The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

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Editors

Phil Corman | Jim Price

Contributors

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

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Features

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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

Mooneys are Traveling Machines

My wife and I just returned from 3 weeks at the amazing Sunriver Resort (S21). The resort has lodge rooms, condos, cabins and more. Activities include horseback riding, fishing, river rafting, canoeing, kayaking, etc. There is also an Observatory, a water slide park, 40 miles of bike/hiking trails and a village filled with shops and restaurants.

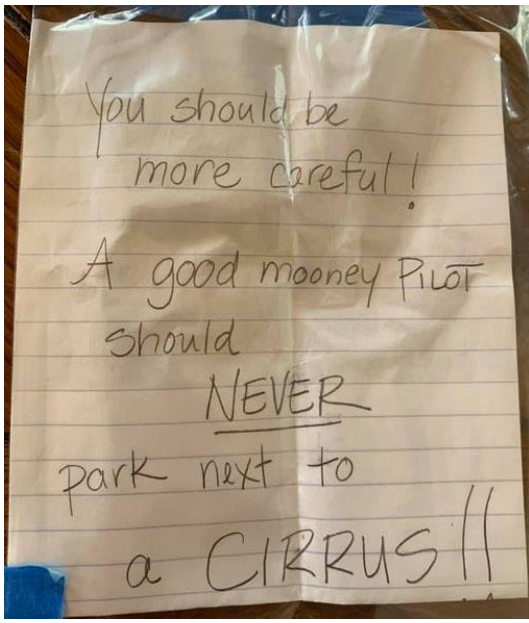
But the best part is that it has its own airport (S21) which is in the process of a complete renovation. If you plan to spend your vacation at the resort, you will not need to rent a car because the resort will shuttle you from Point A to Point B with a quick call, free of charge.

Our Mooney makes it all possible. By car, it's a 12-hour drive plus stops for gas, rest and food. Flying our Eagle, it's under three hours and the views are drop dead beautiful at 8,500'. We returned home, washed our clothes, did some house upkeeping chores, and tomorrow we are off to South Lake Tahoe (KTVL) to spend time with half of our family and grandkids. Again, by car it's a 6-hour drive plus stops. By Mooney it's a tad over one hour. Again, our Eagle makes it all possible and the views over the Sierra Nevada and the first glimpses of Lake Tahoe are breathtaking.

Mooneys are simply an amazing traveling machine, making the world a smaller/closer place.

Mooneys – Making Friends and Reacquainting with Old Friends

Mooneys bring us together with new and old friends. Fly-Ins are a great example of this. In the past, the Vintage Mooney Group had fly-ins at different locations around the west almost every month. The friendships formed during those events remain today.



On our recent trip to Sunriver, we made quite a few new friends. After landing, we parked next to a Cirrus. Later, when we returned to our plane to clean off the bugs, there was a note on our Mooney from the Cirrus pilot, (shown at right). I let him know that his note revealed his jealousy – that parked on the ramp was the only time that his Cirrus could keep up with our Mooney.

At the airport, we met George and Amy Steed, a Bonanza couple; airport bums like us. We became good friends during our stay, meeting for coffee, etc. We were also invited to another Bonanza couple's home with an attached hangar. We will probably be friends for a long time, courtesy of our Mooney.

Later Jeff and Pattie Kupperman flew in with their M20K 252. Finally, some kindred souls. Jeff flies for FEDEX and Pattie for Alaska Airlines. When I introduced myself, they both said, "Are you Phil Corman?" I cautiously admitted to that and then they said, "I can't believe we are meeting an Editor of The Mooney Flyer". After several Mooney related questions, we parted, and I hope we remain in touch.

Later, friends from Florida, Michael and Sylvia Diamant, who I had not seen for 35 years, arrived at Sun River. I suggested we meet for a coffee. Instead of coffee, we spent hours at the Lodge that overlooks the valley, catching up on 3 ½ decades. It was truly magical.

My point is simple. Our Mooney made these new friends possible. Mooneys are happy places.

Next month's poll: "I Use my Mooney Primarily for" **CLICK HERE** to vote.

Letters to the EDITOR

TheMooneyFlyer@gmail.com

We love and appreciate mail, so please add your valuable thoughts to The Mooney Flyer.

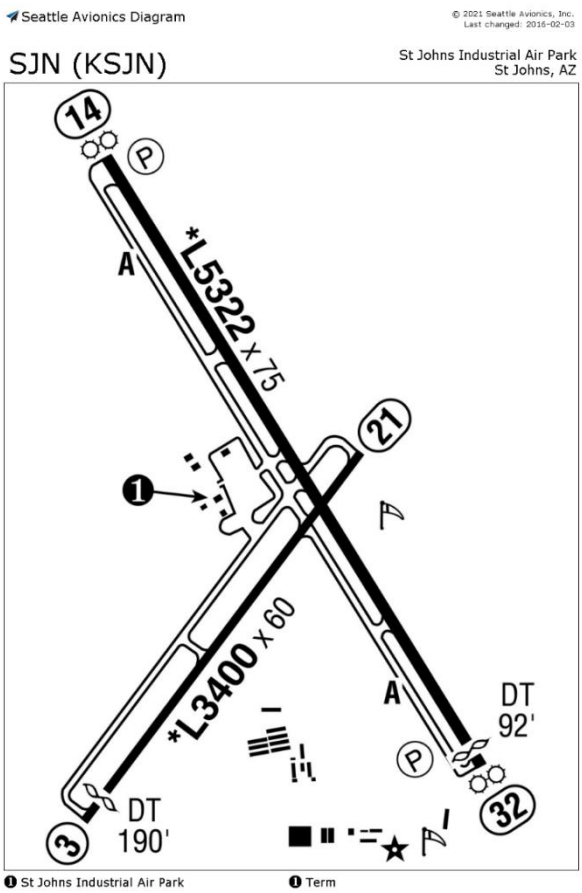
Fly Your Dang Airplane!!

Recently, I saw a mechanic from our Mooney Service Center, Chandler Aviation, entering a nearby hangar. I waved and asked him if he needed any help. He told me that the Columbia aircraft in that hangar had recently received an Annual Inspection and he was just touching up the windscreen. Then he said, "When this airplane came to us for inspection, it had a thick coat of dust on it and had only flown 15 hours in the past year."

I thought, "That's a very expensive aircraft to basically store in a hangar and fly so infrequently. Quick! Call Aircraft Protective Services (APS) because that's a classic case of Aircraft Abuse". Let me explain with a tragic story from 2008.

In April 2008, Christian Nielson and his wife Stephanie purchased a 1968 Cessna 177 Cardinal (N3487T) and based it at Falcon Field, (KFFZ), near their home in Mesa, Arizona.

On August 16, 2008, Christian, Stephanie and their friend and CFI Doug Kinneard had a fun day visit to their ranch in New Mexico. On their return trip to Mesa, they planned a fuel stop at St. Johns Industrial Airpark, (KSJN) St. Johns, Arizona. Christian had received his Private Pilot Certificate just a few weeks before, so Doug was flying with Christian to help him gain confidence in the Cardinal and learn about flying in mountainous terrain. KSJN has a field elevation of 5,736 feet.

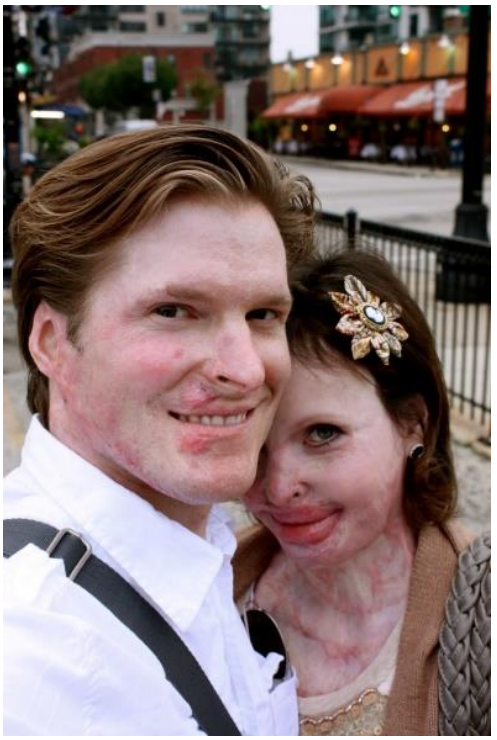


At 3:20 pm, while landing at SJN, the Cardinal bounced on the runway and the engine lost power. After the landing rollout, Christian could not restart the engine, so they towed it from the runway to the fueling area. They topped off the fuel tanks and the engine started without difficulty.

For the VFR flight to Mesa, the density altitude was 8,690 feet mean sea level and the estimated gross weight was about 130 pounds less than the maximum gross weight. Performance calculations showed that at the maximum gross weight and 1/4 flaps at 6,250 feet mean sea level, the distance required to clear a 50-foot obstacle would have been about 4,452' with about 310 feet per minute rate of climb.

At 3:45 pm, they began their takeoff roll on runway 14. Finally, at the departure end of the runway, the airplane lifted out of ground effect but did not climb any higher. Doug assumed control of the airplane and attempted a steeper climb to clear the obstacles. Christian stated that as the flight controls were pulled back, it felt like they had less available power, most likely due to the attitude of the airplane. At the departure end of the runway, the airplane stalled and turned to the left, collided with terrain and burst into flames.

Doug Kinneard, Christian and Stephanie Nielson were seriously injured and suffered extensive 3rd degree burns. Medivac helicopters carried all three to the Arizona Burn Center at Maricopa Medical Center in Phoenix. However, Kinneard's injuries proved overwhelming. The husband and father of four died at the hospital.



Both Stephanie and Christian Nielson were placed in medically induced comas. Stephanie Nielson's burns were so widespread that family members said they could only recognize her feet. Christian regained awareness after a couple of weeks. Stephanie did not regain consciousness until November.

The Engine History

On December 8, 1998, at a tachometer time of 2,296 hours, the engine was field overhauled. The camshaft and tappet bodies were replaced, and the engine was zero timed.

At the time of the accident, it had been almost 10 years since the overhaul. During that time, the engine had 330 hours. Since the overhaul, the Cardinal had only been flown an average of 33 hours per year.

Engine Examination

The intake lifter for the Number 4-cylinder camshaft lobe was worn and the follower was heavily pitted. Both the intake and exhaust lifter for the Number 3 cylinder were heavily scored and the corresponding camshaft lobes were heavily worn. While the exact amount of degradation to the engine's power output could not be established, the alteration of the cam lobe profile will alter the amount and duration of the valve opening, thus affecting power output.

LYCOMING ENGINE OPERATION GUIDANCE

According to the Textron Lycoming publication Lycoming Flyer, "We have firm evidence that engines not flown frequently may not achieve the normal expected overhaul life. Engines flown only occasionally deteriorate much more rapidly than those that fly consistently." When an aircraft engine is flown once or twice a month it, "...usually accumulates rust and corrosion internally. This rust and corrosion is often found when an engine is torn down." Additionally, the Textron Lycoming Key Reprints from the Lycoming Flyer state that “Corrosion is a known cause of tappet and cam lobe wear. The engines of aircraft that are not flown regularly may be extremely vulnerable to corrosion...Once started, the process is not likely to stop until it reaches a point where these parts are doing an unacceptable job.”

According to Textron Lycoming Service Instruction No. 1009AS the recommended time between overhaul periods was 2,000 hours or every 12 years. Lycoming Service Letter L180B states that, "Engines in aircraft that are flown only occasionally may not achieve normal service life because of corrosion. The desired flight time for air cooled engines is at least one continuous hour at oil temperatures of 165 degrees Fahrenheit to 200 degrees Fahrenheit at intervals not to exceed 30 days, depending on location and storage conditions. This one hour does not include taxi, take-off, and landing time." Additionally, it states that if an aircraft is to remain inactive for 30 days or more, a preservative should be installed, "...especially if the aircraft is located near salt water or similar humid environment."

NTSB Probable Cause

The failure of both pilots to abort the takeoff when a suitable climb rate could not be attained. Contributing to the accident was the reduction of available power due to the camshaft lobe and lifter corrosion/wear, the high density altitude, and the CFI’s inadequate supervision.

Love Your Mooney

Whether you have a Lycoming or a Continental engine, please fly your airplane a lot more than 30 hours a year. It is such a privilege to fly a Mooney and we must fly our aircraft to keep it “healthy”. This we do, in loving exchange for the phenomenal freedoms it affords us.

See https://planecrashmap.com/plane/az/N3487T/ for more information.

Some Worthy Aviation Podcasts

Podcasts are generally free and there are thousands of them. Like most things on the internet, you must sift through tons of dirt to find a single diamond. I thought I would share a few Podcasts that are useful to us, the Pilots In Command:

- **Aviation News Talk** – Max Trescott does these and he is really good, despite the fact that he is a Cirrus Instructor (😊). https://aviationnewstalk.com/
- **Ask the A&Ps** is an AOPA Podcast and features maintenance experts like Mike Busch, Paul New and Colleen Sterling. www.AOPA.org/podcasts
- **Airplane Geeks** is just a fun set of geeks making fun of lots of things. www.Airplanegeeks.com
- **The Finer Points** is one of the oldest and longest running Podcasts dating back to 2005. Jason Miller covers topics that go "Beyond the Book" and it is very interesting. www.TheFinerPoints.com
- **Hangar Talk** by AOPA covers headlines and usually has an interesting guest. It's straightforward, kind of dry, but has some useful stuff. www.AOPA.org/podcasts
- If you like to learn from other pilot's mistakes, then **Never Again** is for you. It's another AOPA podcast and found at www.AOPA.org/podcasts.
- Along similar lines an AOPA podcast entitled **There I Was.** It shares harrowing firsthand experiences by pilots who had them. www.AOPA.org/podcasts
- Want to keep up on ATC? This is a pilot and controller podcast, so it covers issues from both sides. www.OpposingBases.com
- Another AOPA favorite is **Pilot Protection Services** Podcast which covers the very useful AOPA service by the same name. www.AOPA.org/podcasts

Flying with an Auto Pilot – How the Other Half Lives

by Richard Brown

In December 2016, I scraped together my pennies and bought the nicest, regularly flying Mooney I could afford. This M20D, had no GPS, minimal radios for IFR, no auto pilot, and not even the wing leveler because Mooney did not put them in the D's. Over the past four and a half years, we have put more than 500 hours on her, travelling mostly around the Southwest from our home base in the LA Basin to Phoenix and Salt Lake City. There have been a handful of trips to Idaho, one to Oregon, and an amazing one, all the way to First Flight in North Carolina. These flights were all hand flown.

I am not a stranger to "minimal equipment" in vehicles. My first car was a Honda Civic, manual transmission, manual door locks, manual windows, and no cruise control. That car took me all over, including two separate trips from Arizona to Alabama and back.

Did I wish I had cruise control? You bet! Somewhere in Texas my right leg was cramping up and I found myself with my left foot on the gas and my right leg stretched out in the passenger footwell. But that car was all I could afford, and I was grateful to have reliable transportation. Similarly, my Mooney was all I could afford, and I was grateful to own a plane and fly whenever and wherever I wanted.

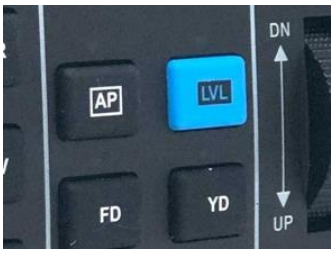
But – and this is a HUGE BUT, I have finally seen "how the other half lives" and I don't think I can ever go back. I had a pair of AV-30's on pre-order for a couple years with the plan to install them, along with the TruTrak Autopilot. You all probably know how that is progressing, and I don't want to take you down that discussion rabbit hole. Last year I gave up and installed dual G-5's in anticipation of the GFC500 approval for the short bodies. Incidentally, a few days into my G-5 installation with the panel torn apart, the AV-30's finally received certification.

My plane went into the shop for the GFC500 at the beginning of May, and I picked it up three and a half weeks later. I was begging and praying that it would be done before Memorial Day Weekend so I could fly to my wife's family reunion in St George, Utah (KSGU) instead of slogging through Las Vegas Holiday traffic. It was ready the Wednesday before and I was all smiles, at least once I got them to fix an issue with the trim, which is a story for a different time.

How does the other half live? It is like the heavens parted, the angels were singing, and somewhere, someone was fixing me a bowl of ice cream with a warm chocolate chip cookie on the side. Seriously, I am not kidding, it is that amazing. After 500 hours of hand flying, how else do you think I would describe it? I only had a short 15-minute flight from the installer back to my

home base, which was not enough time to play with it much. However, two days later we launched for St George.

With my flight plan in the GNC355, we took off from Fullerton, CA (KFUL), made a turn to the Northeast on a heading to intercept the flight plan, and… I pushed the button. For those of you that have been living under a rock, here is a very brief, not all encompassing, rundown of the GFC500. It will fly IAS and VS climbs and descents. It will fly headings, intercept flight plans and fly them. It will fly coupled approaches, anticipate turns so they are all smooth – like the plane is on rails. It has envelope protection even when the autopilot is off, and a "magic blue button", (not a magic blue pill), with the letters "LVL". When pushed, that button will bring the plane to straight and level flight.



There are lots of great reviews and videos on YouTube about the GFC500. A quick shoutout to Dan Watkins. He has an avionics shop SureFlight at Coatesville, PA (KMQS), who put together this video.

Back to the story. With the GFC500 in heading mode to intercept my flight plan and climbing us out at an IAS climb of 110 mph, I told my son in the right seat, "Watch what happens when we get close to that purple line." As we approached it, the plane rolled smoothly into a climbing left bank, still holding 110 mph IAS, and rolled out on course as it continued the climb.

His response was three words, "What the crazy?!!"

"I know," I said. "It's like cheating!"

We flew the rest of the trip without me ever touching the yoke until we were about five miles from KSGU. I disconnected the autopilot, overflew the airport to enter a left downwind for runway 19, and set her down gently on the centerline. I was as fresh as if I had taken off 15 minutes earlier for a short hop to a local airport. It wasn't as if I had flown almost two and a half hours, dealing with afternoon thermals over the desert. A few days later, the flight home was just as amazing, with the GFC500 holding altitude within 20 feet, despite the afternoon desert thermals.

I am knee deep in my IFR training, just passing 20 hours of simulated instrument time. The marine layer has not been cooperating, so I have not done much more flying with the autopilot. I am hand flying most of the IFR stuff and all the approaches to build those skills. The couple of times that I have turned it on for a few minutes enroute, the decrease in workload was palatable and I could appreciate the added safety that it brings to my flying.

Do I regret the years of flying without an autopilot? Absolutely not! If I had waited until I could afford a plane with an auto pilot, I would have missed out on many a memorable flight. Do I ever want to go back? Definitely not! A lot of people think it is crazy to spend that kind of money on a plane like my 1965 M20D, and maybe in their minds, they are right. I've now put more into the plane with the panel upgrades and auto pilot than I spent on the plane. However, even if I had to sell it and lose out on what I have spent, I would do it again for the memories and the pleasure of flying such an amazing aircraft.

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

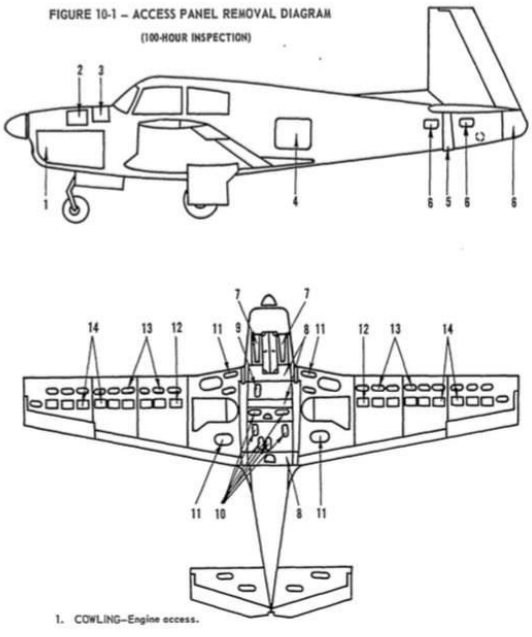
Stuff You Should Know About Your Annuals

Mooney owners run the gamut regarding how involved they are in their Annuals. Some owners are A&Ps, even IAs, while others profess that they only know how to fly their Mooney but know little or nothing about its airframe or power plant. They avoid getting involved in the annual process. Here, at The Mooney Flyer, we believe that, as much as possible, every Mooney owner should be as knowledgeable and involved in the mechanics of their airplane. Part of the responsibility of ownership is that since you are the only one flying, you should know your planes maintenance history. We can detect many changes in its health through listening to it, noting unusual smells, feeling things in the seat of your pants and more. This is valuable.

Being involved in the Annual is a big step up to truly understanding your Mooney. To begin with, checkout FAR Part 43, Appendix D which describes the contents of an Annual Inspection. There are basically two parts to an Annual. The first part is the "Inspection". As the word implies, this part involves inspecting the airframe, power plant and propeller. There are no repairs included. Each model has documented how many hours are typically involved. Some shops will take fewer hours and others will take more.

Picking a Shop

Blindly picking a shop for your Annual is probably not a good strategy. Most of us start with a Mooney Service Center. Others have found an excellent A&P/IA with Mooney Experience and a great reputation "with a wrench". Either choice is good. Remember that not all MSCs are equal. It's a good policy to connect with other Mooney owners and get several PIREPs on them before engaging. Ditto for non-MSC shops. Then, pick your A&P or shop.



Laying Out How You want the Shop to Work with You

This step is key. Remember that you should stay involved with the process. Upfront, you should identify any squawks that need attention. This goes above and beyond the cost of the Annual Inspection.

If you choose, you can save money and get a little more involved by preparing your Mooney for the Inspection. This could involve removing all the cowlings, inspection plates, etc. required for inspection. If you are ambitious, you can remove the tires in preparation for inspection, ball bearing lubrication, and other similar stuff. You can learn a lot while your A&P checks compression and borescopes your cylinders.

After communicating with the shop, your next step is to inform them that you would like an itemized list of all "Airworthy" items that are found in the Inspection. NOTE: Double check any items that are specified as "Airworthy". Not all airworthy determinations are a given. If you question it, ask or get a second opinion. You would like this list before the shop begins with any repairs. Ideally, a shop provides a list of "Required Airworthiness" repairs versus recommended repair items. This keeps you involved in proceeding beyond the Inspection and it will reduce or eliminate any surprises and costs at the end.

Mooney Specific Stuff to Know

There are many things to stay on top of with your Mooney. First and foremost, ensure that your landing gear is properly adjusted. If it needs adjustments, it takes a fair amount of skill. It is also useful to ensure that your gear doors are "flush" when the gear is retracted.

Also remember that your landing gear biscuits need to be measured for wear and should be replaced before 12 years, even if they are still within tolerance.

Corrosion is an issue with our Mooneys. Check inside the wings and fuselage every year for corrosion, especially on or near the spars.

Check the tail jackscrew for wear and free play.

If you have a Johnson Bar, ensure that the locking bracket has not worn so much that it won't lock perfectly. You don't want it popping out as you touchdown. LASAR sells a replacement that is better than the original.

Building a Relationship

Building a relationship over time with a mechanic or shop is invaluable. The A&P learns your Mooney and over time, you build trust and understanding. This really helps.

If you find a place, your natural tendency will be to go to them every year. This isn't a bad decision, but you may find it useful to take your Mooney to a different shop every so often. Why would you do this if you have found a good mechanic? There is only one good reason. Every mechanic has their strengths,

but every so often, it may be useful to have a "new set of eyes" looking over your plane. This is food for thought for your consideration.

Useful Sources to help you stay informed

Many relevant documents can be found at https://themooneyflyer.com/tech.html. This is a useful place to start.

Savvy Maintenance is another excellent resource, with special emphasis on your powerplant including proper ROP/LOP operation, using your engine monitor to identify issues before they become an issue, and much more

If you are into social media, the best place to go is MooneySpace. However, a second forum which is also useful and not as obvious is BeechTalk. I utilize both of these forums frequently.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Wisconsin Aviation Expands Aircraft Interiors Service with the Acquisition of Jaeger Aviation & Its Spatial Interior

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

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

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

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

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

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

(para) 'Chuting the Moon' (ey)

thirteenth in the series
by Ron Blum

Some people believe that all airplanes should have a whole-aircraft parachute … but others don't. Some people believe that a whole-aircraft parachute will expand capabilities of the airplane and/or pilot (single engine, night, IFR in the mountains) … but others don't. Some people believe that "real" pilots don't need a whole-aircraft parachute; pilot skill is the answer … but others don't. We won't be answering any of those questions here, as they are up to each individual to assess. What we will be discussing is: "Is it physically possible to add a whole-aircraft parachute to an existing M20?"

As an Enginerd, the simple answer is, "Yes, a whole-aircraft parachute can be added to an M20." We'll spend the next couple pages looking at regulatory and physical tradeoffs of parachute versus no parachute. The final decision is really up to you. The 2014-designed M10 is a great example of this tradeoff. The M10 was being designed with a whole-aircraft parachute … as an option.

Before we get into tradeoffs, let's clarify a couple items. The first is that I have spent the majority of my career in Flight Test. We used airplanes with ballistic parachutes often, but those parachutes were for upset recovery (spinning, tumbling, deep stall, etc.) in new designs. Those parachutes are designed only to get the pointy end going forward again … then they are released from the tail of the aircraft. Those parachutes are MUCH smaller, have longer risers and typically have 2 explosive devices (one to put the parachute out and another to release it (cut the risers) … plus backup systems). This article is about whole-aircraft parachutes. The other item to clarify, as alluded to with the M10, is that it is always easier to design a whole-aircraft parachute into the design from the beginning. Let's get started.

With certificated airplanes, everything starts with regulations. Specific to parachutes, there are few, if any, regulations. Putting a parachute on an M20 is totally different (regulatory-wise) than incorporating one into a Cirrus. Why? In the case of the Cirrus, the parachute is there to show compliance to meet a regulation, 23.221 "Spinning". If interested, one can read the Equivalent Level Of Safety (ELOS) for the Cirrus installation; it is an interesting read. As a side note, the original concept of the Cirrus parachute was for survivability after a mid-air collision (not spinning). Long story.

On a Mooney, the parachute would fall under NOn-Required Safety Enhancing Equipment (NORSEE) as the parachute would not be a required installation to show compliance to any regulation. In the eyes of the FAA, it is there to enhance safety. The Cessna STC installations fall under this same philosophy of enhancing safety. The parachute is not required equipment to show compliance to any regulation. How much actual deployment testing required by the FAA for NORSEE installations will vary with FAA ACO and personnel …until a good precedence is established.

Aerodynamically, a parachute installation will not slow an M20 down significantly in cruise (1-2 knots due to additional weight). There will need to be straps/cables (parachute harness/risers) installed from the static parachute location to the deployed structural attach points and coverings for those straps on the outside of the airframe; negligible drag if properly designed. Where the parachute deploys from the aircraft, the aluminum or composite skin will need to be replaced with a frangible area.

Parachute installation weight will be roughly 150 lbs. Unless the aircraft gross weight can be raised this amount, useful load will be lowered. This additional weight will also affect the center of gravity. Note: this could help the long bodies, if the parachute is installed in the baggage area. Everything is a tradeoff.

Because of Mooney's steel tube fuselage (roll cage), structure can be changed to handle the very high parachute opening loads. Depending on the parachute, desired deployment envelope (very important) and other considerations, opening loads could be in excess of 3G to 9G of the entire aircraft. The M20 is not designed for a load that high in that direction (aft). The rocket that deploys the parachute exerts little force on the airplane itself. Speaking of loads, what about the "landing" loads on occupants?

We are proud of the retractable landing gear and the stiff, one-piece, wing, but these are detriments to a parachute installation. The seats, designed before the 26G requirements, also fall in this category. Would the landing gear need to be automatically extended at the same time as the parachute? In the end, the new design will need to not impart more than 1,500 lbs. into the occupants' spines. That works out mathematically to a maximum 30 fps. descent rate.

We also need to think about aircraft attitude after the parachute deploys. The Cirrus was originally flat to take advantage of all three landing gear touching at the same time. After a couple deployments over water, the attitude was changed to be slightly nose down to let the forward fuselage take the initial impact both on hard surfaces and in the water.

In addition to high and low airspeed limits, high and low altitude limits, aircraft attitude, height above ground, rate of descent toward the ground and weight limits for safe deployment, there are also surface wind limits and other weather-related limits to consider … like icing.

I almost forgot costs! In two words, "Not cheap!" The parachutes will run an OEM between $8K and $25K each. Time between repacks varies with the parachute manufacturers. So does the cost for repack. Ask a Cirrus owner; the number varies greatly.

How many deployments will be required by the FAA for certification? There are many, many unanswered questions, as we have just touched the surface. If you're Cirrius about installing a whole-aircraft parachute, I would like to help. It definitely won't be inexpensive or easy, but it is physically possible! PULL!

Next month is Oshkosh. I will be giving three forums there: 1) Demythifying Stall/Angle of Attack, Tuesday, July 27 · 8:30 AM - 9:45 AM, Forum Stage 02 – GAMA; 2) Wright Gliders, Airplanes & Glider?

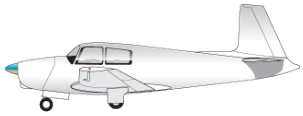
Wednesday, July 28 · 8:30 AM - 9:45 AM, EAA Museum - Hilton Theater and 3) Mooney (General Av) Aerodynamics, Saturday, July 31 · 1:00 PM - 2:15 PM, Forum Stage 02 – GAMA. I'll if Mark Forss will let me do the Mooney Aerodynamics one earlier in the week, too. Please check the schedule.

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

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

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

Mooney Maintenance



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

Click here

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

Click here

LASAR
Fanatically Mooney. Exceptionally Fast.

Ask the Top Gun

Tom Rouch
Founder of Top Gun Aviation, Stockton, California

Send your questions for Tom to TheMooneyFlyer@gmail.com

Question: There are a couple of questions that I have, and I'd be interested if you have the answer:

1. Can airframe parts like jackscrews, bell cranks and flap/gear actuators be overhauled?
2. Do such overhauls have to be done through Mooney or can I have it done directly by their authorised repair shops? How do I find out who is authorised by Mooney (and/or the FAA?) to do such overhauls?
3. To minimise downtime, what parts do you think it makes sense for an individual owner to keep in stock? For instance, I'm about to have a Surefly electronic ignition installed and I'll have my Slick magneto overhauled to have it ready for the next magneto inspection.
4. For owner groups, like the Australian Mooney Pilots, that include about 100 aircraft, are there parts that we could keep in stock that meet the following criteria:
    a. Hard to source now and in the future;
    b. Applicable to a reasonable proportion of the aircraft in the fleet;
    c. Likely to ground the aircraft if not available; and
    d. Unlikely to be held in stock by the typical MSC.

    …or, is this a wild goose chase, as there are no parts that meet all or most of those criteria?

Answer: I will take it your questions one at a time.

1. The term “overhaul” can have several meanings. Aircraft engines, propellers, and avionics are parts we most refer to as being “overhauled’ and you could apply it to anything. However, these overhauls are not actually required for air worthiness unless specified by an AD (airworthiness directive). Individual parts manufacturers usually list minimum requirements to keep their parts airworthy, like a minimum compression for cylinders and minimum wear for many parts. The aircraft manufacturer builds an airframe and almost all the parts are built by someone else. Mooney provides all the manuals on how to keep your plane airworthy, but the “overhaul” or repair of each part is spelled out by the part manufacturer. The level of repair is controlled by the level of the repairman, A&P, IA, Repair Station, etc.

2. There is no requirement to overhaul anything, but the airplane parts need to be maintained to minimum standards. For example, as an IA, I could certify the airplane to meet Annual Inspection requirements just by inspecting the plane. If the tail assembly moved too much up or down, then I would have the trim actuator removed, repaired/replaced to the meet minimum standards. Then, re-install the actuator and certify airworthy. You could say I overhauled the actuator but “repair to airworthy standard” is a more correct term. Mooney does not authorize anybody to work on the plane. They do appoint Service Centers, but that is an arrangement to provide people they deem qualified to maintain a Mooney and more so applies to a facility to do warranty work for the factory.

Anyone with an A&P license can legally work on your plane.

3. To recommend parts for an owner to keep in stock is very subjective and should be tailored to fit the use of the plane.

Maybe a set of spark plugs, brake pads, or fuel cap seals would be a start. However, beyond those, it could get quite expensive to stock many parts. Even as a service center, we stock less than we did ten years ago because the nature of the aircraft business has changed so much, that it is too costly for us to try and stock a lot of parts. This is an area of a much broader discussion.

4. The question of large groups sharing in a stockpile is really not feasible to me, for the same reason that as a MSC, I don't stock as much as in the past because of the high cost. We now try to maintain Mooneys from the early sixties to the present. As I speak, we have in the shop a 1964 model and a 2018 model, plus a dozen more in between models.

As a side note about parts, there are a lot of aftermarket parts available, including starters, alternators, etc. They are good, but currently, the manufacturers do no provide parts or tech data, so we cannot repair those parts anymore. We used to make a large part of our income on parts sales, but now, we depend more on just labor charges.

1) When is the control tower required to turn on the beacon?

a) Anytime ceilings are less than 1,000' or visibility is less than 3SM.
b) Anytime ceilings are less than 2,000' or visibility is less than 5SM.
c) ATC isn't required to turn the beacon on during the day.

Answer: a) There's no regulatory requirement to turn on the airport beacon when weather drops below VFR minimums (See AIM). At many airports, the tower can't control the beacon because it's controlled by a photoelectric cell or a timer. At airports where the tower can control the beacon, the ATC rulebook requires tower controllers to turn on the beacon between sunrise and sunset anytime the weather drops below basic VFR minimums. So, don't use the beacon to determine if the field is VFR or IFR.

2) Updrafts in a thunderstorm can exceed:

a) 1,000 FPM
b) 3,000 FPM
c) 6,000 FPM

Answer: c) Thunderstorm updrafts can exceed 6,000 FPM. Never try to climb above a developing thunderstorm, because it can grow much faster than you can climb.

3) If you fly underneath virga, what is most likely going to happen next?

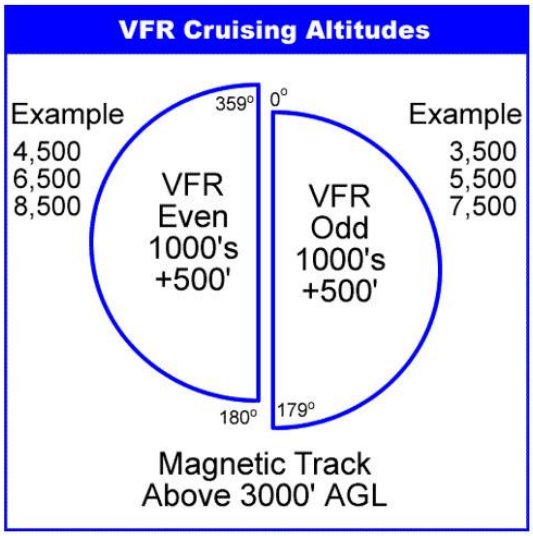
a) Updraft.
b) Downdraft.
c) Nothing will happen.

Answer: b) Virga can cause downdrafts, and can also be associated with microbursts. There may also be moderate to severe turbulence under virga, so try to avoid it.

1) How many satellites need to be in view at all times to allow your GPS to gather position and altitude information?

a) Three satellites in triangulation
b) Just one satellite
c) Four satellites
d) Five satellites

Answer: c) GPS receivers need 4 satellites in view to get an accurate position and altitude.



IFR … Really?

by Ray Reher

To WAAS, or not to WAAS? Nope, that's not the question anymore. With the ADS-B mandate, WAAS is wide-spread and a done deal. But this is not about ADS-B. This is about where WAAS figures into the equipment or a plane you may be thinking about buying, or even the capabilities of your current equipment if you are an IFR filer. Some of us have not yet invested our Powerball winnings into the latest cosmic panel mounted GPS. My rubber band windup 4-seater along with myself are IFR capable. I try not to make a habit of sticking my face in Rocky Mountain weather with its two issues of Ice in winter and Convection in summer.

However, there are times when fields are reporting marginal VFR conditions or Class E visibilities of 2sm FU/HZ/BR, or maybe an overcast layer with enough room underneath to find a spot to save yourself if the motor quits. It is nice not to have to turn around or stay home. So where does WAAS figure into all this? So many airports do not have ground-based instrument approach equipment, such as a VOR or ILS. We are relying more and more on GPS. So, you have a panel mount, IFR certified GPS. Most articles like this are pretty basic, but this time let's get into the weeds.

Scenario

Your destination is KMNW (Middle of Nowhere Regional Airport) with an Elevation of 2,600 feet. MNW's only approach is the **RNAV (GPS) RWY 36.** The GFA forecast (**G**raphical **F**orecast for **A**viation) is used in this case since MNW does not have a Terminal Area Forecast (TAF). The GFA reports *OVC040TOP 100. VIS 3-5SM - RASN BR.* Remember, the ceiling on GFA CLOUD is reported in MSL unless AGL is specifically noted. If the clouds are forecast in MSL, this means MNW is forecast for less than a 2,000 ft ceiling. So, we need an alternate. The TAF and METAR for the nearest airfield KCGA (Cheap Gas Airport) are looking good, but the VOR is OTS (Out of Service). CGA's only approach is the **VOR or GPS RWY 11**. Can you file CGA as an alternate? This is one of the areas where WAAS becomes a factor. Really?

Navigators certified under TSO 129 and 196(most non-WAAS units) are considered "supplemental navigation equipment". Supplemental status adds restrictions. For instance, RNAV approaches may be planned at either your destination or alternate, but not at both. Pilots using TSO-145/146 navigators (typically those with WAAS), can plan to use RNAV approaches for both the destination and alternate. It is possible to install an ADS-B unit with self-contained WAAS. But that WAAS does not do anything for the panel mount GPS unit that is needed and used to fly the approach.

If you have your Garmin 430 modified with WAAS for ADS-B, does that make it a TSO-145/146 unit? The "Pilot Guide/Pilot Manual/Equipment Supplement/Installation Manual" for the unit should say in the first few pages what TSO the equipment is certified under, and what type of RNAV/GPS approaches may be flown with that unit. These are your limits.

Let's say we have a non-WAAS Garmin 430, so we will pass on KCGA for an alternate, since we used up our RNAV approach privileges when we filed to KMNW. What about KMLR (My Last Resort International) as an alternate? It has non-GPS approaches. KMLR TAF indicates *0000KT P6SM BKN010*. No sweat with the **ILS or LOC/DME RWY 21** at MLR. But the catch is that the approach notes for the ILS/LOC, includes "**DME required."** Many GPS installations have involved removing the old primary nav equipment that included the DME receiver. GPS can be used in lieu of DME and ADF on all localizer-type approaches as well as VOR/DME approaches, including when charted NDB or DME transmitters are temporarily out of service. BUT… THE EXCEPTION states IF a *non*-GPS approach procedure (VOR/ILS) **must exist at the alternate airport** when an alternate airport is required to be filed by regulation, (true in this case). AND, if the non-GPS approaches on which the pilot must rely require DME or ADF, the aircraft must be equipped with DME or ADF avionics as appropriate. GPS substitution for DME/ADF is not permitted in this case for filing an alternate with a non-WAAS GPS. OK, so much for the ILS. The **VOR/DME RWY 21** also requires DME. Ha!
How about the **VOR-A**? Oops… The forecast is *BKN010*, and the lowest VOR-A minimums for a Category A aircraft is at 1,300 ft. In this case, without WAAS, KMLR is no good for an alternate either. Now what?

There are many factors when considering GPS equipment, such as TSOs, IFR filing/flying with RNAV, and GPS in lieu of DME/NDB. This could go on for more pages, but it is only meant to be a brief example of the complexities and considerations you will need to investigate before buying equipment or a plane or using your own IFR equipment for that matter. Santa needs to do a little research.

FLY THE LEADER

MOONEY MARK 21 FOR '62

10 new features . . .

EXTRA comfort·safety·economy·performance

—**new**. . . more pay load. —**new** pilot-planned instrument panel. —**new** flap system. —**new** exhaust system for whisper-quiet cabin. —**new** sophisticated interior with contour seats. —**new** cabin heater. —**new** automatic pilot. —**new** rudder pedal. —**new** trim system. —**new** propeller.

Add these to the Mark 21's proven supremacy in high speed performance and economy and you'll discover that the all-metal Mooney Mark 21 for '62 has **all** of the qualities which herald the out-flyingest, out-sellingest plane on the market.

Never has a new airplane been such a rewarding investment: in pleasure, comfort and safety. The Mark 21 will pamper your pride and your pocketbook. See your Mooney dealer today or write for an illustrated brochure on the "world's most efficient airplane."

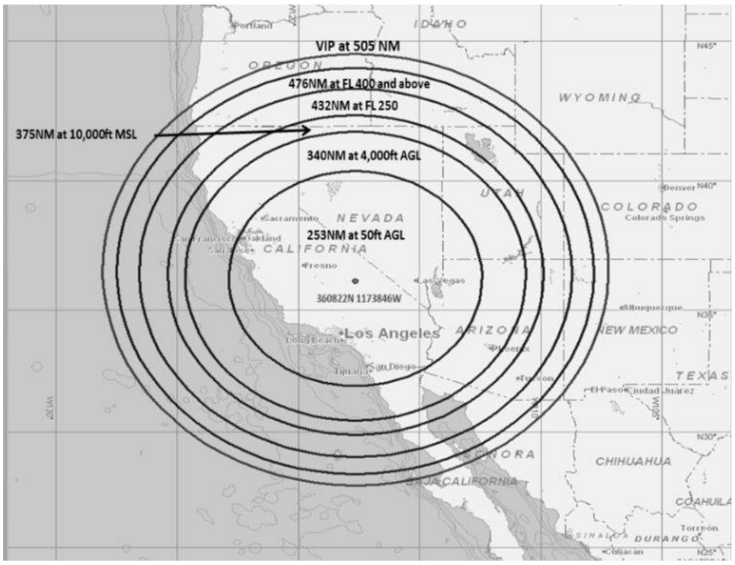
MOONEY
AIRCRAFT INC. KERRVILLE, TEXAS

FLYING—November 1961

1

FAA Acknowledges Pilots' GPS Jamming Events Concerns

(AOPA May 26, 2021)



For years, AOPA and other aviation organizations have expressed reservations about the increase in intentional government jamming of GPS reception for "deprived environment" military exercises while sometimes doubting that officials shared the sense of urgency.

Now GA advocates have received new assurances that their signals of concern have been received.

The FAA gave an update during a recent virtual airspace briefing on what it is doing to make the planned GPS outages conducted by the Department of Defense less of a risk to GA. Officials summarized several actions implemented and other steps being planned to mitigate the possibility of a sudden loss of GPS navigation for GA aircraft, said Jim McClay, AOPA director of airspace, air traffic, and security.

The briefing itself amounted to a long-promised response to the **letter** AOPA and the National Business Aviation Association sent to the two government agencies in February, noting that GA had received no acknowledgement of recommended fixes offered three years ago.

Since then, McClay said, **GPS jamming events have increased** both in number and in areas affected by the staging of military training exercises that are based on depriving the participating forces of some GPS functions.

According to an NBAA **news release** issued after the briefing, in the past 10 years GPS interference events nearly quadrupled. In the last two or three years, locations where the events took place have doubled, it said.

For pilots seeking awareness of GPS-deprived airspace, rusty preflight planning skills won't make life easier. Although the FAA said it has increased its advance notice for issuing advisories about specific

GPS jamming activities to 120 hours, the notams may not appear in a standard briefing, McClay said. An additional complication is that the relevant notam could be buried in a long list of other notams.

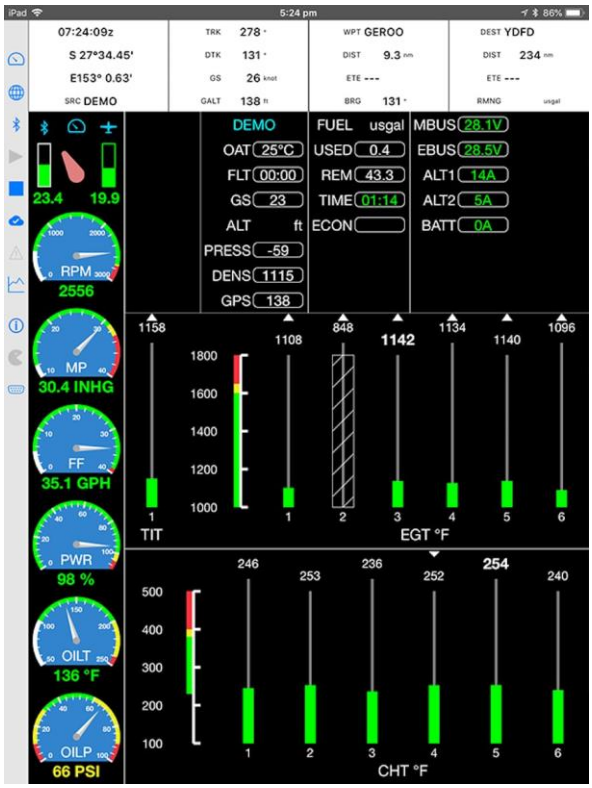
AOPA and NBAA representatives also emphasized to officials that including graphics could help pilots interpret GPS notams. McClay believes officials received the message.

“They emphasized a desire to continue working with industry on this,” he said, adding that the FAA assured the stakeholders that it was not ignoring the 25 mitigations the industry proposed in a 2018 **report** from the Tactical Operations Committee of the aviation technical advisory organization RTCA.

As discussions continue, one measure that could reduce the impact of GPS jamming is an effort by the Pentagon to coordinate its event scheduling with the FAA’s air route traffic control centers to avoid jamming signals during the ARTCCs’ busiest periods of traffic volume, he said.

BlueMAX Portable MFD Updated

FlightData Solutions has added new features to its BlueMAX wireless adapter, including auto connect, auto uploads, and auto reporting.



BlueMax is a Bluetooth adapter that enables wireless streaming of aircraft data, such as engine, systems, and navigation data, to a portable device. When paired with the free BlueMAX mobile app (available for iOS and Android), the pilot’s mobile device becomes a portable multifunction display and data recorder.

The BlueMAX was already integrated to allow data uploads to Flightdata.com, the company’s data analysis and archiving platform. The latest release allows for automatic connection to the BlueMAX adapter without opening the app, as well as automatic uploads to the cloud.

The latest update also unlocks internal storage within the BlueMAX adapter, allowing data to be captured during flights without a paired device and then transferred during the next device pairing, company officials noted.

The company has also updated the sharing features on FlightData.com to allow users with third party analysis or reporting programs, such as those provided by CAMP, Boeing and SAVVY Aviation, to automatically share data.

The BlueMAX is compatible with Avidyne Entegra, JPI EDM series and ARNAV engine monitoring systems. It is $995, with no additional subscription fees. Installation usually takes less than an hour.

Appareo Announces 4K Ultra HD Flight Data Recorder with Cellular Data Offload

FARGO, North Dakota (June 22, 2021) — Appareo announced a new 4K ultra-high-definition Airborne Image Recording System (AIRS), model AIRS-400, that is equipped for cellular data offload. In addition to recording 4K Ultra HD video, AIRS-400 captures pilot intercom system audio, ambient audio, and detailed flight data.

With its internal inertial measurement units, AIRS-400 captures WAAS GPS (altitude, latitude, longitude, ground speed, vertical speed), attitude data (pitch, roll, yaw), rates of rotation, and acceleration data (G forces).

It comes with options for ARINC 429 input, ED-155 audio output, and RS-422 output, making it the most versatile and flexible lightweight flight data recorder on the market.

Designed to be “simple to install,” the AIR-400 is lightweight (11 ounces) with a compact footprint (2.8” x 3.4” x 2.6”) making it “ideal for any rotor or fixed-wing aircraft,” according to the company. Equipped with internal sensors, the AIRS-400 needs only aircraft power and ground. The package includes a small GPS antenna that is installed inside the aircraft. An optional intercom interface (no extra charge) records crew and ATC communications along with ambient audio. No special tools are needed for the installation, which takes about one day.

Appareo did not release pricing information as of press time.

FAA Approves First General Aviation Head-up Display

After extensive design work, flight testing, and certification efforts, SkyDisplay, a division of MyGoFlight, received FAA certification on June 22 for its first supplemental type certificate (STC) covering the installation of the SkyDisplay HUD (head-up display) in a Cirrus SR22. Not only is this the first STC for the SkyDisplay HUD, but it is also the first approval for any such display for light aircraft. While HUDs have long been available in midsize and larger business jets and commercial aircraft, the SkyDisplay HUD brings the safety benefits of HUD to four-seat piston-powered airplanes through piston twins, single-engine turboprops, and light jets.

The SkyDisplay HUD, which displays data from the aircraft’s certified avionics, is part of an integrated system comprised of the projector and display screen in the pilot’s field of view and an aircraft interface device (AID) that connects to the aircraft's Arinc 429 and serial data buses. It is literally a visible extension of the aircraft’s air data and navigation system.

While traditional HUDs have cost hundreds of thousands of dollars, the SkyDisplay HUD substantially lowers that barrier at an initial price of **$29,500**, not including installation. Duncan Aviation worked with SkyDisplay on the HUD installation for the certification program.
The EVS integration is available with the purchase of an EVS interface for **$5,000**; the Max-Viz EVS must be purchased separately.
The SkyDisplay HUD was approved first for the Cirrus SR piston singles and is available as part of an approved model list STC for other Part 23 aircraft operating under Part 91 regulations. Among these are Beechcraft Bonanzas, Barons, and King Air 300s; Cessna turboprops and light jets; Cirrus SF50 Vision Jet; Embraer Phenom 100; **Mooney M20**; Pilatus PC-12; Piper Twin Comanche, Cheyenne, and Malibu Matrix; and Daher TBM 700 and 850. More than 20 aircraft are committed to installations of the SkyDisplay HUD now that it is certified, according to MyGoFlight.

Pilots Wanted for Loss of Control Study

Researchers at the School of Aeronautics and Astronautics at Purdue University are investigating the causes of inflight loss of control accidents (LOC-I).
LOC-I means that a pilot was unable to maintain control of the aircraft in flight, resulting in an unrecoverable deviation from the intended flight path. Inadvertent means that the LOC-I was not intentional (such as an intentional stall during training), the researchers explain.

To help with their research, they are asking general aviation pilots who have experienced or prevented an inadvertent loss of control to fill out a survey.

“The responses from the survey may help reduce general aviation loss of control accidents,” says Neelakshi Majumdar, a PhD student who is conducting the research with Professor Karen Marais.

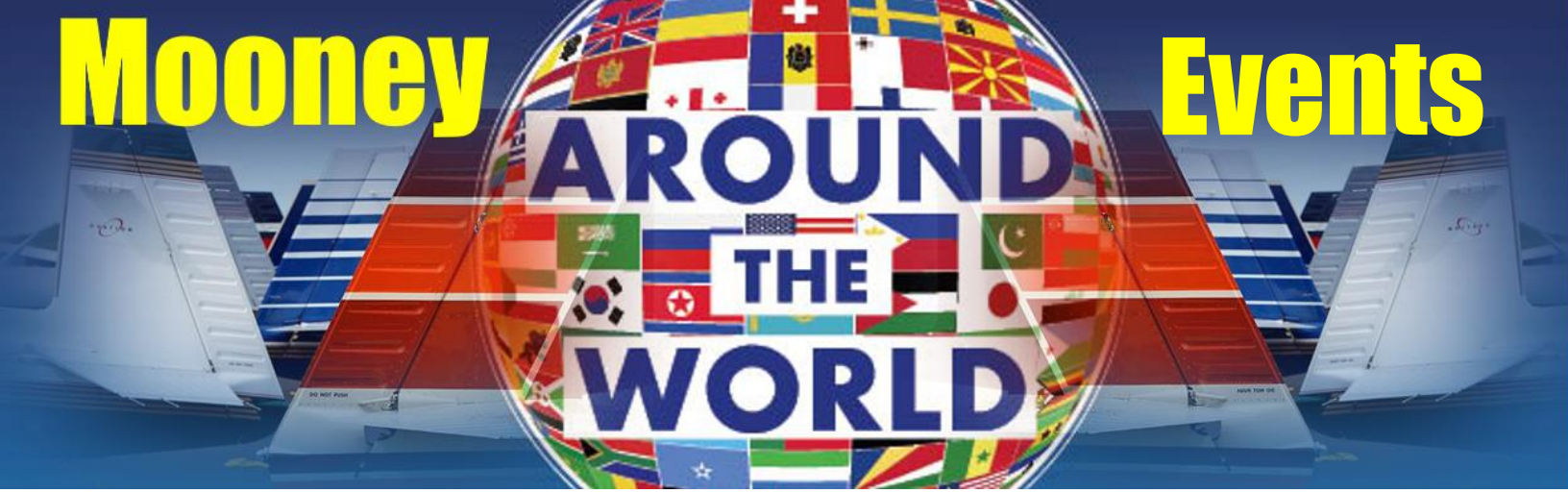
The study, funded by the FAA, is a part of the Safety Analysis and General Aviation (SAGA) research project under Partnership to Enhance General Aviation Safety, Accessibility, and Sustainability (PEGASAS) Center of Excellence.

The overall goal of this study is to develop focused training methods that could help pilots to avoid LOC-I accidents.

The survey asks questions about your inadvertent LOC-I experiences and the training you received to avoid or recover from LOC-I. Pilots will also be asked a few demographic questions. All responses are anonymous.

The survey should take approximately 20 to 50 minutes to complete, depending on how many LOC-I experiences you choose to share.

You can find the survey here.



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* July 10: Williston (X60) August 14: Okeechobee (KOBE) September 11: Venice (VNC)
Mooney Caravan	July 23: Arrivals at MSN July 24:MSN- OSH, Arrival at KOSH at 11:30am CLICK HERE for details
MooneySafety.com MAPA Safety Foundation Pilot Proficiency Program	**2021** 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	October 22-24: CLICK HERE for details
Australian Mooney Pilots Association	October 8. 2021: Spring Fly-in, Merimbula, NSW. CLICK HERE for the AMPA website. March 17-21: Gathering of Mooneys - Coonawarra wine region
EMPOA	CLICK HERE for details
Other Mooney Events	

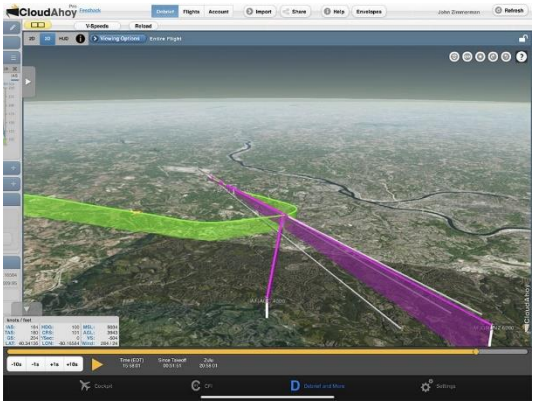
TMF PRODUCT REVIEW

CloudAhoy Flight Debriefing

Version 5.0 now available

CloudAhoy debriefing for pilots

CloudAhoy is a powerful app that makes it easy to record and play back all of your flights. It is ideal for student pilots, instrument pilots, CFIs, or anyone who wants to be a better pilot. The app goes beyond a simple 2D map, with chart overlays, glass cockpit gauges, altitude graphs and much more. Flight recording is easy with the iPad's built-in GPS or an external device like a Bad Elf GPS or Stratus ADS-B receiver. Also accepts ForeFlight track logs – simply export from ForeFlight directly into CloudAhoy.



New features:

- Stabilized approach analysis
- Improved flight analyzer
- Worldwide aviation charts from SkyVector
- Redesigned flight list with search and maneuver list

Works with Stratus 2 and Stratus 2S AHRS!

Using Stratus's built-in attitude heading reference system (AHRS) and its automatic flight data recorder, you can save every flight you make with a Stratus 2, 2S, or 3. Simply transfer your flight log from Stratus to ForeFlight, then upload it to the ForeFlight online track log library. From there, you can quickly import all track log data (including attitude) into CloudAhoy. Details here on importing track logs from the web.

Features:

- Auto-segments your flight maneuvers
- View your flights in 2D or 3D, on any computer platform
- Overlay aviation charts, terrain maps, or satellite images
- Cockpit view: relive your flight in 3D animation
- Glass cockpit gauges
- Display the wind along your route. Check your wind corrections
- IFR? Compare your instrument approaches vs. 3D or 2D published IAPs
- Plot altitude, TAS and VS profiles of your approaches
- CFI mode for marking the flight in real-time
- Logbook-like listing of any flight you have flown with CloudAhoy
- Use the internal iPhone/iPad GPS, or an external GPS
- Flight sharing between CloudAhoy pilots, and people without an account.

An annual subscription is $66.

Parts for Sale

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

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

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

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

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

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

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

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

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

N9426V
1970 Mooney M20F s/n 700029

5725 Total Time
475 SMOH in 2013
1384 SNEW Prop, 3 Blade Hartzell $69.900

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

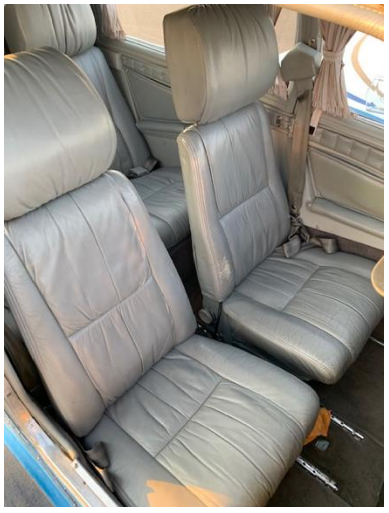
Avionics:
#1 Nav/Com King KX155 w/ GS. Coupled to HSI
#2 Nav/Com King KX170B
King KCS55 Slaved HSI
Narco AT-150 Linked to Uavionix Tail Beacon, ADS-B Out
JPI EDM 930. Full function with Fuel Flow
PS Engineering 4 Place Intercom
Airtex 406 ELT
Vertical Card Compass

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

Useful Load: 1036 lbs.

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

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



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

1/3 SHARE FOR SALE

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

- Garmin GNS 430 WAAS
- King KX 155 N/C/LOC/GS
- Castleberry electric back AI
- King KFC 150 FD/AP alt hold, climb/descend, simulated GPSS
- King KCS 55A HIS
- Garmin GTX 330 ES TXP with traffic, ADS-B out
- Newly Overhauled KX 256 AI ($1,730)
- King KN 64 DME
- New Garmin GMA 345 Audio Panel
- New JPI 830 with *all* options
- ADS-B in including traffic, weather, Sirius XM, etc. via a new certified Garmin GDL 52R hard wired to a panel mounted Garmin Aera 660. A new yoke Aera 760 will be hard wired to provide IFR charts and Additional features. 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

mounted
More

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

$37,950

25% Share – 69 November LLC

1982 M20J - N1169N **KGTU Hangar**

Garmin: GNS 530W, GTX-330ES, GFC-500 AP, Dual G-5 AI/HSI, FlightStream 210, GDL-69 XM Weather, WX-500 StormScope, JPI-700 Eng. Monitor, KM24 Audio Pnl, KX165 NAV/Com, KN64 DME, P-1000 Digital Tach, Stratus 2 (Weather, Traffic, AHRS), SureFly SIM4P E-Mag. Annual Inspection due June 2022. Must be IFR/Retract qualified.

For Information: rce.elliott@gmail.com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