver it the next day. We planned to get everything ready and then drop in the new encoder upon arrival. Most of the work was done that Monday. We had a few things to do on Tuesday, but it looked like I might be able to leave as soon as the encoder arrived.

It didn't arrive. Somehow it got misplaced in shipping. Now I was worried. It was looking like I was going to end up running up a big hotel and rental car bill for extra days as well as run out of clean underwear. (Didn't your mother ever admonish you to have clean underwear in case you had to go to the hospital?) That 4-hour drive no longer looked all that bad and I wished I had taken it. All we could do was hope that the part would arrive with the regular UPS shipment on Wednesday.

Wednesday before noon, UPS delivered the shipment. I dropped in the new encoder, buttoned up the panel, and proceeded to program the transponder/ADS-B. I tentatively packed the airplane and did a weight-and-balance. I was going to be right at max gross weight for utility category with full fuel. It looked like there wasn't going to be a spare cubic inch left in the airplane with three parachutes (two came with the plane), logs, documents, spare equipment, tools, etc. At that point I made a command decision to remove and set aside the things I didn't need for the flight home and get them packaged up to ship via UPS. I had my own 'chute, my luggage (getting heavier with dirty clothes), my tools, etc., that I felt needed to come with me. I was ready to go, but the three days of severe-clear over my route of flight home would have had, had passed. Now there was a monsoon coming up from the Sea of Cortez through Arizona and New Mexico. If I left Wednesday, I would have been stopped short by weather and decided to check back into the hotel yet again for another night.

Since I was staying over Wednesday evening and everything was ready to go, I decided to do some pattern work to be sure that everything was working properly in the plane. I did several laps in the pattern and then returned to the shop. I logged the post-maintenance check and then invited Jesse, the young airport bum who had been hanging around and helping, to fly with me while I checked out the CAP10B.

For a lot of pilots, being an "airport bum" is a standard right-of-passage. You are young, broke, love airplanes, and want to make flying your vocation. You live at the airport, helping pilots and begging for stick time. I remember doing that. Well, that is Jesse. He clearly is serious about this as he has already made it through private, instrument, tailwheel, commercial single and multiengine land certificates and ratings. He asked me about where to go to get a flying job. I pointed him to some friends of mine flying in the Caribbean and suggested he try there. When you are in your twenties, unattached, and desperate to build hours, flying in the Caribbean can look pretty good.

So, I gave him an hour of dual in the CAP10B and signed his logbook. He is paying me back by packing and shipping my extra stuff. I think that is a fair trade. (I am going to pay for the shipping.)

So, now it is Thursday morning. The airplane is packed, fueled, and ready to go. I launch out of Camarillo on a route that takes me over the Rose Bowl, along the northern edge of the LA basin past Ontario, out through Banning Pass, past Palm Springs, and on to Ak-Chin airport south of Phoenix. Mugu approach was too busy to take my request for flight following, so I switched to SoCal approach. They assign me a squawk and then … they could not see me. Nothing was coming from my transponder; no reply light on the transponder either. Hmm.

I had a niggling suspicion when the transponder was going in that I might have connected it to the wrong transponder antenna cable. The CAP10B came from the factory with a nav-com, DME, and ADF. There is usually a transponder antenna and a DME antenna on the belly. This CAP10B had no transponder antenna, just a DME antenna. (A DME antenna may be used for a transponder, but a transponder antenna may not be used for DME or ADS-B.) I realized that the old transponder had been connected to the cable labeled 'DME' instead of 'transponder'. I thought I had checked and marked the correct one, but, as we all know, with Murphy's law, if you have a 50% chance of being right you will be wrong 90% of the time.

SoCal approach was amazingly accommodating. After a turn for identification, they handled me as a primary target with no complaint. Several handoffs later they handed me to Palm Springs

approach, whose radar was out. The controller kept asking for position reports as he blindly worked traffic. As I passed from his sector I canceled my request for flight following. At that point I was following I-10. If anything went wrong, I would go down next to the highway and hitchhike home.

So the rest of the flight to Ak-Chin was quiet. I checked AWOS stations along the way for altimeter settings and just enjoyed the beautiful day over the Southwest.

Ak-Chin always has cheap fuel so I make it a regular stop when going from San Antonio to San Diego or vice versa. I landed, parked, took my lunch inside, ate, and then came back out to the plane. I dropped the right side instrument panel into my lap and swapped the antenna cables going to the transponder. I turned it on and right away I started to get a reply light on the transponder and ADS-B traffic showed up on my iPhone from the Stratus. Problem solved. Panel back in place, I dragged the airplane over to the fuel pump and topped off the tanks. I was now under the edge of the Monsoon, but it looked like it was breaking up to the South, so I opted to fly down through Tucson to get out the back side of the weather. The ceiling kept me down low, about 1500' AGL. Tucson approach had me follow I-10 exactly, which took me right down the middle between Davis-Monthan AFB and Tucson International. It is pretty busy airspace and I was right in the Davis-Monthan pattern with A-10s and C-130s.

Continuing southeast I started seeing big breaks in the overcast. I opted to climb up and get on top. I climbed to 9,500' and realized I wasn't going to clear the tops further down. I continued up to 11,500', which got me up on top for a bit, but that didn't last long either. I asked center if they minded if I climbed to 12,500', which was the wrong altitude for the direction of flight, but kept me from needing O2. I continued this way for a bit, but then needed to climb again. I finally ended up at 14,500' for about 20 minutes, finally getting over the mountains and able to descend to 7,500' for the run into Doña Ana on the west side of El Paso. I did see 197 kts over the ground in level cruise at one point. Most of the trip was with 25-35 kts on the tail. Great tailwinds!

The FBO at Doña Ana was just closing when I got there. They stayed and put the CAP10B into the hangar with the jets. I wanted to avoid having to preheat in the morning.

I was up pretty early for the leg to Midland for lunch with friends. The weather behind the Monsoon had cleared out nicely and my flight to Midland, and the final leg home to Kestrel Airpark, was breathtakingly beautiful. Tailwinds, blue sky, and a smooth ride. I was glad I got everything done and waited out the weather even if it did mean I had to wear Thursday's underwear again on Friday.

Usually my story comes with a sacred cow to kill. This time, not so much, just a reminder of a truism:

There is never a need to rush. Rushing and Get-There-itis has killed more pilots than almost anything else.

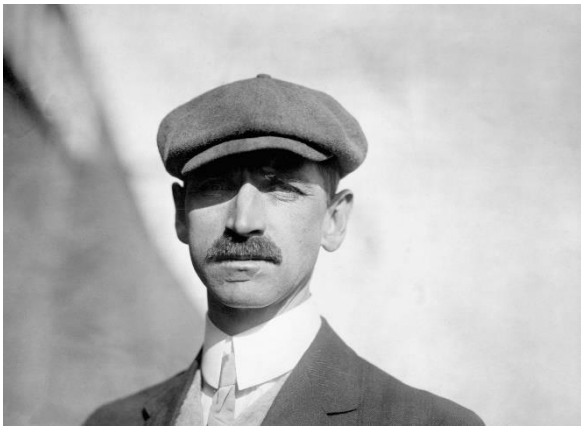
Happy New Year. I'm looking forward to 2021 where we are going to fly more safely, fly better, and have way more fun than we did in 2020.

Flying

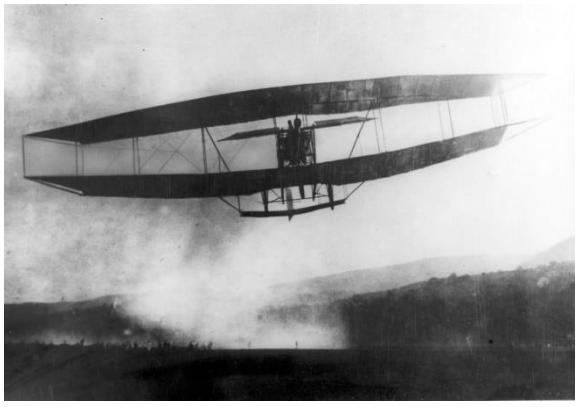
The Eternal Dream

Orville and Wilbur Wright were courageous innovators and inventors. Because of them, the aviation industry was born on December 17, 1903 in Kill Devil Hills, North Carolina, which is about four miles south of Kitty Hawk. From that day forward, their life was one problem after another. They needed to sell the concept and deal with legal problems.

The Wright brothers wrote their 1903 patent application themselves, but it was rejected. In January 1904, they hired Ohio patent attorney Henry Toulmin, and on May 22, 1906, they were granted U.S. Patent 821393[15] for "new and useful Improvements in Flying Machines".



Glenn Curtiss and other early aviators devised the use of ailerons for lateral control which was described in the patent and demonstrated by the Wrights in their public flights. Soon after Curtiss' historic July 4, 1908, one-kilometer flight in the Aviation Experimental Association (AEA) June Bug, the Wrights warned him not to infringe their patent by profiting from flying or selling aircraft that used ailerons, (French for "Little Wing").

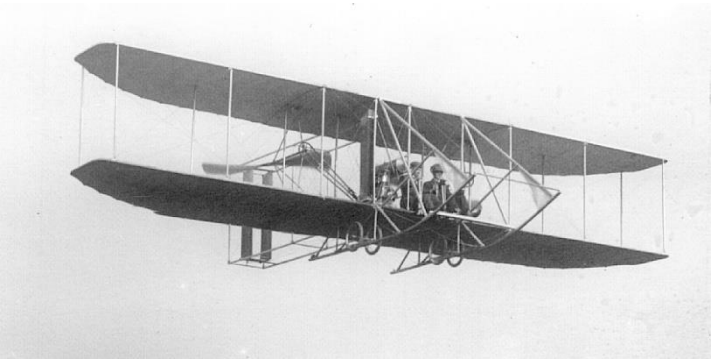


From 1910, Wilbur Wright took the leading role in the patent struggle. He traveled incessantly to consult with lawyers and testify in what he felt was a moral cause, particularly against Curtiss, who was creating a large company to manufacture aircraft. The Wrights' preoccupation with the legal issue stifled their work on new designs, and by 1911 Wright airplanes were considered inferior to those of European makers. Indeed, aviation development in the U.S. was suppressed to such an extent that when the U.S. entered World War I, no acceptable American-designed airplanes were available, and U.S. forces were compelled to use French machines.

In early June 1911, Wilbur conducted a brief training flight with a German pilot in Berlin. He never flew again as a pilot or passenger. He lost interest in flying and discontinued piloting aircraft. There was never any mention of why.

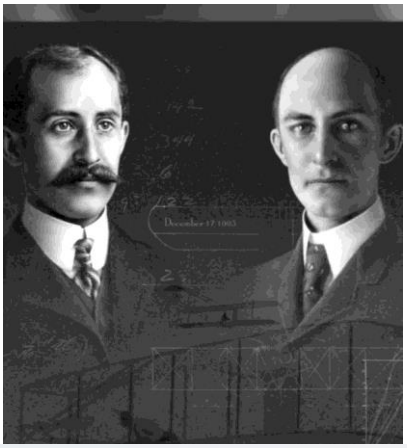
Wilbur became ill on a business trip to Boston in April 1912. The illness is sometimes attributed to eating bad shellfish at a banquet. After returning to Dayton in early May 1912, worn down in mind and body, he fell ill again and was diagnosed with typhoid fever. He lingered on, his symptoms relapsing and remitting for many days. Wilbur died, at age 45, at the Wright family home on May 30. Orville and Katharine Wright believed Curtiss was partly responsible for Wilbur's premature death, which occurred in the wake of his exhausting travels and the stress of the legal battle.

Orville made his last flight as a pilot in 1918 in a 1911 ‘B’ Model. This was the Wright’s two-seat sports biplane, powered by a 35-hp (26-kW) Wright piston engine. He retired from business and became the elder statesman of aviation, serving on various official boards and committees, including the National Advisory Committee for Aeronautics (NACA), predecessor agency to the National Aeronautics and Space Administration (NASA) and Aeronautical Chamber of Commerce (ACCA), the predecessor to the Aerospace Industries Association (AIA).



On April 19, 1944, the second production Lockheed Constellation, piloted by Howard Hughes and TWA president Jack Frye, flew from Burbank, California, to Washington, D.C. in 6 hours and 57 minutes (2300 mi, 330.9 mph). On the return trip, the airliner stopped at Dayton’s Wright Field to give Orville Wright his last airplane ride. Orville commented that the Constellation 123-foot wingspan was longer than the distance of his first flight, which was 120 feet. Orville died January 30, 1948 in Dayton, Ohio.

Like Orville and Wilbur, each of us will eventually walk away from aviation. Some might leave by choice. Some, because of health concerns or age limitations, will unwillingly leave the cockpit. On the day that you stop flying, you can take great comfort in knowing that you followed the Wright brothers into the air before "hanging up your spurs".

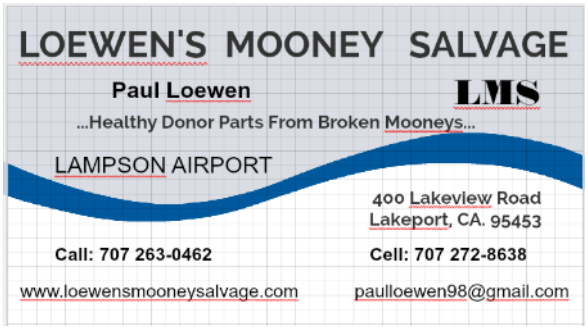


The reasons will vary, but the result for all will be the same. For me, the love of flying is an eternal dream. Each time you hear a plane overhead I hope you will always look up, smile and remember that you lived an incredible life – you really, really lived.

On October 30, 2020, Flying Tigers veteran Harry Moyer climbed into his 1964 Mooney M20E to celebrate his 100th birthday. He flew a couple of laps around the San Luis Obispo, California airport, tipping his wings to the 80 or so people on the ground watching him.
Harry bought his Mooney in 1976 and he has been actively flying ever since.

Local controllers at the airport cleared Moyer to land, saying, "Happy birthday, Captain Moyer. We appreciate your service."

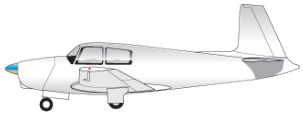
Read more HERE



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

Dear Tom,

Question: I love my Mooney, but the seeping/leaking tanks are horrible and seemingly expensive to fix. What can I, as an owner, do to delay a tank from leaking? Also, what exactly causes them to leak?

Answer: Leaking fuel tanks have been a problem for a long time. Mooney decided to use wet wings (no internal tanks) to save weight.

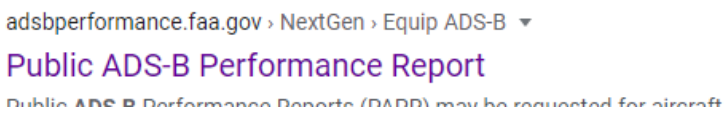
We are now dealing with many Mooneys over 50 years old. The composition of fuel has changed and that has a deteriorating effect on the old sealant. Also, as the sealant ages, time takes its toll. I quit trying to fix leaks because it is really a losing proposition and there is very little room for a mechanic to work on the reseal. The only real fix is to strip and reseal the tanks or install rubber tanks. Both options are expensive. I always hoped that someone would develop an additive to pour in the fuel to seal the leak.

The only thing you can do to delay the leaking is to try and keep your tanks as full as possible. This keeps the sealant wet. The sealant will eventually dry and crack, especially if your aircraft is sitting out in the sun year after year. I have seen many leaks at the main spar, so my guess is that hard landings also take their toll.

PS: When I was a crew chief on a B-52, we had wet wings and they leaked too. So I am very familiar with the problem.

How to Verify that your ADS-B Out is operating correctly

Simply Google “ads-b check” and you’ll find “Public ADS-B Performance Report”



Click on the URL listed here

https://adsbperformance.faa.gov/PAPRRequest.aspx

Fill out the form and Click the “Submit Request” button. You’ll have your report (PDF format) in less than five minutes.

Category	NACp	NACv	Vel
% Fail	0.01%	0.37%	0.39%
Max dT(s)	2	48	48
MCF	1	48	48

If any component is reported in red, get it fixed before flying in ADS-B mandate airspace.

If all your components are reported in white, congratulations, your ADS-B out is operating within allowable parameters.

Category	NIC	NACp	NACv	SIL	SDA
% Fail	0.00%	0.00%	0.00%	0.00%	0.00%
Max dT	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
MCF	0	0	0	0	0

IT'S QUIETER!

MOONEY MARK 20!

it's quieter because:

sound proof insulation
famous Handlin-Wilson muffler
wheel well doors

New design features of the Mark 20 assure you of a quiet, comfortable ride. You'll like this smart way to travel . . . the cost is small and the travel time you save is great. The four-place Mooney Mark 20 cruises at 165 m.p.h. . . . see it now at your distributor.

Feature for feature you get more for your money when you get Mooney. Fly it and you'll buy it. Priced at $12,500.

Mooney AIRCRAFT INC • KERRVILLE, TEXAS

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Mosser Flying Service, Inc., Statesville, N. C.
Russell Neal, Fresno, Calif.
Frank Ogden, Toronto, Canada
Vest Aircraft, Denver, Colo.
West Texas Flying Service, Midland, Texas

FLYING—July 1956

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Canada Mandates 406 ELTs – Foreign Aircraft Need this Beacon

Foreign-registered aircraft flying to Canada after Nov. 25, 2021, will have to have either an ELT capable of broadcasting simultaneous 406 and 121.5 MHz emergency signals or have a portable 406 beacon on board as part of the country's new ELT rules. Transport Canada published notice in the Canada Gazette, the equivalent of the U.S. Federal Register, amendments to its regulations regarding ELTs. Foreign aircraft that don't comply with the Canadian regs can still fly in Canada with the approved 406 beacon. There is no requirement in the U.S. for an aircraft to have a 406 ELT. Instead, the FCC has banned the manufacture of ELTs that operate on 121.5 only. All new ELTs emit both signals simultaneously, but there are still thousands of 121.5 devices in use.

Canadian aviation groups had opposed the 406 mandate saying less expensive satellite-based tracking systems or ADS-B could be used instead and they wouldn't suffer the reliability issues of ELTs, which often don't trigger or whose signals are blocked because of the position of the wreck. However, the tracking systems don't send an alert if they detect a high-G impact and that was apparently a deciding factor for Transport Canada. Operators are, of course, free to carry a tracking device with them in addition to the mandatory ELT.

Aithre's new Small Refillable Oxygen Bottles

Aithre has launched a new line of portable oxygen bottles.

The Aithre oxygen bottle is only 2.5 inches in diameter and 11.5 inches in length, weighing just 1 pound, 14 ounces due to its composite carbon fiber and aluminum construction.

It fills to 47L of oxygen at 2000 PSI. The bottle delivers two hours of continuous or intermittent flow of oxygen. This bottle is designed to fit in your flight bag or backpack and be ready for use anytime you need it. Pilots can refill the Aithre oxygen bottle themselves or at any FBO using standard transfilling equipment.

The Aithre oxygen bottle includes the carbon fiber bottle, combined regulator/valve, neoprene sport carrying bag, and a Uni-flo2 cannula. Price: $395.
You can add the Aithre Altus Meso oxygen pressure monitor and the Aithre Illyrian wearable oximeter as part of any new Aithre oxygen bottle to maximize oxygen use.

A Better Barf Bag

Getting motion sickness in a small aircraft is not a pleasant experience. Pulling a folded small garbage bag out of a small paper envelope while trying to hold back the chunks will leave you thinking there has to be a better way. Then trying to use a twist tie to seal it up while bouncing around on a hot summer day confirms your notion that we can do better.

The Better Barf Bag was born after one of these vomit comet events. A flimsy garbage bag or paper sack is no match for the Better Barf Bag. Constructed with thick, heat-sealed plastic, this bag seals in the liquid with a zipper, leak-resistant top. The gusseted bottom helps to increase capacity while giving the bag a solid base to keep upright when placed on the floor. The dark color of the bag helps to mask the contents, so you don't have to do the walk of shame from the plane to the trash can. Each bag measures 8" x 8" and has a 2.5" gusset. Comes in a pack of 10 bags. Available at Sporty's, 10 for $6.50

Click here for more information

CFIT

Did you know that more than 75% of Controlled Flight into Terrain (CFIT) accidents occur during daylight hours? CFIT is an unintentional collision with terrain while an aircraft is under positive control. In a typical year, there are about 40 CFIT accidents and half of those are fatal.
Want to know more? CLICK HERE for the FAA's Safety Brief.
The entire Nov/Dec issue of the FAA's Safety Briefing is devoted to CFIT. HERE'S A LINK.

GFC 500 Autopilot

Garmin's GFC 500 Autopilot received Supplemental Type Certification from the Federal Aviation Administration ("FAA") for use in Mooney M20 models C*, D*, E*, F, and G. The 500 had already been authorized for use in the J, K, M, R, and S models.
*Certain serial numbers are excluded. See an authorized Garmin installation center for details.

You might have this adapter on your M20K

C6SC
STC# SE8409SW

The C6SC F&M oil filter adapter is an **aftermarket** oil filter adapter for the Mooney M20K. This adapter allows the use of a spin-on oil filter, rather than the manufacturer's brass oil screen. On October 25, 2019, Stratus Tool Technologies, the current STC holder and manufacturer of the TempestPlus filter adapters, published a mandatory service bulletin (SB). This SB requires inspections and updated procedures to be accomplished on K models with a C6SC adapter and resolving any discrepancies prior to further flight.

The SB did not require Part 91 owners to comply. **However**, after reviewing accident reports, the NTSB recently issued a safety recommendation that urges the FAA to issue an Airworthiness Directive (AD), which would require Part 91 compliance.

There is no such thing as a natural born pilot. Whatever my aptitudes or talents, becoming a proficient pilot was hard work, really a lifetime's learning experience. For the best pilots, flying is an obsession, the one thing in life they must do continually. The best pilots fly more than the others; that's why they're the best. Experience is everything. The eagerness to learn how and why every piece of equipment works is everything. And luck is everything, too. Chuck Yeager

GlobalAir.com Celebrates 25 Year Anniversary

LOUISVILLE, KY (December 14, 2020) – On December 14, 2020, GlobalAir.com will celebrate 25 years of "Connecting the Aviation Industry" even through a global pandemic.

What began in the basement of a house in 1995, has now grown into the largest aviation industry platform on the internet. Through the ups and downs GlobalAir.com has faced throughout multiple economic obstacles, its aviation-related platform has continued to thrive. The company has built a platform of trust by clients and users alike.

The .com bust, recession, and now COVID-19 have been just a few of the challenges that GlobalAir.com has faced and overcome during its 25-year lifespan. GlobalAir.com has maintained a slow but steady growth, without the need for a buy-out, equity financing, or capital floorplans. To this day, the company is still owned and operated by a single family, as it has been since its start in 1995.

One thing, however, has not changed – the company's commitment to developing new products to keep pilots in the air and aircraft flying. Whether it is aviation news distribution or helping aircraft buyers find the right wings for their mission with decision making data, GlobalAir.com has been a trusted source from the beginning.

The support for GlobalAir.com's projects this last year has been tremendous, from launching the momentous AirMail News Broadcast to the establishment of the BuyPlane App based on the pre-owned aircraft market.

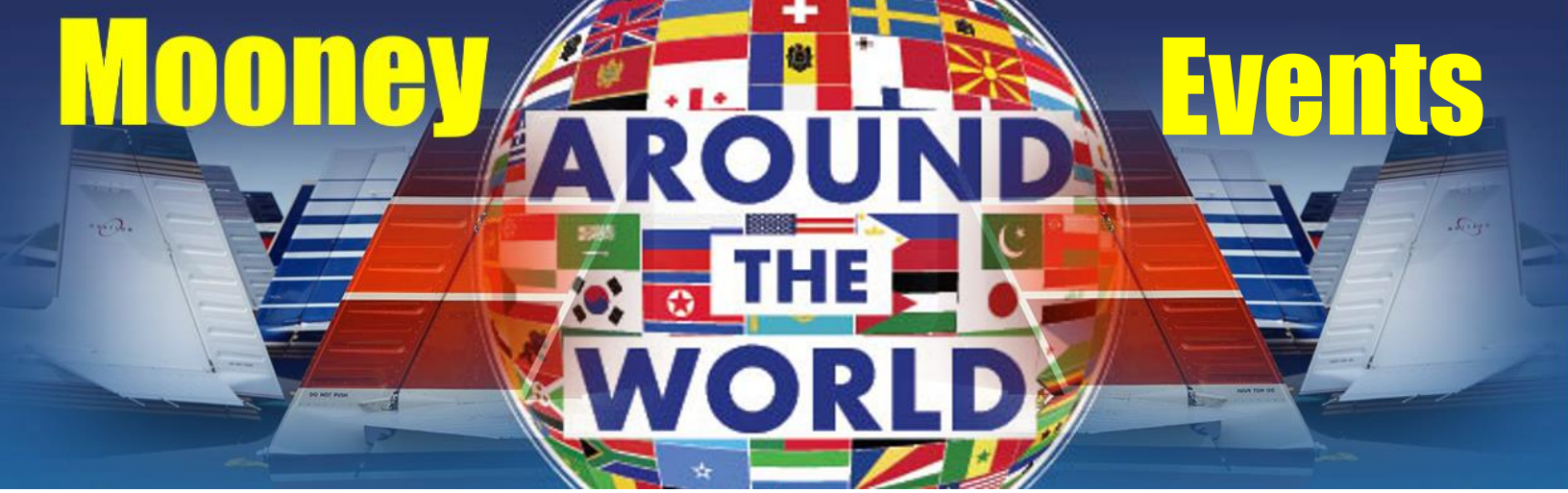
"We have been so fortunate this year," commented Jeffrey Carrithers, GlobalAir.com's President and CEO. "Because of the pandemic, everyone's thoughts were 'how do we survive another downturn?' Luckily, GlobalAir.com is a platform with several different revenue sources, so when one slows down, we can rely on others. The wonderful part is that we did not see any downturns. We actually saw very good growth across the board, particularly in the 3rd and 4th quarters of this year."

As 2020 comes to a close, GlobalAir.com is looking forward to the new year with a renewed focus on expanding and modernizing the website platform even further and additional enhancements to the BuyPlane app. Globalair.com has several innovations and updates coming to their platform that will be part of their growth plan in 2021. The company's new calendar events section, due out in January, will be a game-changer for webinars and conferences to expand their reach.

Always true to their roots, GlobalAir.com thanks the pilots, FBO facilities, flight departments, aircraft brokers/dealers, and the many aviation product and services companies who have utilized the multitude of resources it has available to connect buyers and sellers, facilitate the latest news in the aviation industry, and remain knowledgeable of the prices for aviation fuel across the United States.

"With over 250,000 people visiting the Globalair.com website each month, we are very proud of what we have achieved. Despite being a small fish in the aviation pond, GlobalAir.com has established itself to be a premium aggregator of information in a very competitive industry," Carrithers remarked.

Press Contact: Caitlyn Bruszewski, Digital and Content Manager, 502.456.3934, Caitlyn.Bruszewski@GlobalAir.com



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* CANCELLED
MOONEY CARAVAN	
MOONEY SAFETY.COM MAPA Safety Foundation Pilot Proficiency Program	**2021** April 23-25: Santa Fe, NM June 18-20: Fort Worth, TX Sep 10-12: Chicopee, MA Oct 15-17: Wichita, KS **Sign Up at** https://www.mooneysafety.com/ppp-registration/
MOONEYSUMMIT	CLICK HERE for details
Australian Mooney Pilots Association	March 25-30, 2021 - AGM 2021 at Annuka Resort, Coffs Harbour
EMPOA	CLICK HERE for details
Other Mooney Events	May 21-23: *The Mooney Flyer* is planning a Fly-In to Paso Robles, CA (KPRB). Dinner on Friday.. Saturday Ramp Arrivals, Wine Tasting, Seminars for Pilots and Passengers at Estrella Warbird Museum (Tours available) Sport competitions, Horseback Rides and SPA Treatments, Wine & Food Party on Saturday night

TMF PRODUCT REVIEW

SwitcheOn

Cellular/LTE/4G remote power switch

SwitcheOn allows you to remotely control devices in your hangar

SwitcheOn comes in 2 or 4 channels, up to 15 amps. It has a temperature sensor and works with both iOS and Android. It does not require WiFi, a hotspot or additional SIM service.
The 2 channel model costs $199 or you can have 4 channels for $299. The first year of service is included and subsequent service costs $50/year. There are no SIM cards to manage, maintain or refill and it has worldwide service in 130 countries.

What can I control with SwitcheOn?
Anything that requires power! For instance, you can automatically power your engine heater, preheating the engine so that it's nice and warm when you arrive at your hangar.

How do I setup my SwitcheOn?
Just download the mobile app, plug in your SwitcheOn and Scan the QR code displayed on the SwitcheOn. Now, open the SwitcheOn mobile app and toggle a switch.

How does SwitcheOn handle power outages?
When power returns, SwitcheOn remembers what to do. All outlets will return to the state they were in when power was interrupted. Automations will be reloaded, but if an alarm has been missed, it will not run late for safety reasons.

To learn more and order, go to https://switcheon.com/

FOR SALE Mooney Stuff

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)

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
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