The Mooney Flyer

The Official Online Magazine for the Mooney Community

www.TheMooneyFlyer.com

September 2014

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MOONEY FLYERS

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Phil Corman
Jim Price

Contributing Writers
Bob Kromer
Tom Rouch
Paul Loewen
Geoff Lee
Linda Corman
Michael Riter
Cliff Biggs
Mike Elliott

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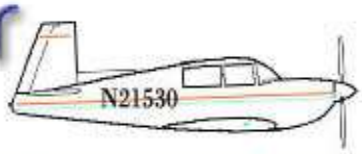
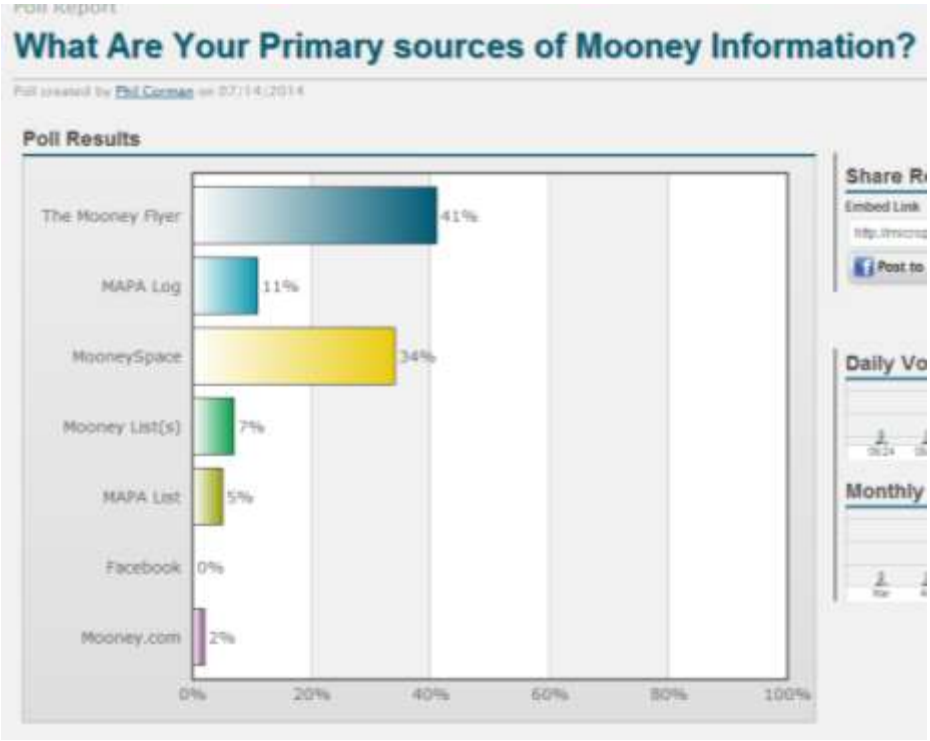
From the Editor

Phil Corman



Last month's poll asked, **"What are your Primary Sources of Mooney Information?"** We are ecstatic that *The Mooney Flyer* is the primary publication providing information to Mooney Owners.



Next month's poll: What is your favorite Mooney Event?

CLICK HERE to vote.

Mooney Flyer Apparel

Did you notice that you can now purchase *very cool* Mooney Flyer shirts & hats.

CLICK HERE to take a look.

Note: We are sorry that it took so long to fulfill our early orders for hats and shirts. We were slightly overwhelmed by the interest. Thank you to everyone that got some of our cool stuff.

At The Mooney Flyer and across the Mooney family, we are all ecstatic to report that **Mike Elliott** is recurperating from the Mooney crash he was a part of in Indianapolis. Mike is an accomplished instructor and co-founder, with Dr. Ron Dubin, of The Mooney Summit! We are proud to count him in our ranks, call him a friend, and benefit from his leadership.

The Wright Brothers created the single greatest cultural force since the invention of writing. The airplane became the first World Wide Web, bringing people, languages, ideas, and values together. Bill Gates

Appraise Your Mooney's Value

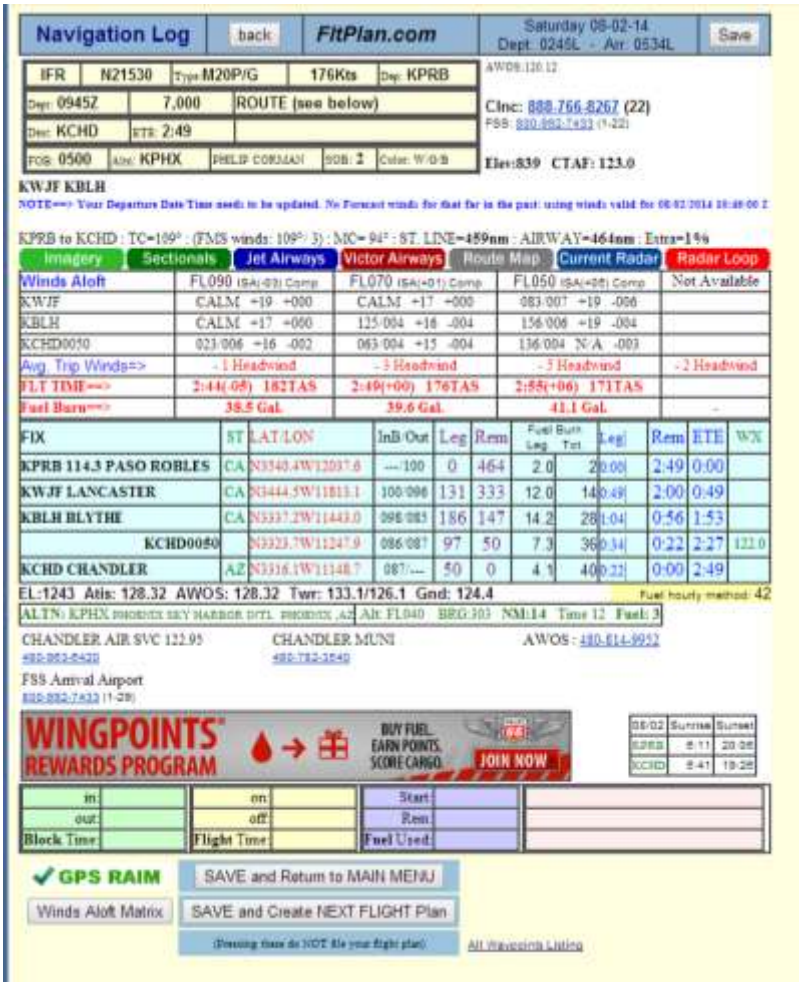
Don't forget about our cool new **Appraise your Mooney's Value** using Jimmy Garrision's valuation. Jimmy is from All American Aircraft, the country's largest Mooney reseller. We have implemented the models for M20C, M20E, M20G, M20F & M20J. Click on your model to simply complete the valuation. You no longer need paper and pencil. Just another benefit to our subscribers. These forms are currently Beta test quality. Please send errors to us.

M20C M20E M20G M20F M20J

FltPlan

https://www.fltplan.com/

A reader suggested that we highlight FltPlan.com. Why? Because it's powerful and it's FREE. You can access FltPlan from a PC, Mac, iPad or smart phone.



It has all the tools a Mooney pilot could want. It enables you to create VFR and IFR flight plans.

On the Tools side, it is complete with tools for Weight & Balance, Density Altitude, *eLogBook*, Checklist, Documents, as well as the usual Airport Information and FBOs.

It supports the new digital chart format and even includes Canadian charts for FREE, which is something that ForeFlight and WingX do not.

If you are looking for an App for your iPad or iPhone, check out our review of FltPlanGo in this month's Product Review.

You haven't seen a tree, until you've seen its shadow from the sky.
Amelia Earhardt

As a Mooney owner (1966 M20E), I'm appalled at the lack of demonstrated frugality in our group. We used to be known as Cheap People...what happened? I'm referring to our beloved iPads, and the expensive apps that keep getting touted in this and other media. I will not pay for an app or Nav data, when I can get it for nothing. Check out the desktop program http://www.fltplan.com/, and its companion iPad app FltPlanGo. What's not to like? Completely free flight planning, weather, charts (sectionals and enroute with moving map), procedures, flight tracking, weight & balance, flight level optimization, and so much more. All this, and Canadian data too. I've been using it for years, and it keeps getting better. However, it can't get more FREE!
Chris S

Another fantastic issue. Top stuff! I really liked Linda's article and hope to visit those places when next in California, most likely next year. It was a surprise to see Robin Miller's Mooney on the stand at Jandakot. I knew Robin well and admired her greatly. What a tragedy that she died so young – from Melanoma. Actually, it's not Robin's aircraft, but a substitute! Her original VH-REM is alive and well and flying in Queensland, which is in the top right-hand corner of this massive island.
Tony R

Wow! The Mooney Flyer has as many "getaway ideas" as The Pilot's Getaway magazine. My wife and I had never heard of Florence, OR or Newport, OR. After reading Linda Corman's **Mooney Tales** article, my wife is demanding that we schedule a flight there. Thanks guys…
Tom M

Thanks to Wolfgang for his interesting article, *Mooneys Under the Midnight Sun*. I wish I could have heard Hennig Huffer's stories of his around the world flights, not just a flight. I had not known about EMPOA and it sure sounds like it's an active and fun Mooney organization. I may wish to contact them and maybe fly with a member while visiting Europe.
George S

Jim Price's article on **Unable to Outclimb Terrain** is a sad, sad recap. The salient point of his analysis is that just because a technique has worked in the past does not make it a good decision, and may also come back and bite you. I'm constantly challenging my decisions, not in the thick of a tough decision, but in thinking about a flight beforehand, or thinking back on a just completed flight. Good article. Thanks.
Don C

Radios are a blessing. Despite all of the new toys and gadgets (i.e., glass), radios remain central to safe flight. However, pilots seem to push the button and proceed to misuse and "abuse" their radios. By now, you are probably offended. No, I'm not pointing the finger at you, accusing you of misusing the radio. It is the misuse of airtime that is the problem. Before I get ahead of myself, we will reference the FAA AIM (Airman Information Manual), but may deviate from it. But in every situation, we believe that our recommendations are consistent with the AIM and improve the safety of a Mooney flight.

The prime principle regarding usage of a particular radio frequency is that the channel is shared by multiple pilots and sometimes ATC. That means that only 1 transmission can take place at any time. While that transmission is happening, everyone else on the frequency can only listen. So the bottom line is that that frequency is valuable. In this article, we will concentrate on VFR flights. The best way to manage the channel is:

1. Listen, Listen, Listen before keying the PTT (Push to Transmit) button
2. Think about what you are going to say before keying the PTT
3. Use no superfluous words or phrases

And here is one phrase to ALWAYS AVOID… "any traffic in the pattern, please advise". This will cause all pilots to key their PTT and repeat everything that they have already announced. This is not a safe

When once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return.
Leonardo Da Vinci

methodology. Please refer to Guideline #1 on the previous page… If you have been listening (and looking), you already know who is in the pattern.

Remember to be aware of a stuck microphone. The best indicator of this is when a busy frequency goes silent. That pretty much could indicate that you are transmitting with a stuck mike.

Given this as a basis, let's deal with different phases of flight and the usage of each frequency.

During Taxi Before Takeoff

At an **uncontrolled airfield**, or as we at The Mooney Flyer like to call them – "P**ilot-Controlled"**, most of the time there is absolutely no reason to transmit on the Common Traffic Advisory Frequency (CTAF). CTAF should be reserved for planes in the pattern travelling at altitude. On the ground, planes are taxiing at 5-10 miles per hour. There is plenty of time to look around. There is an option of halting, or stopping, a taxi operation. This option is not available to those in the pattern. What value is there to notify other planes that you are taxiing from transient parking to runway X, or taxiing from parking to the fuel depot? It is tying up the frequency for everyone in the pattern.

In our opinion, the only *GROUND* transmission that makes sense to us, is when you are going to taxi across a runway. Back taxiing on a runway clearly calls for a CTAF transmission. Additionally, there may be some peculiar attributes of some uncontrolled fields where other transmissions may make sense, and in that case, usage of CTAF while taxiing might improve safety.

In **Class D/C/B airspace**, the rules are clearly different. Listen to ATIS before keying the PTT. Then, call Clearance or the Ground Controller. Here's the transmission we recommend at this point. "*XXX Ground, Mooney 123 at <location>, ready to taxi with <ATIS Letter>".* No other words are necessary. Remember, you may think that a ground frequency is not as time critical as an air frequency, since on the ground, planes are moving slowly and can stop. But think about runway incursions or taxiway incursions. Being on or off the frequency at the right time is important.

During Departure

At a pilot-controlled airfield, always announce taking the runway and its number, before actually doing so. We recommend that you announce your departure intention at the same time. So a transmission might go something like this: "Paso Robles Traffic, Mooney 123 departing runway 19, left crosswind departure". Now you don't have to transmit again, unless you hear a new plane approaching the pattern, and they need to know your intentions.

At towered airports, just do what the controller says and playback their instructions before executing them. If you are told to change frequencies, for instance to Departure Control, remember to linger on the tower frequency for a few seconds to make sure that you have read back the correct instructions.

Flying Over or Near a "Pilot Controlled Airport" (ie, Non-Towered)

How many times do you hear pilots transmit that they are overflying the field at 4,500' (which for example's sake is 3,000' above pattern altitude. Or, another departing pilot transmitting that her or she is 7 miles south at 4,300' flying south. These are totally unnecessary transmissions. CTAF should be used for airplanes in or approaching the traffic pattern.

When Requesting Flight Following

Now you are "wheels up" and want to request Flight Following. First, listen to the frequency and wait until it is free (quiet). Existing aircraft need priority over your request. The first call should be limited to

something like this: "*XXX Center, Mooney 123, at <location>, VFR request*". This uses the minimum number of words and enables the controller to call you back when he or she is not busy. It makes little sense to describe your full flight following request upfront because it ties up the frequency too long. When ATC comes back to you, if they are going to give you flight following, often they will give you a squawk code and then ask you to go ahead with your request. "*XXX Center, Mooney 123 request flight following to <destination>".* At this point, anything else you say is superfluous until or unless the controller asks for it. Often they might ask you for your route of flight, planned cruise altitude and your equipment/suffix. At that point, give it to ATC. Now, if "local" ATC custom expects certain items, and you know that, then give it to them, by all means, before they request it.

During Flight Following, you will be handed off to the next controller. Again, after you repeat the hand off, lingering for a few seconds to ensure that the controller doesn't correct your playback or amend it. Then, go to the new frequency, listen, and then announce "*XXX center, Mooney 123, x thousand 500 feet*". The new controller needs no additional information and any additional information is unnecessarily tying up the frequency. Please don't say cute stuff like "with you". Many controllers hate it.

Approaching an Airport to Land

As you approach a pilot-controlled airport, you will want to know the conditions and current traffic. If they have an ASOS/AWOS, then that's the first thing you should get. That will provide you with current weather and indicate the most appropriate runway. In your pre-flight briefing, you already should know the preferred or customary runway used in calm winds.

The next item is to tune in the CTAF long before you get to the pattern and listen. You will understand the level of traffic and the runway in use. By the way, at a pilot-controlled airport, there is NO "ACTIVE runway". There are only runways in use. We recommend that you don't make your first call until about 10 miles out. Otherwise, we think you are giving unnecessary information to pilots in the pattern before you become relevant to them. Here's the minimum transmission to make. "*Paso Robles Traffic, Mooney 123, X miles northeast, entering <45 or left/right downwind, or left/right base, or straight-in> for runway X*". Do not say "traffic permitting". All maneuvers in the pattern are always traffic permitting and the FARs specify who has priority.

Remember that good and accurate radio technique is a key factor in the conduct of a safe flight. Each frequency's usage is precious and effective use of it has a significant effect on the safety of your flight. Which guy are you?

You will significantly improve your chances of getting approved to operate in Class B or Class C, or any controlled airspace, if your radio technique is professional. Minimize your transmission and broadcast only essential info.

Pre-Purchase Inspections

CLICK HERE for a printable Pre-Buy Checklist

We receive a lot of calls from people looking to buy a Mooney. Whether you are looking at buying your first Mooney or looking at upgrading to something more complex, I cannot stress enough the importance of a pre-purchase inspection. When selling an airplane the seller is responsible for ensuring that the airplane is truly airworthy. It's normally the buyer that is paying for the Pre-Purchase Inspection. We have all seen and heard horror stories about people buying an aircraft and having a very expensive first annual. One comes to mind. A gentleman was thinking about getting his first Mooney and came in to talk to us about it. He was looking at buying an older D model. We talked for a while and at the end, I told him, "Don't buy it without getting a Pre-Buy Inspection. You want to know what you're getting into." A few months later he comes in and schedules an annual. I asked him if he got a pre-buy and he said, "No. I talked to a guy who knew the mechanic that worked on it and he said the mechanic was a great guy and not to worry about it." I cringed a little and thought to myself, "Oh no." I won't give you the whole list, but the highlights were: internal corrosion (nothing structural but it had to be dealt with), the muffler was coming apart internally and cracked, you could easily pull the Johnson bar out of the down lock block and the engine mount was cracked. This is only one of many examples I could give. Please save yourself this experience and make a Pre-Purchase Inspection a part of your research prior to buying an aircraft.

What is involved in a Pre-Purchase Inspection?

All shops do things a little differently, so know what you are going to get for your money. At a minimum it should include an inspection of the aircraft, examining the log books and all aircraft records and an AD search. At LASAR, we like to start with a walk around the aircraft. We're looking for dents, seams where there shouldn't be, patches, corrosion, mod's or aftermarket items on the aircraft. After the walk around, we like to take it for a test flight. We check to see how it handles on the ground at high speeds. Does it fly straight and level hands free? How does the aircraft perform? We are also checking things like radios, autopilot, trim etc.. After the test flight, we get it into the shop. I like to start on the engine. You can find many things in the engine compartment. We do a compression test and check the oil filter for contamination. We also check the magnetos, muffler and engine hoses. We are also looking at what has been added and the overall condition of the engine.

At any point, if the things we find are starting to get extensive and expensive, we stop and call the prospective buyer.

Moving on, we open the aircraft like you would for an annual inspection. Checking the landing gear is very important. We raise the airplane and check the gear and steering components that frequently wear. Checking for corrosion is important as well. Corrosion on an airplane is like cancer in the body. It grows and if left untreated it will destroy. As we are inspecting, we are not only writing down what we find wrong, we are also writing down all the things we see, like repairs and things that were added since it left the factory.

As we inspect, we look at the log books and the aircraft records. How much time is on the airframe, engine, and propeller? How much time is left on the engine and who did the last overhaul? When reviewing the logs, if I see a lot of annual sign offs with no maintenance, that tells me a lot. Do the log books and 337's match what we saw in the aircraft, and are add-on's installed correctly? For example, we find a lot of fuel flow transducers installed too close to the exhaust and we have found them installed in places other than where the manufacture says to place them. Is the Equipment List and Weight and Balance current? Is everything we see in the logs and 337's on the Equipment List and Weight and Balance? Everything that was done to that aircraft needs to be documented. We have seen aircraft with major repairs and no log book and no 337. Without documentation it is not airworthy. We have seen engine analyzers installed with no 337; not airworthy. The lack of paperwork can be fixed, but it is an additional expense. It is also important to look at time-life on things that have a required or recommended inspection/replacement interval. For instance, when was the last magneto inspection? (Due every 500 hours). Also, the "no back clutch spring" replacement is due at each 1000 hours on some gear actuators. After going through the paperwork, we do an Airworthiness Directive (AD) search, making sure that all AD's that apply have been complied with. The AD search is for the airframe, engine, propeller and appliances – things like magnetos, carburetors, ignition switch, standby vacuum, etc.

Once all that is done, we put together a report for the buyer. I like to put things in categories. The first is ***Airworthy Items.*** These are things that must be done before the aircraft can be certified airworthy and safe for flight. The second is ***Non-Airworthy Items***. These are things that do not affect the airworthiness or flight safety, but will require attention in the future. The last category is ***Things to do in the Best Interest of the Airplane*****.** These are things that if fixed now, the new owner will benefit.

So, with all this information you are able to negotiate with the seller on the final price of the aircraft. It is my belief that the owner should take care of, or adjust the price on all items that affect the airworthiness and safety of flight. You may be able to negotiate the price with some of the other items as well. The buyer should be willing to pay for new items or work that will be to his benefit as a new owner, like a fresh IFR Cert., new ELT battery, new gear shock disks, O2 refill, tires and things of that nature. Many buyers roll the Pre-Purchase into an annual.

Typically we like to spend 3 days going over an aircraft on the Pre-Purchase Inspection. The inspection is extensive and not cheap, but it is well worth the money. It can save you thousands of dollars. With any Pre-Purchase Inspection, there is no guarantee that everything will be found. We all do our best to find everything we can, and some mechanical parts will stop working without showing signs they are failing.

There are some Pre-Purchase Inspection Guides available. You can find one available on the LASAR website, www.lasar.com, which covers what we like to look for. It was developed from our years of experience as a Mooney Specialist. I hope this helps with your aircraft purchase.

IT'S QUIETER!

MOONEY MARK 20!

it's quieter because:

sound proof insulation
famous Hanallin-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.

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Geoff lee.

CFI

A Wing

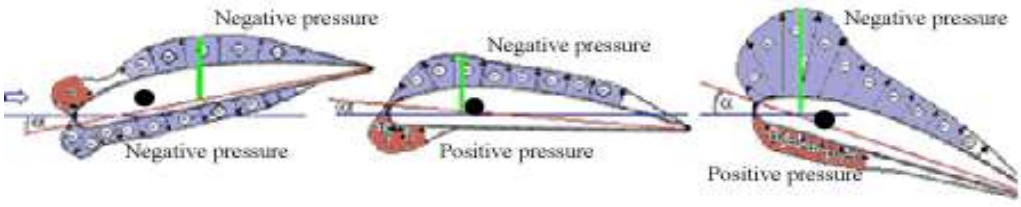
Much is written on the design and function of the airfoil but very little is clearly understood by the average general aviation pilot.

Most pilots understand that when a wing is acting in a stream of air, there exists a negative or low pressure area related to the upper wing surface and an area of positive pressure acting on the bottom surface of that wing. The resultant force created by the two simultaneous conditions is termed “lift”. **Lift** acts through the **center of pressure** of the wing and is directed **perpendicular** to the direction of relative airflow.

Opposing lift is that nemesis of flight called **gravity,** which acts upon the weight of the aircraft and is focused toward the earths’ center through a relatively confined location point called the **center of gravity** (C of G). The aircraft will rotate in pitch, roll and yaw about the C of G. As we fly along, the C of G may relocate slightly due to the reduction in weight relative to fuel burned and the location of the fuel tanks. The C of G will not be relocated if the fuel load is evenly dispersed about the C of G of the aircraft.

As we change the pitch angle of the wing in the stream of air, the focus of the pressure on the undersurface changes position. That focus point is termed “center of pressure” and it travels forward as we pitch up and rearward when we reduce pitch. On aircraft loaded within their normal CG range, the center of pressure will act through a line slightly aft of the CG in level flight.

As stated, the combination of positive and negative pressure results in a **lifting force**. Negative pressure abounds on the wings underside as we **pitch down** and an **area of positive pressure now shows up on the upper wing surface** forward of the broader area of negative pressure. The diagram below reveals that the focus of **negative pressure (***denoted by the blue bulge*) **moves well forward** on the airfoil when **pitch is increased,** as does the “center of pressure” denoted by the **green arrow.** It could be deduced, from the diagram, that one could modify both of these areas of pressure by changing the shape of the airfoil.



Center of Gravity

Ideally the **center of pressure** would always be located at the **C of G** thus providing a stable aircraft. But, as pitch angle changes, that perverse **center of pressure** starts to move around and travels forward as pitch angle increases and rearward with any decrease in pitch angle. This is much like the **bubble in a spirit level**. The black dot in the foregoing diagram represents the pivot point of the C of G. But, if we

load the aircraft such that the weight is distributed more aft, increasing the distance between the lifting force and the C of G, one can visualize that the lifting forces could be great enough to exceed the compensating leverage capability of the elevator in higher angles of attack. Pitch sensitivity and stall recovery would become an issue. Aircraft manufactures obviously limit the distance that the C of G can be moved as you load the aircraft, by providing a range of travel, forward and aft, that is safe relative to aircraft control. This range is the **C of G "envelope".**

If an aircraft is **loaded aft** of the envelope the **stall speed will be lower** and **airspeed will increase.** Pitch sensitivity will also increase.

If an aircraft is **loaded forward** of the envelope, the **stall speed will increase**, **airspeed will decrease. The aircraft will be** more stable, but heavier handling will result.

Unfortunately, as **lift** increases, so does devil **Drag,** in all its many forms. Drag diminishes lovely **Lift, thrust** is depleted and we have to settle for a somewhat reduced **resultant Lift** force to oppose the dark force of **Gravity. Thrust** is the direct opponent of drag so if we wish to climb like an angel with our nose stuck in the air, generating lots of lift, we do need to have lots of **thrust** available from the **propeller,** which in turn requires optimum **horsepower** from the **engine.** All of this generates speed and thus **more airflow** over the wing and in turn **more lift.**

Parasite and **Induced drag** are the two main forms of drag. **Parasite drag** appears and grows with the quantity of projections emanating from the aircraft and piercing the airflow, such as antennas, dirt and bugs, frost and ice on the wings. It also includes trim tabs and wheel pants. (These two issues were solved by Al Mooney). **Induced drag** is attendant upon the production of lift like flap deployment and wing tip vortices on a slow moving heavy jet. There are many drag subheadings like **Form drag,** caused by the shape of the aircraft, **skin friction,** due to the area and smoothness of aircraft skin exposed to the airstream. **Thrust** must overcome all the dark forms of devil **drag**. Since some of us are not operating turbines near the speed of sound, I shall not mention "Wave" and "Ram" drag.

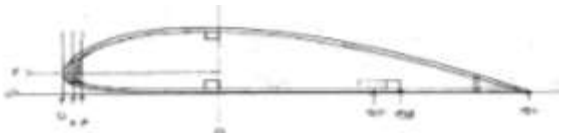
Just sitting there airborne with **no view over the nose** and 80 mph on the ASI in a non-turbo 180- 200HP Mooney on a summer day is generally a poor way to climb. At gross weight on an 80 degree day at the Truckee airport, if you cannot see over the nose during climb out, you are probably doing something wrong.

Let us say that you pitch up for climb at V_y, using the airspeed value indicated in your POH. Observe your attitude indicator. It will probably settle between 7 and 10 degrees nose up, depending upon the loading of the aircraft and the density altitude. Observe the climb rate on the VSI. When the attitude and climb rate has stabilized, lower the nose about 2 to 3 degrees and patiently observe the climb rate. It will initially decrease, but as the airspeed increases because of the lower pitch attitude, many times it will increase back to where it was or better than before. Additionally, you have achieved a higher rate of speed, better engine cooling and certainly better forward visibility. With flight at various loads, particularly below full gross, a habit of finding the best pitch attitude for optimum climb performance under each different set of circumstances is good technique.

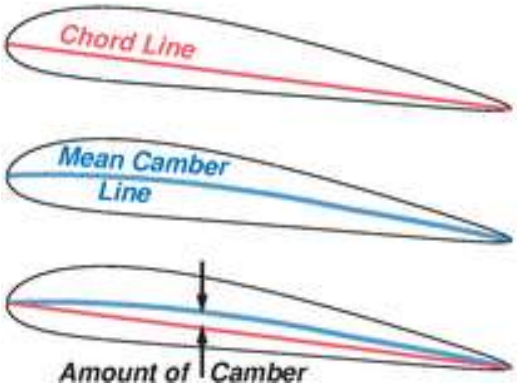
Mooney pilots are all flying essentially the same wing, but carrying different loads and with a different assortment of thrust capabilities derived from different engines and propellers. You must give that laminar wing a chance to maximize its **lifting capability.** It needs airflow, so simply pitching the aircraft to the V_x and V_y numbers published in the POH is not necessarily the optimum way to climb in all circumstances. That's because V_x and V_y vary with aircraft weight, loading, density altitude, and certainly, with available thrust. The POH values for all certified aircraft were developed with a new plane at full gross weight, at sea level on a standard day by an experienced test pilot. Those values should be regarded as the maximum set of parameters for your aircraft.

Laminar Flow

The Mooney wing is designed around a "laminar flow" NACA 63-215 airfoil. It is a NACA 64-412 out at the wing tip. Simplistically, laminar flow refers to the air molecules adhering closely and tenaciously to the surface of the wing. It is designed for speed. A laminar flow wing has a maximum thickness in the middle of its curvature or camber line. This occurs at about 40% of the distance back from the leading edge or almost at the center of the wing. It has a relatively sharp or narrow leading edge. The laminar wing has curvature on the top surface and to a lesser degree, on the underside. Having the maximum camber in the middle, at higher cruising speeds, laminar flow is possible over a larger percentage of the wing than would be the case of flow over the Piper's Hershey Bar wing, (the early "Hershey Bar" wing, shown at right), which has essentially a flat underside and a broad and gently rounded leading edge. This wing design emphasizes lift more than speed.



Editors Note: *It would probably shock most of Mooney Flyer subscribers and crush their image of laminar flow wing but the PA28 series uses laminar flow airfoil as well (NACA 65-415)! It is a constant thickness, unlike the tapered wing Mooney wing, that uses 15% at wing root and 12% on tips; this airfoil and similar are used on many newer Pipers as well. The reason was to move aft a maximum thickness of the wing (40%) so designers could place a main spar behind the pilot's seats. As always in aircraft design, it's all about compromise.*



The Mooney has a clear and clean stall point due to that narrow leading edge. It stalls at a higher airspeed than the Hershey Bar Cherokee, which is difficult to stall. The early 1967 Mooney Executive had a wing that was modified with a drooped leading edge, positioned only at a point opposite the ailerons. It was supposed to provide continuing aileron control as the stall occurred, but it also slowed the plane a couple of

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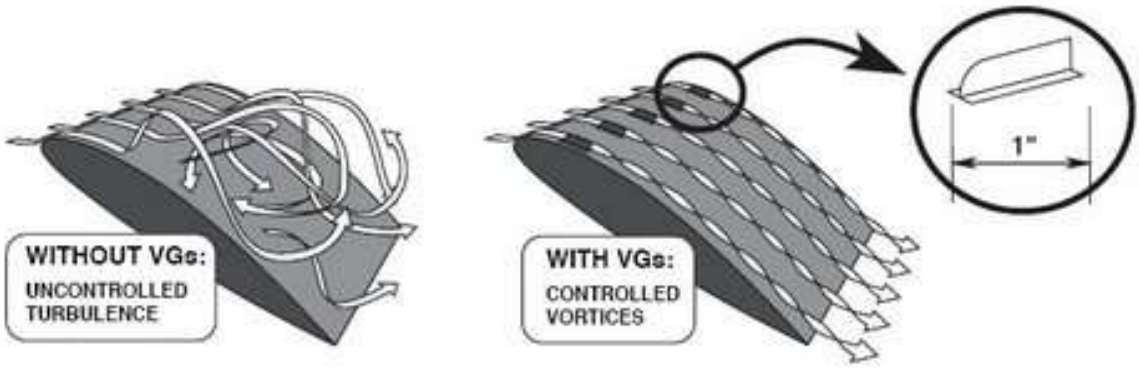
knots. So, it was discontinued on 1968 models. (*One should not be flapping ones ailerons around in a stall*). The diagram to the left depicts how the camber of a wing is measured between the chord line and the mean camber line.

Mooney Vortex Generators (VGs)

I recently flew a 231 with the VGs installed on the wing and did not notice any significant difference in the normal handling of the aircraft. However, I did not investigate slower speeds or the stall regime. They look like they *must* inhibit airspeed, but I did not notice any difference during a relatively casual flight. Visually they diminish the aesthetic appeal of that beautiful, clean wing and, personally, I have never felt the need for handling improvement in a Mooney. I guess if I had to work out of a 1500ft strip regularly, I might consider the option.



The VGs are lauded as providing a lower stall speed and improved low speed handling by delaying the onset of airflow separation from the wing or any other airfoil surface at low airspeeds. A lower stall speed suggests that **useful load could be increased.** (The *252s could use this*). My direct experience with VGs has been with my AEROSTAR. That aircraft was produced with a ventral fin (*boat rudder*) that moved with the rudder to enhance the rudder and control effectiveness at low airspeed. It was really ugly! VGs were attached to one side of the vertical stabilizer and the underside of the horizontal stabilizer and voila, the ventral fin could be removed, beauty was restored, control remained and maybe a little improved. **VGs do work.** Cleaning facility was not improved; I have the scars to prove it.

On the Mooney, a row of VG tabs can be glued at a point about 7%-10% in from the leading edge. I would wear wrist protection during cleaning/polishing to minimize the possibility of exsanguination and always carry some spare tabs in case of inadvertent removal. There is a limit to the quantity that can be allowed to be absent without affecting performance. **Keep your wing waxed and clean.** Laminar flow is highly susceptible to disruption when passing over rough surfaces such as frost/snow, bugs and even minimally perceptible dirt on the wing.

Allow the wing to work, **keep your nose low** until the airflow has solidly established itself across the total area of the wing.

Cliff Biggs
ATP, 767,757,737,727, A320, LRJet, CE500, MU-2, Wright Bros Award, A&P 46 Yrs, B707, B727, B720, B747, DC-10, DC9, DC-8, CE500

DUGOSH – GEMINI AVIATION – HUH?

For those who have not been there

Every Mooney needs to go "home" at some time. Ours went home a few weeks ago. It was a nice flight from KEYQ (Weiser Airport near Houston) to KERV. As we approached the airport there was one Cherokee in the pattern for runway 12. As we slid onto final, the Cherokee called leaving the pattern and we had the airport to ourselves. Upon landing, we taxied to the ramp and parked in front of Kerrville Aviation; right next door to the infamous "Dugosh Aircraft Maintenance". Not hard to find with the name "DUGOSH" emblazoned across the top of the hangar door.

Kerrville Aviation has a grand building and lobby, some very helpful employees and we were made to feel right at home. They are actually very busy during the day with all sorts of traffic in and out, from jets to Mooneys and Cessnas. Rental cars can get scarce, so call ahead.

Gemini Aviation LLC
dba, "DUGOSH"

We can vouch for one place close to the airport for lunch - "Vicky's Burger Bar"! It's a little hole in the wall restaurant about 3 miles from the FBO, but it has GREAT burgers. You gotta try it.

The airport beast (crew car) is an older van but the air conditioning works! This is very important during Texas summers.

For accommodations in town, we used ***Trip Advisor*** and picked the Comfort Inn; one of the many places available,. We found a fine dinner being served at the Lake House Restaurant with large windows overlooking the river. It is highly recommended.

Kerrville is bigger than you might think if you haven't been there before. One might spend a few days there looking around while having work done on your Mooney.

Many have heard that Dugosh Aircraft Maintenance was bought out a while back by "Gemini Aviation, LLC". Some think it goes by the Gemini name and some don't, but it really is operating as "Dugosh" dba (doing business as) "Gemini Aviation, LLC". I think this is a good move from an historical point of view.

Just the name "Dugosh" evokes decades of Mooney history. Our own M20D/C was in the shop way back in 1964 (one month young) for a dual brake install and it was signed off by the elder Dugosh who still lives in Kerrville .

When we arrived at the hangar we sought out Vannette Bollier, the Office Manager. Having talked to her by phone it was a distinct pleasure to meet her in person. Vannette is a very gracious lady. She introduced us to James Gandy, the owner of Gemini Aviation LLC, David Behrens, Manager of Dugosh and Keith Perrin, a sheet metal guru who was in the middle of replacing a top carry through spar on an F

model wing. These are all outstanding people; offering to help us in any way they could. We didn't need much as we were only there on a fact finding trip, but they opened their doors to us as if we owned the Conquest that was sitting in the hangar.

In the shop we found several Mooneys, a Cessna Conquest, a Cessna 310 and a light sport taildragger. Quite a range of aircraft to work on. As mentioned, the F model, with the wing off, was being rebuilt with a new spar; a large sheet metal project for sure. The Conquest had its wheels off for maintenance, engine work on the taildragger, and on and on it goes. But, the bottom line is that they know Mooneys. From all I can tell, their reputation precedes them and is still intact. They can handle anything anyone might need in Mooney maintenance.

So if you were like me and wondering about Dugosh, they are alive and well and doing business as usual in Kerrville, Texas. If you have a hankering to bring your bird "back home" to Kerrville, just for the fun of it or you need a quick stop for gas or food, stop by sometime. You will be impressed and you will enjoy the experience.

"Real knowledge is to know the extent of one's ignorance." — Confucius

Don't Trust the Fuel Gauges

JIM PRICE ATP, CFI-I, MEI

Can you really trust your fuel gauges?

January 26, 2014
Rutherfordton, NC
Day, VMC
N6762U, M20C – No injuries

The pilot, based in the Atlanta area, was enroute to meet his father in Hickory, NC (KHKY). At 140 kts TAS, this flight, assuming the pilot departed from Charlie Brown (KFTY), would take 1 hour and 28 minutes.

The pilot said that he checked the fuel gauges in the airplane before departing

The NTSB investigators referenced the M20C POH, which indicates that each fuel tank holds 26 gallons of fuel, for a total of 52 gallons. However, in each tank, only 24 gallons can be counted on to be usable. The pilot stated that the left **fuel gauge** indicated 1/2 a tank (13 gallons). Of that, only 11 gallons of fuel were usable – which, at a burn rate of 10 Gallons per Hour, is a wee bit over one hour of fuel.
The **right fuel gauge** indicated 1/4 tank (6.5 gallons). Only 4.5 gallons in the right tank was usable. In time, that's about ½ hour of fuel, or the ½ hour of fuel needed for reserve fuel.

The tendency of an event to occur varies inversely with one's preparation for it.

The pilot did not visually check the fuel quantity in the tanks and did not take on any additional fuel. Not surprisingly, approximately 60 nautical miles (NM) from his destination (Hickory, NC (KHKY), when he switched from the left fuel tank to the right fuel tank, the engine began to "stutter". He then switched back to the left fuel tank and the engine resumed normal operation. He located the nearest airport, Rutherford County (KFQD), which was 10 NM from his location and made a turn towards it.

Shortly thereafter, the engine began to "stutter" again and the pilot shut the engine down and made an emergency landing in a field.

During the emergency landing, the airplane collided with trees, and sustained substantial damage to the wings and fuselage. Examination of the fuel system revealed that the left and right fuel tanks contained less than 1 gallon of fuel in each.

The NTSB's probable causes: The pilot's inadequate pre-flight planning and in-flight monitoring of the fuel level, which resulted in a total loss of engine power due to fuel exhaustion.
Ref: NTSB Report

LESSON #1: This is right out of the M20C Pilot Operating Handbook (POH), which states that ***"The fuel tanks should be visually checked before flight."***

LESSON #2: Shown at left is the FuelHawk Universal Fuel Gauge. Get one, calibrate it and use it!

LESSON #3: Something we should all remember from when we trained to receive our Private Pilot License is the need for TRIP & RESERVE FUEL.
It's spelled out in FAR 91.151, which gives us: Fuel requirements for flight in VFR conditions.
(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed —

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

LESSON #4: A half hour of day VFR reserve fuel is way too little. Start with one hour of reserve fuel and you will always

Fly Safe,
Jim

In the ongoing battle between objects made of aluminum going hundreds of miles per hour and the ground doing zero miles per hour, the ground is winning!

Ladies, Pack Your Bags for a Mooney Trip

by Linda Corman

This month I am not going to talk about a destination, but instead, I'll discuss how to pack for a destination. Phil and I have traveled extensively, not only in the Mooney, but on commercial airlines as well. Phil says that I have "gotten pretty good at packing for a woman." In fact, we just got back from a three week cruise in the Mediteranean and I just took a wheelie and a backpack. I had everything I needed and wore everything I brought.

Packing for men is easy. A few shirts, jeans, shorts, bathing suit, shaving kit, deodorant, Mooney flightbag, and an iPad.

Three Colors

Over the years, packing has evolved from large suitcases to just carry on luggage. You can do this with a little planning and just three colors. This is also helpful when packing for a weekend Mooney trip. I first need to know the weather where we are going and the activities we will do once we are there. I have learned that layering clothes works wonders. Back to the three color scheme, I have found you generally need to worry about only three colors to coordinate an outfit. I got the technique of Three Colors from my good friend and Mooney companion, Vikki. I usually bring something black, white and yellow. I wear jeans as they are the easiest and last the longest without repeated laundry and no ironing. They are also easy to mix and match with tops. One of my dressing rules is: **Don't bring printed tops or T-shirts**. If you have solid colors they can be mixed with tank tops, blouses and then sweatshirts or sweaters.

If you want a pop of color, bring a scarf with a print or even your sneakers with a bright color or a print. Speaking of sneakers, I avoid bringing along every pair of shoes I own or any shoe with a high heel. If the occasion calls for a dressier shoe, I have found cute flats or sandals work well and they take up less space in your bag. The flats and sandals can be worn with jeans to dress them up as well. Right now, espadrilles are very much in fashion and fold flat together to save room for more clothes in your bag. Another pair of shoes I don't travel with is athletic shoes, unless you plan to only wear them and nothing else. These shoes are bulky and are only good if you are hiking or walking for miles and miles. I have seen women all over the world wear their athletic shoes and I have to say, they usually don't look that great.

Roll not Fold

I found a tip online that has helped me pack and it is: Don't fold your clothes, but roll them. This may sound like everything

Fit more clothes into your luggage by rolling them up instead of folding them.

will be wrinkled, but believe it or not, that isn't the case. I roll my clothes tight and stack them according to weight in my wheelie. What I mean by weight is, larger, heavier clothes in the bottom and lighter clothes on top. After traveling for hundreds of hours on commercial airlines, my clothes are ready to wear with no ironing needed. Sometimes, just hanging them up for a little while will loosen any wrinkle. Speaking of commercial airlines, I have found that going through TSA is difficult enough without stopping while they open and inspect all the items in your carry on luggage. I always put my liquids (makeup, toothpaste, soaps, etc.) in a clear see through plastic bag. I just reach in, take it out and put it in the tray along with shoes, coats, and metal. They just glance at it and pass it on. However, if it isn't in this bag, they have to open it up and search through it while the person behind me rolls his or her eyes. The plastic bag is also helpful in case you have a leak. Now it is contained in the plastic and not on your best blouse. This has happened before when something like sunscreen lotion or face cream blew up from the pressure, and I was glad to only need to clean up the plastic bag.

Leave Your Jewelry

Another tip I have learned over the years is: Leave all your really good jewelry at home. Actually, I don't generally travel with jewelry. I wear a couple of rings, my earrings, a watch and a simple necklace. I have seen women being stalked in cities as the pickpocket eyes all the bling. This also goes for large purses or backpacks worn on the arm or in the back. First of all, do you need to carry a large tote or backpack if you are out walking a city? I never carry a purse when we travel overseas. It usually takes up too much room in my luggage and I already have a backpack if needed. Phil carries any credit cards that I may need and I don't miss the weight on my shoulders.

These are just a few little ideas to make your travel time a bit easier not only when you travel on commercial airlines but when you travel Mooney Express. I remember when Phil would load my luggage in the back and asked if I really needed every ounce of "stuff" in the bags. I wasn't always sure and of course, I would bring half of the stuff back home, still clean and unworn. There are unforeseen occasions, but life is that way. Who says you can't stop and buy a cute new top or a pair of shorts? Leave room in your bag for a couple of new items. That is half the fun in traveling to new places. I almost forgot to talk about hats. I am one of those women who needs to wear a hat outside because of hair issues and too much sun on the face and neck. I have found some really cute hats that roll up and pack as well as a straw hat that has gone all over Europe and Mexico. The straw hat is crushable and easy to put in overhead bins without damage. Wide brimmed hats are my hat of choice, but baseball caps can work as well, as long as they are not advertising an athletic team, company or political cause; then they can get a bit tacky. (Mooney Flyer apparel is quite fashionable, however).. These are just a few packing tips that work for me and I hope they will work for those over packers out there with husbands who ask, "Do you really need that huge bag for two nights honey?"

September 13, Lakeland (LAL)
October 14, Flagler (XFL)
November 8, Vero Beach, (VRB)
December 13, Punta Gorda (PGD)

September 26-27: LASAR Fly-In (1O2) – 3-in-1, including a Mooney BBQ, Splash-In Fly-in, and Pear Festival. Friday afternoon seminars. Friday evening Prop Wash, an informal wine & cheese gathering. Splash-In Pancake breakfast on Saturday morning. LASAR Mooney-Only BBQ from 1-3pm on Saturday. Shuttle service from LASAR to Splash-In & Pear Festival. Plus 100LL Fuel discounts. **CLICK HERE** to register for this Fly-In. At LASAR's request, please register on or before September 20th.

October 3-5: Return to Page, Arizona (KPGA) – Join us for a day or the entire weekend at beautiful Lake Powell. Fly-into Page (KPGA). Optional activities include Lake Powell Flight Seeing Tour, Dinosaur Museum, "Blue Boat" Colorado River Tour, World Class Trout Fishing trip, Slot Canyon Tour, as well as the usual dinners on Friday and Saturday night and Lunch on Saturday at the airport.

The 2nd Mooney Summit will be hosted by Dr. Ron Dubin and Mike Elliott on **October 24-26**, at Panama City Beach, FL.

The **Mooney Safety Foundation** has two pilot proficiency programs remaining for 2014:

September 5-7 – Roanoke, VA
October 10-12 – Branson, MO

Flying is throwing yourself at the ground and missing!

Send your questions for Tom to TheMooneyFlyer@gmail.com

Q1: What should I lubricate on my Mooney between annuals? What lubricants do you recommend for each?

These are probably the most recurring questions that I get. I am old enough to remember using leather to shim worn crank bearings on the old Chevy six cylinder and through my years, I have learned that lubrication is the basis for almost all aircraft maintenance. First, I must restate AD73-21-01 (A thru G models) which requires 100 hour and Annual Inspection lubing of the flight controls and landing gear. Once a year is really not enough. There are many different lubes and items to lube and the complete list is in each Service Manual. That being said, If every owner would buy a can of **Tri-Flo**, (a spray silicone lubricant) and about every three months, spray every Heim bearing (rod end) that you can get to, then you would lubricate almost all the important points. I never counted, but there are dozens of rod ends on the Mooney, because of its control rod flight control system. The flight control hinges take a very light oil – NOT Tri-Flo. I recommend low temp oil, general purpose, MIL-L-7870. For the more energetic, buy a grease gun and learn how to grease all the items with grease fittings. It is a light oil in a spray can. Grease stays in place longer, so you can get by longer on those fittings. On Mooneys, we change more rod ends than any other part, especially those for the ailerons and the rear rudder and elevator controls.

Q2: How often should I take my lower cowling off to inspect for issues/problems during the year, assuming I fly about 100 hrs between annuals?

The first thing I want to address is oil change frequency. On turbo Lycomings we change oil every 25 hours. On all the rest of the engines, the recommended change interval is every 50 hours. I think that's fine if you fly a lot. However, if you are the typical less that 100 hours a year pilot, I recommend changing the oil every 30-35 hours. Oil does get contaminated with moisture, blowby, etc., which is why we change oil on the turbos every 25 hours. It has been proven that oil consumption increases in the second twenty five hours of operation, so you not only improve the consumption rate but increase the useful life of the engine. With the current prices of engines, the cost of extra oil is cheap insurance. Now I can answer the question.

I assume whoever asked the question may have an older model with a lower cowl that is a big chore to remove. On all oil changes on the 1977 models and up, we remove both the top and lower cowl. On the vintage models, we remove the top and side panels. This provides ample access for a brief inspection of the engine, even those with the lower cowl still in place. If you are an owner that flies less than 100 hrs in a year, you might consider lowering the oil change time that I recommend, which would automatically give you an extra chance to inspect your engine during the year.

Learn from the mistakes of other pilots. You won't live long enough to make them all yourself.

September, 2014

L-3's Lynx Promises Low-Cost ADS-B Path

Lynx is described by L-3 as a single-box solution for ADS-B compliance with pricing starting at under $2,000. That will provide buyers with ADS-B Out capability and a WAAS GPS source to meet the 2020 equipment rule. Lynx can be upgraded with optional capabilities for display of traffic and weather information in flight, and more.

READ MORE

Aspen Avionics Expands ADS-B Product Line

EAA AirVenture - Oshkosh, WI, July 28, 2014: Aspen Avionics announced today it has expanded its ADS-B product line to include more options to meet the NextGen ADS-B mandate.
READ MORE

BendixKing Announces ADS-B Products, KSN 770 Cert

The new ADS-B products are called the KGX series and there are four products to choose from. The KGX 150 is a transceiver for ADS-B for aircraft operating below 18,000 and is equipped with a WAAS-capable GPS receiver. The KGX 130 has the same capability, but without the GPS receiver. Both are capable of transmitting data wirelessly to cockpit tablets. The new product series can be paired with existing transponders and some panel display units. Gould said prices range from $1489 to $4069, with an additional $349 for wireless capability.

Gould also said BendixKing will shortly receive TSO and STC approval for its KSN770 receiver and deliveries to dealers are expected by the end of August. **READ MORE**

Avidyne IFD540 GPS Navcom Receives FAA Certification, AML-STC

The IFD540 joins Avidyne's TSO'd avionics, which include the AMX240 audio panel andAXP340 Mode S ADS-B transponder, and all of these units are plug-and-play compatible. This means installation requires only removing existing avionics, inserting the new Avidyne units into the existing tray, testing them and then updating logbooks to reflect the installation. The IFD540 replaces Garmin's GNS530 and fits in the same mounting tray. Price of the 10-watt, 8.33-kHz IFD540 is $16,995; a 16-watt transmitter is optional. While the IFD540 can use the existing antenna, Avidyne offers antennas for an additional charge if needed. READ MORE

FreeFlight Receives TSO for RANGR ADS-B Receiver

FreeFlight Systems announced today at AirVenture that the FAA has granted Technical Service Order (TSO) approval to the company's RANGR FDL- 978-RX ADS-B receiver with optional built-in WAAS GPS. The system provides what FreeFlight described as an affordable and flexible way to add ADS-B In traffic and weather capabilities to aircraft with certified 1090ES or UAT ADS-B Out transmitters. The list price for the RANGR FDL-978-RX without the integrated WAAS GPS is $1,495 and $3,295 with the integrated WAAS GPS. **READ MORE**

FltPlanGo

This app for the iPhone is completely FREE. Unlike ForeFlight, WingX, or Garmin Pilot, there is no subscription fee. It actually has much of the functionality of the above apps, but in our opinion, the interface is not as intuitive or usable. This could just be that we have not used the app enough to acclimate to its interface.

First, flight plan using www.FltPlan.com and your plan is readily available on the app. This is somewhat clunky, as dealing with FltPlan.com on the iPhone is tedious. The illustration to the left shows the depth of information presented when querying a specific airport. Nice summary and sufficient detail.

All of the digital charts are available. NOTAMS, Wx, TFRs, SUAs, Approaches, Departures, Arrival Routes and Departure Routes are accessible for FREE. We loved it that Canada is also included. Canada costs $150 per year on apps like ForeFlight.

You can zoom in/out with pinching and performance is satisfactory. IFR High and Low charts are also available.

Some Mooney pilots like tools at their fingertips and ***FltPlanGo*** does not disappoint.

CHECKLISTS

We all love checklists and they are an important part of any pre-flight and flight. You can download and/or create custom CheckLists, including those for all phases of flight; both normal and emergency lists. We like that this is included in the app. You can buy separate apps for this, but the integration puts it at your fingertips. **As of this writing, there were only a handful of existing Checklists, and none of them were for a Mooney.**

Moving Maps

FltPlanGo supports moving maps and even includes "breadcrumbs" so you can mark your flight path. *ForeFlight* only recently added this capability.

All in all, this is a pretty darn good app, especially for the price (i.e., FREE). Why not give it a test drive?!

Cool pic!!

Don't Try This in Your Mooney!

Mooney Instructors Around The Country

Arizona

Jim Price (CFII, MEI, ATP). Chandler, AZ (KCHD). 480-772-1527. Proficiency training and IPCs. Website: www.JDPriceCFI.com

Connecticut

Robert McGuire , Durham, 203-645-2222 cell, rmcguire007@hotmail.com

Winslow Bud Johnson, smgemail@aol.com, 203-348-2356

California

Chuck McGill (Master CFI) located in San Diego, CA 858-451-2742, Master CFI, MAPA PPP Instructor, M20M, M20R, M20TN, Website: Click Here

Don Kaye (Maser CFI) located in Palo Alto, CA, (408)-249-7626, Website: www.DonKaye.com

Geoff Lee, San Martin, 69050@comcast.net

Rodrigo Von Contra, Oakland, (510) 541-7283, Rodrigo@vonconta.com

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Mike Elliott (CFII)Master CFI located in Tarpon Springs, FL, Contact 317-371-4161, Email mike@aviating.com, Quality instrument & commercial instruction, transition training, ownership assistance, plane ferrying

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Georgia

Jim Stevens, USAF, Col, (ret), CFII. Atlanta, Ga area. 404-277-4123. Instrument, commercial, IPC, BFR, transition training. 20 year owner of 1968 M20F.

South Carolina

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A NAFI Master CFI with extensive Mooney experience. He is also an FAA Designated Pilot Examiner and has been awarded the FAA Wright Brothers Master Pilot Award. Wallace is a retired airline pilot and Mooney owner.

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PhD, Specializing in Models C thru J, www.WaldenAviation.com

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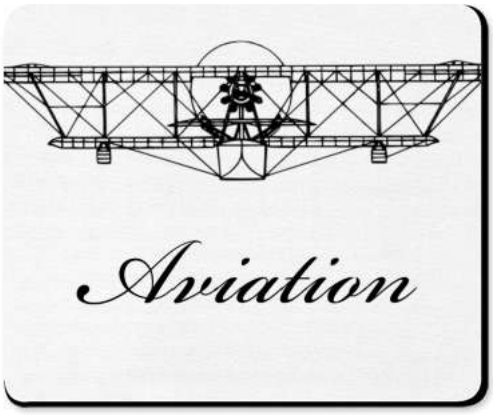
Jerry Johnson, mooney9281V@hotmail.com, 817-454-2426

Vermont

Ted Corsones, tedc@corsones.com, 813 435 8464



LASAR'S Free Site

Check out Lake Aero Styling & Repair's " LASAR" Web Site: www.lasar.com : New under Mooneys for Sale, "List your Mooney for free" and "Mooney Instructors." Also check out Parts, Mods, and Services! LASAR, est. 1975 **(707) 263-0412** e-mail: parts-mods@lasar.com and service@lasar.com --

"LIKE" us on Facebook!!!

Airworthiness Directive (AD) 2014-CE-020-AD and Mooney Service Bulletin M20-318, for <u>some</u> M20R, M20TN, M20M, M20C and M20E. CLICK HERE for the AD

Click on the Service Bulletin for details, or go to:
http://www.mooney.com/wp-content/uploads/2014/06/M20_318_v6.pdf

MOONEY INTERNATIONAL CORPORATION

SERVICE BULLETIN

165 Al Mooney Road North
Kerrville, Texas 78028

THIS BULLETIN IS FAA APPROVED FOR ENGINEERING DESIGN

SERVICE BULLETIN M20-318
Date: June 2, 2014

SUBJECT: Outboard Empennage Attach Fittings on some production M20R and M20TN Aircraft and procured through Mooney Service Parts.

MODELS/ SN AFFECTED: Mooney M20R – Serial Numbers 29-0513 thru 29-0519
Mooney M20TN – Serial Numbers 31-0101 thru 31-0127
Procured Parts – Serial Numbers M20M 27-0057, M20R 29-0141, M20C 2313, M20E 761

TIME OF COMPLIANCE: **WITHIN NEXT 10 HOURS OF FLIGHT**

INTRODUCTION: During Post-Hibernation inspection of production line aircraft, three outboard empennage attach fittings, were found to be out of tolerance. These attach fittings are used on current production M20R and M20TN Airplanes, as well as through the Mooney Service Parts Department. We are issuing this Service Bulletin because we have determined these parts are not manufactured to Mooney's Type Design. This will require an inspection, and if found to be discrepant, corrective action taken. **The attached compliance card needs to be filled out and returned to Mooney International Corporation upon completion of this Service Bulletin M20-318.**

INSTRUCTIONS: **Read entire procedures before beginning work.**

NOTE:

All work to be done in accordance with FAA AC43.13-2B.

<u>STEP 1 - Empennage Outboard Attach Fitting(s) - Inspection:</u>

1.1. Turn master switch – OFF.
1.2. Remove LH and RH empennage fairing and inspection panel(s).
1.3. Remove empennage assembly per applicable Mooney Service and Maintenance Manual, (refer to Chapter 53). Stow empennage onto a cradle making sure assembly is properly secured while performing the work described in this service bulletin.
1.4. Measure thickness of each outer empennage attach fittings 350061-007 (LH) and 350061-008 (RH) with an appropriate micrometer or caliper. The thickness requirements are .190" +/- .010" (refer to Figure SB M20-318-2).
1.5. If both attach fittings are within tolerance, proceed to STEP 1.7 of this service bulletin.
1.6. If one or both attach fittings are out of tolerance, proceed to STEP 2 of this service bulletin.
1.7. Reinstall Empennage Assembly per applicable Mooney Service and Maintenance Manual refer to Chapter 53 with new mounting hardware found in the M20-318-001 Service Bulletin kit. Shim as required with NAS1149F0463P and NAS1149F0432P Washers. One minimum each end of 914081-003 Bushings, 3 total maximum per side (refer to Figures SB M20-318-1 & 2) – Proceed to Step 2.9 of this Service Bulletin.

<u>STEP 2 - Empennage Outboard Attach Fitting(s) - Removal and Replacement:</u>

2.1. Remove tailcone fairing by drilling out Avex rivets 1691-0410 per section 51 of the applicable Mooney Service and Maintenance Manual, (refer to Figures SB M20-318-1 & 3).
2.2. Remove tailcone skin rivets MS20470AD (as required) to access the empennage attach fittings per section 51 of the applicable Mooney Service and Maintenance Manual, (refer to Figures SB M20-318-1 & 3).

Mooney M20C Price Trends

Editor's Warning: This may be distressing to small children

Mooney M20C

Single Engine Piston

Years Manufactured: 1962-1978

Number of Pre-Owned Aircraft For Sale:	10 (Click to View)
High Asking Price:	$49,500 (1975 / 3,042 hrs)
Low Asking Price:	$500 (1969 / 4,300 hrs)
Average Asking Price:	$35,810

5-Year Average Asking Price Trend